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Does Oil Promote or Prevent Coups? the Answer Is Yes

Frode Martin Nordvik*

Abstract

A large literature investigates the relation between oil and conflict, yet no empirical study has found any link between oil and coups d'état. Using a new data set on oil production separated into onshore and offshore volumes, oil price shocks are seen to promote coups in onshore-intensive oil countries, while preventing them in offshore-intensive oil countries. A likely mechanism is that onshore oil motivates military build-ups, while offshore oil does not. From a political leader's point of view, a large military is a double-edged sword, because it may turn against him and stage a coup.

JEL codes: Q34, Q41, D74, H56, O17

Keywords:: political economy, natural resources, coups d'état, military spending

A striking feature of cross-country coup data is that eight of the ten countries that have experienced the most coups since 1950 are oil producers, see Figure 1. Furthermore, the output of seven of these oil producing countries derives largely from onshore oil deposits. Yet existing studies of oil and political conflict are unable to identify whether oil rents

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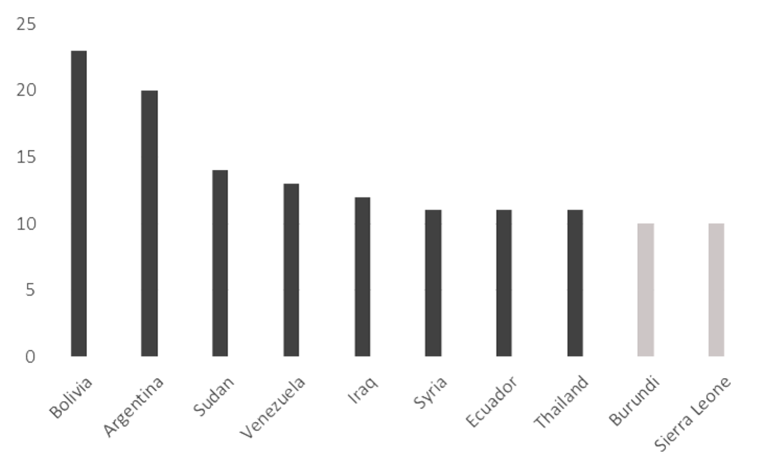
Figure 1. *Top 10 Coup Countries 1950-2012*



Note: The Figure ranks the 10 countries with the highest number of coup attempts over the period 1950-2012. Dark grey bars represent oil-producing countries, while light grey bars represent non oil-producing countries.

promote coups. The most recent examples are studies by Bazzi and Blattman (2014) and Cotet and Tsui (2013). The latter find no robust link between aggregate oil reserves and the occurrence of coups, while the former find zero effect from commodity price shocks on coup likelihood in oil-rich countries. In this paper, I analyse whether the *location* of oil deposits matter for the frequency of coups. The paper's key innovation is to employ new industry-licenced oil data that disentangles oil production into onshore and offshore volumes. This allows me to study the association between coups and oil's location in a panel data set of about 190 countries in the period 1950-2012. After disentangling oil production into onshore and offshore volumes, I exploit plausibly exogenous variation in the world price of crude oil, weighted by countries' average intensity of onshore and offshore extraction to identify the heterogenous effects of an oil price shock on coups. A main finding is that an exogenous shock in the price of crude oil increases the likelihood of a coup for countries with a higher intensity of onshore oil production, while an oil price shock lowers coup likelihood for countries with a higher intensity of offshore oil.

Common to onshore and offshore oil is that both provide rents to the government. A key difference, however, is that onshore oil facilities are difficult to defend, and hence creates an incentive to build a strong military. First, it is well known that *onshore* oil deposits are vulnerable to theft by insurgents (Le Billon, 2001). As a very recent example, consider the IS terrorist group in Iraq and Syria which have exported sizeable volumes of oil from captured onshore oil fields to fund their operations.[1] *Offshore* oil fields, on the other hand, do not seem to offer funding opportunities to rebels, the reason being their location far from land, and the physical characteristics of the oil rigs. While onshore oil can be loaded on to trucks and transported to black-market customers,[2] this is not a feasible option for offshore oil.

Second, onshore oil is also susceptible to pure sabotage. Numerous attacks against onshore oil installations are carried out each year without any clear motivation other than to voice opposition against the ruling regime.[3] Thus, land-based natural resources provide insurgents with an opportunity to directly voice their grievances through sabotage, or to capture oil revenue through the illegal appropriation of oil fields. Hence, onshore oil creates incentives to build a strong military, while offshore oil does not.

Rising oil prices increase resource rents, making the state wealthier. This may create incentives among the political elite to capture it, as described in Bates (2015) and Besley and Persson (2011). However, linking oil price shocks to coups d'état in oil-rich countries has so far resulted in inconclusive evidence. Bazzi and Blattman (2014) find no evidence of a link between a price shock in fuels on the probability of coup d'etat. The same conclusions are reached using oil reserves, as seen in Cotet and Tsui (2013) and fuel

[1]Reuters, July 23 2014, "Oil smuggling finances Islamic State's new caliphate".
[2]Wall Street Journal, September 16 2014, "Islamic State Funds push Into Syria and Iraq With Labyrinthine Oil-Smuggling Operation".
[3]Financial Times, May 4 2014, "Theft and sabotage lead Nigeria into an oil crisis".

exports, as seen in Svolik (2015), as explanatory variables. One possible interpretation of these non-results is that the net effect of oil on coups could be nulled out in an analysis where offshore and onshore resources are lumped together into one single resource wealth measure, be it fuel exports or aggregate oil reserves. Or analogously when the price of oil is not weighted by the type of resource to allow for possible heterogenous effects. Indeed, using the new oil production data, and aggregating the onshore and offshore oil production variables that I use in this paper into one single variable, and weighting the oil price innovations by this aggregate, my analysis confirms the previous non-results.

The existing theoretical literature on natural resources and conflict focuses largely on civil war, and not coups (Aslaksen and Torvik (2006); Van der Ploeg and Rohner (2012)). Some exceptions are Acemoglu *et al.* (2010a) and Gallego and Pitchik (2004). In fact, two prominent papers (Acemoglu *et al.* (2010a); Acemoglu *et al.* (2010b)) develop theory where one fundamental claim is that a dictator needs to build a large military in order to stay in power and to avoid a costly transition to democracy. But a strong military is a double-edged sword; it can be effective in preventing transition to democracy and/or to defeat rebellions, but it also creates, as (Acemoglu *et al.*, 2010a, p. 2) note 'a political moral hazard problem because it can turn against the elite and take direct control of the government'. In Gallego and Pitchik (2004), the probability of a coup increases in the number of "kingmakers", an elite group whose members compete for the dictators position.

To support my argument, I explore the hypothesis that, because regimes in countries rich with onshore oil have an additional incentive to build a strong military branch, there is an increased risk the military may be tempted to stage a coup against the regime. Indeed, I find a significant positive correlation between levels of onshore oil production and military spending, but a low correlation for offshore oil. Also, simple summary statistics confirm a link between onshore oil and defense spending. Countries that produce crude oil only from onshore oil fields spent on average 4.0 % of GDP on defense during the sample period, while countries that produce oil only from offshore oil fields spent on average 2.3 %. To identify a possible causal effect of military spending on coup likelihood, I test the mechanism in a more rigorous framework, using an instrumental variables framework. I instrument variation in the level of military spending by cross-country variation in the intensity of onshore oil production, weighted by the global price of oil. In the first stage, I find that oil price shocks increase military spending as share of GDP in onshore oil-rich countries, but the opposite is true for offshore oil-rich countries. In the second stage, using military spending instrumented by the location-weighted oil price shocks lend support to the main hypothesis: plausibly exogenous increases in military spending appear to increase the incidence of coups d'etat. By symmetry, an exogenous decrease in military spending as share of GDP reduces the threat of coups.

While this paper is about coups, the study fits well with the branch of the resource curse literature that links oil and primary commodities to conflict (e.g. Fearon and Laitin (2003); Collier and Hoeffler (2004); Ross (2004); Lujala (2010)). Common to virtually all previous contributions is their failure to take into account the location of natural resource extraction − or any other sources of oil heterogeneity for that matter. A few exceptions are Lujala (2010), who studies the outbreak and persistence of civil wars, and Caselli *et al.* (2015), studying inter-state wars and the location of oil fields. However, the difference between coups and civil war is that violence in civil wars is two-sided, between one insurgent (or several) and a government (Besley and Persson, 2011), and often takes place in remote corners of a country. Inter-state wars differ in that they involve two-sided conflicts between different states. In contrast to civil war, coups have their origin *within* a nation's political elite. Moreover, both Lujala (2010) and Caselli *et al.* (2015) lack data on onshore and offshore production *quantities*, but rely on location of oil fields and the number of oil fields onshore and offshore, independent of the quantity of oil. The current analysis, however, uses information on oil production volumes at the two different types of locations.

This paper also adds to the literature on the causes of coups by providing empirical evidence supporting recent theoretical work (McMahon and Slantchev, 2015) and (Piplani and Talmadge, 2016), which claim that interstate wars should reduce the risk of coup attempts. Poverty, inequality and political fractionalization are more structural conditions that make societies more coup-prone (Jackman (1978); Londregan and Poole (1990); Huntington (1995); Acemoglu and Robinson (2001); Belkin and Schofer (2003)). Coups are particularly common in non-democratic regimes, but have also occurred in democracies, as well as in transitional regimes (Sutter (2000); Hiroi and Omori (2013)).

Moreover, I also improve the methodological approach of previous work. In Cotet and Tsui (2013), country fixed effects are included in the estimation but time fixed effects are not properly accounted for. Since annual coups in the world have trended downwards since the 1960s, this warrants the inclusion of a common time trend in the analysis. Additionally, OLS can be inappropriate for count data since it can predict negative counts and might yield inefficient estimators. Hence, this study uses a fixed effects negative binomial regression, which is better suited for discrete counts such as coups (King, 1988).

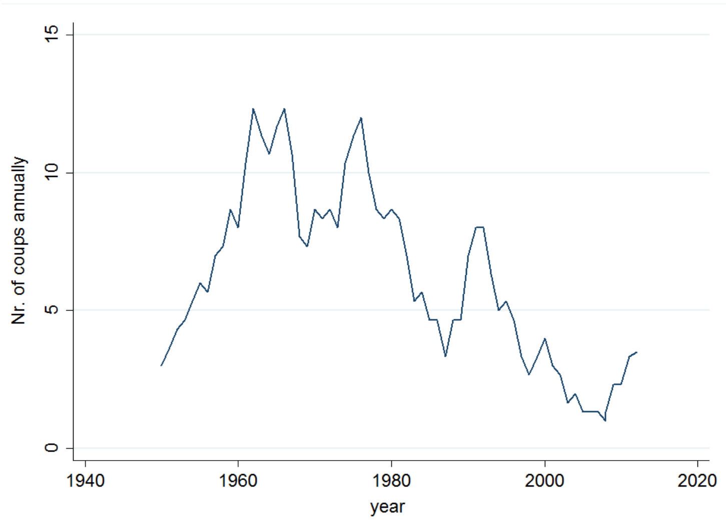
Lastly, the paper relates to the broader literature on the effect of political instability on economic performance. In this literature, Alesina *et al.* (1996) documents the adverse effects of political instability, of which coups is a main source of variation, on economic growth - a finding that has been confirmed also by others (e.g., Aisen and Veiga (2013)). I advance this literature by identifying how political instability can be traced back to the location of natural resources.

The paper proceeds as follows. Section 1 covers the data and coup definition as well as a describing the oil data set and the military spending data. Section 2 outlines the empirical estimation framework, while section 3 provides the main results from the estimations, along with a range of robustness tests and extensions. Section 4 present results from an instrumental variable (IV) framework where military spending is instrumented by the location-weighted oil price shocks. Section 5 concludes.

1 Data and Definition

1.1 *Coup Data*

Figure 2. *Annual Coups in the World, 1950-2012*



Note: A three-year moving average of annual coups in the world, data from Powell and Thyne (2011).

The main dependent variable in this paper is the number of observed coup attempts, successful or not, in country i at time t.[4] Hence, the data covers both successful and failed coup attempts. Success is defined as coup events where coup-makers were able to hold on to power for at least seven days. The coup data were compiled by Powell and Thyne (2011), and covers the period 1950 to 2012. Coup is defined as "Illegal and overt attempts by the military or other elites within the state apparatus to unseat the sitting executive".

Essential to a coup attempt is the control of all or part of the armed forces or other military elements. Unlike a revolution, which is usually achieved by large numbers of people seeking basic political and economic change, a coup is a change in power from the top that, if successful, results in the abrupt replacement of the ruling elite. As such, a coup rarely changes a nations fundamental social and economic policies (Encyclopedia Britannica, 2014). Also, rebel insurgencies that result in coup attempts are exempt from the definition used in this data set, unless the coup attempts were supported by any within-government agencies. For my purposes, a coup attempt is an observable measure of political instability.

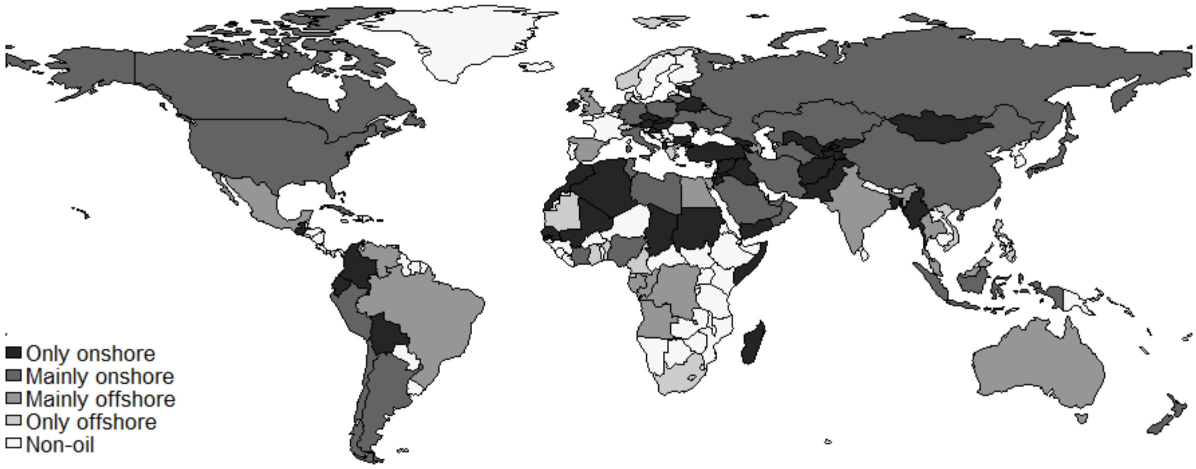
The distribution of coups has an excess of zero observations, and positive observations consist mainly of country-years with one single coup attempt. This can be seen in figure A7 in the appendix, where the frequency distribution of coups is plotted for all years with at least one coup attempt. Coups are the most prevalent form of non-democratic regime change in the world. The total number of coup attempts in the data set is 383, and the total number of observations is 11604 , implying that the unconditional probability of experiencing a coup attempt is in the data is .033. Hence, on average, a coup occurs

[4]Throughout, coups d'état will be referred to simply as "coup". Also, see summary statistics in A1 in the appendix for more details about the coup data.

every 30 years in the data, for each country. In this paper, this is referred to as the mean *coup rate* or frequency of coup attempts. The corresponding mean success rate is 48 % during the entire time span. Figure A5 in the appendix is a world map displaying the historical occurrence of coup attempts throughout the world. Geographically, almost three quarters of these coup attempts have been observed in Africa and Latin America, with 41 % in Africa and 31 % in Latin America. Figure 2 shows that the number of annual coup events worldwide has declined since the 1960s, when coup attempts were particularly rife. However, since 2008, there has been a rebound in the number of coups globally, partly owing to the Arab uprisings in 2011.

1.2 *Oil Data*

Figure 3. *Onshore and Offshore Oil Countries*



Note: Based on mean annual production levels in barrels per capita for time period 1950-2012. Mainly onshore (offshore) refers to countries in which more than 50 % of total production is from onshore (offshore) sources. Data is from Rystad Energy (2014).

The global oil production series decomposed into onshore and offshore sources is provided by Rystad Energy's UCube database (2014). Rystad is an independent oil and gas consulting services company headquartered in Oslo, Norway. They in turn have collected the production data from oil and gas companies' annual reports as well as authorities'

Table 1. *Means of Polity2 and Coups by Oil's Location*

Location	Mean polity2	Mean coup	N
Only onshore	-0.61	0.075	37
Mainly onshore	-0.15	0.043	28
Mainly offshore	2.33	0.036	16
Only offshore	0.83	0.05	12
Non-oil	0.82	0.037	63

Note: Only onshore (offshore) refers to producers who never produced offshore (onshore) oil. Mainly onshore (offshore) refers to countries who on average have produced more onshore (offshore) than offshore (onshore). Mean coup refers to the total number of coup events divided by the total nr. of country-years for the subsample in question.

historical production accounts. Figure 3 is a map of countries that ever produced oil, categorized in terms of onshore and offshore oil production intensity. Clearly, many countries produce from both onshore and offshore sources. Africa and Middle East is where most of the strictly onshore oil countries are found, while most of the very large producers, such as Saudi Arabia, Russia and the US produce from both onshore and offshore oil fields.

Table 1 displays some comparative statistics for the different types of oil producers. The polity2 score performs relatively poorly for countries with only onshore oil, and is the highest for mainly offshore oil countries. However, on a scale ranging from -10 to 10, the differences are small, and they are not significantly different from each other. The average coup prevalence is also broken down for different types of oil producers. The mean coup prevalence is the highest for only onshore countries, and the lowest for countries with mainly offshore oil extraction.

Historically, the volume of onshore oil production is higher than offshore oil production, and today offshore volumes are about half the volume from onshore sources.[5] Also, the timing is different. It was not until the 1960s and 1970s that output from offshore oil fields reached significant levels, relative to the volumes from onshore sources. Perhaps

[5]See Figure A6 in the appendix for a graphical display of historical onshore and offshore oil production measured in thousand barrels per day.

surprisingly, countries below the mean democracy level have an eleven times higher average accumulated offshore oil production than their democratic counterparts, and similarly for onshore oil. This suggests that, with the aid of foreign oil majors, weakly institutionalised countries have been able to develop both offshore and onshore oil reserves. An illustration of this is Chevrons presence in Venezuela since the 1920s, or Royal Dutch Shell's operations in Nigeria since 1937. As figure 3 displays, many countries that have produced oil have been endowed with both onshore and offshore oil, and both onshore and offshore producers are found in all major regions.

The annual oil price series is retrieved from BP Statistical Review. It is an average of four global oil price reference prices, namely, Dubai, Brent, Nigerian Forcados and West Texas Intermediate (WTI). Several econometric diagnostics confirm that the oil price is a persistent time series. The series has an autocorrelation coefficient of .96. An augmented Dickey Fuller test indicates that the unit root null hypothesis cannot be rejected at any conventional levels of confidence. Other tests, such as the DF-GLS test and the Phillips-Perron test yield the same results. Applying the same tests on the first-difference of the oil price series gives evidence against a unit root at the 99.9 % confidence level, indicating that the first-difference of the oil price is stationary. I therefore proceed under the assumption that the annual change in the price of oil follow a stationary process, but that the oil price series in levels follow a random walk. Hence, annual percentage innovations in the oil price can plausibly be interpreted as oil price shocks. The global copper price series employed to instrument the oil price in section 4 is downloaded from the US Geological Survey (USGS) and covers the years 1960 - 2012.

1.3 *Military Spending Data and Additional Controls*

In order to explore the potential link between onshore oil, the military and coups, I use recently released data from Stockholm International Peace Research Institute (SIPRI), with coverage from 1950 to 2012 and for 159 countries. The data measures the share of GDP allocated to defense and military purchases.

As a robustness, I also add a battery of controls that are assumed to predict variation in coup events. The following determinants of coups are used: log of GDP; log of population; Polity IV democracy index from the Center for Systemic Peace, size of oil discoveries from the Association for the Study of Peak Oil (ASPO), a dummy for ongoing civil war from Gleditsch Correlates of War, version 1.52, and a dummy for instances of interstate militarised disputes, version 4.1, also from The Correlates of War Project.

2 Empirical Strategy

2.1 *Main Analysis of Oil and Coups*

The coup variable analysed is a standard count variable, representing the number of coup attempts for country i at time t. A useful approximation to the underlying data generating process for an event count is usually taken to be a Poisson distribution, a distribution that is discrete and is restricted to positive values. King (1988) lists several problems associated with using OLS models on event count data. First, OLS assumes a linear relationship. Imposing a linear relation often results in predicting event counts that are less than zero and therefore meaningless. Second, OLS introduces inefficiencies in the estimates because it does not take into account the underlying Poisson distribution of the disturbances. According to King (1988), the result can be that OLS estimators get both the sign and size wrong.

To avoid this source of impreciseness in the estimates, I use a negative binomial regression with fixed effects, as proposed by Cameron and Trivedi (2013) as a baseline regression.[6] Because of overdispersion in the distribution of coups, the negative binomial regression model fits better than the pure Poisson specification.

The negative binomial distribution can be regarded as a general version of the Poisson distribution with an additional parameter allowing the variance to exceed the mean. In our case the mean of the coup variable is 0.033 and the variance is 0.04. I therefore specify the following dynamic panel count data model:

$$y_{it} = exp(\beta_0 y_{it-1} + \beta_1 \theta_i^{onshore} \Delta \log Pr_{t-1} + \beta_2 \theta_i^{offshore} \Delta \log Pr_{t-1} + X_{it} + \mu_i + \delta_t + e_{it}), \quad (1)$$

where y_{it} is the nr. of coups in country i in year t, restricted to be a positive integer. $\theta_i^{onshore}$ and $\theta_i^{offshore}$ are the weights for the average intensity of onshore and offshore oil production. The θ-indicators are the annual production of onshore and offshore oil, measured in barrels per capita, averaged over the time period studied. A straightforward interpretation of $\theta_i^{onshore} \Delta \log Pr_{t-1}$ and $\theta_i^{offshore} \Delta \log Pr_{t-1}$ is that these represent proxies for, respectively, onshore and offshore oil income shocks. The reason for using the lagged percentage change in the price of crude oil is that contemporaneous changes may suffer from reverse causality. If an oil producing country experiences an unexpected coup at time t, it may lead to fears of future supply shortfall, and a resulting spike in the price of

[6]An early application of count regression in a panel data setting is found in Hausman *et al.* (1984), in a study of patents.

oil at time t. Instead exploiting the percentage variation in the oil price one period ago, the risk of such an effect is diminished. The vector X_{it} contains time-varying country-level controls, μ_i are the country-fixed effects, δ_t are the year-fixed effects and e_{it} is an error term which is clustered at the country level. Adding country fixed effects allows the model to control for any time-invariant unobserved cross-country heterogeneity. The omitted variable bias arising from the exclusion of any stable confounding factors on the country level, is thus removed from the estimation. In our setting, time-invariant country-characteristics that may be important to control for, are factors like political culture and norms as well as historically predetermined conditions such as, e.g., colonial past, geographic traits and social structures that have been relatively stable over the time span. The time fixed effects are mainly included to control for a common time trend in the evolution of coups. From Figure 2, showing the annual number of coups globally since 1950, it is clearly necessary to control for time trends, since the number of coups seem to have declined more or less steadily since the early 1960s.

Because of the potential Nickel bias (Nickell, 1981) when estimating a fixed effects model with a lagged dependent variable, I also estimate a linear dynamic model using the Arellano-Bond estimator as a robustness.

3 Results

3.1 *Main Results*

The baseline results in the following section refer to the estimation of model 1, where the dependent variable is the number of coups in country i at time t; the results are displayed in Table 2. Country and year fixed effects are included in all estimations. Column 1 shows the estimation where the percentage changes in the oil price are weighted by the mean aggregate oil production per country. The coefficient is insignificant and close to zero, echoing previous results, such as Cotet and Tsui (2013) and Bazzi and Blattman (2014) who find no effect of aggregate oil reserves and fuel price shocks, respectively, on the number of coup attempts.

In Column 2, the only change from Column 1 is that the weighting variable mean total oil production per capita is disentangled into mean onshore and offshore production per capita, and each interacted with lagged percentage changes in the price of crude oil. Importantly, this yields highly significant coefficients, but with opposite signs. Oil price changes weighted by annual mean onshore oil production per capita has a positive effect on the likelihood of coups. For the offshore oil weighting, the reverse is true: an oil price shock in countries with higher mean annual offshore production impacts the likelihood of coups negatively. In a negative binomial regression, the interpretation of the coefficients requires that one takes the exponential of each coefficient. Doing so yields the following results: For a one unit increase in the price of oil, moving from having no oil production to having an onshore oil production on the same level as Iraq, carries the side-effect of increasing the *rate of coup attempts by 70 % of its mean.* This means that a coup attempt happens once every 17 years, on average, compared to an unconditional mean rate of coup attempts every 30 years for the entire sample of countries.[7] In the data, Iraq had a total of 12 coup attempts over the course of 63 years. The result for offshore oil is the following: For a one standard deviation increase in the price of oil, moving from having no oil to having offshore oil production at the level of Azerbaijan, decreases the *frequency of coup*

[7] Interpretation of coefficients from a negative binomial regression requires one to take the exponent of the coefficient to find the average impact on the coup *rate*. Hence, the model is not a probability model. For a coefficient of 0.013, this gives $e^{0.013}$ =1.013. Since the coefficients are multiplicative, they must be raised to the power of plausible values of mean onshore intensity and oil price innovations, it gives the factor by which the coup risk is increased compared to some reference level.

attempts by 52 % of its mean. This corresponds to moving from one coup attempt every 30 years which is the unconditional mean to once every 60 years. In the data, offshore producer Azerbaijan had two coup attempts over the course of 63 years. Hence, the model accurately predicts the rate of coup attempts within-sample for Azerbaijan.

In Column 3, I add lagged coups, to account for any omitted autocorrelation in annual coups. The lagged term is not very close to one, but positive and highly significant, indicating that having experienced a coup one year increases the risk of another one shortly after.

Column 4 shows robustness results for a linear dynamic panel model, using the system GMM technique. Since it is a linear model, and not a count data model, I expect the coefficients to change compared to using a non-linear count data framework. Indeed, the size of the coefficients are reduced, and standard errors are larger, but both the onshore and offshore interaction terms remain significant at the 10 % level. The post-estimation diagnostics are reassuring. Importantly, the Hansen J-statistic indicates that the overidentifying restrictions are valid in this specification.

Table 2. *Oil Price Shocks, Location of Production, and Coups*

	(1) Negbin	(2) Negbin	(3) Negbin	(4) SYS-GMM
$Dep.var: Nr.of\, coups_{it}$				
$Total\, Oil * \Delta\ Oil\, price_{t-1}$	-0.000			
	(-0.38)			
$Onshore * \Delta\ Oil\, price_{t-1}$		0.013***	0.014***	0.0006*
		(3.34)	(3.53)	(1.70)
$Offshore * \Delta\ Oil\, price_{t-1}$		-0.037**	-0.037**	-0.001*
		(-2.84)	(-2.98)	(-1.75)
$Lag\, nr.of\, coup\, attempts$			0.43***	0.369
			(4.87)	(1.24)
Country FE	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes
Observations	11604	11604	11604	11604
Nr. of countries	190	190	190	190
Nr. of instruments	-	-	-	68
Hansen	-	-	-	2.38
AR(1)	-	-	-	0.01
AR(2)	-	-	-	0.396

z statistics in parentheses in Columns 1-3, t statistics in Column 4.

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes: The dependent variable is the nr. of coup attempts at time t in country i. The method of estimation in Columns 1-3 is negative binomial regression, in Column 4 system-GMM (Blundell-Bond). The values reported for AR(1) and AR(2) are the p-values for first- and second-order autocorrelated disturbances in the first differences equations. Hansen shows the test results for the validity of the overidentifying restrictions. Standard errors are clustered at the country level.

3.2 *Robustness*

First, I let the sample of countries included in this analysis respond to various placebo-treatments. It is essential that there is no effect of an oil price shock weighted by onshore and offshore oil intensity when there should be none. In Table A2, Column 1, the main result of this paper is reiterated. In Column 2, the same model is estimated, but this time using an oil price shock in period *t+1* as a placebo. The resulting coefficients are close to zero and statistically insignificant. In Column 3, oil price variation two years in the future are allowed to affect coup likelihood today. This again yields estimates that are statistically insignificant and close to zero. Finally, in Column 4, I let oil price shocks two periods ago affect the coup likelihood today. This results in estimators for onshore and offshore weighted oil price shocks around zero. In sum, the responses to the placebo treatments support the claim that there is a robust effect of a location-weighted oil price shock on coup likelihood.

The price of oil is determined in the global market by both supply and demand shocks. However, a supply shock could be due to unrest in any of the major oil producing countries, introducing endogeneity of oil prices with respect to coups. Therefore, it is necessary to filter out supply shocks from the oil price series. Oil supply shocks impact the price of oil, but a supply shock specific to the oil market does not impact the global price of copper or steel. The basic idea, as seen in Newell *et al.* (2016), is to use the annual change in the price of copper, which is a common indicator of global demand, as a demand shifter and instrument for annual changes in the oil price, and predict the price of oil using a least squares prediction.

This new price series, $\widehat{Oil\,price}_t$, reflects global demand shocks in the oil price series, and should be uncorrelated with oil supply developments. In fact, the first-stage regression yields a F-statistic of almost 12, which means the copper price is significant as predictor of oil prices at the 1 % level. Table A3 shows the results of this exercise, where the sample period is from 1960 to 2012[8], hence 10 years shorter than the original sample period. The coefficients on the oil demand shocks weighted by the mean onshore oil production are statistically significant at the 99 % level, and larger in magnitude than the baseline results, yielding a strong effect of an exogenous global oil demand shock on the likelihood of coups. The offshore weighted oil demand shocks are also large and statistically significant. The

[8]This is due to the coverage of the copper price series.

oil price shocks driven by global demand have the expected impact on coup likelihood for both onshore and offshore oil-rich countries. In sum, this suggests that the main result is not driven by potentially endogenous oil price shocks.

Another issue is that aggregating positive and negative oil price shocks together could conceal potential asymmetries in the response to the shocks. Columns 3 and 4 shows the results after censoring the location-weighted oil price series into positive and negative price shocks. The positive oil price shocks interacted with the intensity of onshore production show very similar results as in the baseline. However, the negative oil price shocks are not statistically significant. Recall that we expect a negative oil price shock in an offshore oil-rich country to *increase* the coup risk, while a negative oil price shock should *decrease* coup risk in an onshore oil-rich country. Hence, there appears to be some indication of asymmetric responses, with stronger effects of positive oil price shocks in onshore oil-rich countries on coup prevalence.

A third potential concern would be that the results are due to omitted unobserved cross-country heterogeneity. The inclusion of country fixed effects removes any omitted confounding factors at the country level. However, omitted *time-varying* country characteristics could potentially bias results. Therefore, in Table A4, I add a battery of time-varying controls to check whether the baseline results are biased due to omitted variables. As can be seen, coefficients on the location-weighted oil price shocks are stable throughout Columns 2-5. As expected, income level is negatively associated with coup attempts. Also population size seems to be negatively linked to coup attempts. Also as expected, a country's polity 2 score is negatively associated with coup attempts. Being in a state of civil conflict is a strong predictor of coup attempts. A civil war raises the need for a large military, which in turn elevates conflict levels, which in turn may explain the persistence of civil wars in the post-war period, as shown by Acemoglu *et al.* (2010b). The results show that it also exerts a large influence on the coup likelihood, perhaps further exacerbating political unrest. An oil discovery seems to be negatively associated with coup attempts, but the coefficient is not statistically significant.

Furthermore, I estimate several regressions where I exclude certain country subsamples, and estimate alternative models. First, a robustness exercise is to check if the main results hold when we exclude countries that never produced oil. Since oil price shocks do not affect the state's income to the same degree in countries that do not produce oil, it is a better test of my model to exclude this sample of countries. Table A5, Column 1 shows the results. The coefficients stay roughly the same, but the t-values become somewhat larger, confirming the results from the baseline regression.

Expectations of political unrest in one of the largest oil producing countries in the world could arguably lead to fears about future supply, and possibly oil price increases some time before any actual unrest occurs. To confront this, I exclude the 15 % largest oil producers from the estimation in addition to the countries that do not produce oil. Only very few countries are believed to have any market power in the global oil market, and excluding the top 15 % should remove those that could potentially impact the price on a short term. The result, seen in Column 2, is that the coefficient for onshore oil becomes larger in magnitude, but significance level is reduced to the 10 % level. The offshore oil coefficient is still negative, but not statistically significant in this regression, suggesting that the negative effect on coup likelihood from having offshore oil could be driven by the largest oil producers in the sample.

In Column 3, I limit the estimation to country-year observations when there is no civil war. Civil wars may sometimes trigger coups, and vice versa, but this paper is about the causes and mechanisms behind coups d'etat. In this exercise, I check whether the coefficients change given that a country is not in a state of civil war. Coefficients stay stable also through this exercise.

Another concern is the joint evolution of institutions and education levels within countries over time, consistent with modernization theory (Lipset, 1959) , implying that countries evolving in such a way may experience less coups. First, this would be a within-country *long-term* trend, as institutions and education levels do not change over night. The same applies to the development of oil reserves, which can take several decades in the case of offshore reserves. In Column 4, I control for all country-specific linear trends. The significance and direction of coefficients stay the same also for this exercise.

A potential caveat is that country-years with several coup attempts within one year are relatively few compared to country-years with only one coup attempt. Hence, defining the country-years with coup attempts as an indicator variable, and applying an econometric model suitable for predicting probability is a useful robustness check of sensitivity to model choice. Column 5 shows the result from a fixed effect probability model, where the probability of a coup attempt is modeled using a logistic function, which is linear in the parameters of the model. Also, inclusion of the fixed effects rules out countries with all-zero observations, since the country fixed effect perfectly predicts all-zero coup attempts for those countries that never experienced coup attempts. The coefficients for the location-weighted oil price shocks are large and statistically significant.

Table A6 shows further robustness for the baseline estimation. In Column 1, the upper 10th percentile in terms of coup prevalence is excluded from the sample in order to check that results are not entirely driven by extremely coup-prone countries. This does not appear to be the case as coefficients stay stable also for this sample. Column 2 excludes the 10th percentile in terms of military spending, showing that results are not driven by extreme military spenders in the sample. Column 3 excludes both the upper 10th percentile in terms of coup prevalence and the upper 10th percentile in terms of military spending. The coefficients stay very similar to the baseline estimates.

There is also a possibility that results might be entirely due to a few very large negative or positive oil price shocks. In order to confront this concern, I exclude the 10 % largest positive oil price shocks in the sample period in Column 4. As can be seen, the onshore and offshore coefficients stay roughly the same through this exercise. In Column 5, I repeat the exercise, but this time excluding the 10 % largest *negative* oil price shocks. Also when excluding the extremely negative oil price shocks, the coefficients stay roughly the same as in the original model. Hence, the main results of the paper do not appear to be driven by extreme oil price events.

3.3 *Extensions*

Table A7 in the appendix shows results for different levels of average institutional quality, as measured by the polity2-index. As can be seen, the strongest effect is found for countries at intermediate institutional levels. The effect on coups of an oil price shock in so-called anocracies is almost tenfold the average effect for the full sample. This confirms recent findings in Caselli and Tesei (2016), who find that natural resources do not generate instability in consolidated democracies and in entrenched autocracies, and that one finds the strongest effect of oil wealth on institutional outcomes in intermediate and transitional countries.

Using annual production averaged over the sample period as a weight in the regressions is useful for identification, since there is less cause for concern about reverse causality from coups (a short-term event) and the long-term mean production level. However, it may give rise to an aggregation bias, since I am essentially aggregating production over the sample period. First, such bias could arise if there are trends and temporary spikes in production within a country over the sample period that could inform estimates. Second, if a country only had production in a few years of the sample period, averaging production over the sample period may give a erroneous image of the country's production history. Table A8 addresses these issues.

In Columns 1 and 2, the oil price is weighted by the production from the years when output was above and below the within-country mean production level, respectively. The estimate on the onshore-weighted oil price shock indicates that the effect on coup frequency is stronger when production is above its long-run mean than if output is below its long-run mean. In Column 3, I exclude countries where the average oil production weight is calculated using less than half of sample years. As can be seen, the exclusion of such countries do not seem to alter results. In Column 4, the production level in 1970, onshore and offshore is used as weight interacted with the oil price. The results indicate that the effects are smaller when using production levels from 1970 as weights, but the direction and significance of results are still present.

Table A9 breaks results into geographical regions where the vast majority of coups have occurred. As can be seen, results are most pronounced for Latin America and Africa, and not present for Asia. Around 75 % of all coups have taken place in Africa and Latin America.

Table A10 shows the results using a Poisson model with a separate equation to model the excess zeroes in the data. This type of model is especially suitable for zero-inflated probability distributions such as the coup data. The results are in line with the baseline regression where a negative binomial regression was employed.

One potential caveat of count data models is that they assume country-years with only zeros come from the same data generating process as country-years with non-zeros. However, there could be some structural differences between the countries that have never experienced coups, and those that have repeating occurrences. To explore this, I employ a hurdle model. It estimates two equations, which handle the lower and upper bounding of the dependent variable. The first equation determines the likelihood that a country "clears" the hurdle, and is a part of the sample of countries that do experience coups. If it does not clear the hurdle, it is bounded at zero. The second equation determines the upper bound, and predicts the number of coups, conditional on having cleared the hurdle, and being part of the sample that experience coups.

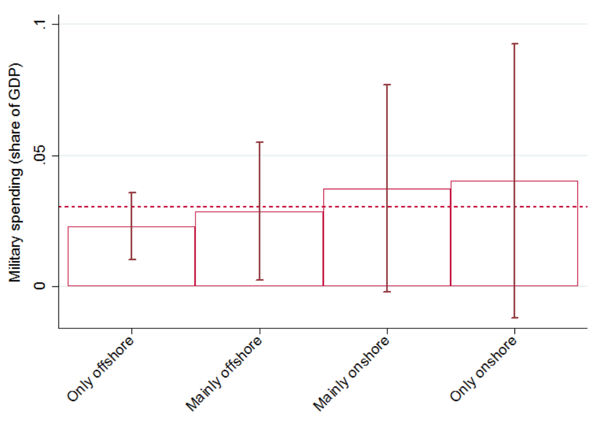
Table A11 present results from the linear hurdle model. Oil price shocks in onshore and offshore countries seem to predict significantly, but with opposite signs the likelihood of clearing the hurdle, or equivalently, of being away from the zero lower bound in terms of coup prevalence. While an oil price shock in onshore intensive countries positively affects the likelihood that the country is a coup-country, and clears the hurdle, an oil price shock in an offshore intensive country reduces the likelihood that a country will be part of the countries that experience coups. While Column 1 shows results for the full sample, column 2 excludes the top and bottom 25th percentile in terms of mean polity2-score. As can be seen in the selection model, the effects are particularly strong for the sub-sample of countries with intermediate institutional quality. Column 3 shows results for the bottom 25th percentile in terms of institutional quality. The hurdle model supports the previous finding that the strongest effect is found among countries in the intermediate range in terms of institutional quality.

4 Military Spending: an IV Approach

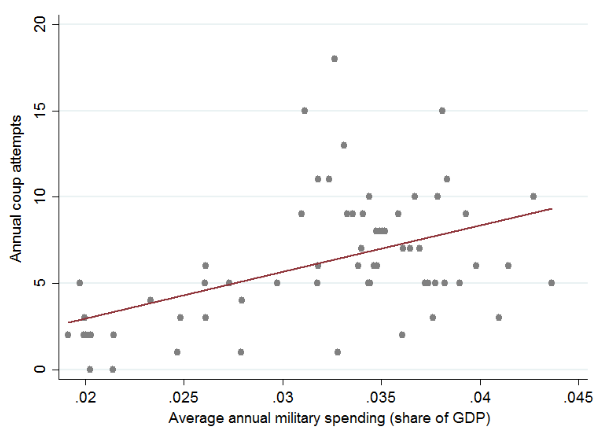
4.1 *Onshore Oil and Military Spending*

Why do offshore and onshore oil have opposite signs in the regressions predicting coup attempts? Roughly 3 out of 4 coups originate in the military (Oberg et al., 2011). Hence, any mechanism that aims to explain variation in coup attempts should include the military.

To reiterate my hypothesis, if a dictator wants to secure the rents from onshore oil, he needs to build a strong army to protect oil fields from rebels and insurgents. However, based on the model in Acemoglu *et al.* (2010a), a strong military may turn against the dictator and stage a coup. Another model proposing this mechanism is Besley and Persson (2011), whose theory of military coups emphasizes a dictator's need to control the military. In their model, only a large military poses a coup threat, contrary to a "tin pot" military which is too weak to stage a coup. For the data to support this proposed mechanism, onshore oil must be associated with higher average levels of military spending. Moreover, onshore and offshore oil must have different impacts on defense spending.



(a) *Oil's Location and Military Spending*



(b) *Coups and Military Spending (1950-2012)*

Figure 4. *Onshore Oil, Military Spending and Coups*

Perlo-Freeman *et al.* (2012) describe several ways in which natural resources can lead to a build-up in military expenditure. First, since oil rents are a source of income independent of taxation of citizens, such revenues are often more easily used for arms purchases than money from ordinary taxpayers. Second, defense spending can be increased in order to protect oil infrastructure from attacks. Third, a regime whose hold on power depends critically on resource revenue, may spend more on the military as a guarantor of regime survival.

Existing empirical evidence suggests that authoritarian regimes spend more on defense than democratic regimes (Hewitt (1992); Goldsmith (2003)). Furthermore, Cotet and Tsui (2013) find that in non-democratic countries, oil discoveries are associated with increased military spending. Ali et al. (2013), studying military spending patterns in the Middle East and North Africa, find that abundance of oil leads to increased military spending.

Broad patterns in the data do seem to suggest a closer link between onshore oil and military spending. The unconditional correlation between mean onshore production per capita and the mean military spending level as share of GDP is .41, which twice the raw correlation between mean offshore oil production and military spending. For a barrel increase in average onshore production per capita over the sample period, a country has on average almost half a percentage unit higher military spending relative to GDP.

Figure 4 a) tells a similar story. Countries with production predominantly onshore have higher defense spending levels than the unconditional mean (illustrated by the dashed horizontal line), while countries producing offshore oil have military spending levels below the sample mean. In fact, countries that produce only from onshore sources have almost double the mean military spending level as share of GDP as countries that only produce from offshore sources. Figure 4 b) shows the broad historical pattern of military spending and coup activity globally, which has a positive correlation of 0.51. In years where there were more coup activity, military spending as share of GDP was higher.

4.2 *Identification*

Clearly, military spending is endogenous with respect to coups, and the broad correlations and plots do not allow for any causal interpretations. Therefore, in order to identify a possible causal link between military spending and the occurrence of coups d'etat, I will exploit the link between the location of oil extraction and military spending. However, using production as an instrument would not satisfy the exogeneity assumption, since the production level within a year could co-vary with the level of political unrest. I will therefore use the plausibly exogenous variation in global oil prices weighted by the long-run intensity of a country's onshore and offshore oil production as instruments for within-country variation in military spending levels.

To estimate the model, I employ a linear Generalised method of moments instrumental variables estimator (IV-GMM) framework that allows for heteroscedasticity of unknown form. The first-stage is estimated according to the following least squares regression model

$$Military_{it} = \alpha_0 + \beta_1 \theta_i^{onshore} \Delta \log Pr_{t-1} + \beta_2 \theta_i^{offshore} \Delta \log Pr_{t-1} + \mu_i + \delta_t + e_{it} \quad (2)$$

Military_{it} is the percentage of GDP allocated to defense spending, while the location-weighted oil price shocks terms are defined as in model 1. μ_i and δ_t are country and time fixed effects, respectively, and e_{it} is an error term clustered at the country level.

To test the strength of the instruments, I estimate multiple first-stage models where the onshore and offshore oil price indices are used as regressors to explain military spending levels using an unbalanced panel of 159 countries from 1950 to 2012. Table 3 shows the results from these tests, along with F-statistics from a test of the joint significance of the two location-weighted oil price shocks. In Columns 1-3, the two instruments appear to be strong predictors of military spending, and the corresponding F-statistics indicate that the two instruments are relevant. While oil price shocks in onshore oil-rich countries increases military spending in GDP, positive innovations in the oil price decrease military spending as share of GDP in offshore oil-rich countries.

Hence, onshore oil-rich nations appear to allocate a higher fraction of every dollar earned by oil windfalls to military spending, while offshore countries reduce the fraction of the windfalls allocated to defense spending.[9] Moreover, an interstate conflict strongly and significantly impacts military spending levels, and increases the fraction allocated to the armed forces by 0.26 percentage point of GDP on average.

[9]Importantly, the absolute *value* of military spending may increase also in offshore oil-rich countries following an oil price shock since GDP more often than not will rise in tandem with oil prices.

Table 3. *Test of Instrument Strength*

	(1) LS	(2) LS	(3) LS
$Dep.var: Military_{it}$			
$Onshore * \Delta\ Oil\,price_{t-1}$	0.004***	0.016***	0.017***
		(5.37)	(8.42)
$Offshore * \Delta\ Oil\,price_{t-1}$	-0.01**	-0.017**	-0.017**
	(-2.11)	(-2.24)	(-2.16)
$Military_{it-1}$		0.60***	0.59***
		(5.23)	(5.20)
$Interstate\,dispute_t$			0.264**
			(2.14)
F-statistic	15.42	34.54	35.47
N	6838	6838	6838
Countries	159	159	159
FE	C/Y	C/Y	C/Y

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 shows estimates from a fixed effects regression of military spending as share of GDP on the two location-weighed oil price variables. Column 2 adds the lagged level of military spending, and Column 3 adds an indicator for militarised interstate disputes. The F-statistics refer to a joint significance test of the two weighted oil price coefficients. Standard errors are clustered at the country level.

The results strongly supports the use of the two weighted oil price indices as instruments for military spending. I therefore set up the following second-stage model:

$$Coups_{it} = \alpha_0 + \beta_1 \widehat{Military}_{it} + X_{it} + \mu_i + \delta_t + e_{it}, \tag{3}$$

where military spending is instrumented using the weighted oil price shocks. The vector X_{it} contains any included instruments. The model estimates country and year fixed effects, represented by the terms μ_i and δ_t, and the standard errors are robust to heteroscedasticity of unknown form.

4.3 *IV Results*

First, in Column 1 of Table 4, I show results from a regression where coups are regressed on military spending as share of GDP, but where the estimator for military spending is likely to be biased upwards due to reverse causality. The coefficient on military spending is large and highly statistically significant. A one percentage unit increase in military spending as share of GDP is associated with almost 10 % increase in the frequency of coup attempts. To illustrate: for a onshore oil-rich country like Iraq, with mean military spending at 7.2 % of GDP, the estimate implies a 45 % higher frequency of coups than in offshore oil-rich Azerbaijan, which has 2.7 % military spending as share of GDP.

Column 2 shows results when using the two weighted oil price shocks as instruments for military spending in a pooled model, without country or year fixed effects included. The coefficient on military spending is very large and positive, and statistically significant at the 10 % level. However, as can be seen, the Hansen test J-statistic implies that I reject the joint null hypothesis that the oil price series are valid instruments with 95 % confidence, i.e., uncorrelated with the error term, and that it is correct to exclude the instrument from the estimated model. Recall that the error term in the pooled panel regression model contains both stable country characteristics and annual aggregate time trends. These are correlated with the two oil price series, since they contain both a stable country characteristic (a country's mean production level), and aggregate time trends (oil price). Hence, it is crucial for the instrumental variables GMM specification to remove any country and year fixed effects from the error term, since this may be correlated with the two excluded instruments.

Table 4. *IV Estimation of Mechanism*

	(1) (Endogenous) Coups	(2) (IV-GMM) Coups	(3) (IV-GMM) Coups	(4) (IV-GMM) Coups
$Military_{it}$	0.09***	3.97*	0.063*	0.061*
	(3.21)	(1.66)	(1.72)	(1.66)
$Interstate\, dispute_t$				-0.03**
				(-2.03)
$Coups_{t-1}$				0.09***
				(3.08)
Hansen	-	3.79	1.07	1.35
N	6838	6838	6838	6838
Countries	159	159	159	159
FE	C/Y	No	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 reports results from a regression of coup attempts on military spending as share of GDP. Column 2 shows the IV regression results when using a pooled specification. Columns 3 and 4 reports the IV estimates, using the weighted oil price series as instruments for military spending with fixed effects on the country-level in Column 3 and on both country and years in Column 4. The first stage specification in all the IV regressions corresponds to Column 1 in Table 3.

Column 3 shows the results for the fixed effects specification, and the J-statistic implies that the instrument is valid, with 95 % confidence.

In Column 4, I add both lagged coup attempts and the indicator variable for interstate disputes as regressors. The coefficient for the instrumented military spending remains the same, while the indicator for interstate disputes has a negative and statistically significant coefficient. A coup attempts appears to be less likely when the military is involved in a military dispute with another state. This is perhaps intuitive. First, an interstate war requires a lot of resources from the military, possibly making it less attractive to attempt a coup. Second, when a country faces the risk of losing an interstate conflict and possibly its sovereignty, the expected pay-off from staging a coup and gaining control of the executive is likely to be smaller. This result is evidence in favor of hypotheses put forward in recent theoretical work on civil-military relations by McMahon and Slantchev (2015) and Piplani and Talmadge (2016).

The effect of military spending on coups is significant and very large. A one percentage unit exogenous increase in military spending as share of GDP increases the frequency of coups by 6.3 percentage points. Moving from having an average military spending level as share of GDP (3.3 % of GDP) to having the level of military spending equal to Iraq's, increases the conditional probability of a coup in Iraq to 0.25. Thus, the model predicts a coup attempt every four years in Iraq on average, which is very close to the actual coup history of Iraq, of one coup every five years on average. Iraq has experienced 12 coups in the course of 63 years. For an offshore oil producer such as Brazil, which started producing offshore in the 1970s and has an average military spending level at 2 % of GDP, the model predicts a coup every 12 years. Brazil has in the sample period experienced a coup attempt every ten years on average. The effect is at least as strong after controlling for annual aggregate shocks in Column 4. Hence, instrumenting annual variation in military spending with plausibly exogenous changes in the global oil price supports the main hypothesis that increases in military spending elevates the risk of coups. For all the IV regressions, Column 1 in Table 3 represent the first stage specification.

4.4 *Specification Concerns*

Since 75 % of all coup attempts have their origin in the military branch, it is natural to assume that the military branch is a key channel through which oil windfalls may affect coup frequency. Furthermore, the notion that only a large and powerful military may stage a coup is also a fundamental assumption in the theory model in Acemoglu *et al.* (2010a). The instrumental variable model makes the assumption that oil price shocks in oil-producing countries affects the occurrence of coups *only* via military spending. However, recall that any direct effect of the weighted oil prices on coups must be present given the covariates that are included in the model. Hence, if there exist a significant direct effect of oil price shocks weighted by onshore and offshore oil production after controlling for country and year fixed effects, as well as other country-level covariates, this would violate the exclusion restriction imposed on the model. The direct effect could stem from a stable country characteristic correlated with the average onshore intensity in the country, affecting coup likelihood when interacted with oil price innovations.

To address these concerns, I test several alternative models where the oil price is interacted with other stable country characteristics that are potentially correlated with having onshore oil. One such country characteristic is being landlocked, which obviously restricts any oil production to onshore oil. The results are presented in Table A12. The estimates on the instrumented military spending hardly changes, and if anything, becomes larger in magnitude. The alternative models support the results from the baseline. Throughout the alternative models, the Hansen J-statistic is small, and I cannot reject the null that the model is well specified at the conventional levels of confidence.

Furthermore, if it is the case that military spending is a key transmission channel of oil windfalls to coup risk, one would expect the two weighted oil price shocks to be insignificant as predictors of coup attempts in oil-producing countries that have low levels of military spending. Unfortunately, no country in the military spending sample has a zero share of GDP in military spending. However, some oil-producing countries have spent small fractions of their GDP on the military in the sample period. To have enough data for estimation, I estimate model 1 on oil-producing countries with a mean military spending level below a threshold of 1.5 %. The overall sample mean is 3.3 %. Some oil-producing countries in this sub-sample are Ghana, Ivory Coast, DR Congo, Bangladesh and Kazakhstan. I also estimate model 1 on the sample with military spending above the threshold, to check if there is a reduced form relationship between the weighted oil price shocks and coups when military spending levels are sufficiently high, as would be expected. The latter should help clarify that the relationship between onshore and offshore weighted oil price shocks and coups are primarily driven by the sample of countries with relatively high military spending levels.

Furthermore, I estimate two placebo IV models, where I use onshore and offshore weighted oil price shocks three years ahead and three years lagged as instruments for contemporaneous military spending level. The results can be seen in table A13. The estimates in Column 1 are imprecise and not significantly different from zero for the sample of oil-producing countries with low levels of military spending. This indicates that there is no direct effect of oil price shocks in oil-producing countries when military spending is low, lending some credence to the exclusion restriction that oil price shocks influence coups d'etat through military spending only. In Column 2, I restrict estimation to the sample of oil-producers with military spending above 1.5 %, and the results are similar to the baseline estimation, and statistically significant. Overall, this exercise provides reassuring, but not bullet-proof evidence that the model is well specified. In Columns 3 and 4, I estimate the placebo models with three years forwarded oil price shocks, and three years lagged oil price shocks as instruments. The results are statistically insignificant, as expected.

5 Concluding Remarks

A striking pattern in the data is that out of the ten countries that have experienced the most coups in the world, as many as eight have produced significant amounts of oil. Yet, the literature has never established any link between oil wealth and coups.

This paper's main contribution is to show that aggregate data on oil production contain valuable information of relevance for the prevalence of coups. However, this information is not utilised unless oil production is disentangled according to the location of oil extraction. The reason is that onshore and offshore oil operations differ in ways that matter for political incentives.

The study shows a positive link between onshore oil and military spending. The hypothesized mechanism is that frequent attacks against onshore oil facilities makes it necessary for political leaders to build a large military, in order to protect oil fields from attacks. But a large military can also spin out of control, turn against the ruling elite, and stage a coup. A test of this hypothesis using recently released military spending data combined with an instrumental variables approach, supports the claim.

However, the potential mechanisms for the established heterogeneous link between oil and coups that have been explored are by no means exhaustive. Future research should address such hypotheses in greater depth.

Importantly, the results of this paper suggest that anyone studying the effect of oil on political conflict should take the location of oil extraction into account. Moreover, it is also possible that the spatial heterogeneity of oil production matters for other types of conflict. Further research should attempt to explore this.

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Appendices

A Tables and Figures

Table A1. *Summary Statistics*

Main time series			
Start	1950	Nr years	63
End	2012		
Mean onshore production	8.20	St.dev	43.89
Mean offshore production	4.42	St.dev	23.59
Mean crude oil price	40.63	St.dev	29.84
Mean oil price perc. change	0.031	St.dev	0.249
Mean annual coup incidence	0.033	St.dev	0.21
Mean annual GDP growth	0.02	St.dev	0.058
Mean annual log GDP	0.079	St.dev	0.01
Oil data cross section			
Nr. of countries	190	Nr. of oil producers	93
Nr. of only onshore producers	37	Nr. of only offshore producers	11
Nr. of mainly onshore producers	67	Nr. of mainly offshore producers	26
Observations	10,732		
Coup data cross section			
Nr. of countries	190		
Total nr. of coups	383	Nr. of coups in Africa	186
Nr. of coups in South America	140	Nr. of coups in RoW	57
Observations	11,604		
Military data			
Start	1950	Nr years	63
End	2012		
Total nr. of countries	159		
Mean military exp./GDP (perc)	3.3	St.dev	3.1

Notes. Onshore and offshore production is measured in nr of annual barrels per capita.

Table A2. *Placebo Tests*

	(1) Baseline	(2) Placebo	(3) Placebo	(4) Placebo
$Dep.var: Nr.of\,coups_{it}$				
$Onshore * \Delta\ Oil\,price_{t-1}$	0.013***			
	(3.34)			
$Onshore * \Delta\ Oil\,price_{t+1}$		0.004		
		(0.82)		
$Onshore * \Delta\ Oil\,price_{t+2}$			-0.004	
			(-0.40)	
$Onshore * \Delta\ Oil\,price_{t-2}$				-0.005
				(-1.21)
$Offshore * \Delta\ Oil\,price_{t-1}$	-0.037**			
	(-2.84)			
$Offshore * \Delta\ Oil\,price_{t+1}$		-0.007		
		(-0.57)		
$Offshore * \Delta\ Oil\,price_{t+2}$			0.016	
			(0.72)	
$Offshore * \Delta\ Oil\,price_{t-2}$				-0.006
				(-0.55)
N	11604	11414	11414	11414
Countries	190	190	190	190
FE	C/Y	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 displays the original baseline result, while Columns 2,3 and 4 show results using lead and lagged oil price shocks at different time horizons as placebo.

Table A3. *Oil Demand Shocks, Oil Price Symmetry*

	(1) Demand shocks	(2) Demand shocks	(3) Censored	(4) Censored
$Dep.var:\ Nr.of\,coups_{it}$				
$Onshore * \Delta\ \widehat{Oil\,price}_{t-1}$	0.032***	0.032***		
	(2.64)	(2.82)		
$Offshore * \Delta\ \widehat{Oil\,price}_{t-1}$	-0.065**	-0.065**		
	(-1.94)	(-2.10)		
$Lag\,nr.of\,coup\,attempts$		0.456***		0.436***
		(4.67)		(4.84)
$Onshore * \Delta\ Oil\,price^{+}_{t-1}$			0.012**	0.012***
			(2.18)	(2.66)
$Onshore * \Delta\ Oil\,price^{-}_{t-1}$			0.05	0.0552
			(1.58)	(1.60)
$Offshore * \Delta\ Oil\,price^{+}_{t-1}$			-0.06	-0.055
			(-1.22)	(-1.40)
$Offshore * \Delta\ Oil\,price^{-}_{t-1}$			-0.042	-0.044
			(-1.40)	(-1.41)
N	9704	9704	11604	11604
Countries	190	190	190	190
FE	C/Y	C/Y	C/Y	C/Y

z statistics in parentheses

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

Notes. Column 1 and 2 displays the baseline results, but using oil price movements as projected by the global price of copper, in order to proxy global demand shocks. Columns 3 and 4 shows results when using oil price series censored into positive and negative oil price shocks.

Table A4. *Control Variables*

	(1) Coups	(2) Coups	(3) Coups	(4) Coups	(5) Coups
$Dep.\,var:\ Nr.\,of\,coups_{it}$					
$Onshore * \Delta\ Oil\,price_{t-1}$	0.017***	0.018***	0.02***	0.019***	0.018***
	(3.93)	(3.97)	(4.46)	(4.13)	(3.59)
$Offshore * \Delta\ Oil\,price_{t-1}$	-0.041***	-0.045***	-0.05***	-0.048***	-0.047***
	(-3.41)	(-3.33)	(-4.27)	(-3.98)	(-3.54)
$Log\,GDP$	-123.81***	-138.46***	-106.86***	-105.57***	-83.47*
	(-3.86)	(-3.97)	(-3.01)	(-3.30)	(-2.43)
$Log\,population$		-111.1	-165.28*	-154.22	-129.15
		(-1.47)	(-2.52)	(-1.94)	(-1.45)
$Polity2$			-0.041**	-0.039**	-0.043***
			(-2.52)	(-2.36)	(-2.83)
$Civil\,conflict$				0.75**	0.727**
				(2.85)	(2.52)
$Oil\,discovery$					-1.59
					(-1.33)
N	7972	7972	6803	6374	4927
Countries	151	151	145	144	114
FE	C/Y	C/Y	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. The table shows robustness for a range of control variables. Column 1 adds log of GDP per capita (divided by 100), Column 2 adds log of population size (divided by 100), Column 3 adds the polity2-score, Column 4 adds an indicator for being in a civil conflict and Column 5 adds the log of new oil discoveries per capita (divided by 100).

Table A5. *Checks on Robustness*

	(Excl. non-oil)	(Excl. > 15 %/non-oil)	(No war)	(Country trends)	(Coup dummy)
$Dep. var: Nr. of coups_{it}$					
$Onshore * \Delta\ Oil\, price_{t-1}$	0.015***	0.24**	0.014***	0.01*	0.017***
	(4.48)	(2.59)	(4.03)	(3.16)	(3.30)
$Offshore * \Delta Oil\, price_{t-1}$	-0.039***	0.136	-0.04***	-0.024**	-0.044***
	(-3.41)	(0.28)	(-3.06)	(-2.71)	(-2.71)
$Lag\, nr. of\, coup\, attempts$	0.39***	0.49***	0.44 ***	1.82 ***	0.88 ***
	(3.89)	(3.70)	(5.16)	(10.59)	(4.82)
N	6324	3720	8869	11604	4560
Countries	102	60	189	190	76
FE	C/Y	C/Y	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 excludes non-oil countries, defined as having less than 0.1 barrels of oil produced pr. day on average. Column 2 excludes the 15 % largest oil producers historically, both onshore and offshore as well as non-oil producers. Column 3 excludes country-years when there was a civil conflict. Column 4 estimates the baseline regression but also controlling for country-specific trends, while Column 5 excludes countries that have never experienced any coup. Standard errors are clustered at the country level.

Table A6. *Checks on Robustness*

	(> 10 % cps)	(> 10 % mil)	(Comb.)	(> 10 % pos. pr.)	(> 10 % neg. pr.)
$Dep.\,var:\ Nr.\,of\,coups_{it}$					
$Onshore * \Delta\ Oil\,price_{t-1}$	0.013***	0.017***	0.014***	0.013***	0.016***
	(4.46)	(3.68)	(5.27)	(3.45)	(3.44)
$Offshore * \Delta Oil\,price_{t-1}$	-0.032***	-0.045***	-0.034***	-0.035***	-0.042***
	(-5.05)	(-3.42)	(-5.93)	(-2.85)	(-3.24)
$Lag\,nr.\,of\,coup\,attempts$	0.58***	0.49***	0.55***	0.39 ***	0.46 ***
	(3.26)	(5.26)	(3.12)	(4.53)	(5.12)
N	10550	7446	6516	8176	10582
Countries	173	121	106	146	190
FE	C/Y	C/Y	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 excludes the upper 10th percentile of countries in terms of total number of coup attempts. Column 2 excludes the upper 10th percentile of countries in terms of military spending level per GDP. Column 3 excludes both these groups. Column 4 excludes the 10 % largest positive oil price shocks historically from the analysis. Column 5 excludes the 10 % largest negative oil price shocks. Standard errors are clustered at the country level.

Table A7. *Checks on Institutional Quality*

	(non-dem.)	(dem.)	(Intermed.)
$Dep. var: Nr. of\, coups_{it}$			
$Onshore * \Delta\ Oil\, price_{t-1}$	0.012**	0.09	0.10**
	(2.71)	(1.27)	(1.96)
$Offshore * \Delta Oil\, price_{t-1}$	-0.03***	-0.21***	-0.048*
	(-2.89)	(-2.65)	(-1.88)
$Lag\, nr. of\, coup\, attempts$	0.36*	0.37***	0.47***
	(2.54)	(2.69)	(4.52)
N	5048	6556	4606
Countries	82	108	75
FE	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 shows estimates for the sample of countries with an average polity2 score below zero. Column 2 shows estimates for the sample of countries with a polity2 score above zero. Column 3 shows results for the sample of countries that are so-called anocracies, with a polity2 score between -5 and 5.

Table A8. *Checks on Production Data*

	(1) Hi prod.	(2) Low prod.	(3) <50%	(4) Base 1970
$Dep. var: Nr. of\ coups_{it}$				
$Lag\ nr. of\ coup\ attempts$	0.18	1.43**	0.426***	0.444***
	(1.35)	(6.79)	(4.66)	(4.78)
$Onshore * \Delta\ Oil\ price_{t-1}$	0.014***	0.010	0.013***	
	(-2.85)	(1.41)	(3.62)	
$Offshore * \Delta\ Oil\ price_{t-1}$	-0.026***	-0.024	-0.036***	
	(-2.72)	(-1.30)	(-3.04)	
$Onshore(1970) * \Delta\ Oil\ price_{t-1}$				0.006*
				(7.75)
$Offshore(1970) * \Delta\ Oil\ price_{t-1}$				-0.024**
				(-4.67)
N	2308	3271	10674	8052
Countries	89	89	175	132
FE	C/Y	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Columns 1 and 2 show estimates for years in which oil production is higher and lower than the country's average over the sample period, respectively. Column 3 shows estimates when excluding countries for which the onshore average share is calculated using production data from less than half the sample period. Column 4 shows estimates when the oil price shocks are weighted by the onshore and offshore production intensity in 1970.

Table A9. *Results by Region*

	(1) Africa	(2) Latin america	(3) Asia
$Dep. var: Nr. of\, coups_{it}$			
$Lag\, nr. of\, coup\, attempts$	0.201	0.275	0.58
	(1.19)	(1.50)	(2.53)
$Onshore * \Delta\ Oil\, price_{t-1}$	0.013***	0.13	-0.005
	(6.54)	(1.57)	(-0.34)
$Offshore * \Delta\ Oil\, price_{t-1}$	-0.037**	-0.388**	0.017
	(-2.35)	(-3.03)	(0.51)
N	3010	2010	995
Countries	49	33	33
FE	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 shows estimates for Africa, Column 2 for Latin American and Caribbean countries and Column 3 for Asia.

Table A10. *Zero-inflated Poisson*

	(1) Coups	(2) Coups	(3) Coups
$Dep. var: \ Nr. of\ coups_{it}$			
$Total\,Oil * \Delta\ Oil\,price_{t-1}$	0.002		
	(0.56)		
$Onshore * \Delta\ Oil\,price_{t-1}$		0.011**	0.011**
		(2.29)	(2.29)
$Offshore * \Delta\ Oil\,price_{t-1}$		-0.029**	-0.029**
		(-2.25)	(-2.37)
$Lag\,nr.\,of\,coup\,attempts$			0.307***
			(3.34)
N	7972	7972	7972
Countries	151	151	151
FE	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. The dependent variable is the nr. of coup attempts at time t in country i. The method of estimation is a Poisson regression with a separate equation for modelling the excess zeroes in the data. The predictor for excess zeroes is the log of GDP.

Table A11. *Hurdle Model*

	All	Intermed.	Non-dem
$Dep.\,var:\ Nr.\,of\,coups_{it}$			
$Onshore * \Delta\ Oil\,price_{t-1}$	0.00001	0.023	-0.001
	(0.48)	(0.76)	(-0.42)
$Offshore * \Delta\ Oil\,price_{t-1}$	-0.003	-0.05*	0.001
	(-0.95)	(-1.65)	(0.08)
$Civil\,war$	0.096	0.027	-0.338
	(0.91)	(1.00)	(-0.91)
$Economic\,growth$	-0.33	-0.012	-0.16
	(-0.95)	(-0.01)	(0.24)
$Log\,GDP$	6.44	-1.79	8.02***
	(0.56)	(-0.08)	(0.96)
Selection model:			
$Onshore * \Delta\ Oil\,price_{t-1}$	0.008***	0.19***	0.006
	(2.86)	(3.82)	(1.39)
$Offshore * \Delta\ Oil\,price_{t-1}$	-0.014**	-0.3**	-0.01***
	(-2.34)	(-4.94)	(-1.14)
$Civil\,war$	0.364***	0.265	0.402**
	(3.65)	(1.73)	(2.16)
$Economic\,growth$	-1.81***	-2.21***	-0.81
	(-3.69)	(-2.61)	(-1.18)
$Log\,GDP$	-16.8***	-10.60	-3.97**
	(-3.54)	(-1.08)	(-0.66)
N	7468	1819	1710
Countries	151	36	34
Country FE	Yes	Yes	Yes

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 shows estimates from a linear hurdle model on the full sample, while Column 2 excludes the upper and bottom 25th percentile in terms of average polity2-score, and Column 3 estimates only on the bottom 25th percentile in terms of average polity2-score .

Table A12. *Robustness of IV*

	(IV-GMM) Coups	(IV-GMM) Coups	(IV-GMM) Coups	(IV-GMM) Coups
$Military_{it}$	0.076*	0.077*	0.078*	0.082**
	(1.87)	(1.84)	(1.88)	(1.90)
$Ethnic\,fractions\,x\,Oil\,price_{t-1}$	0.97	2.24	1.37	2.84
	(0.14)	(0.33)	(0.21)	(0.44)
$Landlocked\,x\,Oil\,price_{t-1}$		-0.037	-0.03	-0.026
		(-1.02)	(-0.85)	(-0.71)
$Land\,area\,x\,Oil\,price_{t-1}$			0.00	0.00*
			(1.57)	(1.76)
$Religious\,fraction\,x\,Oil\,price_{t-1}$				-6.97
				(-1.23)
Hansen	0.866	1.25	0.99	0.93
N	5660	5660	5660	5660
Countries	136	136	136	136
FE	C/Y	C/Y	C/Y	C/Y

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Notes. Column 1 shows estimates from the instrumental variables specification when including a measure of ethnic fractionalization, interacted with annual oil price changes. Columns 2 adds a landlocked indicator variable, interacted with annual oil price changes. Column 3 adds the size of the country in square km, interacted with annual oil price changes, while Column 2 adds variable measuring religious fractionalization with the same interaction.

Table A13. *Robustness of IV*

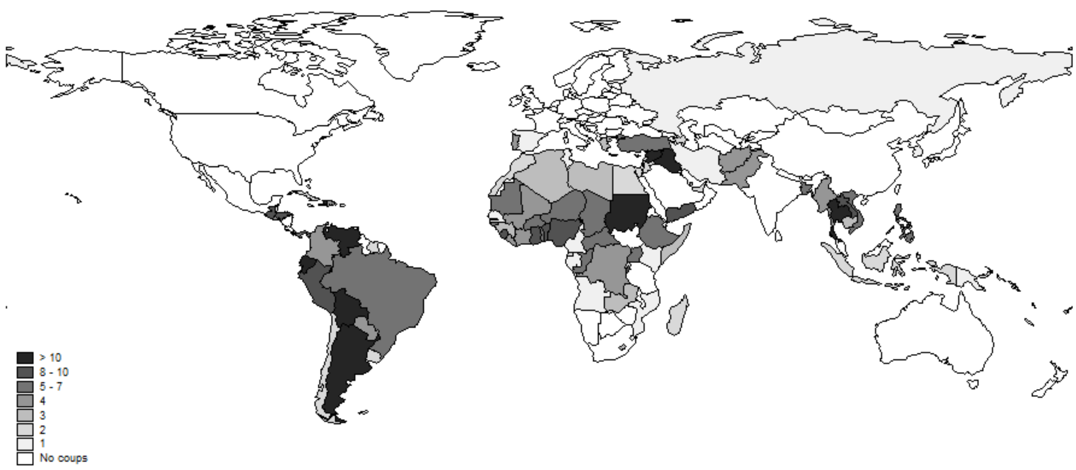
	(Negbin) <1.5%	(Negbin) >1.5%	(IV-GMM) Placebo	(IV-GMM) Placebo
$Onshore * \Delta \; Oil\,price_{t-1}$	-9.023	0.014***		
	(-1.11)	(3.96)		
$Offshore * \Delta \; Oil\,price_{t-1}$	-47.99	-0.038***		
	(-1.10)	(-2.96)		
$Military_{it}$			0.005	0.003
			(0.86)	(0.55)
N	1178	5270	6811	7197
Countries	19	85	161	161
FE	C/Y	C/Y	C/Y	C/Y

z statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

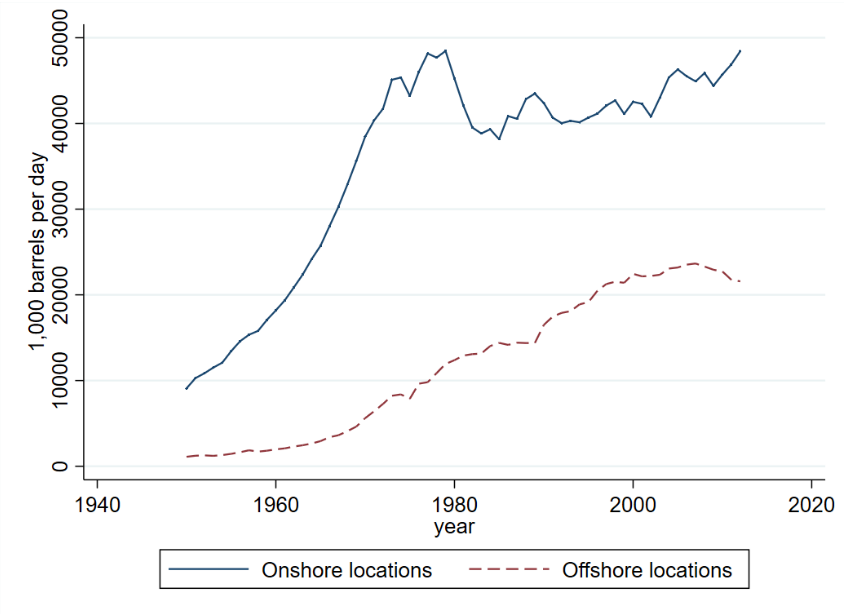
Notes. Column 1 shows estimates from the baseline estimation, but on the sample of countries with mean military spending as share of GDP below 1.5%, while Column 2 shows the same estimation for sample with military spending above 1.5 %. Column 3 estimates the IV placebo, using oil price shocks three years ahead weighted by onshore and offshore oil production as instrument. Column 4 shows placebo results for three years lagged oil price shocks as instruments.

Figure A5. *Coups in the World 1950-2012*



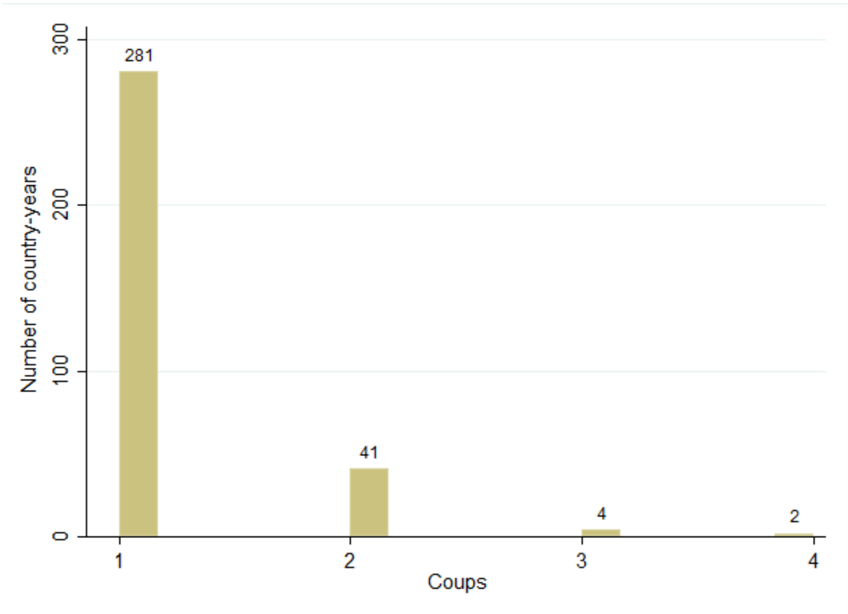
Note: Constructed with data from Powell and Thyne (2011)

Figure A6. *Total Onshore and Offshore Production 1950-2012*



Note: Data is from Rystad Energy.

Figure A7. *Frequency of Coup-years*



Note: histogram shows number of country-years with one or more coup attempts within the same year.

Table A14. *Mean Cnshore and Offshore Oil Production pr. Capita, Barrels pr. Year*

Country	Mean onshore oil	Mean offshore oil
Afghanistan	.0045719	0
Albania	3.208514	0
Algeria	13.14837	0
American Samoa	0	0
Andorra	0	0
Angola	.8894819	14.39028
Antigua and Barbuda	0	0
Argentina	5.024155	.0638442
Armenia	0	0
Aruba	0	0
Australia	.689963	5.260775
Austria	1.516825	0
Azerbaijan	6.412205	17.73152
Bahamas		
Bahrain	58.27203	0
Bangladesh	.0000129	0
Barbados		
Belarus	.8430515	0
Belgium	0	0
Belize		
Benin	0	.0861079
Bermuda	0	0
Bhutan	0	0
Bolivia	.6336327	0
Bosnia and Hercegovina	0	0
Botswana	0	0
Brazil	.388364	.9165219
British virgin Islands	0	0
Brunei		
Bulgaria	.1150126	0
Burkina Faso	0	0
Burundi	0	0
Cambodia	0	0
Cameroon	0	1.674513
Canada	18.14884	.681009
Cape Verde	0	0
Cayman Islands	0	0
Central African Republic	0	0
Chad	.737173	0
Chile	.485491	.1904598
China	.5576092	.0416811
Colombia	3.89588	0
Comoros	0	0
Congo	.5968986	13.38092

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Table A14 – continued from previous page

Country	Mean onshore oil	Mean offshore oil
Cook Islands	0	0
Costa Rica	0	0
Cote d'Ivoire	0	.1762618
Croatia	0	0
Cuba	.4689295	.115574
Cyprus		
Czech Republic	.0881308	0
Czechoslovakia		
Democratic Republic of Congo	.0294607	.0994332
Denmark	0	6.402559
Djibouti	0	0
Dominica	0	0
Dominican Republic	0	0
East Timor		
Ecuador	7.352214	0
Egypt	1.00222	2.122114
El Salvador	0	0
Equatorial Guinea	0	34.95651
Eritrea		
Estonia	.1615188	0
Ethiopia		
Falkland Islands		
Faroe Islands		
Fiji	0	0
Finland	0	0
France		
French Guiana		
French Polynesia	0	0
Gabon	29.79053	35.59693
Gambia	0	0
Georgia	.7324129	0
Germany	.3944115	.0051746
Ghana	0	.0414394
Gibraltar	0	0
Greece	0	.1801116
Greenland		
Grenada		
Guadeloupe		
Guam	0	0
Guatemala	.2110058	0
Guinea	0	0
Guinea-Bissau	0	0
Haiti	0	0
Honduras	0	0
Hong Kong	0	0
Hungary	.7559422	0

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Table A14 – continued from previous page

Country	Mean onshore oil	Mean offshore oil
Iceland		
India	.0681387	.0770739
Indonesia	1.699111	.5250287
Iran	22.70632	2.152393
Iraq	40.98326	0
Ireland	0	0
Israel	.105427	0
Italy	.2702949	.0914768
Jamaica	0	0
Japan	.0135996	.0063859
Jordan	.0062691	0
Kazakhstan	9.487003	.0101905
Kenya	0	0
Kiribati	0	0
Kuwait	833.0298	0
Kyrgyzstan	.3948123	0
Laos	0	0
Latvia	0	0
Lebanon	0	0
Lesotho	0	0
Liberia	0	0
Libya	142.1754	1.94355
Liechtenstein	0	0
Lithuania	.1337146	.0467071
Luxembourg	0	0
Macau	0	0
Macedonia	0	0
Madagascar	0	0
Malawi	0	0
Malaysia	.0557306	5.693512
Maldives	0	0
Mali	0	0
Malta		
Marshall Islands	0	0
Martinique		
Mauritania	0	.1677095
Mauritius	0	0
Mayotte	0	0
Mexico	3.053106	4.209152
Micronesia	0	0
Moldova	.0123878	0
Monaco	0	0
Mongolia	.1759046	0
Montserrat	0	0
Morocco	.0193001	0
Mozambique	0	0

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Country	Mean onshore oil	Mean offshore oil
Myanmar	.157246	0
Namibia	0	0
Nauru	0	0
Nepal	0	0
Netherlands	.5957371	.3017802
Netherlands Antilles	0	0
New Caledonia		
New Zealand	.3908194	.3981278
Nicaragua	0	0
Niger	.0028369	0
Nigeria	3.058937	2.177641
Niue	0	0
North Korea	0	0
Northern Mariana Islands	0	0
Norway	0	86.22024
Oman	81.94611	.0432902
Pakistan	.0596097	0
Palau	0	0
Panama	0	0
Papua New Guinea		
Paraguay	0	0
Peru	1.769222	.2845959
Philippines	0	.012249
Poland	.0615781	.0119306
Portugal	0	0
Puerto Rico	0	0
Qatar	495.8649	207.4748
Reunion	0	0
Romania	3.269247	.1130815
Russia	8.719076	.038415
Russian Federation	0	0
Rwanda	0	0
Saint Helena	0	0
Saint Kitts and Nevis	0	0
Saint Lucia	0	0
Saint Pierre and Miquelon	0	0
Saint Vincents and the Grenadines	0	0
Samoa	0	0
San Marino	0	0
Sao Tome and Principe	0	0
Saudi Arabia	122.7575	43.24738
Senegal	0	0
Serbia	.4813572	0
Seychelles	0	0
Sierra Leone	0	0
Singapore	0	0

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Country	Mean onshore oil	Mean offshore oil
Slovakia	.0691212	0
Slovenia	.0000288	0
Solomon Islands	0	0
Somalia	0	0
South Africa	0	.0389723
South Korea	0	0
Spain	.0076297	.1092699
Sri Lanka	0	0
Sudan	.1807181	0
Suriname		
Swaziland	0	0
Sweden	0	0
Switzerland	0	0
Syria	6.629284	0
Taiwan	.0341763	.0008284
Tajikistan	.1851172	0
Tanzania	0	0
Thailand	.0674961	.1078677
Togo	0	0
Tonga	0	0
Trinidad and Tobago	18.81605	27.41913
Tunisia	2.258086	.8493147
Turkey	.3233851	0
Turkmenistan	20.194	.7939189
Turks and Caicos Islands	0	0
UAE	217.5587	205.2986
US Virgin Islands	0	0
Uganda	0	0
Ukraine	.7960531	.0127832
United Kingdom	.1395643	6.242043
United States	10.08482	1.247783
Uruguay	0	0
Uzbekistan	.8855781	0
Vanuatu	0	0
Venezuela	41.2182	34.67029
Vietnam	0	.4262825
Yemen	2.384564	0
Zambia	0	0
Zimbabwe	0	0