



Giant oil discoveries and conflicts

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Received: 6 June 2022 / Accepted: 17 April 2023 / Published online: 2 May 2023
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Abstract

This study investigates the effects of oil discoveries on conflict. We propose that the effects from oil discoveries may differ depending on types of conflicts, mainly interstate versus intrastate. Using a measure for oil discoveries for a global panel of countries between 1970 and 2012, we find a positive association between oil discoveries and both conflict types, controlling for other conflict determinants and unobserved heterogeneity. However, we observe that the effects on intrastate conflicts are evident within a year of discovering the oil, while the effects on interstate conflicts only become evident after five years of the discovery. We also find that within intrastate conflicts, the results are mainly driven by the effects on ethnic conflicts. The findings imply that there may be different mechanisms at play for interstate versus intrastate conflicts related to resource discoveries. For example, resource-induced inequality can aggravate already existing tensions between groups in society, which can result in internal conflict soon after discovering the resource. On the other hand, the feasibility of engaging in conflict with a neighbouring resource-rich country depends on fighting capacity and mobilising resources, which can delay interstate conflicts. Overall, we believe the results from this study will provide some further understanding to the dynamics involving natural resources and types of conflict.

Keywords Panel data · Conflict · Oil discoveries · Global

JEL Classification C23 · F01 · O13 · Q34 · Q32

We would like to thank three anonymous referees for many helpful comments. However, any remaining errors are solely ours.

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1 Introduction

The debate surrounding the natural resources curse continues to dominate the economic growth literature today, with several studies finding adverse effects of natural resources on economic growth (Sachs & Warner, 1995; Gylfason et al., 1999; Ross, 2004), institutions and conflict (Arezki & Gylfason, 2013; Lujala, 2009; Antonakakis et al., 2017). Improved data availability over the years has also allowed for further studies based on disaggregated measures of natural resource endowments, such as oil versus minerals, or lootable versus non-lootable resources (Cotet & Tsui, 2013; Lei & Michaels, 2014; Rigterink, 2019; Tsui, 2011). While there is a fair amount of discussion on the effects of natural resources on conflict (including the importance of differentiating between different types of resources) (Le Billon, 2001; Snyder & Bhavnani, 2005; Janus, 2012; Nillesen & Bulte, 2014; Adhvaryu et al., 2021), we, however, find a gap that exists in the literature on the association between resources and different types of conflicts. Most of the evidence in the literature is primarily based on the effects of resources on civil conflict (i.e. intrastate conflict) (Fearon & Laitin, 2003; Lei & Michaels, 2014; Berman et al., 2017). Based on this premise, we propose that natural resources, specifically oil discoveries, may have heterogeneous effects on interstate (between countries) conflicts compared to intrastate (within country) conflicts. In particular, we expect oil discoveries to increase intrastate conflicts in the immediate period due to grievances that may arise over resource ownership or extraction, and may exacerbate already existing horizontal and vertical inequalities within the country (Stewart, 2002; Raleigh, 2014). For example, the African continent's oil resources have been a source of contention leading to intrastate conflicts (Collier & Hoeffler, 2004; Barbieri & Reuveny, 2005). The rents accrued from such natural resources can provide motivation and opportunities for elite groups to support themselves through expropriation, and lead to exploitation of ethnic minority groups, which can instigate internal conflict between the two groups (for example, oil conflicts in Angola and the Niger Delta). On the other hand, oil discoveries may take longer to degenerate into interstate conflicts, depending on the location of the resource deposits and the feasibility of engaging in conflict with a neighbouring country (Caselli et al., 2015).

Conflict occurs as a result of a disagreement between actors on the premise of incompatible objectives. These disagreements can range from geographical location, resource ownership to religious or ethnic differences, can become protracted and can lead to loss of lives and damage to infrastructure. For the purpose of our study, we use the definition by Uppsala Conflict Data Project, which states that an armed conflict is a contested incompatibility that concerns government and/or territory where the use of armed force between two parties results in at least 25 battle-related deaths (Gleditsch et al., 2002).

Conflict is one of the channels through which natural resources can impact on socio-economic development, which can delay progress towards sustainable development. For example, Bhattacharyya and Hodler (2010) predict that natural resources increase corruption if quality of democratic institutions is poor. Furthermore, a recent study by Cust et al. (2022) contends that natural resources undermine the competitiveness of African economies, firstly through the Dutch disease (i.e. where labour and capital are diverted from other sectors to the resource sector, which can sometimes result in the appreciation of the domestic currency) and secondly by inefficient and distortionary spending of resource revenues in the public sector. In the same vein, oil discoveries can result in dependency on the resource, which can lead to poor economic outcomes, such as low economic growth (Antonakakis et al., 2017), increased income inequality (Berisha et al., 2021) and increased

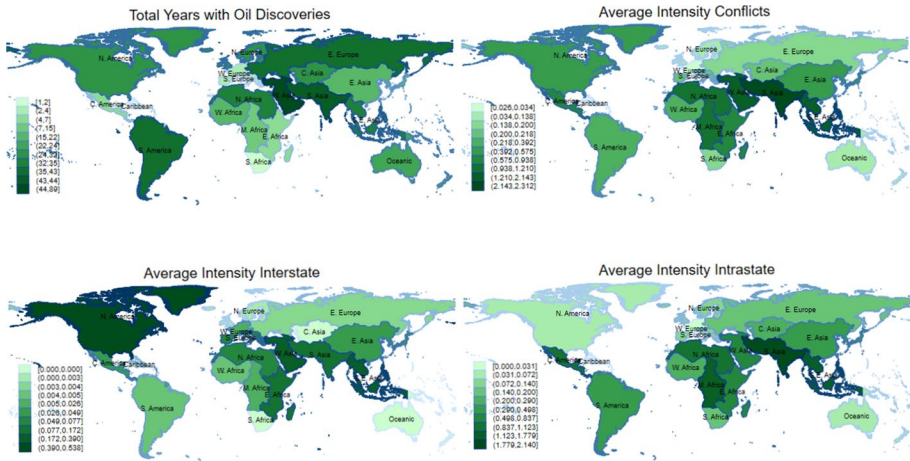


Fig. 1 Oil discoveries and conflicts. Note: Figure 1 shows the correlation between oil discoveries and interstate vs intrastate conflicts. The darker shades indicate higher number of oil discoveries and higher conflict occurrences

conflict if the country's economic structure offers limited alternative income sources (Basedau & Wegenast, 2009). In order to find effective mitigating strategies for the detrimental impact of natural resources, be it oil discoveries, on sustainable development, it is critical to strengthen existing knowledge with updated evidence. As we indicated in the first paragraph, there is still scope for evidence-based studies on effects of natural resources on different types of conflicts. We aim to fill this gap by examining the effects of oil discoveries on two types of conflicts, mainly interstate and intrastate conflicts.

This study relates to two branches of literature. The first is the role of natural resources in determining conflict occurrences pioneered by the early works of Collier and Hoeffler (1998), while the second relates to the growing literature highlighting the importance of analysis at different conflict types (Cederman & Gleditsch, 2009; Weidmann, 2009). As evidenced by Fig. 1, there are some observable differences on the effects of oil discoveries by interstate vs intrastate conflicts. For example, oil discoveries in South American and Eastern European regions appear to drive intrastate conflict, while oil discoveries in North America and the Middle East are associated more with interstate conflicts. We also observe that oil discoveries in the north of Africa are associated more with intrastate conflicts than interstate conflicts.

Making use of a dataset on giant oil discoveries by Horn (2014) and panel data analysis from 1970 to 2012, we find that oil discoveries have a positive and significant effect on both interstate and intrastate conflicts. However, the effects on intrastate conflicts are evident within a year of discovering the oil, while the effects on interstate conflicts only become evident after five years of the discovery. These effects are persistent across the two types of conflict for over ten years after the discovery. Moreover, we observe that within intrastate conflicts, the results are mainly driven by the effects on ethnic conflicts with consistently larger coefficient magnitudes in relation to civil conflicts. We find similar positive effects on conflict with quantity of oil discovered, as well as the expectation of oil discoveries. Although our empirical analysis is restricted to the time period of the giant oil discoveries dataset (i.e. 1970–2012), we find the dataset to be very comprehensive with various information related to different aspects of oil discoveries, such as revenues from

the oil discoveries, countries with exploratory drilling for oil, estimated recoverable oil in barrels and other measures, which affords us the opportunity to conduct robustness checks. Moreover, we believe that the findings from the analysis can still be useful in highlighting the potential impacts of resource discoveries that can either delay or progress development strategies in countries. Given that resource-rich nations are predominantly found in low-income regions prone to weak institutions (Sachs & Warner, 2001; Ross, 2004) and conflicts, we believe the results from this study will provide enhanced understanding of the complex dynamics involving natural resources and types of conflict, which may assist policymakers in making more informed decisions.

2 Related literature

The Malthusian theory is the premise of various theoretical frameworks based on natural resources and economic outcomes. Competition over scarce resources can trigger conflicts. We base our empirical analysis on the theoretical underpinnings that propose three possible mechanisms connecting resources and conflicts: greed and grievances, which constitute the motives for engaging in conflict (Collier & Hoeffler, 1998; Besley & Persson, 2009), and feasibility, which constitutes the means for fighting (Andersen et al., 2021; Fearon & Laitin, 2003; Tullock, 2001).

Firstly, natural resource discoveries typically generate windfall revenues, which can raise the returns for conflict. These increased returns can lead to looting (i.e. greed) where resource rents are not redistributed to benefit society as a whole. Instead, the resource wealth is used for self-preservation by rebel armies (for example, through increased extortions from those who extract the resources and colluding with local politicians, or funding recruitments and ammunition, which exacerbates their monopoly of violence) (Dube & Vargas, 2013; Caselli & Coleman, 2013), or by authoritarian governments to oppress civilians and stem any revolutions (Arezki & Gylfason, 2013; Aslaksen & Torvik, 2006; Barbieri & Reuveny, 2005; Ross, 2012).

Secondly, natural resource discoveries can lead to grievances over land expropriation among the population living in the resource-abundant area, grievances over environmental risks forcing populations to migrate, or grievances over income inequality between those with access to the resources and those that are marginalised. This resource-induced inequality and social exclusion can lead to conflict (Collier & Hoeffler, 2004; Ross, 2004).

A third and related mechanism is the state capacity (i.e. the feasibility of engaging in conflict) where natural resource discoveries can either weaken or strengthen the fighting capacity of whichever party has access to the resources. For example, governments that rely on wealth from natural resources have little incentive to create strong institutions (Fearon & Laitin, 2003; Besley & Persson, 2011). In addition, resource rents increase the opportunity cost of conflict as involved actors do not want to lose control over the resources (Rigterink, 2019; Tsui, 2010). On the other hand, resource revenues can provide government with the capacity to defend itself from oppositions (Bazzi & Blattman, 2014), or alternatively the revenues can give armed groups an incentive to establish their base in the resource-abundant area (i.e. become stationary bandits) rather than raiding the region (Sánchez de la Sierra, 2020).

Previous empirical evidence highlights contrasting results on the effects of natural resources' wealth on conflict. For example, Collier and Hoeffler (1998) find a positive effect between low levels of natural resource dependence and the onset and duration of

civil war, but a negative effect at high levels of natural resources. Moreover, Bellows and Miguel (2009) show that chiefdoms with more diamond wealth in Sierra Leone experienced more internal armed conflict. Evidence by Janus (2012) finds that natural resource extraction increases conflict intensity, particularly when credit constraints indicating that capital spending cannot exceed resource earnings are not adhered to by the fighting groups. More recently, Adhvaryu et al. (2021) reveal that natural resources increase conflict and underdevelopment in Africa mainly when neighbouring regions are resource-rich. When neighbours are resource-poor, they find evidence that a country's own resources promote economic growth.

Countries that are resource-rich also tend to be susceptible to resource price shocks. Mejía and Restrepo (2013), Angrist and Kugler (2008) find that rising cocaine prices lead to more civil conflict in Colombia, while Rigterink (2019) highlights that world price increases of a lootable labour-intensive natural resource can increase internal armed conflicts. He finds the effects true for secondary diamonds, which are labour-intensive and hence easy to extract, compared to primary diamonds which are more capital-intensive to extract. Evidence from Lujala (2009, 2010) confirms that secondary diamonds are related to longer duration of civil conflict and increased number of deaths. Analysis by Snyder and Bhavnani (2005) shows that the resource curse is more evident in countries where non-lootable resources, such as bauxite in Guinea, are not available to rulers as a source of revenue, and in countries where lootable resources, such as diamonds in Sierra Leone or gold in Ghana, are extracted by companies that are difficult to tax. Similarly, Berman et al. (2017) find evidence that minerals with potential for looting are associated with a larger civil conflict risk when prices increase.

On the other hand, several studies fail to find any positive robust correlation between natural resources' wealth and conflict (Bazzi & Blattman, 2014; Cotet & Tsui, 2013; Chisadza & Clance, 2021; Chisadza & Bittencourt, 2018). However, while O'Brochta, 2019 also finds no evidence of a relationship between natural resources and civil conflict, he does find that using primary commodity exports as a measure for natural resources and including geography and ethnic fractionalisation as controls significantly impacts the conflict results. Brunnschweiler and Bulte (2009) further argue that rentier effects from resource wealth lower the probability of civil war. Similarly, Gehring et al. (2019) find compelling evidence that higher opium revenues and profits in Afghanistan result in lower civil conflicts. The conflict-reducing channels include higher opportunity costs that offset contest effects between fighting groups, as well as increased living standards for households.

Literature specifically linked to the association between oil resources and conflict, as well as other economic outcomes include Smith (2004) and Collier & Hoeffler (2004) who find that high levels of oil dependence increase the likelihood of civil war. Moreover, Lei and Michaels (2014) find that giant oil discoveries not only increase per capita oil production and oil exports by up to 50%, but they also fuel internal armed conflicts, especially in countries that have already experienced armed conflicts in the decade prior to oil discovery. According to Andersen et al. (2021), oil revenues increase conflict in onshore-rich countries, while they de-escalate conflict in offshore-rich countries. They attribute these effects to increased fighting capacity, whereby the government can use offshore oil revenues to increase its fighting capacity, while onshore oil may be looted by oppositional groups to finance a rebellion. Bazzi and Blattman (2014) find that oil price shocks are associated with shorter, less intense civil conflicts at a country level, whereas Dube and Vargas (2013) observe that high oil prices are related to greater intensity of internal violence in Colombian areas where oil is extracted from or shipped

via pipelines. However, Caselli and Michaels (2013) find no evidence of internal armed conflict in typically oil-rich countries.

On other economic outcomes, Arezki et al. (2017) observe a delayed response of five years on economic growth and savings rate after the news shock of an oil discovery. Evidence by Tsui (2011) finds that crude oil discoveries have a negative impact on democracy, while Antonakakis et al. (2017) document that oil dependence does not advance economic growth in developing economies because they typically tend to have weak quality of political institutions. On the other hand, O'Reilly and Murphy (2017) find little evidence of significant oil discovery effects on economic freedom.

The literature reviewed draws attention to the dearth of empirical evidence on resource effects on interstate conflicts. According to the theory proposed by Morelli and Rohner (2011), conflicts are more likely when the geographical distribution of natural resources is concentrated in a local ethnic group's region, and where this ethnic group could potentially be wealthier from the resources if they become independent, thus creating incentives for a secessionist rebellion (for example, the separatist movements that led to the creation of Timor-Leste and South Sudan). Moreover, Caselli et al. (2015) propose that the presence and location of oil deposits are important predictors of interstate conflicts. They find that two countries that share a border are more likely to engage in conflict if one of them has oil deposits, which are close to the border, and in cases where both countries have natural resources, if the deposits are located asymmetrically with respect to the border. Similarly, Berman et al. (2017) observe that an increase in the price of minerals extracted in rebel groups' ethnic homelands can enable them to increase their fighting capacity beyond their homelands, escalating local conflicts to interstate conflicts. Furthermore, Acemoglu et al. (2012) associate resource extraction with trade and interstate wars.

Given the gap in the empirical literature, we propose to contribute evidence linking oil discoveries not only to intrastate conflicts, but also to interstate conflicts. In particular, we argue that the resource effects may differ depending on the type of conflict and that examining resource effects by conflict types may help us to understand the mechanisms involved and inform policy decisions related to mitigating different types of conflict.

3 Data and methodology

To test the effect of oil discoveries on conflict types, we estimate the following Poisson model:

$$E \left[V_{jt}^c | x_{jt}, \phi_t, \epsilon_k \right] = \exp(\gamma + \beta x_{jt} + \phi_t + \epsilon_k + \mu_{jkt})$$

where V_{jt} is the measure associated with the episode of violence in country j at time t , x_{jt} is a vector of determinants of conflict, ϕ_t is year effects and ϵ_k is unobserved regional heterogeneity. Dependent variables, such as our conflict measures (superscript c), which comprise of non-negative discrete integers and can often be skewed and therefore not normally distributed, can make methods such as the ordinary least squares (OLS) not the most appropriate estimator to use. The Poisson estimator is more suited to estimating regressions with non-negative discrete integers as they have been designed to deal with the skewness and sparsity of the data and the heteroskedasticity of regression errors (Raleigh, 2014; Beardsley et al., 2019). These models also attenuate the issue of dealing with zero-outcome variables, which are common in conflict measures such as ours (Correia et al., 2019).

We therefore estimate a Poisson regression with multi-way fixed effects. The fixed effects allow for regional spillover effects from oil discoveries on conflict, while the year effects take into account time differences, such as years of onset of conflicts in different countries.¹

Since we are interested in the nature of the conflict, not necessarily the actors involved (e.g. government or militia), we use the conflict variable from the Major Episodes of Political Violence (MEPV) and Conflict Regions (Marshall, 2017), which distinguishes between international, civil and ethnic conflicts. Major episodes of political violence involve at least 500 directly related deaths and reach a level of intensity in which the use of lethal violence by organised groups is systematic and sustained. The variable *conflict* measures the total summed magnitudes or severity (based on number of deaths) of all societal and interstate violence, which include international, civil, ethnic, communal and genocidal violence. Episodes are scaled from one (low intensity—number of deaths less than two thousand) to ten (high intensity—number of deaths exceeding five million) according to an assessment of the full impact of the violence on the society's normal networking and functioning, which is directly affected by the conflict. The variable therefore takes into account the intangible aspects of conflict such as torture, rape and a general deterioration in the living standards of the affected country. It does not include other measures of political action, such as general strikes or anti-government demonstrations, but focuses on violence that disrupts economic activities, destroys infrastructure, displaces population and causes grievous injury resulting in deaths. The greater the effects of the violence on society, for example, the higher the number of fatalities or casualties, the greater the magnitude of the conflict.

We further separate the conflict variable into intrastate and interstate conflicts. Interstate conflicts take place between two or more countries. Intrastate conflicts include civil and ethnic conflicts that take place between the government of a country and internal opposition group/s without intervention from other countries. We also separate the intrastate conflicts into civil and ethnic. "Civil" involves rival political groups, while "Ethnic" involves the state agent and a distinct ethnic group. According to Sambanis (2001), treating civil conflict as an aggregate category may fail to consider if identity conflicts, such as those that are ethnic or religious-driven, may have different causes than non-identity conflicts. He argues the importance of this distinction that identity wars are mostly due to political grievances rather than economic opportunities.

The main explanatory variable is an oil discovery measure, which is taken from Horn (2014) dataset. The dataset contains information on the country and year of the discovery, whether the field contains oil and/or gas, the estimated total ultimately recoverable amount in oil equivalent, the revenues from the oil discoveries and countries with exploratory drilling (wild cat) for oil and/or gas. For the baseline analysis, we use the discovery event indicator that captures the number of oil discoveries across the sample of countries. For additional analysis, we make use of the net present value of the oil discoveries to capture the revenue effects, the total ultimate recovery of oil equivalence measured by barrels, as well as the wild cat drilling measure.

The control variables are based on the theoretical mechanisms discussed in Section 2. The variables related to the grievance mechanism include income per capita, globalisation and quality of institutions. For the feasibility mechanism, we include military expenditure and population density. Income per capita, military expenditure and population density are obtained from the World Development Indicators. The globalisation index for openness

¹ We also use the negative binomial estimator as a robustness check. The overall interpretation of our findings remains consistent. Complete details of these results are available upon request from the authors.

is compiled by Dreher (2006) and updated by Dreher et al. (2008). The index combines three key components of globalisation (political, economic and social globalisation) into a weighted index ranging from 0 to 100. Globalisation captures international flows of goods, capital, businesses, people, technology, information and the presence of international organisations. The variable measuring quality of institutions, from the Polity IV Project (Marshall et al., 2018), is the polity2 index, which is a revised combined score that is computed by subtracting the autocracy score from the democracy score. The resulting unified polity score ranges from -10 to 10 .²

According to Collier and Hoeffler (2002) and Fearon and Laitin (2003), increases in income will reduce the grievances that make conflict more likely such as poverty and inequality. Similarly, globalisation is expected to have mitigating effects on conflicts through its beneficial effects on growth and political stability (Chisadza & Bittencourt, 2018; Flaten & de Soysa, 2012; Hegre et al., 2010). We also expect increased military expenditure and democracy to be associated with lower episodes of conflict. Strong states have the capacity to suppress conflicts, compared to fragile states, due to better military strength and strong bureaucratic institutions (Olzak, 2011). On the other hand, findings by Barbieri and Reuveny (2005); Gleditsch (1998) show that larger populations may be difficult to sustain as they put strain on available jobs, resources and infrastructure, which can increase the risk of conflict.

All variables are logged except the conflict and democracy indices. While we do acknowledge that conflicts can create an environment that adversely affects the extraction of resources, we also argue that countries have limited control over the timing of resource discoveries, implying that discoveries are exogenous windfalls to the country (Lei & Michaels, 2014), thus minimising the potential bias of endogeneity in the specification of our model. Moreover, we do not restrict our specification to the immediate period for oil discoveries, but also consider longer periods that allow for changes in investment and exploration policies. For example, oil discoveries may contribute to intrastate conflicts within a year of discovery through the grievances mechanism, whereas we may only observe effects of oil discoveries on interstate conflicts after a longer period as building fighting capacity (such as foreign intervention) can take a while and the response to actual revenues or conflicts may take longer to degenerate into violence. We therefore use different lag structures for oil discoveries to capture different time periods: immediate period (one year lag) and longer period (five- and ten-year lags). These lag structures provide us with an opportunity to observe the time differences between discovering oil and intensity of conflicts. In addition, the longer lags should further minimise the potential bias of endogeneity between the predictor and the outcome variables.³

² Tables with the variable statistics, definitions and country list can be found in the Appendix under Tables 14, 15, and 16.

³ We use the control variables lagged one year in the main analysis. Results with control variables lagged five years and ten years do not change the overall findings of the study. These results are available on request from the authors.

4 Results

4.1 Baseline results

Tables 1, 2, and 3 indicate that countries with oil discoveries are prone to increased conflicts across both types. Of interest though is that it takes a relatively shorter time for oil discoveries to affect intrastate conflicts, occurring within the first year of discovering the resource, in relation to interstate conflicts. Adverse effects on interstate conflicts become evident after five years of discovering the oil. However, the effects of oil discoveries on both conflict types are persistent for ten years after the discovery. We also observe that within intrastate conflicts, the effects of discovering oil are mainly driven by the ethnic type whose coefficients are consistently and relatively larger than those for civil conflicts.

The control variables show that population density and surprisingly military expenditure and democracy increase conflicts regardless of type. Military expenditure can be used as a channel by some foreign governments to finance rebels in opposition to the incumbent government, which can lead to increased conflicts (Collier & Hoeffler, 2004). Conflicts are also prone in more densely populated areas as it increases the chances of rebel recruitment (Fearon & Laitin, 2003; Raleigh & Hegre, 2009). According to Pinker (2011), although longer periods of democracy can lead to less conflict, he highlights that democracy can be delayed in countries where governments do not encourage the establishment of better institutions but instead prefer to protect their positions of power. We explore this institutions' mechanism further in our additional analysis in Sect. 5.

Table 1 Oil discovery: 1 period Lag

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t</i>-1}	0.586*** (0.111)	0.517 (0.341)	0.610*** (0.116)	0.729*** (0.144)	0.489*** (0.176)
ln(Military Exp.) _{<i>t</i>-1}	0.653*** (0.056)	1.351*** (0.135)	0.589*** (0.057)	0.529*** (0.056)	0.674*** (0.083)
ln(GDPpc) _{<i>t</i>-1}	-0.074 (0.051)	0.450** (0.184)	-0.125*** (0.048)	-0.188*** (0.049)	0.013 (0.095)
ln(Globalisation) _{<i>t</i>-1}	-2.022*** (0.217)	-3.895*** (0.916)	-1.853*** (0.219)	-2.072*** (0.251)	-1.550*** (0.379)
ln(Pop. Density) _{<i>t</i>-1}	0.212*** (0.028)	0.327*** (0.072)	0.205*** (0.028)	0.249*** (0.030)	0.101* (0.051)
Democracy _{<i>t</i>-1}	1.010*** (0.117)	0.820** (0.400)	1.007*** (0.121)	1.216*** (0.150)	0.745*** (0.202)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.310	0.438	0.306	0.321	0.294
Obs	4528	4528	4528	4528	4528

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 2 Oil discovery: 5 period Lag

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t</i>-1}	0.521*** (0.113)	0.385 (0.384)	0.545*** (0.117)	0.641*** (0.141)	0.450** (0.181)
Discovery _{<i>t</i>-5}	0.594*** (0.122)	0.836** (0.359)	0.603*** (0.124)	0.746*** (0.146)	0.499*** (0.184)
ln(Military Exp.) _{<i>t</i>-1}	0.671*** (0.058)	1.524*** (0.143)	0.598*** (0.059)	0.523*** (0.058)	0.694*** (0.086)
ln(GDPpc) _{<i>t</i>-1}	-0.078 (0.052)	0.398** (0.193)	-0.132*** (0.048)	-0.191*** (0.050)	0.002 (0.097)
ln(Globalisation) _{<i>t</i>-1}	-2.132*** (0.223)	-3.108*** (0.911)	-1.991*** (0.227)	-2.302*** (0.263)	-1.606*** (0.384)
ln(Pop. Density) _{<i>t</i>-1}	0.235*** (0.028)	0.368*** (0.078)	0.231*** (0.028)	0.287*** (0.030)	0.112** (0.052)
Democracy _{<i>t</i>-1}	1.079*** (0.120)	0.633 (0.408)	1.091*** (0.123)	1.366*** (0.153)	0.768*** (0.204)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.319	0.466	0.316	0.333	0.297
Obs	4464	4464	4464	4464	4464

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

Globalisation has mitigating effects on all types of conflicts. The rise of globalisation has contributed to lowering levels of conflict through increased trade, social interactions with heterogeneous societies, and increased access to information through social media (Blanton & Apodaca, 2007; Chisadza & Bittencourt, 2018; Choi, 2010; Flaten & de Soysa, 2012; Hegre et al., 2010). For example, Bo and Bo (2011) find that positive effects to labour intensive industries, which can arise from terms of trade shocks or changes in technology, will raise wages and diminish social conflict. Of interest is the heterogeneous effects of income per capita on intrastate and interstate. Collier and Hoeffler (2004) find that reductions in civil conflict are possible through increasing the standards of living and lowering the risk of conflict over grievances, or incurring high opportunity costs from instability due to conflict. On the other hand, rising income per capita can increase income inequality resulting in unrest (Collier & Hoeffler, 1998), as evidenced by the positive and significant coefficient for interstate conflict.

Table 3 Oil discovery: 10 period Lag

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All Intrastate conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t</i>-1}	0.472*** (0.111)	0.343 (0.356)	0.494*** (0.116)	0.581*** (0.139)	0.404** (0.182)
Discovery _{<i>t</i>-5}	0.548*** (0.122)	0.900*** (0.323)	0.554*** (0.126)	0.688*** (0.147)	0.442** (0.188)
Discovery _{<i>t</i>-10}	0.437*** (0.125)	0.911*** (0.338)	0.399*** (0.130)	0.449*** (0.141)	0.396** (0.191)
ln(Military Exp.) _{<i>t</i>-1}	0.689*** (0.065)	1.787*** (0.254)	0.631*** (0.065)	0.545*** (0.064)	0.734*** (0.092)
ln(GDPpc) _{<i>t</i>-1}	-0.080 (0.052)	0.309* (0.184)	-0.121** (0.048)	-0.205*** (0.051)	0.053 (0.095)
ln(Globalisation) _{<i>t</i>-1}	-2.282*** (0.230)	-3.211*** (0.914)	-2.197*** (0.231)	-2.419*** (0.269)	-1.948*** (0.395)
ln(Pop. Density) _{<i>t</i>-1}	0.268*** (0.028)	0.453*** (0.094)	0.262*** (0.028)	0.311*** (0.030)	0.152*** (0.052)
Democracy _{<i>t</i>-1}	1.150*** (0.122)	0.785* (0.427)	1.164*** (0.124)	1.429*** (0.154)	0.847*** (0.209)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.327	0.464	0.325	0.341	0.305
Obs	4312	4312	4312	4312	4312

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

4.2 Robustness analysis

To check the robustness of the findings from the Poisson model, we also construct ordinal variables for the conflict measures and estimate the model using ordered logit. The conflict measures are broken into 3 intensities based on the MEPV categories of low to high intensity: (1) no conflict (0 episodes); (2) low intensity (if episodes of conflict fall within the scale of 1–5); and (3) high intensity (if episodes of conflict fall within the scale of 6–10). These discrete categories also aid with extreme outliers. We report the marginal effects in Table 4. Looking at Column 1, on average, an increase in oil discovery reduces the likelihood of no conflict by between 3 and 4%, but increases low and high intensity episodes for total conflicts by about 3% to 4% and 0.3% to 0.5%, respectively. The conclusions remain unchanged that interstate conflicts are affected by oil discoveries after a delayed period with respect to intrastate conflicts. The results also confirm that internal societal conflicts are more at risk, particularly the ethnic-type-related conflicts.

Table 4 Ordered logit

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t</i>-1}					
no conflict	-0.03796*** (0.00820)	-0.00002 (0.00001)	-0.02603*** (0.00583)	-0.00293*** (0.00066)	-0.00036** (0.00015)
low intensity	0.03404*** (0.00739)	0.00001 (0.00001)	0.02354*** (0.00530)	0.00277*** (0.00063)	0.00034** (0.00014)
high intensity	0.00391*** (0.00088)	0.00000 (0.00000)	0.00248*** (0.00058)	0.00016*** (0.00004)	0.00003** (0.00001)
Discovery _{<i>t</i>-5}					
no conflict	-0.04543*** (0.00909)	-0.00003*** (0.00001)	-0.03012*** (0.00652)	-0.00383*** (0.00069)	-0.00031** (0.00015)
low intensity	0.04075*** (0.00818)	0.00003*** (0.00001)	0.02724*** (0.00592)	0.00362*** (0.00066)	0.00029** (0.00014)
high intensity	0.00468*** (0.00099)	0.00000** (0.00000)	0.00287*** (0.00066)	0.00021*** (0.00005)	0.00002** (0.00001)
Discovery _{<i>t</i>-10}					
no conflict	-0.02664*** (0.00929)	-0.00003** (0.00001)	-0.01772*** (0.00655)	-0.00300*** (0.00068)	-0.00015 (0.00017)
low intensity	0.02390*** (0.00834)	0.00003** (0.00001)	0.01603*** (0.00593)	0.00283*** (0.00064)	0.00014 (0.00015)
high intensity	0.00275*** (0.00098)	0.00000* (0.00000)	0.00169*** (0.00064)	0.00016*** (0.00004)	0.00001 (0.00001)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.248	0.336	0.252	0.268	0.246
Obs	4312	4312	4312	4312	4312

Marginal effects reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

We also check the robustness of our baseline results by using the oil revenues (*revenue*),⁴ quantity of oil discovered (*retrievable*), as well as the expectation of oil discovery (*wildcat*). The oil revenue is the net present value (NPV) of oil discoveries with country-specific risk discount factor and constant production profile taken into account. The quantity of oil is measured by the total ultimate recovery of oil in million barrels of oil equivalent (MMBOE), while the expectation of oil discovery is measured by the number of exploratory drilling taking place in the country. All these variables are logged.

⁴ We also check the validity of the oil revenues' results using a different measure from World Development Indicators with a longer time period, namely oil rents as a percentage of GDP, which has data from 1960 to 2017. The results remain relatively consistent and are available on request from the authors.

Table 5 Oil revenues

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
$\ln(\text{Revenue})_{t-1}$	0.112** (0.047)	-0.133 (0.192)	0.126*** (0.046)	0.052 (0.073)	0.196*** (0.051)
$\ln(\text{Revenue})_{t-5}$	0.121** (0.050)	-0.021 (0.116)	0.133*** (0.050)	0.157** (0.066)	0.146** (0.064)
$\ln(\text{Revenue})_{t-10}$	0.100* (0.052)	0.013 (0.117)	0.096* (0.054)	0.086 (0.061)	0.151** (0.067)
$\ln(\text{Military Exp.})_{t-1}$	0.698*** (0.070)	1.960*** (0.324)	0.639*** (0.069)	0.561*** (0.070)	0.729*** (0.093)
$\ln(\text{GDPpc})_{t-1}$	0.001 (0.058)	1.028*** (0.186)	-0.060 (0.054)	-0.109* (0.058)	0.048 (0.100)
$\ln(\text{Globalisation})_{t-1}$	-2.339*** (0.240)	-3.262*** (0.791)	-2.218*** (0.241)	-2.108*** (0.301)	-2.596*** (0.412)
$\ln(\text{Pop. Density})_{t-1}$	0.235*** (0.031)	0.112 (0.115)	0.240*** (0.031)	0.268*** (0.034)	0.191*** (0.060)
Democracy_{t-1}	1.178*** (0.134)	2.139*** (0.553)	1.135*** (0.138)	1.486*** (0.171)	0.599*** (0.217)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.312	0.507	0.308	0.308	0.328
Obs	3832	3832	3832	3832	3832

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

In Table 5, we find a statistically significant and positive effect of oil revenues on intrastate conflicts in relation to interstate conflicts. Rentier effects from resource rents provide avenues for expropriation which can result in conflict. We also observe similar positive effects on intrastate conflicts from the quantity of oil discovered. The significant effects, shown in Table 6, extend to interstate conflicts after a delay for 5 years and longer. The control variables remain consistent as in previous results. Table 7 indicates that the expectation of oil discoveries significantly increases intrastate conflicts in relation to interstate conflicts. This is in line with empirical studies that find that there are lagged effects of oil wealth on internal political violence (Cotet & Tsui, 2013), as well as on economic outcomes such as economic growth (Arezki et al., 2017).

As a final robustness check, we use conflict measures from a different source to check the validity of our findings. We conduct our analysis using ordinal measures for interstate and intrastate conflict variables from the Uppsala Conflict Data Program (UCDP) database,⁵ where 0 is no conflict, 1 is minor conflict with between 25 and 999 battle-related deaths in a given year, and 2 is war with at least 1000 battle-related deaths in a given year.

⁵ <https://ucdp.uu.se/>.

Table 6 Barrels of oil

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
$\ln(\text{Retrievable})_{t-1}$	0.067*** (0.015)	0.055 (0.053)	0.070*** (0.016)	0.084*** (0.019)	0.056** (0.025)
$\ln(\text{Retrievable})_{t-5}$	0.078*** (0.017)	0.120*** (0.046)	0.079*** (0.018)	0.099*** (0.020)	0.063** (0.026)
$\ln(\text{Retrievable})_{t-10}$	0.060*** (0.017)	0.116** (0.046)	0.055*** (0.018)	0.059*** (0.019)	0.060** (0.026)
$\ln(\text{Military Exp.})_{t-1}$	0.689*** (0.065)	1.792*** (0.254)	0.632*** (0.065)	0.546*** (0.064)	0.734*** (0.092)
$\ln(\text{GDPpc})_{t-1}$	-0.088* (0.052)	0.298 (0.190)	-0.130*** (0.048)	-0.215*** (0.052)	0.043 (0.095)
$\ln(\text{Globalisation})_{t-1}$	-2.263*** (0.230)	-3.179*** (0.928)	-2.178*** (0.232)	-2.399*** (0.270)	-1.925*** (0.395)
$\ln(\text{Pop. Density})_{t-1}$	0.272*** (0.028)	0.454*** (0.096)	0.267*** (0.028)	0.317*** (0.030)	0.156*** (0.052)
Democracy_{t-1}	1.160*** (0.122)	0.802* (0.424)	1.175*** (0.124)	1.446*** (0.155)	0.855*** (0.209)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.328	0.464	0.326	0.343	0.306
Obs	4312	4312	4312	4312	4312

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

The results in Table 8 are consistent with our main findings that interstate conflicts are affected by oil discoveries after a delayed period compared with intrastate conflicts, though the interstate effects are marginal in comparison with intrastate conflicts.

5 Additional analysis

Findings by O'Brochta (2019) suggest that there may be subtle interconnections between natural resources and conflict that may not be easily observed through the aggregate relationship between natural resources and conflict. We attempt to explore some of these nuances in this section.

For our further analysis, we include income classifications of countries according to the World Bank and use the year 2000 as the base year.⁶ We interact these classifications with oil discoveries to determine whether wealthier countries that discover oil are prone

⁶ Low-to-middle income is between US\$996 and US\$3895 (low-middle); middle-to-high income is between US\$3896 and US\$12055 (high-middle); high income is above US\$12055 (high).

Table 7 Exploratory drilling

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
$\ln(\text{Wildcat})_{t-1}$	0.086 (0.071)	-0.478* (0.244)	0.150** (0.073)	0.226 (0.139)	0.090 (0.087)
$\ln(\text{Wildcat})_{t-5}$	0.332*** (0.074)	0.216 (0.289)	0.334*** (0.073)	0.435*** (0.119)	0.275** (0.108)
$\ln(\text{Wildcat})_{t-10}$	0.193*** (0.075)	-0.176 (0.221)	0.177** (0.069)	0.008 (0.106)	0.302*** (0.100)
$\ln(\text{Military Exp.})_{t-1}$	0.538*** (0.084)	1.814*** (0.543)	0.499*** (0.084)	-0.213* (0.118)	0.953*** (0.116)
$\ln(\text{GDPpc})_{t-1}$	0.294*** (0.101)	1.517*** (0.281)	0.193* (0.099)	-0.117 (0.134)	0.482*** (0.153)
$\ln(\text{Globalisation})_{t-1}$	-6.488*** (0.445)	-12.541*** (3.490)	-6.229*** (0.443)	-4.461*** (0.734)	-7.832*** (0.641)
$\ln(\text{Pop. Density})_{t-1}$	0.477*** (0.080)	1.447*** (0.399)	0.451*** (0.079)	0.261** (0.105)	0.457*** (0.121)
Democracy_{t-1}	0.710*** (0.207)	0.328 (1.032)	0.777*** (0.209)	0.698* (0.360)	0.675** (0.301)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.412	0.666	0.433	0.534	0.448
Obs	1347	1347	1347	1347	1347

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

to increased conflict. The results in Table 9 indicate that, on the one hand, high–middle-income countries that discover oil have fewer conflicts in general. This result is in line with the income per capita effect that as countries get wealthier, they can afford bigger military and police forces to deter violence (Pinker, 2011), as well as improve living standards thus reducing grievances (Collier & Hoeffler, 2004). Interestingly, on the other hand, high-income countries that discover oil appear to have increased conflicts, regardless of type. In this instance, the channel of increased inequality works similarly to that for low-income countries where any increases in wealth can widen income inequality and cause social grievances between marginalised groups and the elite (Michalopoulos & Papaioannou, 2016; Gleditsch, 2007).

In Table 10, we investigate the impact of institutions on conflict in countries that discover oil. Our baseline results in Tables 1, 2, and 3 indicated that democracy had a positive correlation with all types of conflicts. We therefore test for nonlinearity and find that at low levels of democracy, there is evidence of increased conflicts, but the longer that democracy is in effect, countries become less prone to conflicts. Maybe as the institutions improve, it increases the effectiveness of the government in defusing potentially volatile situations. For example, evidence from Reynal-Querol (2005) shows that democracies with political systems that are more inclusive decrease the likelihood of civil conflict. However,

Table 8 Ordered logit: UCDP conflicts

	Conflicts	
	Interstate	Intrastate
Discovery _{<i>t</i>-1}		
No conflict	0.00000 (0.00000)	-0.02559*** (0.00679)
Low intensity	-0.00000 (0.00000)	0.02173*** (0.00579)
High intensity	-0.00000 (0.00000)	0.00386*** (0.00105)
Discovery _{<i>t</i>-5}		
No conflict	-0.00000* (0.00000)	-0.03162*** (0.00657)
Low intensity	0.00000* (0.00000)	0.02685*** (0.00562)
High intensity	0.00000 (0.00000)	0.00477*** (0.00102)
Discovery _{<i>t</i>-10}		
No conflict	-0.00000* (0.00000)	-0.01069 (0.00685)
Low intensity	0.00000* (0.00000)	0.00908 (0.00583)
High intensity	0.00000* (0.00000)	0.00161 (0.00103)
Region FE	Yes	Yes
Year FE	Yes	Yes
Pseudo-R2	0.351	0.232
Obs	4312	4312

Marginal effects reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

we find no significant evidence from the interaction term of institutions mitigating conflict in countries with oil discoveries, in contrast to Bhattacharyya and Mamo (2019). They find that oilfield discoveries lead to less intrastate conflict onset and that the negative effect is magnified in countries with good institutions. Our insignificant findings on the interaction term, if anything, provide further evidence on the random timing of oil discoveries, which may make institutions ineffective. O'Reilly and Murphy (2017) provide evidence that oil discoveries have short-run effects on policy with little impact on overall institutions in the country.

Given the results in Table 10, we decided to isolate the largest oil producers in the world to determine the effects on conflict. We use the Organization for Petroleum Exporting Countries (OPEC) to identify the largest oil producers as of 2019.⁷ The results in Table 11

⁷ Algeria, Angola, Ecuador, Equatorial Guinea, Gabon, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Republic of the Congo, Saudi Arabia, United Arab Emirates and Venezuela.

Table 9 Oil discovery: income classifications

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t-1</i>}	0.568*** (0.177)	-0.485 (0.937)	0.568*** (0.179)	0.616*** (0.196)	0.542* (0.291)
Low-Mid Income	0.015 (0.141)	0.942* (0.520)	-0.060 (0.145)	-0.114 (0.173)	0.197 (0.207)
High-Mid Income	-0.952*** (0.223)	-1.579 (1.242)	-0.981*** (0.224)	-0.609*** (0.235)	-1.188*** (0.363)
High Income	-1.327*** (0.302)	0.078 (1.328)	-1.697*** (0.307)	-0.813*** (0.315)	-18.795*** (0.552)
Discovery _{<i>t-1</i>} xLow-Mid Income	-0.025 (0.227)	0.375 (1.064)	0.037 (0.228)	0.203 (0.292)	-0.120 (0.341)
Discovery _{<i>t-1</i>} xHigh-Mid Income	-1.885*** (0.556)	-17.214*** (1.112)	-1.801*** (0.558)	-17.092*** (0.298)	-1.094* (0.625)
Discovery _{<i>t-1</i>} xHigh Income	0.754*** (0.291)	2.009* (1.040)	1.080*** (0.296)	0.878*** (0.299)	1.054** (0.497)
ln(Military Exp) _{<i>t-1</i>}	0.659*** (0.055)	1.309*** (0.135)	0.601*** (0.057)	0.540*** (0.058)	0.697*** (0.081)
ln(GDPpc) _{<i>t-1</i>}	0.194** (0.076)	0.426 (0.348)	0.184** (0.076)	-0.007 (0.084)	0.402*** (0.139)
ln(Globalisation) _{<i>t-1</i>}	-2.125*** (0.213)	-3.510*** (0.802)	-1.987*** (0.217)	-2.142*** (0.242)	-1.542*** (0.359)
ln(Pop. Density) _{<i>t-1</i>}	0.237*** (0.030)	0.238** (0.116)	0.247*** (0.031)	0.250*** (0.034)	0.220*** (0.065)
Democracy _{<i>t-1</i>}	1.164*** (0.118)	0.557 (0.483)	1.178*** (0.122)	1.325*** (0.149)	0.773*** (0.207)
Region FE	Yes	Yes	Yes	Yes	Yes

Table 9 (continued)

	Aggregates		All interstate conflict		All intrastate conflict		Intrastate conflicts	
	All conflict	Yes	All interstate conflict	Yes	All intrastate conflict	Yes	All ethnic conflict	All civil conflict
Year FE								
Pseudo-R2	0.330		0.478		0.327		0.332	0.336
Obs	4509		4509		4509		4509	4509

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 10 Oil discovery: institutions interacted

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t-1</i>}	0.431 (0.276)	-0.012 (1.071)	0.469* (0.281)	0.477 (0.351)	0.574 (0.424)
ln(Military Exp.) _{<i>t-1</i>}	0.648*** (0.056)	1.452*** (0.135)	0.587*** (0.057)	0.528*** (0.057)	0.666*** (0.083)
ln(GDPpc) _{<i>t-1</i>}	-0.072 (0.051)	0.445*** (0.139)	-0.125*** (0.048)	-0.187*** (0.050)	0.012 (0.094)
ln(Globalisation) _{<i>t-1</i>}	-2.002*** (0.213)	-3.880*** (0.786)	-1.843*** (0.217)	-2.076*** (0.250)	-1.543*** (0.376)
ln(Pop. Density) _{<i>t-1</i>}	0.203*** (0.028)	0.207*** (0.070)	0.201*** (0.029)	0.247*** (0.031)	0.097* (0.051)
Democracy _{<i>t-1</i>}	1.995*** (0.575)	12.790*** (1.993)	1.338** (0.583)	1.115 (0.734)	1.676* (0.927)
Democracy _{<i>t-1</i>} ²	-1.055* (0.590)	-13.139*** (2.087)	-0.358 (0.594)	0.054 (0.756)	-0.924 (0.934)
Discovery _{<i>t-1</i>} x Democracy _{<i>t-1</i>}	0.663 (1.561)	-2.581 (4.092)	0.876 (1.657)	0.925 (2.028)	0.572 (2.546)
Discovery _{<i>t-1</i>} ² x Democracy _{<i>t-1</i>} ²	-0.461 (1.539)	4.897 (3.660)	-0.815 (1.664)	-0.513 (1.966)	-1.137 (2.696)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.311	0.485	0.306	0.322	0.295
Obs	4528	4528	4528	4528	4528

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 11 Oil discovery: petroleum exporting countries

	Aggregates			Intrastate conflicts	
	All conflict	All interstate conflict	All intra-state conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t-1</i>}	0.395*** (0.137)	1.119*** (0.327)	0.349** (0.150)	0.426** (0.175)	0.273 (0.230)
OPEC	1.077*** (0.120)	2.131*** (0.358)	1.059*** (0.123)	1.033*** (0.180)	1.083*** (0.156)
OPECxDiscovery _{<i>t-1</i>}	-0.100 (0.206)	-1.927*** (0.742)	0.056 (0.210)	0.081 (0.264)	0.078 (0.340)
ln(Military Exp.) _{<i>t-1</i>}	0.665*** (0.057)	1.533*** (0.150)	0.599*** (0.057)	0.551*** (0.058)	0.665*** (0.083)
ln(GDPpc) _{<i>t-1</i>}	-0.264*** (0.051)	0.042 (0.162)	-0.321*** (0.051)	-0.344*** (0.058)	-0.253** (0.101)
ln(Globalisation) _{<i>t-1</i>}	-1.763*** (0.217)	-3.008*** (0.941)	-1.592*** (0.221)	-1.878*** (0.259)	-1.150*** (0.390)
ln(Pop. Density) _{<i>t-1</i>}	0.278*** (0.027)	0.487*** (0.082)	0.270*** (0.028)	0.322*** (0.035)	0.156*** (0.053)
OPECxDemocracy _{<i>t-1</i>}	1.184*** (0.117)	1.378*** (0.446)	1.177*** (0.120)	1.421*** (0.152)	0.780*** (0.206)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.330	0.467	0.326	0.334	0.314
Obs	4528	4528	4528	4528	4528

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

indicate that while OPEC countries are highly prone to all conflict types, there is no significant effect when interacted with oil discoveries, implying that oil discoveries may not necessarily be the cause of conflict in these countries. On the other hand, we do find significant evidence of strong institutions mitigating civil conflict in OPEC countries.

As a final analysis, the MEPV dataset also records conflicts in neighbouring countries, namely the sum of all societal and interstate conflicts magnitude scores for all bordering states, the sum of all interstate conflicts magnitude scores for all neighboring states, and the sum of all societal (civil and ethnic) conflicts magnitude scores for all neighboring states. This affords us the opportunity to observe any regional spill-over effects that may be caused by the discovery of natural resources near borders (Caselli et al., 2015). The results in Table 12 show that countries with oil discoveries also increase conflicts in bordering states.

Table 12 Neighbouring conflicts

	Bordering total	Bordering interstate	Bordering intrastate
Discovery _{<i>t</i>-1}	0.347*** (0.068)	0.316** (0.154)	0.362*** (0.068)
Discovery _{<i>t</i>-5}	0.328*** (0.070)	0.109 (0.147)	0.354*** (0.070)
Discovery _{<i>t</i>-10}	0.274*** (0.069)	0.162 (0.141)	0.270*** (0.070)
ln(Military Exp.) _{<i>t</i>-1}	0.126*** (0.028)	0.069 (0.089)	0.128*** (0.027)
ln(GDPpc) _{<i>t</i>-1}	-0.282*** (0.028)	-0.050 (0.063)	-0.325*** (0.027)
ln(Globalisation) _{<i>t</i>-1}	0.121 (0.131)	0.062 (0.406)	0.165 (0.129)
ln(Pop. Density) _{<i>t</i>-1}	-0.113*** (0.016)	-0.154*** (0.035)	-0.105*** (0.016)
Democracy _{<i>t</i>-1}	-0.253*** (0.089)	-0.285 (0.234)	-0.244*** (0.084)
Region FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Pseudo-R2	0.351	0.376	0.342
Obs	4312	4312	4312

Coefficients reported. Robust standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

6 Discussion

This study exploits variations in oil discoveries to ascertain their association with two types of conflicts, mainly interstate and intrastate conflicts. Our results for intrastate conflicts are in line with previous evidence that finds a positive correlation between oil resources and internal armed conflicts (Basedau & Wegenast, 2009; Lei & Michaels, 2014), as well as in line with existing literature on natural resources in general (Rigterink, 2019; Adhvaryu et al., 2021). We extend this existing literature by providing evidence that increases in oil discoveries can precipitate intrastate conflicts within a relatively short period, and if unaddressed can become protracted conflicts. Our results provide further evidence that oil discoveries have a relatively larger effect on ethnic conflicts than civil conflict. These dynamics related to ethnic conflicts may explain why intrastate conflicts become apparent earlier than interstate conflicts after the discovery of resources. For instance, one of the implications of oil discoveries is the resource-induced inequality that may take place between groups in society (Fearon & Laitin, 2003; Collier & Hoeffler, 2004; Barbieri & Reuveny, 2005). Higher levels of wealth from oil discoveries provide motivation and opportunities for discontented groups to support themselves through expropriation, particularly when it comes to controlling the resources or state power (for example, oil conflicts in Angola, Colombia, Nigeria, Indonesia, Venezuela, the Middle East). This type of group in-fighting can play out very quickly after the discovery, especially if there are already existing income

inequalities present in the country, or if local population from the resource-rich area gets displaced. These findings are in line with the grievance mechanism that makes inference to rentier effects from natural resources.

Although there is limited literature related to oil discoveries and interstate conflicts, our findings in this study are in line with Caselli et al. (2015) who propose a model that explains the dynamics that can play out between bordering countries when oil deposits are discovered in one of the countries. In addition, our results are similar to Acemoglu et al. (2012) and Berman et al. (2017) who find that resources can lead to interstate conflicts. We extend this existing literature by providing evidence that oil discoveries have delayed effects on interstate conflicts in relation to intrastate conflicts. This finding implies that there may be different dynamics at play for interstate versus intrastate conflicts related to oil discoveries. For example, grievances over resource ownership rights can quickly escalate into internal conflicts, especially if there are already histories of long-standing hostilities among tribes within the country.⁸ On the other hand, control of oil resources can translate into geopolitical conflicts between the resource-rich and resource-poor countries, especially, when on-going resource-induced conflict between groups become internationalised over time. However, these types of conflicts need substantial revenues to mobilise armies, weapons or to get buy in from foreign interventions, and therefore, the effects of oil discoveries may take longer to materialise into interstate conflicts.

According to evidence from Berman et al. (2017), the adverse effects of fighting groups that control areas with minerals can escalate local violence to global violence. For example, the Angolan oil conflict was internal but involved the participation of foreign countries and subsequently spilled over into neighbouring countries, namely the Democratic Republic of Congo, Congo Republic and Namibia (Frynas & Wood, 2001). Moreover, Caselli et al. (2015) find that the discovery of oil in a country, particularly if the proximity of the resource is close to the border, heightens the incentive (i.e. greed mechanism) for the resource-poor country to engage in conflict to capture the oil. However, in this instance, the neighbouring country may take time to mobilise resources to engage in an interstate conflict (i.e. they need the means to fight, which suggests the feasibility mechanism). Lastly, the results we observe for the ten-year persistence of oil discoveries on both conflict types are in line with Arezki et al. (2017) who find that oil discoveries come with a production lag of four to six years due to delay of setting up the infrastructure necessary to extract the oil.

7 Conclusion

According to the theoretical underpinnings of this study, natural resources can cause conflict through motive of greed, by creating grievances among social groups, by providing opportunity for rebellion, and by weakening the state capacity (Collier & Hoeffler, 2004; Andersen et al., 2021). We contribute to the existing evidence on the resource-conflict nexus by distinguishing the resource effects between intrastate and interstate conflicts. Using oil discovery data for a global panel of countries, we establish positive correlations between oil discoveries and both interstate and intrastate types. However, we find that oil discoveries affect intrastate conflicts earlier than interstate conflicts. We also observe that

⁸ <https://www.middleeasteye.net/big-story/fighting-oil-21st-century-energy-wars>.

within intrastate conflicts, the results are driven by ethnic-related conflicts in relation to civil conflicts. We also find that these correlations hold across various robustness checks.

The findings from this study are twofold. Firstly, the findings highlight the importance of advocating for preventative actions that can address the conflict at an internal level before it spreads to other countries, such as developing continent-wide shared strategies on appropriate interventions that can promote peace-building. Given that many countries are dependent on oil imports, the risk of external involvement in conflicts becomes more likely. Examples include the United States' intervention in the Gulf region, and the involvement of foreign oil companies that contributed to the Angolan war through weapons deals and other forms of assistance in a bid to obtain oil concessions from the state elite (Frynas & Wood, 2001).

Secondly, the findings highlight the importance of quality of institutions. According to Lei and Michaels (2014), oil discoveries can fuel internal conflicts in countries where political disputes are often resolved by violence. Our results also suggest that one of the channels that oil discoveries can increase intrastate conflicts is through grievances related to inequalities between groups. Therefore, domestic governments need to support transparency initiatives for firms that extract the resources and also provide redistribution policies that compensate the local people who usually benefit little from the resource discovery. Moreover, focussing on natural resource governance may assist resource-abundant countries in reducing the likelihood of conflict relapse, especially when resources are discovered in conflict-prone regions, and instead encourage sustainable development.

Although our study may be subject to a few limitations, such as the data coverage or not accounting for geographical factors (e.g. rugged terrain, distance to resources, location of oil discoveries whether onshore or offshore), which may offset the positive effects of oil discoveries, we are confident that our findings still allow us to make a meaningful contribution to the current understanding of resource-conflict dynamics. In particular, the variations in oil discoveries' effects on types of conflict are, to the best of our knowledge, relatively novel evidence, which can be further explored at a micro-level by examining resource types on conflicts that are distinguished by actor types, mainly government, groups and civilian-based violence.

9 Appendix

Given that conflicts tend to be persistent, especially in countries with a history of conflict (Gates et al., 2016), we run a dynamic estimation with the lagged conflicts included as explanatory variables. We report the results in Table 13. The inclusion of the lagged dependent variables does not affect the conclusions from our main findings. The results support the finding that oil discoveries increase intrastate conflicts within a shorter period and interstate conflicts with a delayed effect. The inclusion of the lagged conflict variables

Table 13 Poisson: dynamic regressions—Lagged conflict

	Aggregates			Intrastate Conflicts	
	All conflict	All interstate conflict	All intrastate conflict	All ethnic conflict	All civil conflict
Discovery _{<i>t</i>-1}	0.259*** (0.082)	0.683 (0.450)	0.246*** (0.084)	0.305*** (0.108)	-0.034 (0.094)
Discovery _{<i>t</i>-5}	0.105 (0.087)	0.599* (0.317)	0.126 (0.083)	0.358*** (0.104)	-0.125 (0.121)
Discovery _{<i>t</i>-10}	-0.078 (0.093)	0.661* (0.337)	-0.086 (0.098)	0.225** (0.105)	-0.249* (0.131)
ln(Military Exp.) _{<i>t</i>-1}	0.279*** (0.040)	1.138*** (0.258)	0.288*** (0.041)	0.273*** (0.054)	-0.038 (0.056)
ln(GDPpc) _{<i>t</i>-1}	-0.150*** (0.040)	-0.296** (0.150)	-0.018 (0.039)	0.026 (0.055)	-0.272*** (0.054)
ln(Globalisation) _{<i>t</i>-1}	-1.027*** (0.169)	0.959 (0.791)	-1.478*** (0.175)	-1.157*** (0.277)	-0.606** (0.248)
ln(Pop. Density) _{<i>t</i>-1}	0.213*** (0.030)	0.409*** (0.098)	0.177*** (0.029)	0.251*** (0.033)	-0.144*** (0.054)
Democracy _{<i>t</i>-1}	0.674*** (0.107)	0.058 (0.498)	0.656*** (0.106)	0.768*** (0.141)	0.694*** (0.182)
Total Conflict _{<i>t</i>-1}	0.420*** (0.012)				
Interstate _{<i>t</i>-1}		0.682*** (0.063)			
Intrastate _{<i>t</i>-1}			0.445*** (0.013)		
Ethnic _{<i>t</i>-1}				0.542*** (0.022)	
Civil _{<i>t</i>-1}					0.878*** (0.027)
Region FE	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes
Pseudo-R2	0.563	0.615	0.575	0.593	0.659
Obs	4311	4311	4311	4311	4311

Coefficients reported. Standard errors in parentheses

* $p < .10$, ** $p < .05$, *** $p < .01$

Table 14 Descriptive Statistics Sources: Horn (2014), World Development Indicators, Center for Systemic Peace

	Obs	Mean	Std.Dev.	Min.	Max.
All conflict	7372	0.76	1.79	0.00	10.00
All interstate conflict	7372	0.10	0.65	0.00	9.00
All intrastate conflict	7372	0.67	1.64	0.00	10.00
All ethnic conflict	7372	0.37	1.20	0.00	10.00
All civil conflict	7372	0.29	1.08	0.00	7.00
Discovery	8318	0.05	0.22	0.00	1.00
Military expenditure	5736	2.95	3.75	0.00	117.39
GDP per capita (constant 2010 US\$)	7214	9987.53	15351.42	115.79	144246.37
Globalisation	6934	49.12	16.32	15.37	89.33
Population density	8346	225.36	1205.10	0.63	18891.50
Democracy	7293	0.76	7.45	-10.00	10.00

Table 15 List of variables and definitions

Variable	Description	Source
All conflict	Interstate and intrastate conflicts	Major Episodes of Political Violence and Conflict Regions 2017
Interstate conflict	International wars and violence between states	Major Episodes of Political Violence and Conflict Regions 2017
Intrastate conflict	Civil and ethnic conflicts within states	Major Episodes of Political Violence and Conflict Regions 2017
Ethnic conflict	Ethnic wars and violence between the state agent and a distinct ethnic group	Major Episodes of Political Violence and Conflict Regions 2017
Civil conflict	Civil wars and violence between rival political groups within a state	Major Episodes of Political Violence and Conflict Regions 2017
Discovery	Dummy variable=1 for oil discoveries in a specific year for a country, 0=otherwise	(Horn, 2014)
Military Exp	Military expenditure as a percentage of GDP	World Development Indicators
Real Gdpcap	Income per capita at 2010 US\$ constant prices	World Development Indicators
Globalisation	KOF index of globalisation ranging from 0 (no globalisation) to 100 (highly globalised)	Dreher (2006), Dreher et al. (2008)
Popden	Population density (people per square kilometre of land)	World Development Indicators
Democracy	Polity2 score for democracy ranging from -10 (autocratic) to 10 (democratic)	Polity IV Project 2017

Table 16 Country list

Albania	Ecuador	Laos	Qatar
Algeria	Egypt	Latvia	Russian Federation
Angola	El Salvador	Lebanon	Rwanda
Argentina	Equatorial Guinea	Lesotho	Saudi Arabia
Armenia	Eritrea	Liberia	Senegal
Australia	Estonia	Libya	Sierra Leone
Austria	Eswatini	Lithuania	Singapore
Azerbaijan	Ethiopia	Luxembourg	Slovakia
Bahrain	Fiji	Macedonia	Slovenia
Bangladesh	Finland	Madagascar	South Africa
Belarus	France	Malawi	South Korea
Belgium	Gabon	Malaysia	Spain
Benin	Gambia	Mali	Sri Lanka
Bolivia	Georgia	Mauritania	Sudan
Botswana	Germany	Mauritius	Sweden
Brazil	Ghana	Mexico	Switzerland
Bulgaria	Greece	Moldova	Tajikistan
Burkina Faso	Guatemala	Mongolia	Tanzania
Burundi	Guinea	Morocco	Thailand
Cambodia	Guinea-Bissau	Mozambique	Timor-Leste
Cameroon	Guyana	Myanmar	Togo
Canada	Honduras	Namibia	Trinidad & Tobago
Cape Verde	Hungary	Nepal	Tunisia
Central African Republic	India	Netherlands	Turkey
Chad	Indonesia	New Zealand	Uganda
Chile	Iran	Nicaragua	Ukraine
China	Iraq	Nigeria	United Arab Emirates
Colombia	Ireland	Norway	United Kingdom
Congo	Israel	Oman	United States of America
Cote d'Ivoire	Italy	Pakistan	Uruguay
Croatia	Jamaica	Panama	Uzbekistan
Cuba	Japan	Papua New Guinea	Venezuela
Cyprus	Jordan	Paraguay	Viet Nam
Czech Republic	Kazakhstan	Peru	Yemen
Denmark	Kenya	Philippines	Zambia
Djibouti	Kuwait	Poland	Zimbabwe
Dominican Republic	Kyrgyzstan	Portugal	

also does not attenuate the results for ethnic conflicts, which consistently show relatively larger effects compared to civil conflict.

Tables 14 and 15 report the variable statistics and definitions, while Table 16 indicates the list of countries used in the sample.

Funding Open access funding provided by University of Pretoria. None.

Data Availability The data will be made available on request to authors.

Declarations

Conflict of interest The authors would like to disclose no potential conflicts of interest.

Consent for publication All authors consent.

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