

Political Exclusion, Oil, and Ethnic Armed Conflict

Forthcoming in *Journal of Conflict Resolution*

November 2014

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Abstract

Why do members of some ethnic groups rebel against the state? One approach holds that groups subject to exclusion from national politics engage in armed conflict. We theorize that the presence of resource wealth moderates the effect of political exclusion. Ethnic groups subject to exclusion whose settlement area includes oil wealth are more likely to experience the onset of armed conflict than groups experiencing exclusion alone. We depart from the convention of cross-national analysis to examine sub-national, geocoded units of analysis—ethnic group settlement areas—to better capture the impact of natural resource distribution. Using data on ethnic group political exclusion derived from the Ethnic Power Relations database and geocoded indicators of we conduct a series of logistic regression analyses for the years 1946 to 2005. We find that exclusion alone increase the likelihood of conflict, while the presence of oil wealth further raises the risk of war.

For comments on earlier versions of this paper, we thank Navin Bapat, Justin Conrad, Kevin Greene, Todd Sandler, Beth Elise Whitaker, and Joseph Young. This material is based upon work supported in part by the U.S. Army Research Laboratory and the U. S. Army Research Office through the Minerva Initiative under grant number W911NF-13-0332.

Introduction

Why do members of some ethnic groups eschew violence against the state, while others rebel? An influential line of research holds that ethnic groups are more likely to engage in organized violence when they are excluded from the political system and are unable to pursue their interests or redress their grievances in a peaceful manner (Gurr 2000; Cederman, Wimmer, and Min, 2010). We investigate how the presence of oil wealth influences this relationship between ethnic exclusion and rebellion. Natural resource wealth, especially oil wealth, has been linked to the onset of internal conflict within countries (Collier and Hoeffler, 2004, Fearon and Laitin, 2003, Ross, 2012). These two explanations of conflict onset, one emphasizing the exclusion of ethnic groups and the other the presence of oil, have developed separately from each other. We suggest that work in the later vein can improve our understanding of the link between ethnic exclusion and conflict.

Exclusion from the political system is a strong motivator for armed conflict. We hypothesize that the presence of natural resource wealth substantially increases these motives. By extending the work of Ross (2012), we theorize that when ethnic group settlement areas contain natural resource wealth in the form of oil deposits,¹ group leaders are likely to demand a

¹ We focus in this piece on oil rather than other resources, such as lootable gemstones or drugs, for three reasons. First, oil is a prominent, valuable and important resource; according to Ross (2012), petroleum accounts for fully 85 percent of world trade in natural resources. Second, oil is the most common valuable natural resource paired with the variables of interest in our study. In our data, which uses the ethnic-group year as the unit of analysis, 25 percent of ethnic group-years are characterized by oil production in their settlement area; this is more than twice the percentage for other resources. Third, oil revenues that accrue to the state are not only large, but

share of the resulting revenues. This prompts two potential courses of action: the central government and the ethnic community can negotiate revenue-sharing agreements, or the ethnic group can use violence to push for independence or autonomy to secure control of the oil wealth. Negotiation of a revenue-sharing agreement should provide each side some fraction of the income that results from oil production while avoiding the high costs of armed conflict. But, as Ross (2012) explains, oil revenue-sharing agreements face commitment problems. Because the central government has more complete information about the amount of revenue earned from oil, representatives of the ethnic group fear it will use its control over this information to avoid sharing the agreed amount of revenues.

Armed conflict is one solution to this problem; if an ethnic group seizes control of territory containing natural resources, it no longer has to share the resulting rents with the central government. But armed conflict is risky and expensive. We theorize that the resolution of this commitment problem depends in part on the political status of the ethnic group. Oil in the settlement area of an ethnic group increases the likelihood of ethnic armed conflict, but only when the group is excluded from the national political system. Such exclusion denies representatives of the group the ability to collect more information about the scale of oil revenues, and to punish a government that violates a revenue-sharing agreement by withholding their support. Exclusion can also aggravate commitment problems inherent in ethnic power-sharing arrangements when these exist at the national level. And political exclusion can facilitate the expansion of the rebels' political coalition. It makes it easier for leaders who favor violence

also difficult for outsiders to measure accurately (Ross, 2012). As we discuss below, this opacity has an important influence on the likelihood of ethnic civil war onset.

to link the group's political status to natural resource wealth by highlighting how members are denied jobs or suffer most of the social and environmental costs of resource extraction.

Exclusion alone allows leaders to mobilize supporters who view the treatment of their ethnic group as unjust. Other co-ethnics, however, may not be powerfully motivated by these grievances. Oil wealth allows rebel leaders to attract support from such individuals with the promise that they will be rewarded with oil rents if their revolt is successful.

Combining oil and exclusion, then, should produce a substantial increase in the likelihood of ethnic armed conflict compared to the presence of ethnic exclusion alone. We assess this hypothesis by combining geo-referenced data on oil production and petroleum discoveries with subnational, geo-referenced data on the location and political treatment of ethnic groups around the world. Our project thus differs from studies that use ethnic fractionalization, human rights abuses, or other measures at the country level to proxy the treatment of ethnic groups. The advantage of using the ethnic-group year as the unit of analysis is that it allows us to associate both the political treatment of a particular group and oil with its violent behavior. Using geographic information systems (GIS), we spatially join settlement areas of ethnic groups and the location of oil reserves, which allows us to directly consider the potentially reinforcing incentives of these factors. We test our hypotheses by interacting the presence of petroleum with exclusion of the ethnic group from the national political system. We also compare how the presence of oil wealth combined with political exclusion along ethnic lines has influenced patterns of political violence in Indian states.

We find that the combination of exclusion with oil wealth sharply increases the chance of war compared to groups that are subject to exclusion alone. We view this as a contribution to the literatures on ethnic conflict and on resources and civil war. For the former, we show that, while

political exclusion is a powerful determinant of ethnic conflict, it can be moderated by the economic and geographic circumstances of an ethnic group. For the latter, our findings suggest that there is value in incorporating systematic information about the existence and, more importantly, the political status of ethnic groups into explanations linking resource wealth to conflict onset. The theory and findings present here push forward the movement (Collier and Sambanis, 2005, McAdam, Tilly, and Tarrow, 2001) to draw on insights from literatures view conflict as a result of grievances, one the one hand, and the desire to control wealth and power, on the other to develop more integrated and nuanced explanations.

Oil and Ethnic Conflict

Political entrepreneurs who wish to lead a rebellion face a powerful collective action problem in persuading others to join them. Participation is risky and dangerous for the individual participant, while many of the benefits of a successful revolt are shared by those who did not participate (Lichbach, 1998). A key problem for leaders of potential rebellions is persuading such people to join their cause.

Experience of exclusion and discrimination based on ethnicity, religion, and other collective identities has been shown to play an important role in persuading individuals to engage in collective political action, including political violence (see DeNardo 1985; Esty et al 1998; 1995; Hegre et al. 2001). Such exclusion not only creates grievances against the authorities but also helps to reinforce a collective ethnic identity; a sense of “otherness” based on rejection by mainstream society that draws community members together and lays the foundation on which collective political action can occur (Gurr, 2000). Without such exclusion, political activists hoping to motivate members of an identity group to engage in any type of collective political action – be it voting, engaging in street protests or supporting violent rebellion–would find

mobilizing people to be much more difficult. Many studies have found that countries that exclude, persecute, or discriminate against ethnic or religious minority groups are more prone to civil wars and internal armed conflict (Bonneuil and Ariat 2000; Moore 1998; Lichbach 1987). The recent work of Cederman and his colleagues (Cederman, Min, and Wimmer, 2010; Cederman, Weidmann, and Gleditsch, 2011), which we draw on below, has been particularly important in establishing this connection. It is based on a comprehensive dataset that identifies politically active ethnic groups around the world, identifies the degree to which they are excluded from national politics, and establishes a strong relationship between such exclusion and the onset of ethnic armed conflict.

There is also a large literature that links the presence of natural resource wealth, particularly petroleum, to the onset of armed conflict. Much of this work has developed in opposition to the idea that ethnicity causes such conflict, and has sought to develop the idea that other factors are key drivers of conflict onset. As this work as developed, though, it has increasingly emphasized that the geographical location of resource wealth matters for conflict, and more recent work in this vein has noted that quite frequently groups that engage in political violence in oil-rich regions have an ethnic basis.

Collier and Hoeffler (2004) held that resource wealth is both a motive and a source of finance for rebel movements. Fearon and Laitin (2003) suggested that oil wealth weakens the state's capacity to deter rebellion. Much subsequent work explored these explanations in greater detail, and developed better data sources and statistical assessments of the oil-civil war link (see, among others, Fearon, 2004; Collier, Hoeffler, and Rohner, 2009; Humphreys, 2005, Cotet and Tsui, 2013). An important strand of this later research highlights how the location of petroleum reserves and production within a country influences civil war onset and dynamics. This work has

been useful in identifying which of the causal mechanisms identified above link oil and conflict. For example, Lujala (2010) and Ross (2012) conclude that oil located offshore has little relationship to civil war onset; it is only countries with onshore oil production that face a higher risk of conflict. This finding is important because it indicates that oil wealth per se does not drive conflict, as Fearon and Laitin (2003) might expect; instead, the effects of oil are contingent on its location. Ross (2012) interprets this finding as more consistent with theories which emphasize how resource wealth influences the motive for rebellion. Conflict is also more prevalent in sub-national regions that are both poorer and have more natural resource wealth than the rest of the country (Østby, Nordås and Rød, 2009). This also indicates that the political consequences of petroleum for political violence depend on their location, in this case in poorer regions.

Ross (2012) develops the most sophisticated explanation of how the location of petroleum influences the outbreak of conflict. His theory rests on the fact that the spatial distribution of oil reserves creates two types of citizens—those that reside in oil-rich and in oil-poor regions of the country. Residents of an area with oil wealth could, in principle, be better off by rebelling and forming an independent state. This would allow them to control all of oil revenues generated within this territory. One way that the national government can forestall rebellion is by promising to share more of the revenues it derives from petroleum with the residents of the oil-rich area. It is difficult to ensure that such promises are credible, however. The reason is that the true scale of oil revenues are typically a secret that is tightly controlled by the national government. The petroleum sector in most oil-rich countries is dominated by state-owned national oil companies. National governments control such firms, and often block them from releasing reliable and detailed information regarding the amount of oil that is produced and

the resulting rents (Ross, 2012, 59-62). This secrecy means that residents of the oil-rich region are likely to suspect that the government is understating the true amount of revenue it earns from petroleum. As Ross (2012, 151) puts it,

Imagine there is unrest in an oil-producing region, which the central government wants to subdue by offering locals a share of the revenues. The locals would prefer to accept the offer and not fight, but only if they think the government will keep its end of the bargain. Because the true magnitude of the revenues is secret—they are known to the government but not the locals—the locals fear that they will get cheated. Even if the government's plan looks generous, locals will not consider it credible. The only way locals can be confident that they will receive a fair share of the oil revenues is if they become independent; therefore they decide to fight.”

The problem of distributing oil revenues is thus a commitment problem, where one or both sides in a bargaining situation have an incentive to make promises today but to renege on these promises in the future. Commitment problems are an important source of civil war more generally (Cunningham, 2006, Fearon, 2004, Walter, 1997). This explanation of how oil contributes to civil war onset is a powerful one because it highlights the strategic problems that the location of oil reserves creates for both governments and rebels. It is consistent with the finding that only onshore oil increases the risk of civil war, since such production leads to few or no local residents that are in a position to demand a share of revenues from offshore production. The fact that oil is associated with more conflict in poorer regions is also consistent with this theory, as residents of such regions should have the most to gain from more generous revenue-sharing arrangements, and thus more incentives to threaten to use force to achieve this outcome.

Ethnic Exclusion, Oil, and Conflict

Such commitment problems should exist in every sub-national region with substantial oil reserves. But not all of these experience ethnic armed conflict or civil war. This suggests that some oil-rich regions are better-positioned to strike durable revenue-sharing agreements with the national authorities that both sides prefer over armed conflict. What factors distinguish these regions from those where civil wars begin?

We theorize that the political treatment of ethnic groups are an important part of the answer to this question. Ross (2012) develops his theory based on petroleum's economic characteristics and "purposely leaves ethnic grievances out of the picture" (Ross, 2012, 166). Yet he notes that many armed conflicts over oil begin in regions with ethnic and religious minorities, and concludes that "[t]his implies that natural resource wealth is . . . much more hazardous when combined with preexisting ethnic or religious grievances. . . ethnic cleavages seem to play a critical role in petroleum-based secessions" (Ross, 2012, 166). In what follows, we build on this insight to explain in greater detail how oil and the treatment of ethnic groups by the state interact to exacerbate the commitment problem that governments face when promising to share revenues, and thus increases the likelihood of armed conflict onset.

As discussed above, the existing literature indicates that the exclusion of the representatives of an ethnic group from national politics increases the likelihood of armed conflict. We suggest that this risk of conflict is heightened further when the settlement area of the excluded ethnic group contains oil wealth. Four mechanisms produce this relationship.²

² Inclusion means that members of the ethnic group are not denied the rights afforded to other citizens of the state. Inclusion in a democratic country, for example, would mean that members

First, inclusion in national politics allows representatives of the ethnic group to better monitor the scale of oil revenues. Political representatives of the ethnic group can demand accurate information about revenues from oil, and threaten to oppose government priorities if their requests are not met. Ethnic group leaders who are members of the governing coalition or otherwise politically influential can ensure that co-ethnics are placed in positions within relevant ministries and state-owned firms that provide them with access to oil revenue data, and members of the legislature may be able to use investigatory committees and budget negotiations to obtain similar information. Fighting for independence or autonomy would guarantee that the leaders of the ethnic group have complete information about oil revenues. But rebellion is costly to undertake, and might fail. Inclusion in the national political system may be an acceptable second-best option for many groups. The leaders of many ethnic groups may prefer the (imperfect) monitoring offered by participation in the national political system to the low chance of winning an armed conflict.

Second, exclusion from the political system makes ethnic identity more politically salient. When considering political action, the status of their ethnic group will loom larger for individuals who are members of excluded groups. Such exclusion makes it easier for political

of the ethnic group could run for political office, found political parties, and so on, while exclusion means that members of an ethnic group are not afforded these rights. Inclusion can also occur in non-democratic states, where such rights are limited for most citizens. Here inclusion might mean that elites representing members of the ethnic group can engage in political negotiations, that members of the ethnic group can join government agencies and the military on the same terms as members of other groups, and so on.

entrepreneurs to convincingly link what they view as the unjust distribution of oil wealth to ethnic identity. As Edward Aspinall (2007, 951) puts it, “[n]atural resource exploitation gives rise to conflict when it becomes entangled in wider processes of identity construction and is reinterpreted back to the population by political entrepreneurs in ways that legitimate violence.” The secrecy surrounding oil revenues, which Ross (2012) highlights, can facilitate this process. Secrecy makes it easier for rebel leaders to exaggerate the degree to which co-ethnics are excluded from sharing oil wealth, prevented from taking jobs in the oil industry located in their settlement areas, and the extent to which oil producers create local environmental damage.

Third, if the rebels successfully use force to achieve independence, the government they form will be rich from oil revenues. They may choose to distribute these revenues disproportionately to those that supported their movement before it achieved independence. This could persuade individuals who are not strongly motivated by ethnicity alone to support the rebel movement, because if it succeeds they could share selective incentives such as government contracts or positions. From this perspective, the presence of oil wealth facilitates the organization of rebellion (Ross, 2012). This strategy will be more effective, though, when the ethnic group is subject to political exclusion. Political entrepreneurs in such situations can still appeal to their co-ethnics who are primarily motivated by a desire to secure political rights for their group. Members of the ethnic group for whom personal economic motivates are more important see little benefit from the oil wealth that surrounds them, as political exclusion means they are in a poor position to secure contracts or jobs from the national government. This allows leaders of exclusion-driven rebellions to also appeal for the support of less-committed co-ethnics by promising them a share of the rewards if the rebellion succeeds. This should expand the rebellion’s political coalition, enable it to attract more supporters early in the conflict before it

can exploit oil wealth, and translate this greater support into a more effective military force. In contrast, rebel leaders who cannot appeal to a shared experience of ethnic discrimination must rely solely on the promise of sharing future oil revenues to motivate supporters, who have less to gain from joining an armed group since they do not suffer exclusion from other employment and business opportunities.

A final pathway through which oil can accentuate the risk of civil war created by ethnic exclusion is by making ethnic power-sharing more difficult. Elites representing different ethnic groups often seek to share power at the national level. Such power-sharing pacts, though, can also create commitment problems. Roessler (2011, 301-2) terms this the “coup-civil war trap,” and describes its dynamics in the following terms:

Elites have much to gain by parceling out the state and working together to maintain their hold on power. But they also have a lot to lose if any faction defects from this bargain and conspires to usurp power. . .Reciprocal maneuvering, however, reinforces suspicion within the regime, often triggering an internal security dilemma. . .Amidst this escalating internal conflict, rulers employ an exclusive strategy to neutralize the existential threat posed by those inside their regime and to secure their grip on power.

The presence of oil in the settlement area of an ethnic group aggravates the difficulties that elites have in trusting each other not to renege on power-sharing commitments. The reason is that oil decreases the costs of exclusion from national politics for the leaders of an ethnic group, while increasing their ability to engage in armed conflict. Oil makes it easier for elites to unite members of an ethnic group around the goal of independence by allowing them to promise supporters a share of the resulting spoils. Rebellion may be less attractive for such leaders than is participation in the national political system, but it is more attractive than exclusion from

national politics without the possibility of leading an oil-fuelled rebellion. In other words, the presence of oil deepens the commitment problem that ethnic elites face when trying to share power at the national level (Posen, 1993; Roessler, 2011). Ethnic groups excluded from power are more likely to start armed conflicts aimed at the state, and the presence of oil should ease the collective action problems that such rebellions face.

These mechanisms lead us to hypothesize that oil wealth moderates the effect of political exclusion on the likelihood of ethnic armed conflict:

Hypothesis: In comparing ethnic groups excluded from the national political system, those whose settlement area includes oil wealth are more likely to experience the onset of ethnic armed conflict.

Research Design and Data

The dependent variable in our analysis is the outbreak of an armed conflict between government forces and a non-state actor that claims to represent the interests of an ethnic group. This dichotomous variable is based on the UCDP/PRIO Armed Conflict Dataset, and takes a value of 1 in years in which there is the onset of an internal armed conflict, defined as a confrontation between government and rebel forces in which at least 25 military fatalities occur and there has been no such conflict in the preceding two years, and 0 otherwise (Gleditsch et al, 2002). Following Cederman, Wimmer, and Min (2010, 101), a conflict is coded as having an ethnic basis if the armed group claims to be fighting for more rights or autonomy for members of a particular ethnic group, recruits soldiers primarily from one ethnic group, and allies with other groups based on ethnicity. Since this dependent variable is dichotomous, we use logistic regression and drop group-years in which an armed conflict is ongoing.

We used the Ethnic Power Relations (EPR) dataset to identify ethnic groups and assess the degree to which members were subject to some form of exclusion from national politics (Cederman, Min, and Wimmer, 2010). The EPR uses an expert survey to identify all politically relevant ethnic groups and their degree of participation in national politics from 1946 to 2005. “Politically relevant” groups are those represented by at least one political organization, or whose members are subject to political exclusion from the executive branch of the state. The unit of analysis is the ethnic group-year. The variable *excluded* is a dichotomous measure that takes a value of 1 in years in which members of the ethnic group are subject to exclusion and zero otherwise. Data on petroleum location and production comes from Lujala, Rød, and Thieme (2007). We extract from this source the location of each onshore oil production area, the year in which production of the resource began, and the year production ended. We are interested in the extent to which the location of petroleum production coincides with the settlement patterns of one or more ethnic groups. We used geographic information system (GIS) software to spatially join the location of each producing oil field with the geographic area in which ethnic groups included in the EPR data reside. For this step, we utilized the geo-coded version of the EPR data, known as GeoEPR (Wucherpfenning, et al., 2011). GeoEPR contains shapefiles that map the areas in which members of each ethnic group are concentrated. Our data is thus the result of the joining of the geo-coded petroleum data on resources and GeoEPR.³ We use this data source to

³ Offshore oil production near the settlement area of a concentrated ethnic group might have effects similar to that of onshore oil. For example, much of the oil extracted from the Cabinda enclave in Angola is located offshore, and at various points armed groups have called for independence so that residents of Cabinda can control the revenue from this oil. To assess this

create the independent variable *oil production*. This is a dichotomous measure that takes a value of 1 for each year in which petroleum was produced in an area inhabited by members of a particular ethnic group, and 0 when the petroleum did not exist in this area or when there is no record of production for that particular year.⁴

Following Cederman, Wimmer, and Min (2010), the statistical analysis that follows also includes a number of control variables measured at the group-year and country-year levels. At the group level, these include from the EPR the *downgraded* variable, a dichotomous measure that indicates if the status of the group in national politics has declined in the previous two years. *Group size*, also from EPR, is the group's total population as a percentage of the national population. *Past conflict* is a count of the number of armed conflicts fought in the name of the

proposition, we tested the robustness of the models reported below by incorporating into our measure of petroleum production offshore oil deposits located up to 100 kilometers and up to 250 kilometers from the settlement areas of concentrated ethnic groups. Accounting for offshore oil in this way does not alter the main results reported below.

⁴ Several intersecting areas were based on the overlap of a very small area. It was unclear whether these resulted primarily from digitization errors, mismatched group borders, or the arbitrary grouping and buffering method used to generate some of the resource layers. These potentially spurious intersections only affected the data when there was no other resource of that type in the area. In most cases, other sources of the same resource existed well within the group's boundaries and any change in date of discovery or production would be small. In cases where a variable in the Lujala, Rød, and Thieme (2007) data was missing, we assigned a value of 0 to the resource variable.

ethnic group from the group's entry into the dataset, and *peace years* is a count of the number of years since the last such conflict. Country-level characteristics that influence the outbreak of armed conflict are *GDP per capita* and the log of the national *population*. We also included the distance from the group's settlement area to the national capital, as other research suggests that a location on the periphery increases the likelihood of ethnically-motivated rebellion (Wucherpfennig et al., 2011). For groups that EPR codes as having a regional base, this variable is the distance from the centroid of the group's settlement area to the national capital in kilometers. For groups with more dispersed patterns of settlement across the country, this variable takes a value of zero.

Analysis

We used this merged data to estimate the models in Table 1, where the dependent variable is the onset of an ethnic armed conflict. Model 1 replicates the first model presented in Cederman, Wimmer, and Min (2010). Their key independent variable is *excluded*. In Model 1, *excluded* has a positive and significant relationship with ethnic armed conflict onset. Turning to the control variables, larger ethnic groups as well as those whose status at the national level has been downgraded or that have a history of armed conflict are more likely to rebel, while those located in wealthier countries are less likely to take up arms. All of these results are identical to those reported in Cederman, Wimmer, and Min (2010, 105). Model 2 adds to this model the independent variable *oil production*. Both the *excluded* and *oil production* variables increase the likelihood of rebellion. *Excluded* has a considerably larger substantive influence; while *oil production* doubles the predicted probability of conflict onset, *excluded* triples this probability.

Model 3 adds to model 2 an interaction between *excluded* and *oil production*. This allows us to estimate how the combination of systematic exclusion from national politics and petroleum

resources influence the likelihood of ethnic armed conflict onset. In the ethnic group-years included in our data, 30 percent are not subject to exclusion and do not reside in areas with oil reserves, 45 percent are subject to exclusion alone, 10 percent are not excluded but have settlement areas with oil, and 15 percent are both excluded and near oil reserves.

The interaction between *oil production* and *excluded* is negative and not statistically significant. The coefficient on *excluded* is positive and significant, while that for *oil production* is positive but above the conventional cut-off for statistical significance. Our hypothesis expects that *excluded* and *oil production* should jointly increase the likelihood of ethnic rebellion to a greater extent than either does alone. The fact that the interaction term is not significant could be taken as evidence against this hypothesis. We know from much recent work on interpreting interaction terms, however, that this may not be the case, and that an independent variable can have a marginal impact on the dependent variable for some values of the modifying variable even when the interaction itself is not significant (Berry, Golder, and Milton, 2012; Braumoeller, 2004; Brambor, Clark, and Golder, 2006). One way to assess this possibility is to perform a Wald χ^2 test to determine if *excluded*, *oil production*, and their interaction collectively influence ethnic armed conflict onset. The significant Wald χ^2 reported in model 3 suggests that this is the case.

Another way to determine how *excluded* and *oil production* influence ethnic armed conflict is to analyze the substantive effects of each of these variables and their interaction. Figure 1 reports the predicted probabilities and associated confidence intervals of ethnic armed conflict onset for each of the four combinations of *excluded* and *oil production*. Here we see that, regardless of the value of these variables, the likelihood that an ethnic armed conflict will begin in a particular year is very low. This is not surprising, as such onsets comprise only 119 of the

group-years included in model 3. The probability of rebellion is lowest when the group is not excluded and there is no oil production. This is also unsurprising. *Oil production* when the ethnic group is not excluded from national politics increases the predicted probability of armed conflict. However, the difference from the case without exclusion and without oil production is not statistically significant. This indicates that the presence of oil alone is insufficient to trigger the onset of an ethnic armed conflict by a politically relevant ethnic group. *Exclusion* without *oil production* more than triples the likelihood of armed conflict. This is consistent with the argument that grievance alone can generate conflict, as well as the findings reported in Cederman, Wimmer, and Min (2010). *Exclusion*, then, exerts a considerably larger and more consistent effect on the likelihood of armed conflict than does *oil production*.

The combination of *exclusion* and *oil production* leads to an even higher probability of ethnic conflict onset than does political exclusion alone, consistent with the hypothesis we advance. Note as well that *oil production* alone has a much smaller effect on the likelihood of armed conflict involving a politically relevant ethnic group. We suggested that this is because participation in the national political system allows representatives of the ethnic group to monitor the scale of government oil revenues to ensure that their constituents receive the promised share of such revenues. The fact that *oil production* combined with *exclusion* does lead to a large increase in the likelihood of armed conflict is consistent with this explanation, because in this situation the members of the ethnic group are not as well positioned to determine whether they are receiving what they consider their fair share of revenue from the central government.

Recall that model 2 finds that *exclusion* and *oil production* each independently increase the likelihood of rebellion. In model 3, in contrast, the effect of *oil production* is contingent on the value of *excluded*; it is only when the ethnic group is excluded from national politics that *oil*

production increases the chance of rebellion. This raises the question: which of these is the better specification? We suggest that model 3, which adds an interaction between *excluded* and *oil production*, better captures the relationship between these variables and ethnic armed conflict. Model 2 permits an assessment of only the individual effects of *excluded* and *oil production* on the outbreak of ethnic rebellion. Model 3 provides information about these individual effects, and allows one to evaluate the effects of the combinations of *excluded* and *oil production*. We see in this specification that exclusion from national power consistently increases the likelihood of ethnic armed conflict. The key difference from model 2, then, is in how *oil production* influences such conflict. Here *oil production* in the absence of exclusion has little effect on ethnic armed conflict, while its combination with ethnic exclusion powerfully augments the latter's contribution to civil war. This finding is not one that could be drawn from model 2, which does not interaction *excluded* with *oil production*.

The measure of oil production used to this point is a dummy variable that measures if oil is being produced in the area where a particular ethnic group is settled. It does not measure how much oil is being produced, or how valuable it is. We might imagine that the amount of income generated by oil production would influence the decision to rebel. Groups in areas with marginal oil production may decide that the small rents they would capture if they controlled the resource do not justify the risks of armed conflict against the government. Conversely, ethnic groups in areas with enormous oil wealth might face much stronger incentives to rebel.

We lack accurate global data on how much petroleum is produced in areas inhabited by ethnic groups. But data on oil prices is available. The International Monetary Fund's *International Financial Statistics* reports the average annual petroleum price from 1957 onwards. This variable indexes the price in each year to the real price in the year 2000. Using this data

allows us to estimate how the likelihood of rebellion by an ethnic group varies with the potential economic return to controlling oil resources. We created a new variable, *oil price*, that takes the value of this oil price index when the ethnic group in question resides in areas with oil production, and a value of 0 otherwise. Model 4 interacts this continuous measure of oil prices with *excluded*. It includes only groups with concentrated settlement areas that contain oil production. Figure 2 displays how changes in the price of oil, depicted in increments of 25, influence the likelihood of ethnic armed conflict, contingent on ethnic exclusion. The horizontal axis displays the index price of oil. The vertical axis displays the predicted probability of ethnic armed conflict onset. The two plot lines indicate this probability for ethnic groups that are subject to political exclusion and those that are not. For all but the highest and lowest index values for *oil price*, the likelihood of rebellion is greater when an ethnic group is subject to exclusion and when it is not. In our data, the level of *oil price* is between 25 and 200 for about two-thirds of the observations. Ethnic armed conflicts are more likely to begin, then, when oil prices are higher. But this effect is contingent on the exclusion of the ethnic group from national politics. The likelihood of rebellion among ethnic groups that are not excluded, depicted in the lower line of figure 2, does not vary systematically with *oil price*.

We next probed the robustness of the specification of model 3 in a series of additional statistical models presented in table 2 and figure 3. Cederman et al. (2011) hold that economic inequality is an additional driver of rebellion by ethnic groups. They suggest that members of ethnic groups that are, on average, either much poorer or wealthier than the average national income will hold economic grievances that lead them to rebel. They assess these hypotheses with data on subnational income per capita from Nordhaus' G-Econ dataset (2006). The presence of oil production in the region where an ethnic group settles may lead to an increase in the group's

average income due to greater employment opportunities and inward investment. This income effect might counter the group's incentives to engage in rebellion. Members of the ethnic group might conclude that they have little reason to rebel when they compare their average income to the average income for other citizens of their country. However, ethnic groups in areas with oil production might instead compare their current income to that which would obtain if the group obtained autonomy or independence and could capture all of the rents available from oil production. Model 5 adds to model 3 two measures of relative ethnic group income. Following Cederman et al. (2011), high income is the ratio of group income per capita to national income per capita when this ratio is greater than zero. Positive measures of this variable indicate that members of the ethnic group are, on average, wealthier than other citizens of the same country. Low income is the same ratio when it is less than zero, measuring the extent to which the ethnic group is poorer than the rest of the country. Adding these variables does slightly change the results from model 3. As can be seen in the accompanying plots of predicted probabilities in figure 3, *oil production* alone still does not increase the likelihood of rebellion among groups not subject to exclusion, and *excluded* continues to be associated with a higher probability of ethnic armed conflict onset. The combination of *excluded* and *oil production* produces the highest probability of rebellion. Note, however, that while the predicted probability for this combination is higher than it is for the combination of exclusion and no oil production, the difference between these probabilities is not only significant at the $p < .10$ level. Interestingly, in model 5 the high income variable is not statistically significant, in contrast to the findings reported in Cederman et al. (2011). This suggests that oil production accounts for part of the effect that higher incomes have on the likelihood of ethnic rebellion.

It is possible that the discovery of oil reserves, rather than the production of oil, leads to armed conflict. Ross (2012, 166) suggests that oil discoveries are a useful way to distinguish the objectives of rebel movements. Rebel movements cannot loot oil discoveries, since they do not yet produce wealth that can be appropriated to fund their violence. But the discovery of petroleum reserves might motivate the creation of a separatist movement that starts an armed conflict to capture the rents that will be available once production begins. Model 6 assesses this proposition. It is identical to model 3 but replaces the dummy variable *oil production* with a dichotomous measure, *oil discovery*, which takes a value of 1 in years in which oil has been discovered or produced in the settlement area of a particular ethnic group. Predicted probabilities for all relevant combinations of *oil discovery* and *excluded* are displayed in the subsequent figure. These probabilities are similar to those for model 3. In particular, adding information about the discovery of petroleum reserves does not lead to a statistically-significant increase in the likelihood of an ethnic armed conflict onset. *Exclusion* alone as well as exclusion combined with the discovery of oil increase the chance of armed conflict.

As discussed above, the GeoEPR dataset measures the degree to which groups are concentrated in particular regions or are more widely scattered across the country. One might suspect that such concentrated groups are more likely to rebel than those that are more dispersed (see especially Toft, 2005). Concentration, then, may be an omitted variable in the specifications we have reported to this point. It is not obvious whether concentration should dampen or increase the effect of *oil production* on the likelihood of ethnic armed conflict. On the one hand, it may reduce the independent effect of oil, since concentrated groups—including those whose settlement area does not include petroleum reserves—should find it easier to resolve the collective action problems that hinder revolt and may not need oil as an additional *causis belli*.

Model 7 tackles this by replicating model 3, but including as an additional independent variable *concentrated settlement*, a dichotomous measure of groups' settlement patterns. The results are consistent with our earlier specifications. The predicted probabilities of conflict onset for the four possible combinations of *excluded* and *oil production* reported in the figure are similar to those for model 3; in particular, *excluded* alone sharply increases the chance of conflict, and *excluded* combined with *oil production* has an even larger effect. The difference in predicted probabilities between when *oil production* is introduced largely unchanged than is the case for model 3.

Recall that we hypothesize that participation in national politics by representatives of an ethnic group reduce the commitment problems that arise when oil is discovered and produced. An alternative institutional solution to this commitment problem would be to grant representatives of the ethnic group political autonomy, including the authority to inspect and measure oil production or the power to tax such production directly. Inspection would provide the autonomous regional government with more, and higher-quality, information about the scale of oil production and estimates of the revenues flowing to the central government. Taxing authority would allow such governments to collect such revenues themselves, and reduce or even eliminate the need for transfers from the national authorities. A number of countries have delegated such powers to sub-national governments in recent years (Ahmad and Searle, 2006). In practice, however, such decentralization has a number of political drawbacks. Local and regional governments often lack the administrative capacity and technical knowledge needed to effectively monitor the activities and finances of the national oil company and international oil firms (Ross, Lujala, and Rustad, 2012). If extraction remains under the control of nationalized or foreign firms, as is typically the case, the regional government may have difficulty independently

accounting for the legitimate production costs of the producers, resulting in disagreements over the net amount of revenue it is due. Autonomy, then, might reduce but not eliminate the commitment problem created by the secrecy surrounding oil revenues. Some form of participation in national politics should provide more of the leverage and expertise needed to obtain reliable information about the true state of oil revenues. The Ethnic Power Relations dataset includes a variable measuring if the representatives of an ethnic group have autonomy from the central government. In model 8, we add this as an additional independent variable. This coefficient on this variable is negative and statistically significant, indicating that armed conflict onsets are, in fact, less likely when the ethnic group has autonomy. However, the inclusion of this variable does not alter the relationships between oil, ethnic exclusion, and their combination.⁵

Examples from India help to illustrate the theorized relationship between political exclusion, oil wealth and ethnic group rebellion and political violence. India has been a parliamentary democracy since its independence in 1947 that guarantees *de jure* rights and protections for all of its 1,652 ethno-linguistic groups. However, India is characterized by a legacy of political exclusion and repression of some groups by central and state government authorities (Piazza 2009). Although India is a net energy-importer, its oil sector produces nearly 900,000 barrels per day; approximately the same production level as Indonesia and half that of

⁵ In results reported in the appendix, we consider how more specific classifications of political exclusion—if ethnic groups are powerless, subject to discrimination, or whose political status has been downgraded—as well as the explicit pursuit of separatism influence the likelihood of conflict onset; results are consistent with the main findings reported here.

Algeria. India's on-shore oil production are located in its industrial heartland in the state of Gujarat, in its most populous and urbanized state of Uttar Pradesh, in the rural Northern state of Rajasthan, in the Southernmost state of Tamil Nadu and in its restive and underdeveloped North East (U.S. Energy Information Administration 2014). The combination of uneven ethnic group exclusion—where some enjoy the ability to influence political decision making, particularly at the state-level, while others do not—and regional oil resources and exploitation make India a useful venue for illustrating how oil wealth combined with exclusion can produce more ethnic armed conflict.

The general principle that Indian central government authorities have used in designing its federal system is to afford, where possible, state-level political representation to local ethno-linguistic communities (Cline 2006). For many large ethno-linguistic groups, such as the Bengalis, the Gujaratis and the Tamils, this has meant state boundaries that guarantee community majority at the state level, healthy representation – if not dominance – in state legislative bodies, control of state executive branches, and the resulting ability to affect state policy. In many cases the larger Indian ethnic groups have long enjoyed strong representation in national politics in India – such as the Gujaratis – or have had success electing regional political parties to the Indian Lok Sabha (Parliament) – such as the Tamils – that are able to articulate group policy preferences. It is therefore not surprising to find an absence of rebellion among these groups, despite the exploitation of oil wealth in the regions they inhabit. Each is well-positioned politically to obtain favorable policies regarding, for example, local investment of oil rents or adjudication of disputes involving the oil industry, and each have materially benefit from local oil industry in terms of jobs and development.

However, oil wealth exacerbates rebellion driven by political exclusion suffered by other ethno-linguistic groups, particularly in the North East. Many of the ethno-linguistic minority and tribal groups in the North Eastern states of India – frequently referred to as the “Seven Sisters” region – have a long legacy of seeking autonomy or independence. Many also reside in states in which they suffer from unofficial or official political discrimination and demographic minority status – either due to the way geographic boundaries of the state have been set or migration into the state by other groups – and are unable to affect policy change at the state or national level (Piazza, 2009). Separatist sentiment and activities are particularly acute in those North Eastern states where political exclusion is joined by oil production. For example, using data from the South Asian Terrorism Portal⁶ and the Government of India Ministry of Petroleum and Natural Gas Economic Division (2012), we find a robust correlation between the number of oil wells developed (.59), oil industry infrastructure (.59) and the number of oil fields (.52) and casualties due to political violence in the North Eastern states during the period 2005-2012.

The Indian state of Assam is a case in point. Separatist sentiment and activities have been present among the Assamese linguistic-ethnic population of the state since 1947, as they have been in other North East states, and these have been fueled by political resentments caused by the influx of migrants from other Indian states – particularly from West Bengal – central government rearrangement of the borders of the state to create new states, human rights abuses by counterinsurgency officials, and the experience emergency imposition of direct central government control in 1990 (Piazza 2009). However, unlike other states in the North East, Assam’s considerable oil wealth – some estimates place Assamese oil reserves at 15 to 20 percent of the total for India – has produced specific and strong grievances that have further

⁶ Data available at: <http://www.satp.org/>.

fueled armed conflict. The United Liberation Front of Assam (ULFA), the main armed Assamese separatist group in the state, has moved to capitalize on popular complaints that oil resources are controlled by outsiders, that oil revenues are not benefitting local peoples – or at least not Assamese residents, and that the oil industry has fostered government corruption, despoiled the land and has led to displacement of people (Singh 2010).

As a result, casualties from political violence in Assam have been more than double that of the average for the North Eastern states: Assam suffered 2,197 casualties due to insurgent activities from 2005 to 2012 as opposed to 806 on average for the region as a whole. Other Northeastern states with ethnic minority groups with similar grievances and experience of political exclusion but that lack major oil wealth, such as Aranchul Pradesh, Mizoram or Tripura, experience lower than average rates of casualties during the same period.

Conclusions

The sets of analyses in this study allow us to draw several conclusions. First, we consistently find that political exclusion of ethnic groups alone raises the likelihood of an ethnic armed conflict onset. This is consistent with much of the literature on ethnic grievances and conflict. Second, we find that oil production and the discovery of petroleum reserves in themselves have a much weaker relationship with ethnic conflict onset. The presence of oil in the settlement area of an ethnic group does not increase the likelihood of conflict onset. The theory developed here suggests that this is the case because the opportunity to participate in national politics provides members of an ethnic group with some ability to influence revenue-sharing and to monitor the central government's expenditures more closely. This blunts the impact of resource-derived points of political contention between the government and ethnic communities located in resource-extraction areas. Finally, we find the strongest relationship between the

combination of exclusion from national politics with the presence of oil. This interaction leads to quite large and statistically significant increases in the onset of armed conflict. As we suggested in our third hypothesis, in such cases the presence of the resources serves as an accelerant to conflict motivated in large part by ethnic grievances.

We note one important limitation to our empirical findings. Our unit of analysis is politically-relevant ethnic groups, and we find that the presence of oil reserves in the settlement areas of such groups does not increase the likelihood of armed conflict when the ethnic group is not excluded from the political system. This differs from various theoretical arguments which suggest that oil wealth alone creates incentives for armed conflict (Fearon and Laitin, 2003; Ross 2012). Our findings are not inconsistent with these approaches. Instead, the work presented here suggests the more limited finding that the presence of oil in and of itself does not heighten the chance of ethnic armed conflict. This should not be interpreted as suggesting that oil wealth by itself cannot influence the likelihood of conflict through other mechanisms which do not directly involve activating ethnic identities.

These conclusions advance the debate about the conditions under which resource- and exclusion-based arguments work together, a topic that has figured prominently in studies of armed conflicts, insurrections and other episodes of intrastate political violence. We interpret our body of results to lend support to the contention that the presence of natural resource wealth and experience of political exclusion are not competing forces determining whether or not ethnic groups engage in rebellion, but are rather complementary factors that together can advance our explanations of the conditions under which rebellions will occur. Future studies might further explore the complementary ways resources and political grievances interact by examining different natural resources from petroleum – such as timber, narcotics or alluvial diamonds – and

different types of political exclusion – from executive power versus legislative representation – or political institutions that promote or hinder ethnic group representation.

Table 1. Logistic Regressions of Ethnic Armed Conflict Onset

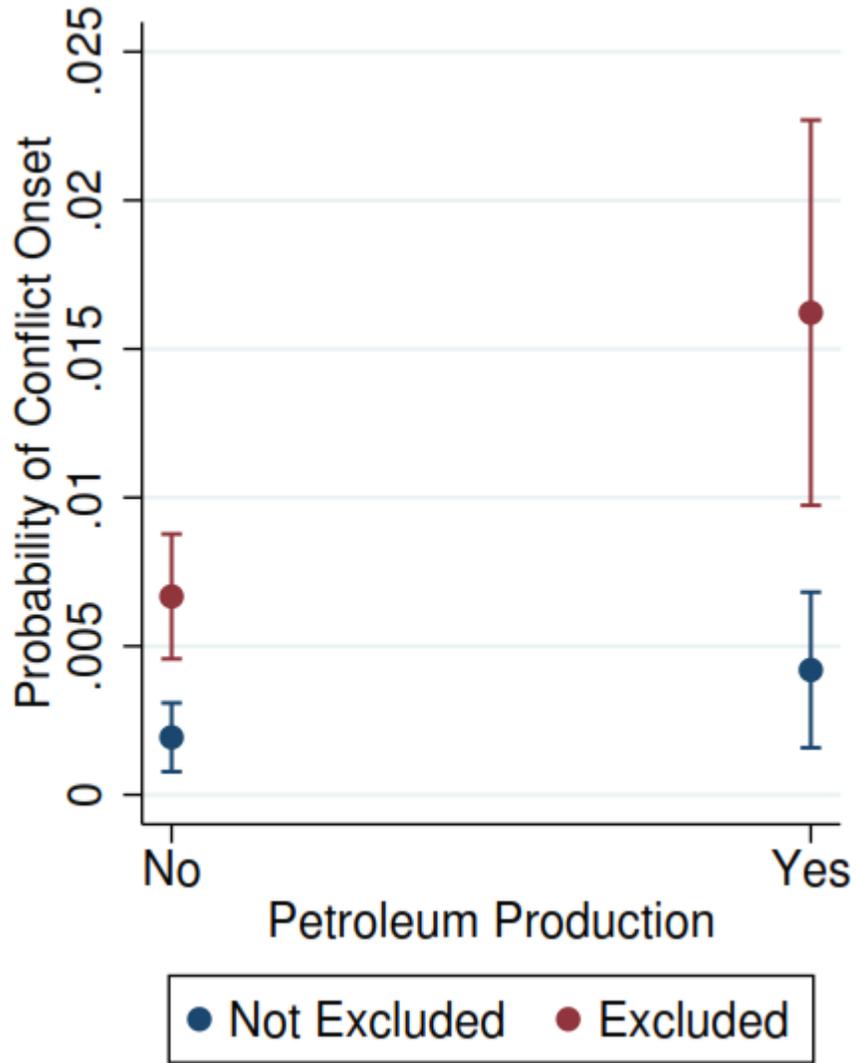
	Model 1	Model 2	Model 3	Model 4
Oil Production*Excluded			-.13 (.48)	
Oil Production		.89** (.19)	.78 (.43)	
Excluded	1.28** (.27)	1.29** (.20)	1.25** (.34)	.93** (.33)
High Income				
Low Income				
Oil Price*Excluded				.01 (.01)
Oil Price				.01 (.00)
Downgraded	1.63** (.40)	1.57** (.38)	1.57** (.38)	.187** (.36)
Group Size (log)	.29** (.07)	.27** (.08)	.27** (.07)	.29** (.10)
Past Conflict	.85** (.17)	.70** (.18)	.70** (.18)	.41 (.22)
GDP per capita (log), Lagged	-.38** (.10)	-.47** (.10)	-.48** (.10)	-.58** (.15)
Population (log), Lagged	-.04 (.08)	-.13 (.08)	-.13 (.08)	-.08 (.12)
Distance from capital	-.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Years Since Last Conflict Onset	-.15* (.07)	-.16* (.08)	-.16* (.08)	-.02 (.11)
Constant	-2.96 (1.20)	-1.64 (1.20)	-1.62 (1.21)	-.03 (2.11)
Wald χ^2	137**	134**	134**	326**
Log pseudolikelihood	-683	-675	-675	-626
Wald χ^2 (3 degrees of freedom)			40.87**	15.03**
Observations	22142	22142	22142	4176

Robust standard errors in parentheses; ** p<.01, * p<.05

Table 2: Robustness Checks

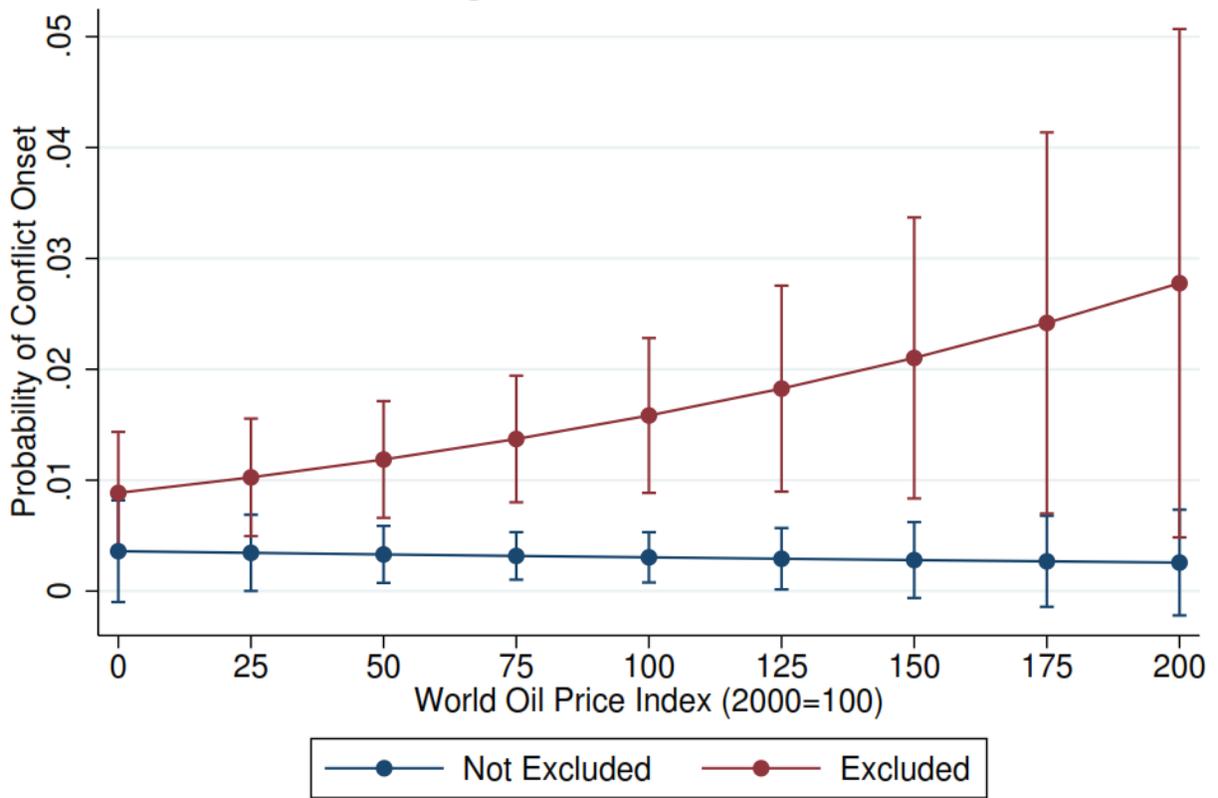
	Model 5	Model 6	Model 7	Model 8
Oil Production*Excluded	-.20 (.80)		.12 (.49)	.23 (.47)
Oil Production	.94* (.46)		.79 (.44)	.78 (.43)
Oil Discovery*Excluded		.25 (.49)		
Oil Discovery		.66 (.45)		
Excluded	1.39* (.39)	1.18** (.37)	1.26** (.35)	1.34** (.34)
High Income	.21 (.20)			
Low Income	.39* (.15)			
Group Autonomy				-.90* (.42)
Concentrated Settlement			.19 (.28)	
Downgraded	1.73** (.37)	1.61** (.39)	1.58** (.34)	1.53** (.39)
Group Size (log)	.27** (.08)	.25** (.07)	.27 (.07)**	.24** (.07)
Past Conflict	.76** (.19)	.73** (.18)	.71** (.18)	.71** (.16)
GDP per capita (log), Lagged	-.44** (.12)	-.48** (.11)	-.45** (.11)	-.44** (.10)
Population (log), Lagged	-.17 (.09)	-.14 (.08)	-.11 (.09)	-.13 (.08)
Distance from capital	.00 (.00)	.00 (.00)	.00 (.00)	.00 (.00)
Years Since Last Conflict Onset	-.15 (.08)	-.16* (.08)	-.16** (.08)	-.16* (.08)
Constant	-2.03 (1.27)	-1.36 (1.22)	-1.94 (1.35)	-1.70 (1.16)
Wald χ^2	125**	141**	141**	188**
Log pseudolikelihood	-606	-674	-675	-671
Wald χ^2 (3 degrees of freedom)	27.33**	45.81**	40.87**	51.61**
Observations	19672	22142	22142	22142

Figure 1. Predicted Probabilities of Ethnic Armed Conflict Onset



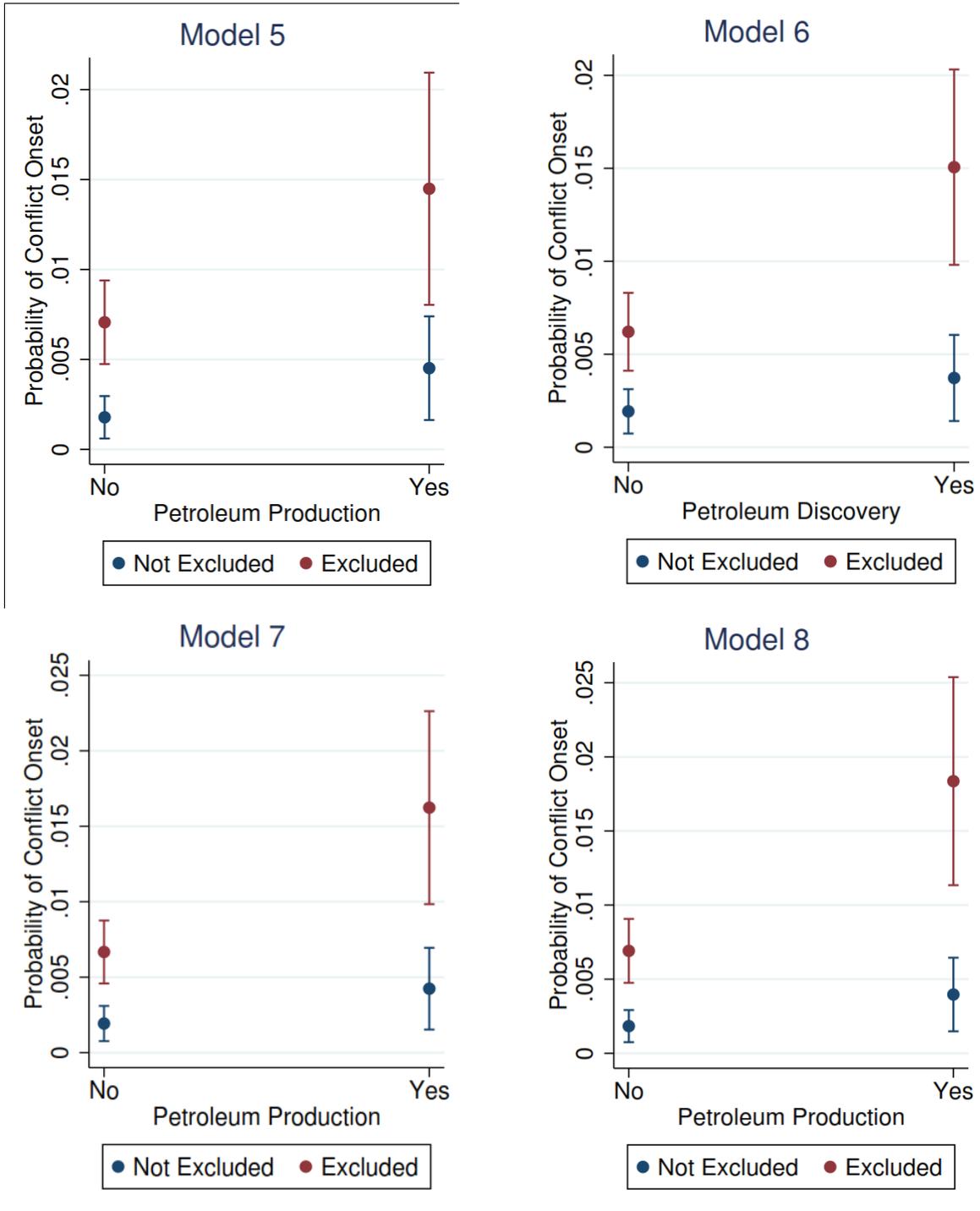
Note: Error bars indicate 95 percent confidence intervals.

Figure 2. Oil Prices and Predicted Probabilities of Ethnic Armed Conflict Onset



Note: Error bars indicate 95 percent confidence intervals.

Figure 3. Predicted Probabilities of Ethnic Armed Conflict Onset



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Appendix

In the main results reported in the paper, we measured the political status of the ethnic group as exclusion from national power. Such exclusion can take a number of more specific forms in the EPR dataset, including groups that are powerless, are subject to discrimination, or have seen their power status downgraded (see Cederman, Wimmer, and Min 2010 for a discussion of these different types of political exclusion). This raises the question: How does the presence of oil influence the effect of these specific types of exclusion on the likelihood of armed conflict? It is possible that the results reported to this point are being driven by only some types of exclusion. We address this question with model 9 in Table A1. In addition to the control variables used in model 3, this includes as independent variables the three more specific measures of political exclusion available in the EPR dataset—powerlessness, discrimination, and downgraded political status. We also include as an additional control variable from the EPR dataset if the representatives of the ethnic group have separatism from the state as their declared objective. This allows a comparison of the relative effects of these types of exclusion on the likelihood of rebellion when oil production is present. Groups that are powerless and whose position at the national political level has recently been downgraded all have higher and statistically significant likelihoods of engaging in an ethnic armed conflict. This is not the case for groups subject to discrimination, although the p -value on this coefficient does approach standard levels of statistical significance ($p = 0.093$). Groups espousing separatist aims have a much larger likelihood of rebellion. This is not surprising, since such groups have already decided that drastic reforms in their relationship with state authorities are needed. Petroleum also leads to a sizable increase in the likelihood that groups whose power status has been downgraded in the past two years will rebel. With the exception of discrimination, then, any type of exclusion

of an ethnic group from the national political process makes armed conflict more likely. This suggests that our earlier results are not driven by a subset of ethnic groups that are excluded from power in a particular way, but and that most types of exclusion combined with the presence of oil increase the likelihood of ethnic armed conflict.

Table A1. Ethnic Armed conflict Onset by Type of Exclusion

	Model 9
Powerless	.91** (.32)
Discrimination	.99 (.59)
Separatist	2.36** (.97)
Downgraded	2.18** (.44)
Group Size (log)	.25** (.10)
Past Conflict	.59** (.24)
GDP per capita (log), Lagged	-.39** (.15)
Population (log), Lagged	-.01 (.10)
Years Since Last Conflict Onset	-.01 (.10)
Peace Spline Years	Yes
Constant	-2.66 (1.21)
Wald χ^2	159**
Log pseudolikelihood	-225
Observations	24511

Robust standard errors in parentheses; ** p<.01, * p<.05