Chapter 4
Digging Deeper: On the Role of Grievances in African Mining Conflicts*

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Abstract

A substantial literature holds that mining operations frequently lead to adverse outcomes for local communities, especially by increasing the risk of political violence. Recent empirical studies of mining sites in Africa support this claim, finding that mining causes elevated levels of protest and civil-war related events. These effects are typically attributed to greedy rebels who seek to appropriate mineral resources or unmet economic expectations on behalf of local communities. This chapter explores to what extent mining-related conflict works through or is amplified by ethnic grievances. Analyses at both the grid-cell and the ethnic group level reveal that new mining projects or rising prices are particularly dangerous where they coincide with ethnopolitical exclusion. In politically excluded areas, mining-related conflict events are more organized, explicitly target the government, and are more often framed in ethnic rather than mere economic terms. As such, they are more likely to escalate to full-blown ethnic rebellion, which is confirmed by our group-level analysis.

The previous chapter showed that the link between petroleum extraction and political violence appears to operate primarily through ethnic inequalities in a way that is compatible with the general grievance logic that was introduced in Chapter 2. Given the theme of this book, the question that this chapter addresses is to what extent this finding can be generalized to cases involving the extraction of non-fuel minerals.

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This is a particularly urgent question because, as we have argued in Chapter 1, a veritable mining boom has swept through large parts the world since the turn of the century (Le Billon, 2012). Extractive operations have entered production at a rate unparalleled in recent history both in Latin America (Bebbington and Bury, 2013) and Africa (Chuhan-Pole, Dabalen and Land, 2017). Figure 4.1 illustrates a steep increase in the number of operating mines on the African continent, the empirical focus of this chapter. Driven by the industry's rapidly increasing demands for precious metals, not the least in China, this impressive wave of foreign direct investment has done much to accelerate development in previously underdeveloped regions. Yet, as shown in the case of oil, there is a dark side to these positive developments. As minerals are extracted at a rapid pace, new problems emerge that may block, and even reverse, the benefits of mining (see e.g. Koubi et al., 2014).

Covering mostly sub-Saharan Africa, most of the contemporary scholarship in this area assumes that the resource curse derives from mobilization opportunities relating to incomplete information (Christensen, 2019) and greed-related factors driven by "rapacity" and rebel finance (Berman et al., 2017). Yet, despite being based on sophisticated difference-in-differences research designs applied to extensive datasets, these findings still leave open the possibility that grievance-related factors may be at play. First, most of this research has tended to rely on relatively time-limited samples, which risk obscuring the influence of longer-term mobilization responding to structural inequalities. Second, as a rule, these studies are to some extent "color-blind" in that they do not conceptualize and measure inequality along ethnic lines. Third, this recent scholarship tends to rely on conflict data that risk blurring the distinction between theoretically relevant event types.

This chapter attempts to overcome all three limitations. First, while also exploiting within-case variations over time, we rely on datasets that span over several decades of history rather than shorter periods. Second, the empirical analysis of this chapter captures the extent to which ethno-politial exclusion conditions the effect of differences in resource extraction over time. Third, and finally, the conflict data used here allow us to narrow down the focus to theoretically meaningful categories, for instance pertaining to the targets of violence and the motivations driving it in way that is more specific than in the existing literature.

Based on these modifications, we find strong support for the grievance logic postulated in Chapter 2 of this book. To test this logic, we analyze whether homelands of ethnically excluded groups see systematically different, potentially more dangerous forms of violent mobilization in response to mineral extraction than what recent research suggests. The empirical strategy relies on grid cells and ethnic settlement areas as units of analysis, with spatial information on conflict events drawn from the SCAD dataset Salehyan et al. (2012) and data on ethnic rebellion from the Ethnic Power Relations dataset Vogt et al. (2015). Our analysis of conflict events at the level of grid cells indicates that mining projects in politically excluded ethnic settlement areas provoke different forms of contestation than is the case in politically represented areas. Mining conflict in excluded regions is more likely to be explicitly cast in ethnic terms and is often directed against the national government. As such, the potential for further escalation beyond the local level seems large. The group-level analysis suggests that, perhaps as a consequence of more confrontational events at the local level, mining operations in the homelands of politically excluded groups increase the risk of full-blown ethnic rebellion.

The chapter is structured as follows. The next section provides an overview of the relevant literature, followed by a section that derives the main hypotheses. Then we present the group-based and cell-based empirical analysis including data, methods and results, before summarizing and discussing the results in a final section.

[Figure 1 about here.]

4.1 Minerals and political strife in the literature

In Chapter 2, we offer a general introduction to the literature on the link between mineral resources and political violence. Here we merely recapitulate the most important aspects that are directly relevant to the current chapter. The contemporary scholarly debate over whether, and to what extent, mineral resources affect political violence largely dates back to two influential articles by Collier and Hoeffler (1998) and Fearon and Laitin (2003). While Collier and Hoeffler argue that revenues from natural resource extraction gives rebels an incentive to launch "greedy" rebellions, Fearon and Laitin stress a conflict-driving logic based on "opportunities" flowing from weak state capacity. Collier and Hoeffler's and Fearon and Laitin's contributions have sparked a quickly growing strand of quantitative literature further investigating the presence, magnitude, and causes of this "resource curse" (for recent reviews, see Koubi et al., 2014; Ross, 2015).

This resource-conflict literature has developed along two main lines. First, to identify the underlying causal mechanisms, there has been a trend towards more disaggregated data and analyzes, both in terms of moving from the analysis of natural resources to more specific groups of commodities, and well as replacing country-level aggregates with sub-national metrics of resource production and violence. Second, scholars have exhibited a growing concern with endogeneity and causal identification.

Disaggregation has turned out to be a very successful strategy for unpacking the resource curse, especially regarding the role of oil and gas extraction. By measuring the location of oil production sites, Ross (2006) and Lujala (2010) are able to show that only onshore oil production appears to affect conflict risk, contradicting Fearon and Laitin's state capacity explanation, and suggesting that the underlying mechanism operates through a more local channel. Some scholars have outlined an active role played by grievances (see e.g. Murshed and Gates, 2005; Østby, Nordås and RØd, 2009). Much of this scholarship rests on Stewart's (2008) notion of "horizontal inequalities," among culturally or ethnically defined groups, as opposed to "vertical inequalities," which compare individuals. Stewart, Brown and Langer (2008, 294-295) argue that natural resources tend to augment the effect of such ethnic differences on conflict. More recently, Asal et al. (2015) and Hunziker and Cederman (2017), the latter included as Chapter 3 of this volume, present results suggesting that oil affects civil conflict primarily by triggering violent ethno-nationalist secessionism.

On the non-fuel side, however, results have been less conclusive. Inspired by popular accounts of "conflict diamonds," several authors analyze the relationship of diamond mines with civil war with mixed results (see e.g. Lujala, Gleditsch and Gilmore, 2005; Ross, 2006). Analyzing data on the level of ethnic groups, Sorens (2010) finds some support that non-fuel mineral resource production increases the risk of secessionism. Similarly, using a grid-cell level approach and focusing on Africa, Berman et al. (2017) show that an increase in a commodity's global market price leads to a greater number of conflict-related events in areas where it is being mined. This finding is in line with Collier and Hoeffler's (1998) opportunity-focused explanation for the resource curse. Pursuing a similar approach, Christensen (2019) analyzes political violence in Africa by comparing local levels of political violence before and after non-fuel mines have gone into production. In contrast to Berman et al. (2017), he finds that mining increases the likelihood of protests and riots, but *not* civil-war related events.

All in all, the literature on mining has been less inclined to highlight explanations based on inequalities and grievances. While considering such a pathway in theory, Berman et al. (2017) focus their empirical investigation on issues relating to the feasibility of fighting rather than grievances. Going even further, Christensen (2019) explicitly rule out such explanations in favor of his own uncertainty-based interpretation.

In parallel to the trend towards more fine-grained analyzes, a growing number of scholars have argued that many of the initial resource-curse findings may be the result of spurious inference (see e.g. Brunnschweiler and Bulte, 2009; Mitchell and Thies, 2012; Cotet and Tsui, 2013; Lei and Michaels, 2014). As discussed in Chapter 2, there are several reasons to believe that whether, and to what degree a given country or region exhibits mineral resource production is not determined exogeneously, but the result of sociopolitical and economic factors. One such confounding variable is the quality of political institutions. Some authors argue that countries featuring poor institutions are more likely to rely an oversized mining sector because they are unable to establish competitive manufacturing and service industries (Ross, 2004; Haber and Menaldo, 2011). Since weak, inefficient states are also more likely to experience violence, this mechanism would imply that previous studies have overstated the resource-conflict link.

Others suggest that weak institutions may be associated with fewer mining projects, as weak property rights disincentivize investments in extractive infrastructure (Cotet and Tsui, 2013; Torvik, 2009). In this case, previous studies would have underestimated the gravity of the resource curse. Another potential threat to inference arises due to reverse causality. In particular, the mere prospect of political violence may deter investments in extractive infrastructure. In this case, correlational analyzes would underestimate the risks associated with mining, as the most dangerous locations never actually see mineral resource production.

Several strategies have been proposed to address these endogeneity problems. For example, the previous chapter instruments for oil extraction based on geological variables. While this approach works relatively straightforwardly in the case of petroleum deposits, unfortunately, it is less directly applicable to non-fuel minerals. The problem is that the linearity assumption does not hold for mining, since the mapping between geological fundamentals and mineral resource production is both highly non-linear and complex.[1]

A more common approach is to dismiss between-unit variance and focus solely on how resource extraction and political violence covary over time. This design eliminates bias caused by unmeasured time-invariant confounders such as political institutions (e.g. Cotet and Tsui, 2013; Haber and Menaldo, 2011). This is also the strategy Christensen (2019) relies upon in his study of mineral resource production in Africa. In particular, following the standard diff-in-diff setup, he shows that areas with newly opened mines exhibit elevated levels of political protest, while featuring pre-treatment trends of protest comparable to non-mining areas. Berman et al. (2017) take a slightly different approach, using fluctuations in world commodity prices as an exogenous source of variation in the market value of local African mineral resource deposits. Hence, Berman et al. (2017) and Christensen (2019) compare levels of violence within a geographic unit over time, investigating whether conflict-related events are more frequent when the locally available resources are more valuable.

[1] In an earlier version of this paper, we therefore introduced an advanced machine-learning technique called "DeepIV" Hartford et al. (2017), but this method will require more work to yield results on the interaction with ethno-political exclusion.

Despite making important progress, these studies suffer from three main limitations. First, the time series are in both cases limited to the period between 1997 and 2010. Yet, relying on short-term changes in production or prices as an identification strategy makes it difficult to analyze effects that only materialize over long time periods. For instance, both Christensen (2019) and Berman et al. (2017) report that economic inequality does not increase the effect of mining on the likelihood of political violence. It is possible, however, that grievances over unfair rent allocation only translate into violence after sustained periods of mineral resource production. Second, while the two studies take inequality and grievances into account, they do not do so systematically along ethnic lines. Third, and finally, their reliance on the ACLED dataset Raleigh et al. (2010) limits their ability to break up the results into events categories that reveal the extent to which the state was targeted and whether the motivation was related to ethnic grievances.

To address these shortcomings, at the end of this paper, we turn to alternative empirical data and analysis that address these concerns.

4.2 How do ethnic grievances affect mining conflict?

At this point, we return to the grievance-related mechanisms that we introduced in Chapter 2 in order to show how mineral resource extraction could trigger civil conflict. Extractive activities impact the affected population in various ways, including by potentially deepening already existing horizontal inequalities among ethnic groups. According to our argument, those affected by resource extraction may harbor grievances that derive from unfair distribution, exposure to non-local, potentially better paid labor, marginalization of the groups' political influence, and finally, negative externalities resulting from environmental pollution or other disruptions of the local population's livelihood or lifestyle.

As illustrated by the previous chapter, the aforementioned grievance-based scenarios are primarily inspired by a series of prominent ethno-regional conflicts involving petroleum or gas, the latter being the case in the Acehnese civil war. In these cases, the high cost of extraction calls for major state involvement, which has far-reaching consequences for the grievance repertoire shown above. In particular, it can be expected that extraction has repercussions that go well beyond environmental grievances.

To what extent can we generalize from this mostly petroleum-focused account to other types of natural resources, such as non-fuel minerals? Of course, what is at stake in not merely the type of resource, but also the political context at hand. Chapter 2 contends that there are good reasons to believe that similar grievances will emerge in connection with mining operations, at least to the extent that they are of reasonably large scale. It is not difficult to find evidence of mobilization around distributional claims, especially if the local population suffers from underdevelopment (e.g. Bebbington et al., 2008). In terms of migration, it is well known that many mining companies rely on foreign workers rather than the local population. In fact, Weiner (1978) introduced his notion of sons-of-the-soil partly in connection with mining operations in South Asia, which attracted an influx of mining workers into peripheral regions of India. When it comes to political grievances, however, we expect less disruption than state-led petroleum projects, which are known to trigger a major surge in state capacity. Yet, even in connection with mining, the threat to their political status constitutes an incentive for local elites to mobilize political support against central rule by appealing to the community's right to "control its own destiny" (see e.g. Ballard and Banks, 2003, 297). Sometimes, political grievances emanate from the extractor's repressive activities that may even include violent suppression of protest and targeted killings of activists (Ibid.). Furthermore, local politicians and community leaders may well be affected by mining even in cases where private companies are involved, for example through an increase in corruption (see e.g. Knutsen et al., 2017). Finally, since many types of mining are associated with major environmental damage, environmental grievances are in principle as likely as in the case of petroleum extraction (see e.g. Bebbington and Williams, 2008).

Based on this reasoning, we introduce our first empirical hypothesis postulating a direct effect exerted by non-fuel extraction:

Hypothesis 4.1. *Mining increases the probability of ethnic civil conflict.*

It seems unlikely, however, that mining operations spur similar grievances and mobilization processes across the board. Instead, we expect national-level ethnic politics to moderate the relationship between resource extraction and ethnic conflict. According to this logic, mining-related grievances are particularly likely to be expressed in sustained mobilization against the state where they activate or reinforce pre-existing frustration over exclusion from political power. So far, we have considered explanations relating to grievance formation, but other stages of the conflict process have to be activated before political violence emerges. In particular, according to Step 3 introduced in the theoretical framework of Chapter 2, grievances need to be transformed into mobilized and armed resistance, which is an effort that requires considerable resources and organization (see e.g. Tilly, 1978).[2]

We see three main reasons why mining may be more dangerous in areas populated by politically excluded ethnic groups. First, national governments are less likely to effectively respond to mining-related grievances in such areas. Political accountability often does not extend beyond African governments' ethnic core constituencies and pressure to accommodate demands from excluded groups is accordingly low. In addition, governments often lack access to elite networks in excluded areas making it harder to correctly anticipate and address grievances related to mining operations (Kasara, 2007; Roessler, 2016). Second, political exclusion provides opportunities to — correctly or incorrectly — attribute responsibility for any type of unwanted change brought about by mineral extraction to national governments. Even where private extractors are the main players, ethnically excluded groups can more plausibly blame governments for distributional, migration-related, political, and environmental grievances or, at least, accuse them of insufficient assistance. Third, pre-existing political inequalities turn economic policy issues into questions of inter-group fairness and ethnic discrimination. While local residents' initial discontent may be rooted in the distribution of revenues or environmental externalities, political exclusion increases the

[2]It is likely, however, that mass-held grievances facilitate mobilizational activities (Cederman, Gleditsch and Buhaug, 2013).

likelihood that these issues are perceived and framed as part of a larger pattern of ethnic discrimination.

As a result of these processes, we expect mining to have stronger conflict-inducing effects in politically excluded ethnic homelands. This leads to our second empirical hypothesis:

Hypothesis 4.2. *Mining increases the probability of ethnic civil conflict in areas inhabited by excluded ethnic groups.*

4.3 Data, methods and results

Our empirical analysis proceeds in two steps. First, we follow recent research and analyze the impact of mining on local-level conflict events at the cell level. Second, we aggregate data on African mining activities to the level of ethnic settlement areas and run models with group-level ethnic conflict onset as the dependent variable. We use the commercial Deposit Database provided by MinEx Consulting (MinEx, 2018) to construct our main independent variables. The MinEx data aims to capture all African mining deposits and provides information on discovery dates, years of extraction activity, main metals, deposit size, approximate value, and geographic location. For the present purpose, we focus on the (logged) number of active mines within a spatial unit as the main independent variable and analyze how within-unit changes in mining activity over time affects different forms of (ethnic) conflict.

4.3.1 Cell-based analysis of conflict events

We draw on the Social Conflict Analysis Database (SCAD) to identify conflict events below the threshold of organized ethnic rebellion against the state (Salehyan et al., 2012). SCAD codes low-intensity events of social conflict in Africa as well as the actors, targets, and issues involved, from 1989 onward. Our preference for SCAD over alternative event data sets like UCDP GED (Sundberg and Melander, 2013) and ACLED (Raleigh et al., 2010) is based on several reasons. The UCDP GED data set only covers violence conducted by organized armed actors and in the context of a broader conflict that has surpassed the conventional intensity threshold of 25 battle-related deaths. As a result, UCDP GED misses many theoretically interesting cases of violent or peaceful mobilization like protests, riots, strikes, or violence by armed groups unrelated to large-scale conflicts. ACLED, on the other hand, only starts in 1997 and thus covers eight years less than SCAD. Longer time series are especially important for analyses exploiting temporal variation within units and for effects that may not immediately materialize in the first year after a new mine has opened. Even more important for our purposes, SCAD provides more detail on individual conflict events allowing, for example, to identify the degree of organization, whether or not protests or violence explicitly target the government, and the political issues driving peaceful or violent mobilization (Salehyan et al., 2012). This enables us to disaggregate SCAD events to categories more closely reflecting the grievance-related mechanisms at the heart of this volume than generic protest or conflict events.

To construct our data set, we aggregate all active mines and SCAD conflict events to spatial cells with an average area of 500 sqkm. We construct these units as Voronoi polygons nested within African country borders. Voronoi cells offer several advantages over frequently used rectangular grids. First, they result in more compact shapes than conventional grids. Second, the distribution of cell sizes has less outliers than is the case with regular raster cells. Third, they are constructed to perfectly align with country borders which makes them more suitable for analyses that employ country or country-year fixed effects. After constructing our spatial units via Voronoi tessellation, we code, for each cell and year, whether at least one conflict occurred. We also code separate dummies for different event types. More specifically, we (i) distinguish organized events (demonstrations, riots, strikes, anti-government violence, extra-government violence) from spontaneous demonstrations and riots, (ii) identify events that explicitly target the national government, and (iii) differentiate between different issues that were "mentioned as the source of tension/disorder" (Salehyan et al., 2012). We estimate linear probability models with a conflict event dummy multiplied by

100 as the dependent variable. All models include cell fixed effects to account for all time-invariant heterogeneity across cells and thus identify effects from within-cell temporal variation only. In addition, we include country-year fixed effects controlling for temporal shocks affecting all cells within the same country. We cluster standard errors at the grid cell level and, at first, only include the logged mine count as main predictor. In a second set of specifications, we add an interaction term with a political exclusion dummy, coding all cells whose centroid falls within an excluded groups' settlement area as 1.

[Table 1 about here.]

Table 4.1 summarizes the results from the baseline models without interactions. Model 1 in Table 4.1 indicates that doubling the number of mines in a cell increase the likelihood of conflict by about one percentage point. This general effect is somewhat larger and more precisely estimated for spontaneous riots and demonstrations (Model 2) than for organized conflict events (Model 3). Models 4–6 restricts the focus to events that explicitly target the central government. Again, there is a positive and significant general effect of active mines on conflict events but the disaggregation according to the degree of organization yields smaller, only marginally significant estimates. These initial results are broadly in line with Christensen (2019) who finds that African mining increases local protests and riots but not more organized rebel activities. The smaller effects on anti-government events may be interpreted as consistent with his argument that contentious events in mining regions result from unmet expectations of economic improvement and may target mining companies and/or local governments first.

[Table 2 about here.]

Table 4.2 reports findings from our interactive specifications. Figure 4.2 plots the associated marginal effects in included and excluded areas as well as the difference between these estimates (i.e. the interaction term coefficient). The mining coefficient in Model 1 shows a large and significant conflict-enhancing effect of new or additional mines in politically represented ethnic homelands. The exclusion interaction is substantively large but only marginally significant. Models 2 and 3 in Table 4.2 show that the conflict effect in included ethnic settlement areas is, if anything, driven by spontaneous riots, strikes, and protests. Shifting the focus to explicitly anti-government events reveals a strikingly different pattern. Mining does not affect such events in included homelands but has a large and significant effect in politically excluded areas (Model 4). This interaction is entirely driven by more organized forms of anti-government mobilization (Models 5 and 6). In line with our theoretical argument, mining-related conflict is amplified by political ethnic inequality. Mineral extraction in politically excluded settlement areas leads to more organized challenges directed at the central government.

[Figure 2 about here.]

Table 4.3 disaggregates events according to the issues motivating mobilization: (1) "economy/jobs", (2) "food, water, subsistence", (3) 'economic resources/assets," (4) "environmental degradation," and (5) "ethnic discrimination, ethnic issues" (Salehyan et al., 2012). Increasing mining activity is associated with substantively large and statistically significant increases in conflicts motivated by resource-related (Model 3) and ethnic issues (Model 5). Mobilization over environmental degradation does not increase as a result of increasing mining activities (Model 4). These findings are harder to square with conventional accounts stressing opportunities for rebellion, economic expectations, or environmental degradation. The interaction models presented in Table 4.4 and Figure 4.3 show that the mining effect on ethnically motivated conflict events only hold in politically excluded areas (Model 5). Mobilization in included regions is, if anything, about the distribution of economic resources. This heterogeneity in conflict drivers supports our expectation that political exclusion has the potential to turn mining-related grievances into ethnic ones, perhaps explaining the more sustained and explicitly anti-government forms of mobilization shown above.

[Table 3 about here.]

[Table 4 about here.]

In sum then, mineral extraction does increase conflict risk at the local level but the forms of mining-related mobilization systematically vary between politically excluded and included ethnic settlement areas. The space for compromise is likely to be smaller where central governments lack incentives and capacity to effectively accommodate mining-related grievances and where local groups' anti-government mobilization is explicitly framed in ethnic terms. As a result, mining conflict in excluded areas can be more plausibly expected to escalate beyond single events at the very local level. In the second part of our empirical analysis, we therefore analyze whether resource extraction in excluded areas leads to full-blown ethnic rebellion against the state.

[Figure 3 about here.]

4.3.2 Group-level analysis of ethnic conflict onset

To investigate whether mining activity predicts ethnic conflict onset at the group level, we use politically relevant ethnic group years from the Ethnic Power Relations (EPR) data set as the unit of analysis (Vogt et al., 2015). The sample is restricted to African ethnic groups that have a settlement area polygon coded in the GeoEPR data set (Wucherpfennig et al., 2011). Our approach uses the GeoEPR polygons to spatially aggregate the MinEx mines to ethnic group years. More specifically, we count, for each year between 1960 and 2017, the number of active mines within each politically relevant groups' settlement area. The main independent variable in our onset models is one plus the natural log of the number of mines. Conflict onset is taken from the ACD2EPR data set that links UCDP conflict actors to EPR ethnic groups (Vogt et al., 2015).

We again estimate simple linear probability models with a conflict onset dummy multiplied by 100 as the dependent variable. We first run naive models that only include a standard set of control variables from the ethnic conflict literature as well as country and year fixed effects. As a result, these models exploit both within-group variation over time and cross-sectional variation between ethnic groups residing in the same country. We then augment these specifications with ethnic group and country-year fixed effects to approximate a difference-in-differences setup that flexibly controls for country-specific temporal shocks. In these models, all effects are identified from temporal variation in mining and conflict within ethnic homelands. In all models, we cluster standard errors at the ethnic group level to account for serial correlation. Expecting grievance-related mechanisms to be particularly relevant in areas mainly inhabited by politically unrepresented ethnic groups (H2), we interact our group-level mining activity variable with a political exclusion dummy from the core EPR data set (Vogt et al., 2015).

[Table 5 about here.]

Table 4.5 summarizes our findings. Columns 1 and 2 show coefficients from the models that still exploit cross-group variation within countries. The mining coefficient in Column 1 is positive, significant, and substantively large. A doubling in the number of active mines (+100%) is associated with an increase in the probability of ethnic conflict onset of 0.5 percentage points. This amounts to almost a doubling of conflict risk compared to the sample mean of 0.68 conflict onsets per 100 ethnic group years. Results in Column 2 show that the association between mining and conflict only reaches significance in settlement areas of politically excluded ethnic groups. The marginal effect of mining in politically excluded ethnic settlement areas is substantively even larger than in the model without interaction term (see Figure 4.4).

Columns 3–5 show results from our within-group specifications. Model 3 indicates that there is no significant unconditional effect of increasing mining activities on a given group's probability to engage in ethnic rebellion. Model 4 again interacts our mining variable with the political exclusion dummy. The coefficient of the interaction term is positive and statistically significant indicating that increasing mining activity affects conflict risk significantly more strongly in politically excluded settlement areas than in their included counterparts. The marginal effect of a 100% increase in the number of mines in politically excluded areas is 1.38 percentage points which amounts to an 78% increase from the average conflict risk among politically excluded ethnic groups. This marginal effect is significant at the 10% level (last row in Figure 4.4).

Omitted variables correlating with political exclusion and conflict risk pose a challenge to interpreting these interactive effects as causal. To address this problem, we further interact the logged mine count with the log of group polygons' centroid distance to their respective national capital as well as mean terrain ruggedness. These variables appear as the most obvious proxies for the feasibility of rebellion that may at the same time correlate with ethnic exclusion. Model 5 indicates that the inclusion of these additional interactions minimally reduces size and precision of the Mines × Exclusion term, but the basic pattern from the previous specifications remains intact.

In sum, our group-level analysis suggests that mining activity is associated with an increased probability of ethnic rebellion but only when extraction takes place in the homelands of politically excluded groups. Effects are somewhat stronger in the naive models that rely not only on temporal but also on cross-group variation within countries. While the more rigorous withing-group models minimize the risk of omitted variable bias, they throw out potentially informative variation between groups.

[Figure 4 about here.]

Taken together, these findings suggest that mining may increase the risk of social conflict, especially in politically excluded areas where it leads to more organized, explicitly anti-government, and ethnically motivated forms of mobilization. In short, mining conflicts appear more dangerous in excluded than in included areas. Where the local population is excluded from national-level political representation, ethnic elites and their followers have an easier time to blame the central government for mining-related grievances and externalities. This may lead to more organized challenges to the state and less space for compromise and accommodation. The analysis of the most salient issues behind instances of social conflict reveals that in excluded areas, mining-related grievances tend to be expressed and mobilized through an ethnic lens. Even though economic expectations and environmental degradation may matter in many cases, political exclusion turns these issues into ethnic issues for which the discriminatory central government can be blamed. The prospects for compromise and accommodation seem lower than in the case of purely economically driven mobilization.

Perceiving and framing mining-related grievances in ethnic terms and actively mobilizing against the government as main culprit implies a higher risk of escalation of mining-related unrest in politically excluded than in included ethnic homelands. In this sense, some of the findings of our conflict event analysis may reflect the early stages of what may turn into large-scale ethnic rebellion, the group-level outcome analyzed above.

4.4 Conclusion

By introducing new data and analysis, this chapter reinterprets the role of grievances in African mining conflicts. While the recent quantitative literature on non-fuel resources and political violence casts doubt on the grievance logic in this part of the world, we believe that this non-finding reflects empirical limitations rather than the absence of such an effect. In response, our investigation extends the relevant time series, focuses explicitly on ethno-political inequality, and uses data that introduce more precision in the assessment of conflict events. Based on these modifications, we find solid evidence that resource-related rebellion is more likely where ethnic groups are excluded. This finding offers considerable support in favor of the theoretical framework introduced in Chapter 2.

While disaggregating theoretically meaningful events categories, this chapter has not been able to fully unpack the precise nature of the causal mechanisms driving the overall findings. There is thus plenty of room for further research efforts in this area. Future quantitative studies could rely on individual-level survey data from for example the Afrobarometer to more directly test for the relevance of the different grievance mechanisms postulated in Chapter 2. Furthermore, in analogy to Chapter 3, it may be possible to exploit variation on geological variables to construct a new statistical instrument, but as noted above, this research strategy requires further development. Finally, it should be remarked that the analysis reported here spans over a large number of cases during a comparatively long period of time. Thus, it is also useful to trace the process linking mining to conflict in greater detail focusing on specific cases. Indeed, this is the task of the remaining chapters of this volume.

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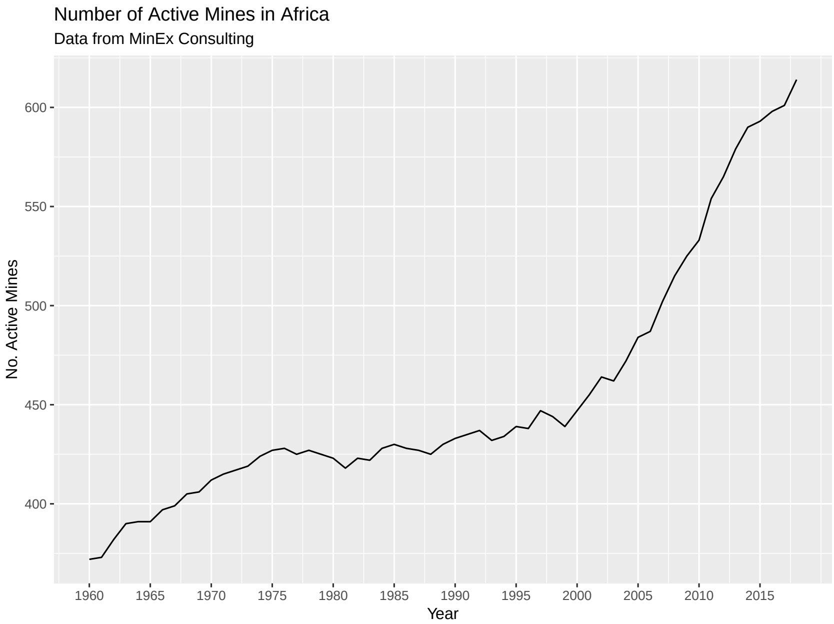

Figure 4.1: The African Mining Boom

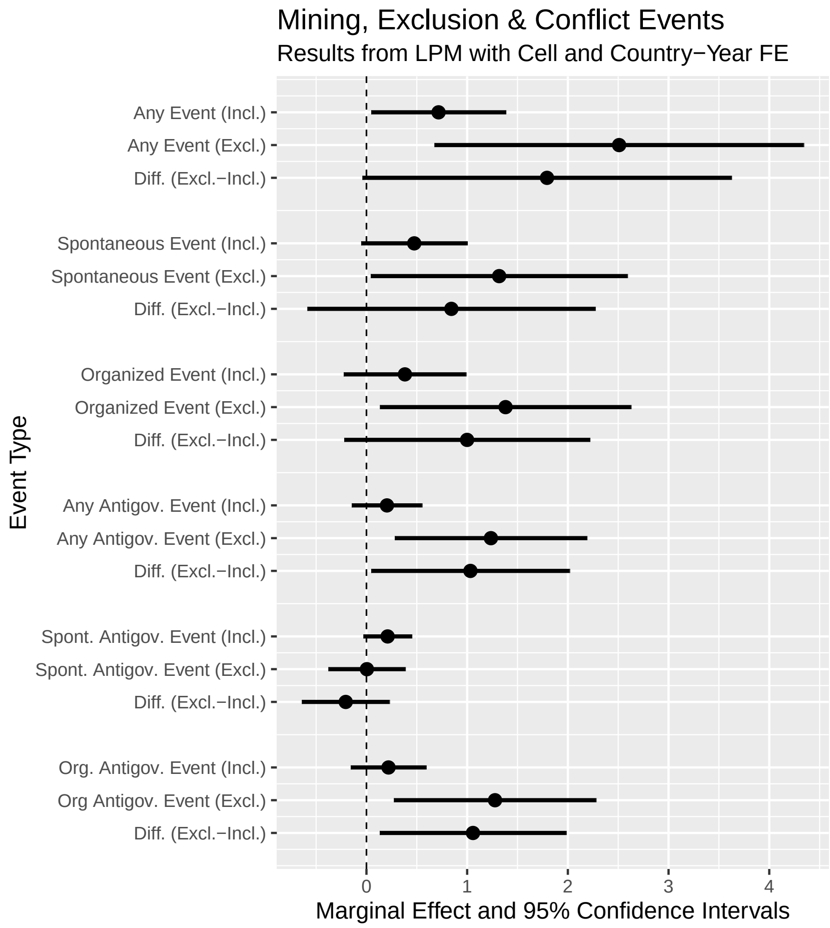

Figure 4.2: Results from cell-level analysis of conflict event data

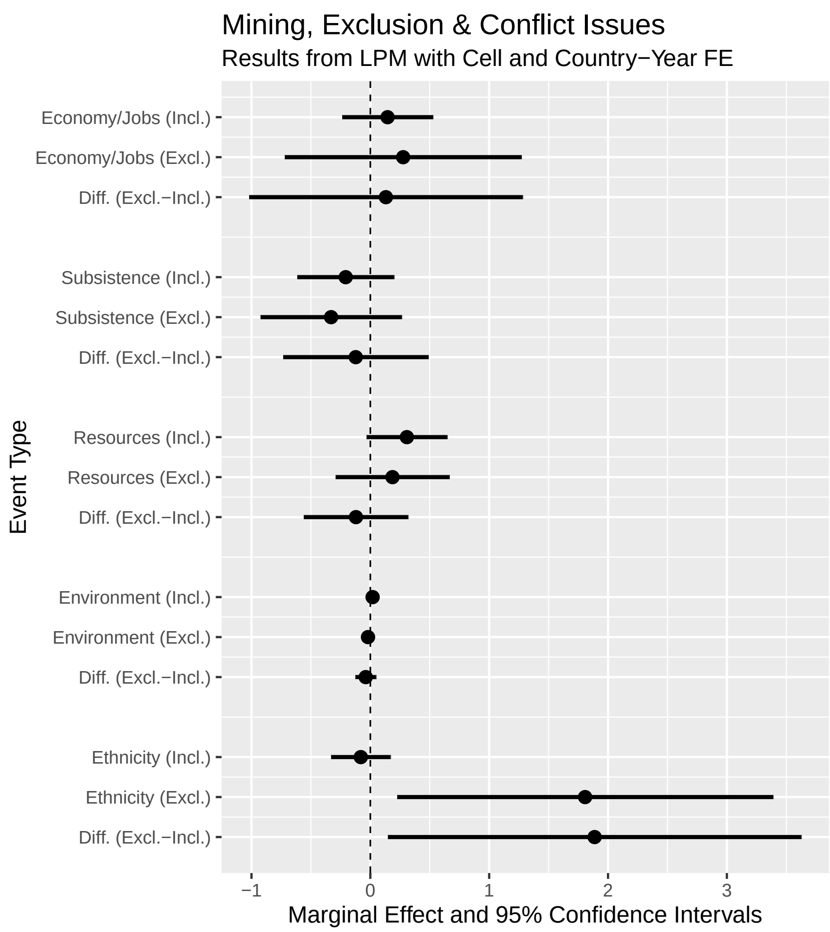

Figure 4.3: Results from cell-level analysis of conflict event data

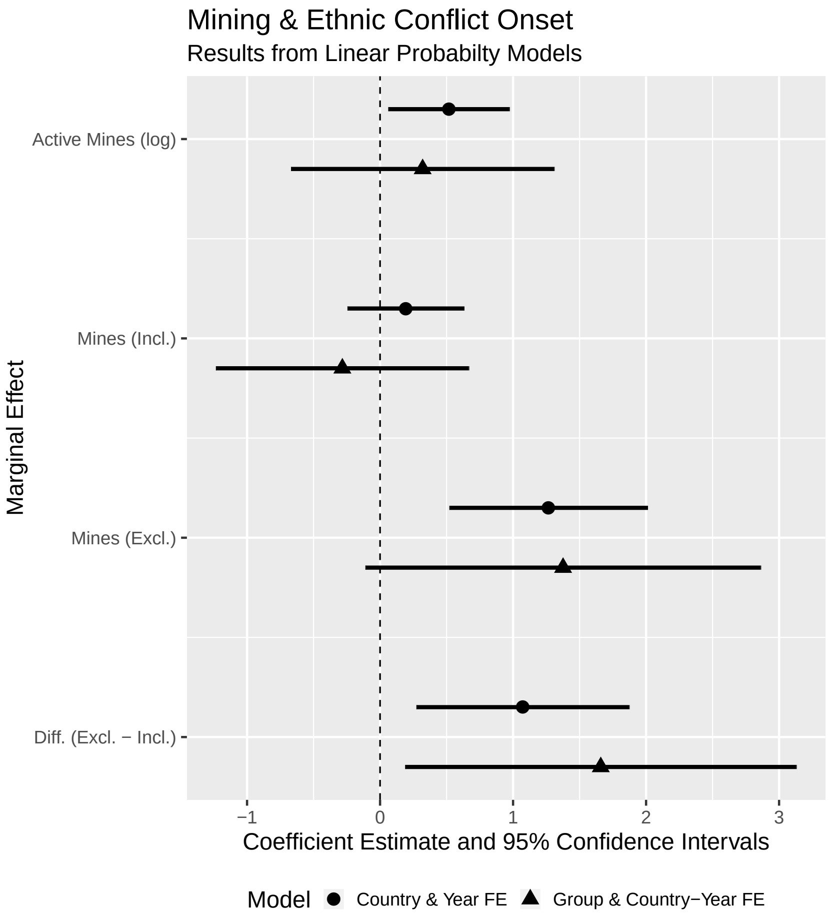

Figure 4.4: Results from group-level analysis of ethnic conflict onset data (Based on Models 1–4 in Table 1)

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Table 4.1: Mining & Conflict Events

	100 × Event Dummy					
	All Events			Anti-government Events		
	Any	Spontaneous	Organized	Any	Spontaneous	Organized
	(1)	(2)	(3)	(4)	(5)	(6)
Active Mines (log)	1.035***	0.625***	0.560*	0.387**	0.174	0.407*
	(0.352)	(0.238)	(0.307)	(0.177)	(0.109)	(0.211)
Grid Cell FE	yes	yes	yes	yes	yes	yes
Country Year FE	yes	yes	yes	yes	yes	yes
Sample Mean DV	0.362	0.156	0.109	0.194	0.087	0.086
Observations	1,680,056	1,680,056	1,680,056	1,680,056	1,680,056	1,680,056
Adjusted R^2	0.265	0.263	0.333	0.288	0.238	0.321

Standard errors clustered on cell in parentheses
Significance: *p<0.1; **p<0.05; ***p<0.01

Table 4.2: Mining, Exclusion & Conflict Events

	100 × Event Dummy					
	All Events			Anti-government Events		
	Any	Spontaneous	Organized	Any	Spontaneous	Organized
	(1)	(2)	(3)	(4)	(5)	(6)
Active Mines (log)	0.716**	0.475*	0.382	0.203	0.210*	0.219
	(0.341)	(0.269)	(0.310)	(0.178)	(0.123)	(0.191)
Excluded	0.054	0.039	-0.003	0.016	0.015	0.002
	(0.040)	(0.024)	(0.019)	(0.027)	(0.016)	(0.018)
Mines × Excl.	1.793*	0.843	0.999	1.032**	-0.206	1.058**
	(0.935)	(0.729)	(0.622)	(0.503)	(0.222)	(0.472)
Grid Cell FE	yes	yes	yes	yes	yes	yes
Country Year FE	yes	yes	yes	yes	yes	yes
Sample Mean DV	0.362	0.156	0.109	0.194	0.087	0.086
Observations	1,680,056	1,680,056	1,680,056	1,680,056	1,680,056	1,680,056
Adjusted R^2	0.265	0.263	0.333	0.288	0.238	0.321

Standard errors clustered on cell in parentheses
Significance: *p<0.1; **p<0.05; ***p<0.01

Table 4.3: Mining & Conflict Issues

	100 × Event Dummy				
	Economy	Subsistence	Resources	Environment	Ethnicity
	(1)	(2)	(3)	(4)	(5)
Active Mines (log)	0.168	-0.229	0.286*	0.012	0.256**
	(0.163)	(0.194)	(0.167)	(0.017)	(0.118)
Grid Cell FE	yes	yes	yes	yes	yes
Country Year FE	yes	yes	yes	yes	yes
Sample Mean DV	0.067	0.03	0.056	0.003	0.059
Observations	1,680,056	1,680,056	1,680,056	1,680,056	1,680,056
Adjusted R^2	0.245	0.116	0.058	0.029	0.057

Standard errors clustered on cell in parentheses
Significance: *p<0.1; **p<0.05; ***p<0.01

Table 4.4: Mining, Exclusion & Conflict Issues

	100 × Event Dummy				
	Economy	Subsistence	Resources	Environment	Ethnicity
	(1)	(2)	(3)	(4)	(5)
Active Mines (log)	0.145	-0.207	0.307*	0.019	-0.080
	(0.195)	(0.207)	(0.173)	(0.025)	(0.127)
Excluded	0.022	0.013	-0.008	0.012**	-0.031
	(0.015)	(0.011)	(0.018)	(0.005)	(0.020)
Mines × Excl.	0.131	-0.123	-0.121	-0.039	1.887**
	(0.587)	(0.311)	(0.224)	(0.044)	(0.887)
Grid Cell FE	yes	yes	yes	yes	yes
Country Year FE	yes	yes	yes	yes	yes
Sample Mean DV	0.067	0.03	0.056	0.003	0.059
Observations	1,680,056	1,680,056	1,680,056	1,680,056	1,680,056
Adjusted R^2	0.245	0.116	0.058	0.029	0.057

Standard errors clustered on cell in parentheses
Significance: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$

Table 4.5: Group-level Specifications

	100 × Conflict Onset				
	(1)	(2)	(3)	(4)	(5)
No. of Active Mines (log)	0.504**	0.217	0.332	-0.210	-6.286*
	(0.221)	(0.203)	(0.510)	(0.494)	(3.311)
Excluded	1.209***	0.613**	2.131***	1.459**	1.741***
	(0.314)	(0.299)	(0.689)	(0.649)	(0.670)
Mines × Excl.		0.992**		1.505**	1.306*
		(0.400)		(0.746)	(0.760)
Mines × Capital Dist.					0.912
					(0.565)
Mines × Ruggedness					0.020*
					(0.011)
Country FE	yes	yes	–	–	–
Year FE	yes	yes	–	–	–
Ethnic Group FE	no	no	yes	yes	yes
Country Year FE	no	no	yes	yes	yes
Controls	yes	yes	no	no	no
Observations	9,725	9,725	9,811	9,811	9,025
Adjusted R^2	0.029	0.031	0.212	0.213	0.215

Notes: OLS linear probability models with onset dummy multiplied by 100 as dependent variable. The sample mean of the dependent variable is 0.73 conflict onsets per 100 group years. Control variables include ethnic groups' demographic size, their settlement areas' size, mean elevation, ruggedness, and capital distance, as well as recent downgrades from power and cubic polynomials for peace duration. Standard errors clustered at the ethnic group level in parentheses. Significance codes: $^{*}p<0.1$; $^{**}p<0.05$; $^{***}p<0.01$