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Resource concentration and civil wars☆

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ABSTRACT

This paper highlights the importance of natural resource concentration and ethnic group regional concentration for ethnic conflict. The existence of multiple conflict terrains (and hence multiple threat points) is the source of bargaining failure, similar to the one determined by the presence of offensive advantages. The theory predicts war to be more likely when resource concentration and group concentration are high, and the empirical analysis, both at the country level and at the ethnic group level, confirms the essential role of geographic concentration variables for civil war.

1. Introduction

This paper provides a theoretical explanation and novel empirical investigation of the importance of the geography of natural resources for civil war. We find that civil wars should be expected to take place more frequently when the homeland of a concentrated minority group is particularly resource rich. The paper then tests the predictions of the theory using both panel data at the country and ethnic group level.

Two things seem to matter in general for civil war incentives: balance of strength and balance of control on resources. When trying to resolve a conflict between two groups over control of resources, one difficulty is that the *relative strength* of the two groups may differ from the *relative wealth* of natural resources of the territories they occupy. Having surplus sharing reflect relative strength eliminates the incentives to "nationwide" wars, but "secessionist" wars could then materialize; on the other hand, making surplus sharing depend on the groups' relative endowments of natural resources avoids secession tensions but may cause incentives for the majority group to use their strength to gain more power.

Recognizing this tension between the two most important determinants of bargaining power, we have decided to focus attention on a connected observation about bargaining games: while in a standard bargaining game there is a unique "threat point" (for example a unique type of war that players could fall into if bargaining breaks down), in reality there are multiple threat points, which depend on the balance of strength and geographic distribution of natural resources. If an ethnic group is particularly influential for the government of a country but another group has an important presence (in terms of population size and rootage to the territory) in a region of the country that is particularly rich in terms of natural resources, the tensions between the two criteria of surplus sharing mentioned above are maximized, and are exacerbated by the fact that the two groups have access to different threats: the powerful group controlling government forces should typically be stronger in a nationwide ethnic conflict, but the minority group could sustain the secession threat with guerrilla war and focus its lower total strength on the defense of the area where it is locally stronger.

We model these tensions in the following way: in a country divided into two regions and populated by two major groups, we assume that the nationwide stronger group has a realistic offensive advantage when starting a nationwide conflict, while a minority group mostly concentrated in one region has a probability of winning in a secessionist civil war that exceeds the probability of winning in a nationwide civil war. When groups are unable to commit not to use their favorite type of fighting as deviations from peace, bargaining may break down for analogous reasons to the ones put forward in the offensive advantage

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literature (see e.g. Chassang and Padro i Miquel, 2009).[1] The most conflict prone situations are shown to be those in which the mineral resources of value are mostly concentrated in the minority group region, and the risk is especially high in case of low state capacity, high regional concentration of the minority group in question, and large geographic distance of the minority region from the capital.

There are many cases where, when the presence of a concentrated ethnic group coincides with large natural resource abundance concentrated in its region, the concentrated minority group could be financially better off if it were independent and may under some conditions have incentives to start secessionist rebellion. This corresponds for example to the separatist movement in the now independent Timor-Leste, and the recent turmoil in the oil-abundant regions of Nigeria. Also the rebellion of the Aceh Freedom Movement in Indonesia starting in 1976 and the armed fight of the Sudan People's Liberation Army beginning in 1983 can to a large extent be explained by the abundance of natural resources in these separatist regions.[2] Other countries where secessionist movements have been linked to large local natural resources include Angola, Myanmar, Democratic Republic of Congo, Morocco and Papua New Guinea. In all these cases an uneven natural resource distribution has been amplified by ethnic divisions. In contrast, if natural resources are absent or if natural resources (and political power) are evenly dispersed in a country, there are typically fewer conflict incentives, even when there are ethnic divisions.[3] Similarly, when there are large amounts of natural resources available, but the society is ethnically homogeneous, war incentives are weak.[4]

In a country level empirical analysis, we study how the unevenness of geographical distribution of petrol fields across ethnic groups in a given country affects the likelihood of conflict. For this purpose we have put together a panel of 157 countries with sample period 1960–2008, and have constructed a new variable, *Oil Gini*, which captures how unevenly oil holdings are spread between different ethnic groups in a country.[5] To the best of our knowledge we are the first to have constructed such a measure of inter-ethnic inequality in abundance of petrol fields. In the regression analysis we include – in addition to our main, new variable of interest – the standard battery of control variables, as well as country fixed effects and annual time dummies. We find that our novel *Oil Gini* measure has a statistically significant and quantitatively strong positive effect on the likelihood of civil war onsets, as predicted by our theory.

Next, we move to a more disaggregated level of analysis: we study the effect of natural resource unevenness on civil war with a panel dataset *at the ethnic group level*, covering 1120 ethnic groups and spanning over the period 1960–2006. This has the advantage that unobserved heterogeneity problems are reduced, and ethnic group level data allows us to better discriminate between our theory and competing explanations: our model predicts that conflicts are fuelled by non-governing ethnic minority groups living in oil rich regions, while alternative mechanisms (discussed below) predict conflict onsets in the presence of oil-rich ethnic groups that control the government. While our country level regressions only establish the link between inter-group oil unevenness and civil war onset, the ethnic group level regressions distinguish such different mechanisms, and show that it is indeed oil abundance in the regions mostly inhabited by powerless groups, rather than in the homelands of governing ethnic groups, that drives civil wars.

Our main, novel independent variable on the ethnic group level is the surface of an ethnic group's territory covered with petrol (i.e. oil and gas) as a percentage of the country's total surface covered with petrol. To the best of our knowledge we are the first to study civil conflict using an ethnic group panel with natural resource variables that vary for different ethnic groups and over time.[6] We find a statistically significant and quantitatively strong positive effect of the relative resource abundance of a non-governing ethnic group on the likelihood that this group is involved in a civil war onset. We also find that the interaction term of an ethnic group's relative resource abundance with its group concentration is positive, very sizeable and statistically significant, which is in line with our theoretical predictions. The results are robust for very demanding specifications that control for ethnic group fixed effects, annual time dummies, time-varying ethnic group level controls and all country-level control variables used in the country-level regressions. Indeed civil war is more likely when resource discoveries happen in regions that are mostly populated by groups that do not belong to the governing coalition in the country.

2. Related literature

Natural resources and ethnic divisions are known to be correlated with civil conflict in one way or another (see e.g., Berman et al., 2014; Collier and Hoeffler, 2004; Dube and Vargas, 2013; Fearon, 2005; Humphreys, 2005; Le Billon, 2001; Lujala, 2010; Lujala et al., 2005; Montalvo and Reynal-Querol, 2005; Ross, 2004a), but the literature does not emphasize the particularly important role of resource concentration and ethnic concentration, independently and jointly. The existing theoretical studies about the effect of natural resources on conflict, by and large, do not relate to geographic concentration: Caselli and Coleman (2013) focus on the decision of the dominant ethnic group to exploit or not the other groups in terms of the proceeds from extraction of natural resources, but do not take into account how the geographic distribution and the economic features of natural resources affect the risk of ethnic conflict of different kinds; Grossman and Mendoza (2003) and Reuveny and Maxwell (2001) use a dynamic framework to predict that present resource scarcity and future resource abundance cause appropriative competition; Hodler (2006) finds that natural resources lead to more conflicts in fractionalized countries; Rohner et al. (2013) predict natural resources to have a particularly detrimental effect if initial trust in a country is low; Fearon (2005) argues that natural resources can foster conflict by weakening state capacity; Bell and Wolford (forthcoming) and Besley and Persson (2011) emphasize that weak institutions, low income and large natural resources lead to a greater risk of civil war; and Rohner (2014) and van der Ploeg and Rohner (2012) study the two-way interaction between natural resource extraction and civil war, focusing on depletion speed and optimal investments of windfalls. To repeat, none of these papers consider geographic concentration of resources and how it overlaps with the geographic concentration of minority groups.

Horowitz (1985) did make the anecdotal observation that backward concentrated minorities with resource concentration may have the highest benefit-cost ratio from rebellion, and Walter (2006b) proposed a reputation building theory for why governments tend to repress

[1] Ray (2010) also studies multiple threats to peace. However, he focuses on the important issue of multiple cleavages, while in our paper the cleavage is unique (for example an ethnic or a religious cleavage), but the groups have different relative strengths in different types of conflict.

[2] For a discussion of these cases see Ross (2004b).

[3] This is for example the case of countries like Benin, which has only few natural resources, or of small oil-rich countries like Brunei or Qatar, where natural resources are evenly spread.

[4] Examples for this include Chile and Mongolia.

[5] As discussed in detail in Section 4.1.1, we have used the GIS-coordinates of all ethnic groups in the "geo-referencing of ethnic groups" (GREG) dataset (Weidmann et al., 2010b), and have merged them with the geo-referenced petroleum dataset (PETRODATA) from Lujala et al. (2007), which allowed us to construct a time-varying measure of how relatively petrol-rich the homelands of a given ethnic group are. Using this information, we have been able to apply the Gini formula to capture geographical oil unevenness.

[6] The only exception is the paper by Sorens (2011) which also uses ethnic group level natural resource data to explain territorial conflict. In contrast to our paper which runs fixed effects regressions on a global sample of all ethnic groups, Sorens' study only contains the selected sample of discriminated groups from the "Minorities at Risk" (MAR) project and runs pooled panel regressions which do not control for country/ethnic group fixed effects.