The Extractive Industries and Society xxx (xxxx) xxx–xxx

Contents lists available at ScienceDirect

The Extractive Industries and Society

journal homepage: www.elsevier.com/locate/exis

Original article

Catalysts of violence: How do natural resource extractive technologies influence civil war outbreak and incidence in sub-Saharan Africa?

Kamil Christoph Klosek

Charles University, Czech Republic

ARTICLE INFO

Keywords:
Sub-Saharan Africa
Civil war
Natural resources
Extraction technologies
Lootability

ABSTRACT

This study provides a more robust understanding of the role natural resources play in civil war outbreaks and incidence. Its point of departure is the feasibility hypothesis, according to which the presence of natural resources alters the financial opportunity structure in favor of rebel groups. Rendering seven different dimensions of "lootability" and "obstructability" explicitly, a 'most-likely' sample of sub-Saharan Africa was used to test those concepts empirically by employing logit models. The results point to the most important dimension being value-to-weight ratio. Resources that are small and can be easily traded increase the probability of civil war incidence. Furthermore, military support for insurgent groups, a common theme in sub-Saharan Africa, appears to be correlated with the presence of high value-to-weight resources. In contrast, other dimensions, such as the mode of transport, seem to have no independent bearing on the explanation of civil war outbreak.

1. Introduction

Over the past 20 years, the debate about the resource curse has taken many forms. The arguments typically revolve around the two major themes of direct and indirect effects.[1] On the one hand, proponents of direct effects highlight greed and grievance as the major causes of large-scale violence. Natural resources can be a powerful motivator for rent-seeking warlords and potential rebels to engage in unlawful and violent behavior. Furthermore, unequal distribution of natural resource wealth and the effects of extraction, such as environmental degradation, on local communities can incite inter-group grievances and serve as a catalyst for an ideological, religious or ethnically-motivated rebellion. On the other hand, indirect effects, such as the negative influence of natural resource export dependence on institutional development and enhanced corruption, may play a role in shaping conflict. Weak states are less able to create strong bonds with local communities and high dependence on primary commodity exports reduces the incentive to invest in the national economy as taxation becomes a secondary concern for incumbent governments.

The present article contributes to this discussion by exploring how different dimensions of natural resource extraction technologies influence the probability of civil war onset and incidence.[2] So far, natural resource extraction technologies have been investigated from two perspectives. A first angle and large part of the academic literature is dedicated to categorizing natural resources into lootable and non-lootable goods for more explanatory leverage (e.g. Snyder and Bhavnani, 2005). The second thread of literature focuses on the environmental and social impact of natural resource extraction technologies on local communities. For instance, Fentiman and Zabbey (2015) analyze the environmental and cultural effects of oil spills on the Bodo community in the Niger Delta, where Obi (2014) also shows how grievances from natural resource extraction are elevated as negotiations between multinational corporations (MNCs) and local elites exclude large parts of affected communities.

In this study, I argue that there is a need to discriminate between different properties such as the value-to-weight ratio and mode of transportation which have been used implicitly to categorize lootable resources from non-lootable resources, but not explicitly. I further argue that different dimensions have a varying impact on civil war onset and incidence. These dimensions are made explicit and then tested for statistical relevance on a sub-Saharan African 'most-likely sample'. I hypothesize that there is a linear effect: that the more lootable a natural resource is, the higher the probability of civil war onset and incidence. I complement analysis of the lootability dimension with analysis of the obstructability dimension. Specifically, I assume that the more difficulties a government faces to obstruct the extraction process, the higher the likelihood for civil war onset and incidence.

This study does not assume explicitly that natural resources are a cause or motivation for rebels to engage in an insurgency. It rather takes the position that they constitute an independent pillar of financial

E-mail address: kamil.klosek@fsv.cuni.cz.

[1] See Humphreys (2005) for a comprehensive list of causal mechanisms

[2] Incidence measures every instance of violence in a specific time period, whereas civil war onset is mainly interested in the conditions that exist at the time the conflict breaks out

https://doi.org/10.1016/j.exis.2018.02.003
Received 2 February 2017; Received in revised form 23 February 2018; Accepted 23 February 2018

income for rebels. While it is perfectly possible for a rebel group to fight for non-resource based causes, natural resources are still perceived as a means to achieve its goals. Hence, using Le Billon's (2014) differentiation between arguments about the "resource curse", "resource wars" and "conflict resources", this approach builds on findings regarding the latter concept. This decoupling of motive ("greed") and opportunity ("feasibility") allows for a separate analysis of the linkage between rebel behavior and natural resources.[3] As Humphreys (2005: 512) explains, referring to the feasibility mechanism, "it is a 'permissive cause' rather than a 'root cause' of conflict".

In contrast to previous studies which measure natural resource dependence (Collier and Hoeffler, 2004), occurrence (Lujala et al., 2005) and abundance (Brunnschweiler, 2008), in order to control for different causal mechanisms, an inclusive threshold approach is used here which sets a minimum bar for natural resource endowment of a country to become relevant for (potential) rebels and then infers from the available resource portfolio. In this way, rebels are situated in an approximately equal position across countries with respect to potential natural resource income. In general, there are multiple paths that link natural resources with the phenomenon of civil war. This study concentrates on financial endowment.

Results show that the most important dimension of natural resources in their capacity to explain the occurrence of domestic violence is their value-to-weight ratio. A high value-to-weight ratio is a statistically significant predictor for civil war incidence in sub-Saharan Africa. A more tentative and inconclusive finding is that resources which require foreign technological expertise are correlated with civil war incidence. This, however, is highly dependent on the coding of kimberlite diamonds. Furthermore, military support for rebel groups is a prevalent phenomenon in sub-Saharan Africa and strongly correlated with the resource dimension, in particular, high value-to-weight resources. In general, the study supports the argument that natural resources are not *per se* factors that can independently explain civil war outbreak but rather that resources with a high value-to-weight ratio become an integral part of rebel finances after violence has broken out, thus serving as an incentive for insurgency.

Section 2 of the paper begins by examining the theoretical aspects of rebel finances and is accompanied by a brief review of the literature on this debate. Subsequently, I introduce the concepts of lootability and obstructability in greater detail and continue to operationalize different natural resources according to seven dimensions in Section 3. I proceed to code these in Section 4. The fifth section of the paper outlines the research design, including providing an explanation of sample choice and data structure. Section 6 offers descriptive accounts of the new variables and tests these, without and with control variables. The paper concludes by assessing the substantial impact of two dimensions on the predicted probability of civil war incidence. It provides a summary of the research conducted and ends by identifying further avenues for research.

2. Rebel finances

There are five main reasons why natural resources are important, economically, for insurgents (Collier, 2000). First, primary commodities can be more easily taxed than those commodities which require organization, assemblage and transaction. Manufactured goods are sensible to tax since different procedural steps have to be implemented; thus, they are more prone to disruption. Furthermore, manufactured goods are often traded in a competitive environment so that rigid taxation would drive the price of the commodity up too high to be sold. Natural resources are often more idiosyncratic and the supply side allows for more taxable leeway. Second, natural resources are mostly extracted in rural areas. Hence, rebel groups can achieve control over routes leading from and to extraction sites and force companies or local authorities to pay taxes for safe transport. Third, depending on the difficulty associated with extracting natural resources from the soil, rebel groups are able to exploit deposits themselves. Instead of accumulating cash by taxation, rebel groups can engage in their own natural resource trade and set prices according to what they believe will maximize their returns. Fourth, in contrast to manufactured commodities, the origin of natural resources is more difficult to identify once the goods have been placed on the market. This can render international efforts to sanction conflict resources trade ineffective. Fifth, natural resource rents are not only crucial in terms of cash but can also be exchanged readily for arms. As Renner (2002: 20) explains, "the trafficking of arms is closely linked to illegal trade in raw materials such as minerals, timber, and diamonds. Arms and commodities often travel the same routes, in opposite directions. Revenues from commodity sales finance the purchase of arms, ammunition, military equipment, uniforms, and other items; sometimes weapons are directly bartered for natural resources, drugs, animal products, and other commodities".

There are two main ways in which rebels can benefit from natural resources during a violent conflict.[4] First, they can capture natural resource extraction sites directly and engage in the looting themselves or in (sometimes involuntary) cooperation with locals or MNCs. From this perspective natural resources, are looted directly. The second possibility is that rebels tax those actors who are engaged in local natural resource extraction. The level of the tax should not diminish the profit margins of the local business actors too much; otherwise, the extraction becomes unprofitable and ceases to take place. In such a case, business actors lose motivation as the price for the production process is no longer competitive. In the worst-case scenario, business actors can defy their subordinate position and support other actors who attempt to overturn reigning warlords (Ahmad, 2015). Based on this discussion, I present two hypotheses.

H_{1a}. The higher the lootability of a natural resource from the rebels' perspective, the higher the probability of civil war onset and incidence

H_{1b}. The more difficult it is to obstruct the natural resource extraction process from the rebels' perspective, the higher the probability of civil war onset and incidence

3. The conceptualization and operationalization of lootability and obstructability

Typically, the effect of natural resources on conflict onset has been measured by the Primary Commodity Export (PCE) variable (see Collier and Hoeffler, 1998, 2004; Collier et al., 2009). However, after criticism that PCE fails to capture relevant natural resources and that the effect is indirect, namely through weakened institutions and a less resilient domestic economy, Fearon and Laitin (2003) and Fearon (2005) showed that its major influence stems from oil export dependence and trade of contraband. Recognizing that the PCE variable mainly measures resource dependence, Brunnschweiler (2008) implements a per capita measure of resource wealth in order to account for resource abundance. The author finds a positive relationship between natural resource abundance and economic growth, hence decreasing the risks of civil war onset. Brunnschweiler and Bulte (2009) explicitly test for natural resource abundance and dependence. The former is found to decrease risks of civil war onset, whereas the latter performs through reversed causality. A prior conflict increases resource dependence but the effect does not unfold *vice versa*. Resource dependence can also be the outcome of deliberate national policies. For instance, leftist governments in South America followed the notion of an "extractive imperative" (Arsel et al., 2016) which involved the nationalization of

[3] See Basedau and Lay (2009), Le Billon and Nicholls (2007)

[4] There can also be instances of "booty futures" (Ross, 2004) in which rebels promise outside actors access to natural resources after the location is captured.