A Theory of Strategic Civil War Aims: Explaining the Mixed Oil-Conflict Curse

Jack Paine*

April 13, 2019

Abstract

This paper develops a theory of strategic civil war aims and applies it to explain an empirical puzzle: oil wealth correlates positively with separatist civil war onset (among oil-rich ethnic minorities), but negatively with civil wars to capture the central government. A formal model with endogenous war aims highlights two countervailing effects of oil production, a conflict-suppressing revenue effect and a conflict-inducing predation effect. Regional ethnic challengers that prefer separatist over center-seeking aims experience a larger predation effect for two reasons. First, a strategic selection mechanism: governments face more severe commitment problems toward small ethnic groups—which prefer separatist over center-seeking civil war. Second, a geography of rebellion mechanism: oil-funded repression more effectively deters center-seeking challenges than peripheral insurgencies. The logic yields additional implications for civil war onset supported by empirical evidence, and provides broader insight into endogenous civil war aims and heterogeneous effects on civil war onset.

Keywords: Civil war, formal theory, oil, resource curse

*Assistant Professor, Department of Political Science, University of Rochester, jackpaine@rochester.edu. I thank Scott Abramson, Karen Albert, Emiel Awad, Bruce Bueno de Mesquita, Jim Fearon, Jacque Gao, Gretchen Helmke, Philipp Hunziker, Brenton Kenkel, Colin Krainin, Alex Lee, Paasha Mahdavi, Bonnie Meguid, Victor Menaldo, Anne Meng, Sergio Montero, Carl Müller-Crepon, Justin Nicholson, Branislav Slantchev, Scott Tyson, and seminar participants at the 2016 Formal Models in International Relations Conference at the University of Southern California, APSA 2016, and University of Washington for helpful discussions and feedback.

1 Introduction

Conventional conflict theories posit diverse explanations for civil war onset ranging from economic motivations (Collier and Hoeffler, 2004) to state weakness (Fearon and Laitin, 2003) to ethnopolitical grievances (Cederman, Gleditsch and Buhaug, 2013). However, most major theories explain aggregate civil war onset without distinguishing rebellion aims, despite the empirical prevalence with which rebels pursue different war goals. Between 1946 and 2013, independent non-European countries experienced 74 major *center-seeking civil wars* in which rebel groups aimed to capture the capital. For example, in Angola, rebel leader Joseph Savimbi of UNITA sought to overthrow the Soviet-influenced "imperial" government in Luanda, the capital city (Savimbi, 1985). Also since 1946, countries have experienced 43 major *separatist civil wars* that aimed to create an autonomous region or independent country. Amid the Angolan government's war with UNITA, the rebel group FLEC sought to gain independence and end Angola's "military occupation" of Cabinda (Cabinda Free State, n.d.).[1]

Why do rebel groups sometimes fight for the center and sometimes to separate? Do conflict risk factors that induce center-seeking fighting differ from factors that encourage separatist insurgencies—given distinct rebellion goals? Although several important theories in the broader literature examine causes of separatist civil wars (Toft, 2005; Walter, 2009; Lacina, 2015) or the technology of rebellion (Kalyvas and Balcells, 2010; Bueno de Mesquita, 2013; Wright, 2017), most theories do not address how rebels choose center-seeking versus separatist civil war aims. In addition to theoretical relevance, understanding rebels' strategic war aims is also crucial for conducting empirical research: if a risk factor correlates with one type of civil war and not the other—or correlates in opposing directions for different conflict types—then aggregating civil wars can miss important relationships.

The empirical relationship between oil production and civil war onset exemplifies these considerations. Scholars in the vast conflict resource curse literature usually examine two key oil-conflict findings independently, or overlook them by aggregating civil wars. First, oil-rich ethnic minority groups, such as Angola's Cabindan Mayombe, fight separatist civil wars relatively *frequently* (Sorens 2011; Ross 2012, 155-6; Morelli and Rohner 2015). Ethnic groups excluded from power in the central government most strongly exhibit this trend (Asal et al., 2016; Hunziker and Cederman, 2017). Second, despite a null statistical relationship

[1] Section 2 introduces the data sources and sample.

between oil production and aggregate civil war onset at the country level,[2] there is evidence that oil-rich countries such as Saudi Arabia fight *fewer* center-seeking civil wars (Paine, 2016). This pattern is consistent with broader anti-resource curse evidence (Menaldo, 2016; Liou and Musgrave, 2014). To show that the mixed oil pattern is not an artifact of particular samples or measures for particular types of civil war across different studies, Section 2 establishes these relationships using a common dataset.

Like the wider literature, most existing resource curse theories do not distinguish war aims, or propose explanations that account for one half of the mixed pattern but not the other. Amid an oil-conflict literature characterized by an "embarrassment of mechanisms" (Humphreys, 2005, 510), perhaps the most convincing mechanism for explaining conflict is that governments generate redistributive grievances by heavily taxing oil-producing regions (Sorens 2011; Ross 2012, 155-6; Asal et al. 2016; Hunziker and Cederman 2017). Oil production is particularly easy for governments to tax not only because it is an immobile asset (Boix, 2003), but also because oil is a capital-intensive, point-source resource (Le Billon, 2005, 34). Paine (2019*a*) compares these properties of oil production to other types of economic activities that producers can more easily hide from the government, and argues that producing oil undermines a region's threat to exit the formal economy in reaction to high taxes—creating incentives to fight.

However, despite characterizing a core property of oil production that can potentially explain the empirical pattern for separatist civil wars, this mechanism cannot explain why oil-producing countries experience fewer center-seeking civil wars than oil-poor countries. Why are grievances over the distribution of resources not also severe for groups that would like to profit from oil production in the government's region—which they could obtain by capturing the center?

Similarly, explanations for the rarity of center-seeking civil wars in oil-rich countries cannot explain why oil-rich regions frequently experience separatist civil wars. Theories that relate oil production to authoritarian stability, as summarized in Ross (2001), focus overwhelmingly on rentier effects that facilitate massive patronage distribution and coercion spending that can account for stabilizing properties of oil production. But why does greater spending on patronage and armament afforded by more oil revenues not also deter separatist civil wars? Other strands of the literature focused on oil and state weakness are also unsatisfactory because they anticipate oil production raising *center-seeking*, but not separatist, civil war incentives

[2] See, for example, Ross's (2015, 251) recent literature review.

(Buhaug, 2006).[3] Better understanding the widely debated oil-conflict relationship requires studying differential effects on center-seeking and separatist civil wars.

This paper presents a new theory that analyzes rebel groups' strategic choice of civil war aims and explains how conflict risk factors—such as oil production—can generate heterogeneous effects on different types of civil war. I formally analyze a game in which a government accrues revenues from economic production in the region of the country where it resides and another region of the country where a challenger resides. The government allocates revenues to its military and offers transfers to the challenger, who can either accept, fight a center-seeking civil war, or fight a separatist civil war. In equilibrium, fighting may occur because the distribution of power shifts over time and the government cannot perfectly commit to deliver future transfers to, or refrain from future taxation of, the challenger.

Increasing oil production in either region exerts countervailing effects on the likelihood that either type of civil war occurs along the equilibrium path. On the one hand, the government easily taxes oil production—a highly capital intensive point-source resource—relative to other economic outputs. This *revenue effect* enhances the funds that the government can spend on the military and on transfers, which raises the likelihood that the government can afford a transfer proposal that the challenger prefers to initiating a civil war. On the other hand, larger oil revenues also increase the challenger's desire to rid itself of government control, either to eliminate government taxation of its oil production or to enable the challenger to predate oil produced in the government's region. This *predation effect* increases the challenger's expected utility to fighting relative to accepting a deal and maintaining the status quo regime in the future.

Connecting these countervailing oil mechanisms to the motivating empirical pattern—frequent separatist civil wars over oil-rich territories and infrequent center-seeking civil wars in oil-rich countries—suggests that the revenue effect of oil should outweigh the predation effect for center-seeking civil wars, whereas the opposite should hold for separatist civil wars (for oil located in the challenger's region). But why?

Combining the model's two main oil mechanisms with substantively based considerations about each of eth-

[3]Other arguments in the vast oil literature focus on rebel financing, but Appendix Section D.3 discusses why these theories are unconvincing for explaining empirical patterns. This section also discusses new implications that my theory offers for understanding an important contention in oil-conflict studies: why the within-country location of oil fields matters for explaining civil war onset.

nic conflict and the geography of rebellion produces two explanations for the mixed empirical oil-conflict pattern. First, the model explains a strategic selection effect in which the government's commitment ability explains whether civil war occurs or not, and the size of the challenging ethnic group explains rebellion aims. The government is less able to commit to provide transfers and to refrain from taxing the challenger's region if its ethnic group is numerically small (Assumption 6), which increases the magnitude of the oil predation effect. Additionally, small groups are better able to win separatist rather than center-seeking campaigns (Assumption 1). This assumption about the effect of ethnic group size determines the challenger's equilibrium war aims after additionally accounting for how the challenger strategically reacts to the government's military spending. By modeling distinct war types, my theory can explain why small groups that optimally choose separatist over center-seeking civil wars face a large predation effect of oil relative to the revenue effect—given low government commitment ability toward small groups. This mechanism links aggrieved oil-rich groups to the equilibrium choice to fight a separatist civil war. By contrast, because the government exhibits greater commitment ability toward large groups, this mechanism also implies that oil wealth enhances the government's ability to peacefully buy off a challenger that—had it fought—would have sought the center. Figure 6, presented later, summarizes the logic.

Second, the balance between the revenue effect and predation effect also depends on the government's ability to translate its military spending into a lower probability of winning a civil war for the challenger. Substantive considerations about the geography of rebellion motivate assuming that although larger oil revenues allow the government to afford a stronger military, improvements in coercive ability less strongly diminish the challenger's prospects for winning a separatist than a center-seeking war (Assumption 2). This implies that the conflict-inducing predation effect is larger in magnitude when separatist rather than center-seeking rebellions are the binding civil war threat. Below, Figure 9 summarizes this logic.

These two mechanisms also yield empirical implications about conditional oil effects. Oil and separatism should correlate most strongly among (1) ethnic minority groups because of the strategic selection effect and (2) favorable geography for secession because of the geography of rebellion mechanism, and the model analysis explains why these other conflict risk factors should *complement* the oil effect. By contrast, conditions that create government vulnerability should dampen the revenue effect and negate the negative relationship between oil production and center-seeking civil war. Individual oil-conflict cases and interactive regression models support these conditional implications.

In addition to helping to explain key empirical patterns in the widespread conflict resource curse literature, this paper offers a novel theoretical contribution by studying endogenous civil war aims and allowing the challenger to choose between two civil war types. Although the theoretical properties connecting commitment problems to conflict are well known (Powell, 2004; Krainin, 2017), most existing formal studies assume that an actor has a single outside option to fight for a particular prize. This includes accruing territory from a neighboring country in models of international war (Fearon, 1995), capturing the central government in models of regime transitions (Acemoglu and Robinson, 2006) or civil war (Powell, 2012), and fighting to separate (Gibilisco, 2017). Fearon (2004) discusses how key parameters in his model differ depending on exogenously specified rebellion aims, although rebels can choose only between accepting a bargaining offer and a single fighting option. Morelli and Rohner's (2015) model contains distinct types of civil war, but rebels cannot freely choose between center-seeking and separatist aims. Instead, the possibility of war occurring in equilibrium in their model follows because the *government* rather than rebel leaders may get to choose the rebels' war aims, as opposed to my focus on *challengers* choosing their civil war aims.[4] The conclusion discusses broader theoretical and empirical implications for explaining strategic civil war aims.

2 Motivating Puzzle: The Mixed Oil-Conflict Relationship

Considerable research analyzes the relationship between oil production and civil war onset, producing a diversity of findings and an emerging consensus that the *aggregate* relationship is null (Ross, 2015, 251). However, studying oil highlights the importance of disaggregating civil war aims. Whereas countries with greater oil wealth tend to experience relatively few center-seeking civil wars (at least, before 2011), oil-rich ethnic groups fight separatist civil wars at elevated rates. Because existing research usually examines these patterns independently, or overlooks them by aggregating civil wars, this section presents regression results that establish the motivating empirical puzzle using a common sample and dataset, and Appendix A provides supporting data information. The country-level specifications relate most closely to those in Paine (2016),

[4] Additionally, for applying their model to explain real-world cases, it is unclear how a government can make a group fight its less-preferred type of war, for example, forcing a group to fight for the center when it would rather secede.

and the ethnic group-level specifications to those in Morelli and Rohner (2015) and Hunziker and Cederman (2017). As Appendix A details, the civil war onset variable that I use here—which draws from Fearon and Laitin's (2003) measure—has advantages over UCDP/PRIO conflict data (used in Hunziker and Cederman 2017 and many related publications) because it uses rigorous criteria for coding civil war "onset" as well as excludes minor conflicts.

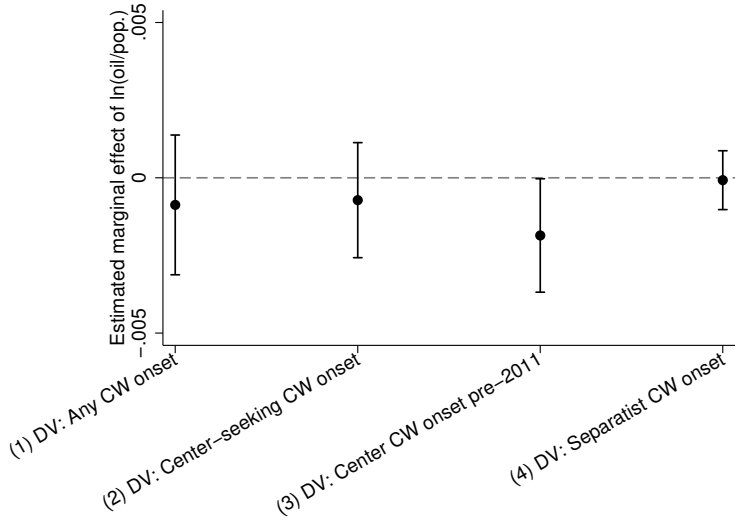
Figure 1 summarizes a series of logit regressions with country-years as the unit of analysis between 1946 and 2013 among 150 independent non-Western European countries. The civil war onset variables draw from Fearon and Laitin's (2003) dataset on major civil war onsets (at least 1,000 battle deaths; often denoted "major" civil wars), updated through 2013 along with other alterations described in Appendix A. Every specification in Figure 1 includes logged annual oil and gas production per capita, log population (the only substantive covariate in Ross' 2012 "core" specification), and peace years and cubic splines. The dependent variable is any type of civil war onset in model 1, center-seeking civil war onset in models 2 and 3, and separatist civil war onset in model 4.

Empirically, almost all post-1945 civil wars enable relatively unambiguous codings about center-seeking versus separatist goals. For the present civil war variables, I combined information from Fearon and Laitin (2003) and other conflict datasets to code war aims. Only two cases yielded codings of multiple war aims for the same rebel group: the SPLM/A in Sudan, and the EPRDF and constituent groups in Ethiopia. More frequently, center-seeking and separatist civil wars occur simultaneously within the same *country*—including Angola, Burma, and India—but each *rebel group* in these conflicts pursued either center-seeking or separatist aims but not both.[5]

Model 1 of Figure 1 shows that the estimated marginal effect of oil production on any civil war onset is negative. Although this result is inconsistent with earlier proclamations of an oil curse, it corresponds with more recent findings that show no evidence of an unconditional oil-conflict relationship. Disaggregating civil war aims, model 2 presents a similar estimate for center-seeking civil wars. However, until recently, oil production exhibited a relatively strong negative correlation with center-seeking civil war onset. Model 3 estimates the same specification prior to the Arab Spring in 2011 and shows a large-magnitude and statis-

[5] Appendix A provides additional detail on how I coded civil war aims, and Section B.3 examines Sudan and Ethiopia in more depth.

Figure 1: Country-Level Correlations



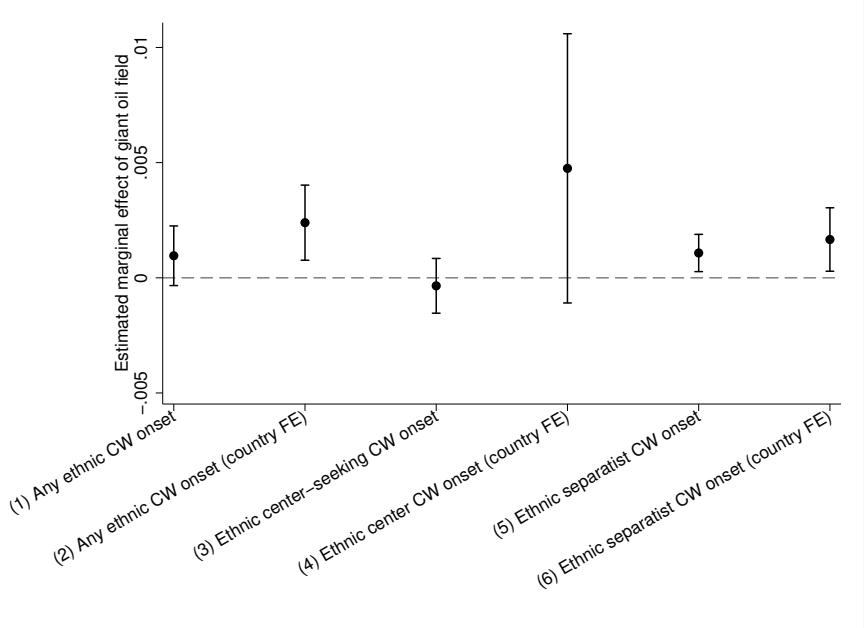
Notes: Figure 1 shows point estimates for the marginal effect of logged oil production on civil war onset in logit models with 95% confidence intervals. The unit of analysis is country-years. Appendix A presents the corresponding regression model and table.

tically significant negative marginal effect estimate—suggesting, perhaps, a resource blessing.[6] Holding the temporal dependence controls at their means in model 3, the predicted probability of center-seeking civil onset is 1.09% in country-years with no oil production compared to 0.57% in country-years with $1,000 in oil income per capita, a 48% decline. Finally, model 4 shows no correlation for separatist civil wars.

Figure 2 summarizes a similar set of logit regressions, except the unit of analysis is ethnic group-years. The sample contains 763 politically relevant ethnic groups from the Ethnic Power Relations (EPR) dataset (Vogt et al., 2015), using similar country and year restrictions as Figure 1. I coded the ethnic civil war data by merging Fearon and Laitin's (2003) civil war list with the EPR dataset, therefore coding "major" civil wars at the ethnic group level. I also matched EPR ethnic groups with giant oil and gas field locations, and the oil variable indicates whether the ethnic group's territory contains any giant oil or gas fields, or if there is a nearby offshore oil field. Every specification contains peace years, cubic splines, and lagged country-level civil war incidence. Even-numbered columns additionally control for country fixed effects. The dependent variable is any ethnic civil war onset in models 1 and 2, ethnic center-seeking onset in models 3 and 4, and ethnic separatist onset in models 5 and 6.

[6]The theory and subsequent data analysis discuss why the Arab Spring and related events should weaken the negative relationship between oil production on center-seeking civil wars. Unreported specifications show that no other findings in Figures 1 and 2 qualitatively differ when truncating the sample to pre-2011.

Figure 2: Ethnic Group-Level Correlations



Notes: Figure 2 shows point estimates for the marginal effect of an indicator for giant oil/gas fields on ethnic civil war onset with 95% confidence intervals. The unit of analysis is ethnic group-years. Appendix A presents the corresponding regression model and table.

Models 1 and 2 of Figure 2 demonstrate a positive association between oil wealth and any ethnic civil war onset. The remaining columns demonstrate that only separatist civil wars robustly exhibit this relationship. In the model 5 specification, holding temporal dependence controls at their means, the annual predicted probability of separatist civil onset is 2.2 times greater for oil-rich than oil-poor groups: 0.30% versus 0.13%. Furthermore, whether or not controlling for country fixed effects, the association is statistically significant at 5%. By contrast, the marginal effect estimate for the giant oil field indicator on center-seeking civil wars is inconsistent in sign and not statistically significant in models 3 and 4.[7]

3 Model Setup and Equilibrium Analysis

The first building block for explaining the mixed relationship between oil production and different types of civil war is to analyze a formal model that evaluates general incentives for civil war. The model builds

[7]Model 4 is imprecisely estimated because adding country fixed effects to the logit models drops many ethnic groups (see Appendix Table A.2). Unreported estimates from linear models do not alter the statistical significance or lack thereof in any model, but decrease the standard error estimates in model 4.

off existing bargaining models of war, and the main new twist is to allow the challenger to choose its civil war aims. There are two players, a government and a regionally based challenger. Economic production occurs in regions occupied by both players, which are most naturally conceived of as distinct ethnic groups. Each player seeks to maximize its share of national output. The factors that directly affect the distribution of economic output between the government and challenger are taxes—which depend on the government's ability to commit to limit taxation and on the nature of economic production—and central transfers. The challenger's probabilities of winning either type of civil war create an indirect strategic effect that alters the distribution of economic output by shaping the bargaining offer that the government makes to the challenger. In turn, the probability that the challenger wins either a center-seeking or a separatist civil war depends on the government's endogenously set military spending and on exogenous parameters that capture the population size of the challenger's ethnic group and the geography of rebellion. Section 3.1 sets up the model, Section 3.2 discusses numerous simplifying assumptions, and Section 3.3 solves the model. Section 4 evaluates comparative statics for oil production.

3.1 Setup

Two actors, a governing group (G) and a challenger (C) with non-overlapping territorial locations, interact in an infinite-horizon game of complete information with time denoted by $t = 1, 2, \ldots$ Both players share a common exponential discount factor $\delta \in \big(\underline{\delta}, 1\big)$, for a lower bound $\underline{\delta} \in (0, 1)$ defined below. Total per-period economic production in each region equals 1.

Exogenously collected tax revenues in each period. In each period $t \geq 2$, G accesses a revenue endowment composed of exogenously collected taxes $1 - e_G$ from its own region and $\big(1-\theta\big) \cdot \big(1-e_C\big)$ from C's region, yielding per-period revenues:

$$R = 1 - e_G + \big(1 - \theta\big) \cdot \big(1 - e_C\big). \tag{1}$$

In every period, C's after-tax income is $1 - \big(1 - \theta\big) \cdot \big(1 - e_C\big)$, and actors outside the present interaction consume the remaining income in G's region, e_G.

Two substantive factors affect G's tax revenues, which can be interpreted as maximum possible tax extraction given political and economic constraints. First, $\theta \in [0, 1]$ relates to C's degree of political clout in the central government which, in the real world, may be high because members of a non-ruling ethnic

group hold cabinet positions or widespread membership in a powerful political party. The assumption that tax revenues from C's region strictly decrease in θ follows from the substantive idea that greater political access for the challenger improves G's *ability to commit* to not imposing an exploitative tax rate. Second, $e_i \in [0, 1]$ can be thought of as the ability of producers to exit the formal economy in reaction to high tax rates. Substantively, certain types of economic production are very difficult to hide from the government, which provides a producer with minimal leverage to withhold revenues. This circumstance corresponds with low e_i. By contrast, for modes of economic production that producers can easily hide from the government or physically move out of the country, the fear of triggering economic exit limits government tax intake.

I also assume that θ and e_C substitute for each other, capturing the intuition that a challenger with a weak economic exit option can still constrain government taxation if it has political representation in the central government, and that groups lacking effective political representation can still guard against the government exploiting their resources if they have a viable economic exit option. The imposed functional form assumption implies that perfect commitment ability ($\theta = 1$) and a perfect exit option ($e_C = 1$) are individually sufficient for a 0 tax rate on C, whereas no commitment ability ($\theta = 0$) and no exit option ($e_C = 0$) are individually necessary and jointly sufficient for a tax rate of 1. Table 1 summarizes these considerations.

Table 1: Parameters that Determine Per-Period Taxes on the Challenger

	Low e_C	**High e_C**
Low θ	*High taxes*	*Low taxes* because C's economic exit option constrains G
High θ	*Low taxes* because of political constraints on G	*Low taxes* because of both

Strategic moves in period 1. In period 1, G allocates its revenues among military spending $m \geq 0$ and patronage transfers $x \geq \theta \cdot \big(1 - e_G\big)$, jointly subject to the budget constraint, $m + x \leq R$.[8] This choice set implies that regardless of how much revenue G accrues from C's region, G can offer these revenues back to C—as well as offer revenues from its own region; or spend on the military, police, intelligence, and other repressive apparatuses. The patronage transfer captures a general decision over private transfers, welfare policies, public sector job provision, and other ways for a government to distribute benefits. The lower bound for the patronage transfer expresses that government commitment ability θ, introduced above for taxation, also affects transfers from the center because G is required to transfer at least θ percent of

[8] I omit time subscripts because G makes these choices only in period 1.

revenues from its region to C.

C decides whether to accept G's offer, to fight a center-seeking civil war, or to fight a separatist civil war. A peaceful bargain in period 1 yields contemporaneous consumption $R-x-m$ for G and $1-(1-\theta)\cdot(1-e_C)+x$ for C, and the status quo regime remains intact in periods $t \geq 2$ with future continuation values described below.

If instead C fights in period 1, then its probability of winning depends on its chosen civil war aims: $\mu \in \{0,1\}$ equals 1 if C chooses center-seeking aims and 0 if C chooses separatist aims. C wins a center-seeking civil war with probability $p_c(m,\alpha,\beta_c) \in (0,1)$ and a separatist civil war with probability $p_s(m,\alpha,\beta_s) \in (0,1)$. These functions are indexed as $p_j(\cdot)$, for $j \in \{c,s\}$. Three arguments affect the probability of winning functions. First, G's military spending m, which strictly lowers $p_j(\cdot)$.[9]

Second, C's share of the country's population, $\alpha \in (0,1)$. I assume that larger groups win any civil war with higher probability than smaller groups, but the effect of a bigger C group is larger in magnitude for center-seeking than separatist civil wars. Later, Section 5.2 provides substantive grounding for Assumption 1. I also assume that larger group size diminishes the effect of military spending on lowering C's probability of winning: $\frac{\partial^2 p_j}{\partial m \partial \alpha} > 0$.

Assumption 1 (Ethnic group size and civil war aims)**.**

An increase in C's percentage of the population increases its probability of winning a center-seeking civil war by a greater magnitude than it increases C's probability of winning a separatist civil war, and both effects are strictly positive. Formally, for all $m \geq 0$:

$$\frac{\partial p_c}{\partial \alpha}(m,\alpha,\beta_c) > \frac{\partial p_s}{\partial \alpha}(m,\alpha,\beta_s) > 0$$

Third, a coercive efficiency parameter. Higher values of $\beta_j \in \mathbb{R}$, for $j \in \{c,s\}$, indicate greater coercive effectiveness, $\frac{\partial p_j(\cdot)}{\partial \beta_j} < 0$, and greater coercive efficiency enhances the effect of military spending on

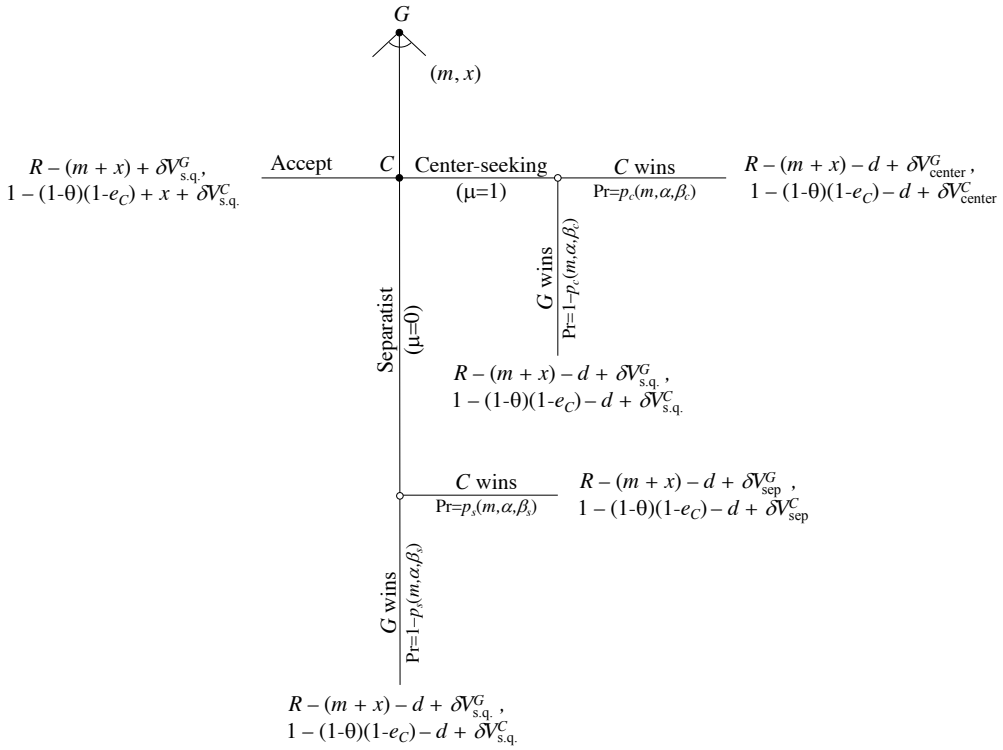
[9] Formally, $p_j(\cdot)$ is a smooth function that, for any $m \geq 0$, satisfies $p_j(m) \in (0,1)$ and $p_j'(m) < 0$. It also satisfies two Inada-type conditions to rule out uninteresting corner solutions in which G wants to spend none or all of its budget on the military: $\lim_{m \to 0} p_j'(m) = -\infty$ and $\lim_{m \to R} p_j'(m) = 0$. I also assume that the function exhibits diminishing marginal returns of a large enough magnitude: $p_j''(m) > \frac{[p_j'(m)]^2}{p_j(m)}$. Any function in which higher-order derivative functions become increasingly steep satisfy this second derivative condition, such as the standard ratio form contest function $\frac{1}{1+m}$ (assuming C's fighting capacity is normalized to 1).

decreasing C's probability of winning: $\frac{\partial^2 p_j(\cdot)}{\partial m \partial \beta_j} < 0$. In other words, β_j and m are complements. Assumption 2 distinguishes these effects by civil war aims, and Section 6.1 provides substantive grounding for this assumption in the context of the geography of rebellion.

> **Assumption 2** (Coercive effectiveness)**.** *G's military spending more effectively decreases C's probability of winning a center-seeking civil war than a separatist civil war. Formally, $\beta_c > \beta_s$.*

If C initiates a civil war rather than accepts the transfer, then each player consumes their region's production (and m is sunk for G) but also pays a fixed cost $d \in \left(0, \overline{d}\right)$ in period 1 that captures the destructiveness of fighting, for $\overline{d}$ defined below in Assumption 4. However, a war in period 1 does not impose costs in future periods. If C launches a war and it fails, then the status quo regime remains intact in $t \geq 2$. By contrast, success in either type of war yields future continuation values described below. Figure 3 presents the stage game played in period 1 and Appendix Table B.1 summarizes notation.

Figure 3: Stage Game in Period 1



Payoffs in future periods. No strategic moves occur in any period $t \geq 2$. If the status quo regime remains intact—because C accepts G's offer in period 1 offer or because C launches but loses a war—then C's and G's respective future continuation values are $V^C_{\text{s.q.}}$ and $V^G_{\text{s.q.}}$. Taxation proceeds in each period as described

earlier, and G is assumed to transfer to C the lower-bound amount of revenues from its region in each period: $\theta \cdot \big(1 - e_G\big)$. Following a successful center-seeking civil war, in each period C consumes all production in its region (which equals 1) and all revenues from G's region, $1 - e_G$; and G consumes 0. The future continuation values are V^C_{center} and V^G_{center}. Following successful secession, C consumes all its regional production, but G retains all revenues from the "central" region, with future continuation values V^C_{sep} and V^G_{sep}.[10] Table 2 summarizes the per-period future continuation values as well as G's and C's differences in consumption following a successful war (of either type) relative to the status quo.

Table 2: Per-Period Future Continuation Values and Differences

	Government	**Challenger**
(1) ***C* wins center**	$(1-\delta) \cdot V^G_{\text{center}} = 0$	$(1-\delta) \cdot V^C_{\text{center}} = 2 - e_G$
(2) ***C* secedes**	$(1-\delta) \cdot V^G_{\text{sep}} = 1 - e_G$	$(1-\delta) \cdot V^C_{\text{sep}} = 1$
(3) **Status quo**	$(1-\delta) \cdot V^G_{\text{s.q.}} =$ $\big(1-\theta\big) \cdot \big(1-e_C\big) + \big(1-\theta\big) \cdot \big(1-e_G\big)$	$(1-\delta) \cdot V^C_{\text{s.q.}} =$ $\underbrace{1 - \big(1-\theta\big) \cdot \big(1-e_C\big)}_{C\text{'s non-taxed income}} + \underbrace{\theta \cdot \big(1-e_G\big)}_{\text{Transfers from } G}$
(4) **Center – s.q.**	$(1-\delta) \cdot \Big(V^G_{\text{center}} - V^G_{\text{s.q.}}\Big) =$ $-\Big[\big(1-\theta\big) \cdot \big(1-e_C\big) + \big(1-\theta\big) \cdot \big(1-e_G\big)\Big]$	$(1-\delta) \cdot \Big(V^C_{\text{center}} - V^C_{\text{s.q.}}\Big) =$ $(1-\theta) \cdot (2 - e_G - e_C)$
(5) **Sep. – s.q.**	$(1-\delta) \cdot \Big(V^G_{\text{sep}} - V^G_{\text{s.q.}}\Big) =$ $-\big(1-\theta\big) \cdot \big(1-e_C\big) + \theta \cdot \big(1-e_G\big)$	$(1-\delta) \cdot \Big(V^C_{\text{sep}} - V^C_{\text{s.q.}}\Big) =$ $\underbrace{(1-\theta) \cdot (1-e_C)}_{\text{Doesn't pay taxes}} - \underbrace{\theta \cdot (1-e_G)}_{\text{Doesn't get transfers}}$

3.2 Simplifying Assumptions and Robustness Checks

To focus attention on the main mechanisms that help to explain the mixed oil curse, the model contains numerous simplifying assumptions. One is that G exogenously accrues tax revenues, even in period 1. Alternatively, we could add two additional strategic moves at the beginning of the game: G proposes a tax rate and then C either accepts the tax rate or exits. Assuming the value of C's exit option equals $\big(1-\theta\big) \cdot \big(1-e_C\big)$, then adding these moves would reproduce the exogenous revenue amounts assumed

[10] The only consequential assumption for periods $t \geq 2$ is that C wins either type of war with probability 0. Given this assumption, even if in every period both actors made the same strategic choices as in period 1, C would accept any offer and G would optimally set $m_t = 0$ and $x_t = \theta \cdot \big(1 - e_G\big)$—yielding the same equilibrium outcomes as assumed here.

above. In the transfer and fighting part of the stage game, C treats taxes as a sunk cost and therefore they do not affect actions later in the period, which in turn implies that G proposes taxes to equal C's exit constraint and C accepts any tax level no greater than that.[11]

The appendix analyzes the consequences of relaxing several other assumptions. Section B.2 parameterizes the total amount of production in each player's region rather than fixes it at 1. Contrary to arguments in the literature that oil production and other natural resources cause civil war by creating a large prize of predation, allowing arbitrarily large production amounts in either region yields qualitatively identical implications as the core model. Section B.3 assumes civil wars can last for multiple periods and allows C to change its civil war aims in between fighting periods. Applying the mechanisms in this extension to empirical cases shows that it helps to explain the overall rarity of rebel groups switching aims amid a war, but also can account for exceptions such as Ethiopia and Sudan. Section B.4 departs from the present setup that implies ethnic group size determines civil war aims (see the analysis below), and instead alters the setup to consider the possibility that regional oil production causes groups to substitute separatist civil wars for center-seeking civil wars. I conclude that empirical cases do not closely match the theoretical scope conditions under which this mechanism operates.

Another simplifying assumption is that C can initiate a war only in the first period. This setup corresponds in a simple way with many formal models in which the distribution of power is assumed to shift over time by capturing the main mechanism through which dynamic commitment problems cause war.[12] Although the strategic interaction ends after period 1, C's per-period consumption in future periods determines its optimal civil war aims and whether or not the players can achieve a peaceful bargain in period 1. The possibility of equilibrium bargaining failure arises because C's bargaining position permanently worsens after period 1, which creates incentives for C to initiate a civil war before the adverse power shift occurs. This is the limiting case of a model in which during every period of an infinite horizon there is a positive probability that C will win a war (for example, Acemoglu and Robinson's 2006 model of political regime transitions).[13] Allowing power to shift only once yields qualitatively similar insights as a model in which power can shift

[11] Additionally, for exogenous taxation, the main results are similar for any smooth function $\tau\left(\theta, e_C\right)$ satisfying $\frac{\partial \tau}{\partial \theta} < 0$, $\frac{\partial \tau}{\partial e_C} < 0$, and $\frac{\partial^2 \tau}{\partial \theta \partial e_C} > 0$, but the imposed functional form assumption simplifies the exposition.

[12] Fearon (1995, 404-408) models dynamic commitment problems in a similar manner.

[13] This would not be true if my model contained a finite number of periods, which motivates modeling an

in every period, and the gain from this simplification is to eliminate the considerable technical difficulties that would arise from modeling G's arming decision in every period (a strategic option omitted in Acemoglu and Robinson's 2006 and many other dynamic bargaining models).[14]

3.3 Equilibrium Analysis

The analysis solves backwards on the period 1 subgame to characterize the unique subgame perfect Nash equilibrium. It examines conditions in which C accepts G's offer along the equilibrium path of play, denoted as a peaceful equilibrium. Appendix Section B.1 proves every formal statement.

3.3.1 Challenger's Civil War Aims

In period 1, C can choose to fight if G makes an unfavorable offer. The allure of initiating a separatist war ($\mu = 0$) is that, if C wins, it retains all future economic production in its region, although it loses any future transfers it would have received from the central region. A center-seeking civil war ($\mu = 1$)—if successful—carries the additional benefit for C of capturing all future taxable output from G's region. Therefore, conditional on winning, C prefers to take the center. However, if C's probability of winning a separatist civil war sufficiently exceeds that of capturing the center, then C's binding fighting threat is separatist. The terms from Table 2 enable expressing whether C's binding war threat is center-seeking or separatist, given G's military spending m:

$$\mu^*(m) = \begin{cases} 0 & \text{if } p_c(m=0,\alpha,\beta_c) < \underbrace{\frac{(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)}{(1-\theta)\cdot(2-e_G-e_C)}}_{<1} \cdot p_s(m,\alpha,\beta_s) \\ [0,1] & \text{if } p_c(m,\alpha,\beta_c) = \frac{(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)}{(1-\theta)\cdot(2-e_G-e_C)} \cdot p_s(m,\alpha,\beta_s) \\ 1 & \text{if } p_c(m,\alpha,\beta_c) > \frac{(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)}{(1-\theta)\cdot(2-e_G-e_C)} \cdot p_s(m,\alpha,\beta_s) \end{cases} \tag{2}$$

Lemma 1 demonstrates that C's share of the population and G's military spending determine the binding civil war constraint. If C is very small, then it prefers separatism over center-seeking regardless of m (part

infinite horizon even though strategic moves occur only in period 1.

[14] Paine (2016) details some of these technical issues.

a), whereas the opposite is true if C is very large (part c). These two results follow from Assumption 1 on ethnic group size and civil war aims, plus the following boundary conditions stating that the smallest possible C strictly prefers separatism and the largest possible C strictly prefers center-seeking.

Assumption 3 (Boundary conditions for civil war aims)**.**

Part a. $p_c(m=0,\alpha=0,\beta_c) < \dfrac{(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)}{(1-\theta)\cdot(2-e_G-e_C)}\cdot p_s(m=0,\alpha=0,\beta_s)$

Part b. $p_c(m=R,\alpha=1,\beta_c) > \dfrac{(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)}{(1-\theta)\cdot(2-e_G-e_C)}\cdot p_s(m=R,\alpha=1,\beta_s)$

If instead α is intermediate, then G's military spending influences the type of civil war that C prefers: center-seeking if m is low and separatist if m is high (part b of Lemma 1). This follows from Assumption 2, which assumes that military spending decreases C's probability of winning a center-seeking civil war by a greater magnitude than it decreases the probability of successful separatism.

Lemma 1 (Optimal civil war aims)**.** *There exist unique threshold values derived in the appendix,* $0<\underline{\alpha}<\overline{\alpha}<1$ *and* $\hat{m}(\alpha)$*, such that:*

Part a. *If* $\alpha\in(0,\underline{\alpha})$*, then* $\mu^*(m)=0$ *for all* $m\in(0,R)$*.*

Part b. *If* $\alpha\in(\underline{\alpha},\overline{\alpha})$*, then* $\mu^*(m)=1$ *if* $m<\hat{m}(\alpha)$ *and* $\mu^*(m)=0$ *if* $m>\hat{m}(\alpha)$*; and* $\hat{m}(\alpha)$ *strictly increases in* α*.*

Part c. *If* $\alpha\in(\overline{\alpha},1)$*, then* $\mu^*(m)=1$ *for all* $m\in(0,R)$*.* *[Go to proof]*

3.3.2 Challenger's Decision to Accept or Fight

C will accept G's period 1 patronage transfer if the proposal yields expected utility at least as high as C would obtain from initiating its preferred type of civil war. Fighting reduces surplus in period 1 by imposing the fixed cost d on both players. However, by creating the possibility of dictating policy in the future, in expectation, C is better off in future periods from fighting in the present period.[15] Fixing m, Equation 3 states C's acceptance constraint, taking into account optimal civil war aims (Lemma 1) and calculations from Table 2: the difference in C's expected utility from winning a center-seeking civil war relative to the

[15]The assumption that the status quo regime—i.e., C's continuation value if it accepts—remains in place in the future following a failed war implies that C can do no worse in *future* periods by fighting in period 1 than it would from accepting the offer.

status quo (row 4) and the difference in C's expected utility from winning a separatist civil war relative to the status quo (row 5).

$$x \geq x^*(m) \equiv \frac{\delta}{1-\delta} \cdot \Bigg\{ \mu^*(m) \cdot \underbrace{p_c(m) \cdot (1-\theta) \cdot (2 - e_G - e_C)}_{\text{Center-seeking}}$$

$$+ \big[1 - \mu^*(m)\big] \cdot \underbrace{p_s(m) \cdot \Big[(1-\theta) \cdot (1-e_C) - \theta \cdot (1-e_G)\Big]}_{\text{Separatist}} \Bigg\} - d \tag{3}$$

The remainder of the analysis imposes Assumption 4 to focus on the strategically non-trivial parameter range in which C can credibly threaten to fight either type of war if G does not arm and proposes the minimum transfer, $\theta \cdot (1 - e_G)$. Each term within the brackets in part a is strictly bounded between 0 and 1, which implies that $\underline{\delta} \in (0, 1)$; and $\delta > \underline{\delta}$ implies that $\overline{d} > 0$.

Assumption 4 (Credible war threats)**.**

Part a. $\delta > \underline{\delta} \equiv \min \Bigg\{ \dfrac{\theta \cdot (1-e_G)}{p_c(0) \cdot (1-\theta) \cdot (2 - e_G - e_C) + \theta \cdot (1-e_G)},$

$$\frac{\theta \cdot (1-e_G)}{p_s(0) \cdot \big[(1-\theta) \cdot (1-e_C) + \theta \cdot (1-e_G)\big] + \theta \cdot (1-e_G)} \Bigg\}$$

Part b. $d < \overline{d} \equiv \dfrac{\delta}{1-\delta} \cdot \min \Big\{ p_c(0) \cdot (1-\theta) \cdot (2 - e_G - e_C), p_s(0) \cdot \Big[(1-\theta) \cdot (1-e_C) - \theta \cdot (1-e_G)\Big] \Big\} - \theta \cdot \big(1 - e_G\big)$

3.3.3 Government's Strategic Choices

G chooses x and m in period 1 to maximize its lifetime expected utility. This requires G to satisfy Equation 3: as the player making the offers, G can hold C to its reservation value to fighting, and surplus is lost if C initiates a civil war. Furthermore, to avoid providing transfers in excess of the amount needed to buy peace (and given Assumption 4), for a given m, G will satisfy Equation 3 with equality.

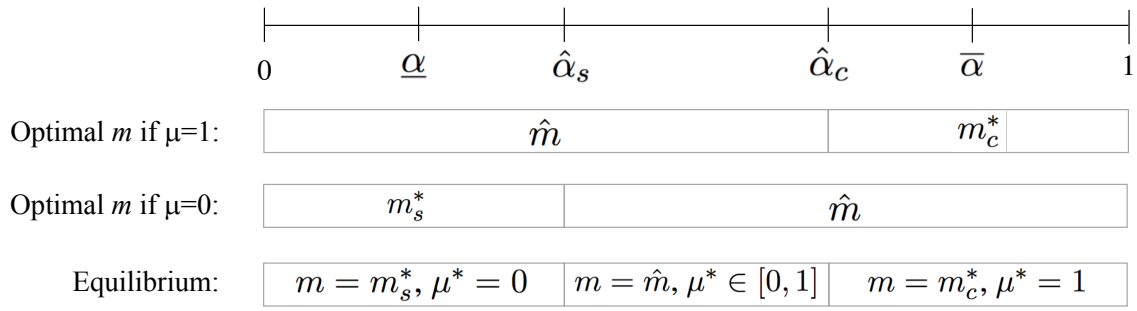
G's military spending also affects C's calculus, both directly and indirectly. The straightforward direct effect is that, for fixed civil war aims, greater armament decreases C's expected utility to initiating a war by

lowering its probability of winning (see Equation 3). This mechanism diminishes the transfer amount that C can credibly demand and implies that G consumes a larger percentage of revenues. An indirect effect arises because G's military spending may influence C's civil war aims (see part b of Lemma 1). G chooses m to maximize lifetime expected utility, taking into account these two effects.[16]

$$m^* \equiv \arg\max \left\{ \underbrace{\max_{m\in[0,\hat{m}]} R - m - x^*(\mu=1,m) + \delta \cdot V^G_{\text{s.q.}}}_{\text{Optimal arming against center-seeking constraint}}, \underbrace{\max_{m\geq\hat{m}} R - m - x^*(\mu=0,m) + \delta \cdot V^G_{\text{s.q.}}}_{\text{Optimal arming against separatist constraint}} \right\} \tag{4}$$

This optimization problem yields a unique optimal arming amount for each value of C's group size, α. Figure 4 summarizes the intuition, and the appendix provides supporting technical details. If we fix C's war aims, then there are unique interior solutions to each of the constituent maximization problems stated in Equation 4: m_c^* for $\mu = 1$ (center-seeking) and m_s^* for $\mu = 0$ (separatist). Given the boundary $\hat{m}$ defined in Lemma 1—at which point C is indifferent between civil war aims—and the Inada-type conditions stated in footnote 9 that rule out $m = 0$ and $m = R$, we can eliminate all $m \notin \{m_c^*, m_s^*, \hat{m}\}$ as possible maximizers.

Figure 4: Equilibrium Military Spending and Civil War Aims



Which of these three possibilities is the unique optimizer depends on α. If C is small, $\alpha \in (0, \hat{\alpha}_s)$, then G chooses $m = m_s^*$ and in equilibrium C's binding constraint is separatist. We already know from part a of Lemma 1 that if C is very small, $\alpha < \underline{\alpha}$, then C's binding civil war threat is separatist regardless of m. In this range, G optimally chooses m to maximize its expected utility given that C's binding constraint

[16]Regarding the inclusive $\hat{m}$ boundary for the two minimization problems, combining Equation 2 and Lemma 1 shows that $\mu^*(\hat{m}) \in [0,1]$. C's indifference over its civil war aims at $\hat{m}$ implies that G's expenditures $\hat{m} + x^*(\mu, \hat{m})$ are constant in $\mu \in [0,1]$.

is separatist, defined as m_s^*. If C is slightly larger, $\alpha \in \left(\underline{\alpha}, \hat{\alpha}_s\right)$, the outcomes are unchanged. C is still relatively small in size in this range. Therefore, given the logic of Lemma 1, only very low military spending will tempt C to fight for the center. Formally, $\hat{m}$ is low if α is low. The low level of military spending that G would have to set to induce center-seeking fighting requires G to considerably sacrifice its coercive potential, and therefore G prefers to choose the higher value m_s^* and face a separatist civil war threat.

The logic is identical (albeit inverted) for large C, $\alpha \in \left(\hat{\alpha}_c, 1\right)$, in which case G chooses $m = m_c^*$ and in equilibrium C's binding constraint is center-seeking. Part c of Lemma 1 shows that C's binding civil war threat is center-seeking regardless of m if C is very large, $\alpha > \overline{\alpha}$. In this range, G's optimally chooses m to maximize its expected utility given that C's binding constraint is center-seeking, defined as m_c^*. If C is slightly smaller, $\alpha \in \left(\hat{\alpha}_c, \overline{\alpha}\right)$, the outcomes are unchanged. C is still relatively large in size in this range, and therefore only very high levels of military spending will deter C from fighting for the center. Formally, $\hat{m}$ is high if α is high. The high level of military spending that G would have to set to deter center-seeking fighting causes it to prefer to spend a lower level m_c^* and face a center-seeking civil war threat.

Finally, for intermediate-sized challengers $\alpha \in \left(\hat{\alpha}_s, \hat{\alpha}_c\right)$, G optimally spends the amount that makes C indifferent between civil war aims, $\hat{m}$. In this range, m_s^* is low enough that $\mu^*(m_s^*) = 1$ (i.e., C's binding constraint would be center-seeking), and m_c^* is high enough that $\mu^*(m_c^*) = 0$ (i.e., C's binding constraint would be separatist). This leaves $\hat{m}$ as the only possible solution.

3.3.4 Equilibrium

G's optimization problem to maximize lifetime utility (Equation 4) is equivalent to maximizing net revenues (i.e., its budget constraint) in period 1 because—conditional on preventing war in period 1—its period 1 choices of m and x do not affect future-period consumption. Furthermore, peaceful bargaining ensues if and only if G's budget constraint is satisfied in equilibrium:

$$B^* \equiv R - m^* - x^* = \underbrace{1 - e_G + \left(1-\theta\right) \cdot \left(1 - e_C\right)}_{\text{Revenues}}$$

$$\underbrace{-m^* - \frac{\delta}{1-\delta} \cdot \left[\mu^* \cdot p_c(m^*) \cdot (1-\theta) \cdot (2 - e_C - e_G) + (1-\mu^*) \cdot p_s(m^*) \cdot \left[(1-\theta) \cdot (1-e_C) - \theta \cdot (1-e_G)\right]\right]}_{\text{Expenditures}} \geq 0 \tag{5}$$

Along the equilibrium path, C will initiate a civil war if and only if Equation 5 is violated. This possibility arises because of G's limited commitment to transfers and to tax concessions in future periods when C cannot fight. To see that low θ is necessary for equilibrium fighting, suppose instead $\theta = 1$. In this case, C faces no taxes and receives maximum transfers in every future period in the status quo regime—identical to a successful center-seeking civil war. These conditions violate Assumption 4 and imply $m^* = 0$, and Equation 5 reduces to $2 - e_G + \frac{\delta}{1-\delta} \cdot (1 - \mu^*) \cdot p_s(0) \cdot (1 - e_G) > 0$. By contrast, if $\theta < 1$, then Equation 5 may be violated. Proposition 1 characterizes the unique subgame perfect Nash equilibrium strategy profile.

Proposition 1 (Equilibrium)**.**

Part a. *If $B^* > 0$, then C accepts any $x \geq x^*(m)$. If $x < x^*(m)$, then C does not accept and Lemma 1 characterizes C's optimal war aims as a function of m. There exist unique thresholds satisfying $\underline{\alpha} < \hat{\alpha}_s < \hat{\alpha}_c < \overline{\alpha}$ such that:*

- *If $\alpha < \hat{\alpha}_s$: G chooses $(m, x) = \left(m_s^*, x^*(m_s^*)\right)$, and C accepts along the equilibrium path.*
- *If $\alpha \in \left(\hat{\alpha}_s, \hat{\alpha}_c\right)$: G chooses $(m, x) = \left(\hat{m}, x^*(\hat{m})\right)$, and C accepts along the equilibrium path.*
- *If $\alpha > \hat{\alpha}_c$: G chooses $(m, x) = \left(m_c^*, x^*(m_c^*)\right)$, and C accepts along the equilibrium path.*

Part b. *If $B^* < 0$, then C does not accept any offer, and Lemma 1 characterizes C's optimal war aims as a function of m.*

- *If $\alpha < \hat{\alpha}_s$, then G chooses $m = m_s^*$ and is indifferent among all $x \in \left[\theta \cdot (1 - e_G), R - m_s^*\right]$; and C fights a separatist civil war along the equilibrium path, $\mu^* = 0$.*
- *If $\alpha \in \left(\hat{\alpha}_s, \hat{\alpha}_c\right)$, then G chooses $m = \hat{m}$ and is indifferent among all $x \in \left[\theta \cdot (1 - e_G), R - \hat{m}\right]$; and C fights a civil war but is indifferent among war aims, $\mu^* \in \{0, 1\}$.*
- *If $\alpha > \hat{\alpha}_c$, then G chooses $m = m_c^*$ and is indifferent among all $x \in \left[\theta \cdot (1 - e_G), R - m_c^*\right]$; and C fights a center-seeking civil war along the equilibrium path, $\mu^* = 1$. [Go to proof]*

4 Countervailing Effects of Oil Production

To introduce oil production into the model, assume that oil provides $O_i \in [0, 1)$ percent of total income in each region, for $i \in \{G, C\}$. Oil production is O_G in G's region ("government oil") and O_C in the region in which C resides ("regional oil"). Taking comparative statics on oil production highlights two key effects:

a revenue effect that shrinks the range of parameter values in which a civil war occurs along the equilibrium path, and a predation effect that increases civil war likelihood. To highlight common mechanisms for both civil war types, this section fixes C's civil war aims before the next two sections show how endogenizing civil war aims yields important insights. Formally, the civil war aims indicator $\mu \in \{0, 1\}$ is fixed in this section.

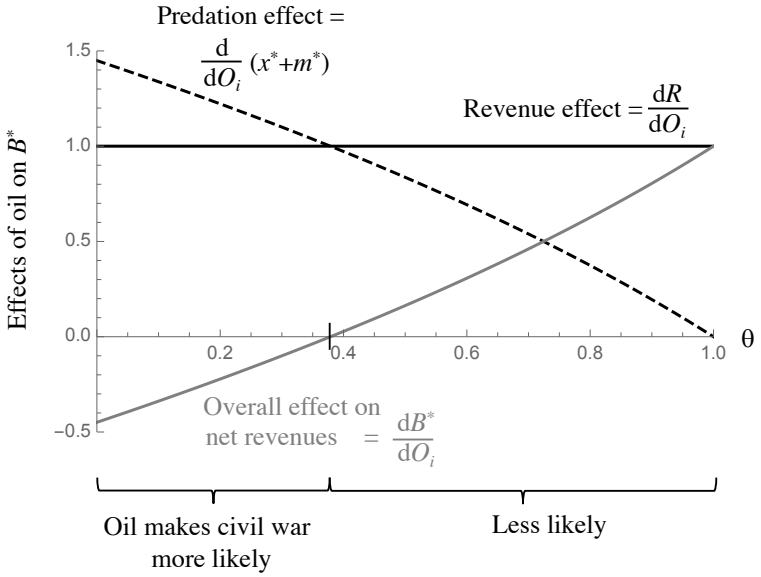
As the introduction discussed, a key property of oil production is that its immobility and high capital intensity undermines producers' ability to exit the formal economy in reaction to high taxes—which facilitates easy government taxation. Formally, assume:

Assumption 5 (Oil production and economic exit option)**.**

$$\frac{de_i}{dO_i} < 0, \textit{for } i \in \{G, C\}$$

Figure 5 depicts the effects of oil as a function of the commitment parameter θ. The gray curve is the overall effect of oil production on the equilibrium budget constraint in period 1, B^*, from Equation 5. For parameter values in which the gray curve is negative, an increase in oil production makes civil war more likely, whereas the opposite is true if the gray curve is positive.

Figure 5: Countervailing Effects of Oil Production



Notes: Figure 5 uses the following parameter values and functional form assumptions: $e_G = e_C = 0.7$, $\mu = 1$, $\gamma = 1$, $\alpha = 0.7$, $\beta_c = 5$, $\delta = 0.9$, $p_c(m) = \left(\frac{1}{1+\beta_c \cdot m}\right) \cdot \alpha$, and $\frac{de_G}{dO_G} = -1$.

The figure also disaggregates the overall effect of oil into two countervailing effects. The solid black line depicts the *revenue effect*. Because oil enables higher taxes than other types of economic activities (Assumption 5), an increase in either government or regional oil production raises G's available revenues to spend on transfers and coercion in period 1. This increases the likelihood that G has sufficient funds to offer to C to meet the budget constraint stated in Equation 5. Formally, this effect equals:

$$\textbf{Revenue effect: } \frac{dR}{dO_i} = \big(1 - \gamma \cdot \theta\big) \cdot \left(- \frac{de_i}{dO_i} \right) > 0, \tag{6}$$

where $\gamma = 0$ indicates production in G's region and $\gamma = 1$ indicates C's region. The revenue effect is qualitatively similar regardless of within-country oil location, although regional oil causes the effect to be multiplied by θ because of the commitment constraint on G taxing C's production.

Oil production also creates a *predation effect* that increases C's incentives to fight. This is effect (1) stated in Equation 7, and captures C's incentives to predate government oil production and G's incentives to predate regional oil production.[17] An increase in government oil production enhances the prize of capturing the center—in which case C consumes *all* revenues from G's region in future periods—relative to future transfers that C would receive in the status quo regime, which equal $1 - \theta$ percent of revenues from G's region. An increase in regional oil production increases the value to C of winning either type of civil war relative to remaining in the status quo regime because a successful war enables C to consume *all* future production from its region. By contrast, it must give some of these revenues to G if the status quo regime remains—that is, oil provides opportunities for G to predate C—and the magnitude of this taxation is scaled by $1 - \theta$. The dashed black line in Figure 5 depicts the predation effect, which works through G's expenditures $x^* + m^*$ because increasing C's post-successful war consumption relative to the status quo

[17] For all $\alpha \in [0, \hat{\alpha}_s] \cup [\hat{\alpha}_c, 1]$, applying the envelope theorem to solve $\frac{d}{dO_i}\big(m^* + x^*\big)$ yields the term stated in Equation 7. The envelope theorem is applicable in this parameter range because G chooses an interior optimal m value. For $\alpha \in [\hat{\alpha}_s, \hat{\alpha}_c]$, G's military choice is not interior and $\frac{d}{dO_i}\big(m^* + x^*\big)$ contains an additional indirect effect $\left(1 + \frac{\partial x^*}{\partial m}\right) \cdot \frac{d\hat{m}}{dO_i}$. However, this parameter range—in which C is indifferent between civil war aims—is less substantively relevant than parameter values in which C strictly prefers one type of civil war in equilibrium. As noted, almost all rebel groups since 1945 have articulated clear aims for the center or to separate, and rarely change civil war aims (which we might expect, empirically, if they mixed). Appendix Section B.3 provides a more detailed discussion of non-constant civil war aims.

raises the minimum amount of government spending on carrots and sticks that satisfies the budget constraint in Equation 5.

Predation effect:

$$\frac{d}{dO_i}(m^*+x^*) = \frac{\delta}{1-\delta}\cdot\left\{\Big[1-(1-\mu^*)\cdot(1-\gamma)\Big]\cdot\underbrace{p_j(m^*)\cdot(1-\theta)}_{\text{(1) Predation effect}}+(1-\mu^*)\cdot(1-\gamma)\cdot\underbrace{p_s(m^*)\cdot\big(-\theta\big)}_{\text{(2)}}\right\}\cdot\left(-\frac{de_i}{dO_i}\right) \tag{7}$$

The predation effect highlights an important point about attributes of economic production and war: even if C is coercively strong and G's commitment ability is low, C will still face low fighting incentives if the predation effect is small in magnitude. If economic production in G's region cannot easily be taxed, then C's incentives to capture the central region are low. Similarly, if C has a strong economic exit option and G cannot easily tax economic production in C's region, then C faces low taxation even in the status quo regime—obviating the need to fight a war to prevent government predation. By contrast, easily extracted revenues such as those from oil production create a large predation effect.

Equation 7 highlights that an increase in oil production exerts similar effects for most combinations of oil location and C's civil war aims: if the oil is produced in C's region and/or C's civil war aims are center-seeking. However, effect (2) in Equation 7 highlights that if C's aims are separatist, then an increase in *government* oil does not exert a predation effect because C would not gain control of these additional revenues even if it succeeded in its separatist civil war. Instead, if C aims to secede, then an increase in government oil strictly decreases C's incentives to fight because successful separation would eliminate future transfers that C would receive under the status quo regime, which equal θ of revenues from G's region in each period. By contrast, as effect (1) shows, if government oil increases and C fights for the center, then the larger prize conditional on winning (100% percent of government revenues in all periods, hence $1-\theta$ in the equation) strictly dominates the opportunity cost of magnitude θ.

Proposition 2 formalizes the countervailing effects from Equations 6 and 7 by taking comparative statics on B^*. An increase in B^* implies a narrower space of parameter values in which fighting will occur, hence decreasing equilibrium civil war prospects. By contrast, a decrease in B^* corresponds with an increase in equilibrium civil war likelihood.[18]

[18]For a given set of parameters, civil war either occurs with probability 0 or 1. The "likelihood" of war

Proposition 2 (Effect of oil production)**.** *An increase in oil production exerts both a revenue effect and a predation effect. Formally, for all* $\alpha \in [0, \hat{\alpha}_s] \cup [\hat{\alpha}_c, 1]$*, the overall effect of oil production on the equilibrium budget constraint in period 1 is:*

$$\frac{dB^*}{dO_i} = \underbrace{\frac{dR}{dO_i}}_{\textit{Revenue effect}} \underbrace{- \frac{d}{dO_i}\left(m^* + x^*\right)}_{\textit{Predation effect}},$$

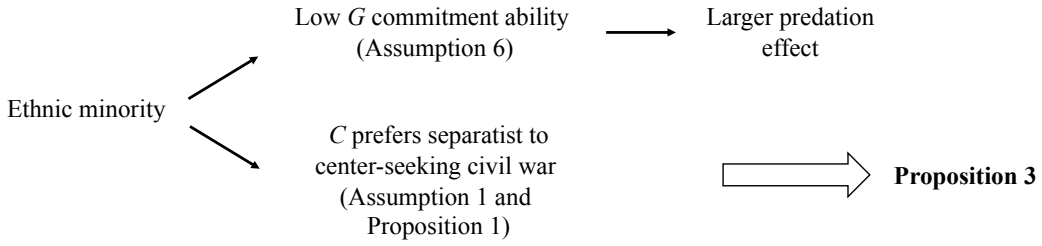
for $i \in \{G, C\}$ *and for the derivatives in Equations 6 and 7.*

5 Explaining the Mixed Oil Curse: Ethnic Minorities Selection Effect

The first mechanism that can help to explain the mixed empirical relationship between oil production and different types of civil wars builds upon ideas in the voluminous literature on ethnicity and civil war. Although in principal the theoretical logic may apply to any geographically segregated identity groups, in the real world, ethnic groups are more likely to be able to organize rebellions—especially those that aim to separate—than groups organized by class or political ideology. Appendix Section C.1 draws from existing ethnicity research to motivate this foundational point. To apply ideas about ethnicity to explain the mixed oil pattern, I focus specifically on the size of C's ethnic group. Before providing the formal logic, this section presents empirical evidence to ground the key assumptions that the commitment parameter θ is relatively small if C is an ethnic minority (Assumption 6), and minority groups face advantages to fighting separatist rather than center-seeking civil wars (Assumption 1). Combining these assumptions with the logic of the model implies that the predation effect of oil is large in magnitude for groups that prefer separatist civil wars, creating what other strands of the literature term "redistributive grievances." By contrast, larger groups that—if they fought—would fight for center tend not to be aggrieved by "stolen" oil production from their territory or by transfers from G's region withheld from them. G's greater ability to commit to deals with large groups diminishes the predation effect relative to the revenue effect of oil. Figure 6 summarizes the logic.

in equilibrium refers to the size of the parameter space in which a civil war occurs in equilibrium, implicitly assuming a veil of ignorance over the realized parameter values.

Figure 6: Oil, Ethnic Minorities, and Civil War Aims



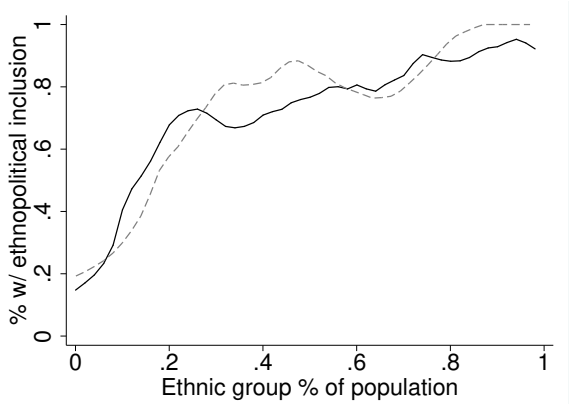
5.1 Motivation for Ethnic Group Size and Commitment Ability Assumption

The first key assumption that underpins the ethnicity-based explanation for the oil-conflict relationship is that governments have lower ability to commit to transfers and to refrain from exploitative taxes when bargaining with numerically small ethnic groups. This assumption is reasonable because, empirically, central governments exclude small ethnic groups from power relatively frequently. Recent ethnic conflict research focuses on access to central power—which can arise from positions in the cabinet, military, legislature, or ruling party—and demonstrates its empirical relationship with civil war onset (Cederman, Gleditsch and Buhaug, 2013). Power-sharing arrangements at the center should improve a government's ability to commit to future transfers and tax concessions, which corresponds with higher θ in my model.

However, the ethnic conflict literature devotes considerably less attention to explaining why some groups but not others command power in the central government. The black line in Figure 7 displays the relationship between group size and power access using the same ethnic group sample as in Figure 2. The horizontal axis expresses the ethnic group's national population share. The vertical axis expresses the percentage of ethnic groups with political representation in the central government. Specifically, the Ethnic Power Relations dataset (Vogt et al., 2015) codes politically relevant ethnic groups' decision-making authority within the central government based on who controls the presidency, cabinet positions, and senior posts in the administration. In Figure 7, group-years with a power access status of "monopoly," "dominant," "senior partner," or "junior partner" are coded as included in power, whereas groups with any other power access status are coded as excluded. The black local polynomial curve demonstrates a positive relationship between ethnic group size and ethnopolitical inclusion. The dashed gray curve shows that the pattern is similar among ethnic groups with a giant oil field in their territory.[19]

[19]Other research demonstrates similar patterns in smaller country samples. Wucherpfennig, Hunziker and Cederman (2016) find that larger groups were more more likely to win control of the state at independence

Figure 7: Ethnic Group Size and Ethnopolitical Inclusion



Notes: Figure 7 summarizes the relationship between ethnic group percentage of the population and ethnopolitical inclusion with local polynomial functions. The black curve uses the same ethnic group sample and years as Figure 2, and the dashed gray curve subsets this sample to ethnic groups with a giant oil field in their territory. Appendix A provides additional data details.

These patterns likely stem from strategic concerns that large groups pose the greatest threats to overthrowing the government if excluded from power (Roessler and Ohls, 2018), and from historical advantages in which large ethnic groups were often organized as hierarchical states prior to the colonial era and, consequently, tended to dominate the post-colonial state (Paine, 2019*b*). Assumption 6 formalizes this premise.

> **Assumption 6** (Ethnic group size and commitment ability)**.** *G's ability to commit to raising C's consumption strictly increases in C's share of the population. Formally, for any challenger of size α' with corresponding G commitment ability θ', and for any challenger of size $\alpha'' > \alpha'$ with corresponding θ'', we have $\theta'' > \theta'$.*

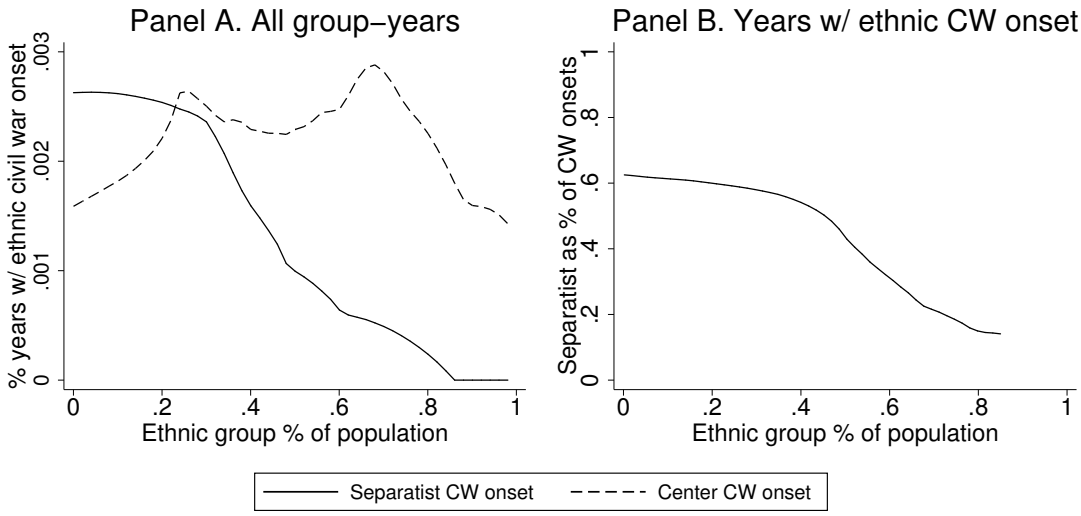
5.2 Motivation for Ethnic Group Size and Civil War Aims Assumption

Ethnic group size also influences civil war aims. Earlier I imposed Assumption 1: hypothetically increasing an ethnic group's size exerts a larger positive effect on its probability of winning a center-seeking civil war than on its probability of successfully seceding. Surprisingly, existing research pays little attention to the relationship between group size and civil war aims, and instead usually aggregates all civil wars: scholars have demonstrated that larger ethnic groups positively covary with the onset of *any* type of civil war (Buhaug et al. 2008, 544; Cederman et al. 2013, 73). These findings rest on the sensible premise that larger group size makes a rebellion more feasible, but do not address incentives for different types of civil war.

in a sample of British and French colonies. Francois, Rainer and Trebbi (2015) show in a sample of African countries that cabinet positions are usually allocated in proportion to ethnic group size.

Figure 8 provides empirical evidence consistent with this assumption using the same ethnic group sample and civil war data as in Figure 2. In Panel A, the unit of analysis is ethnic group-years. The vertical axis presents ethnic civil war onset frequency, with wars disaggregated into center-seeking and separatist. Panel B restricts the sample to group-years with ethnic civil war onset, and the vertical axis indicates whether the new civil war is separatist. Panel A demonstrates a clear trend of separatist civil war propensity decreasing in ethnic group size. And, the overall pattern for small enough groups (roughly, 75% of the population or less) is that center-seeking civil war frequency increases in group size. Correspondingly, at a threshold of around 25% of the population, the modal type of ethnic civil war switches from separatist to center-seeking. Panel B demonstrates this change in relative frequency even more clearly: conditional on rebelling, separatist civil wars become rarer as ethnic group size increases. In fact, in the sample, only two ethnic majority groups fought separatist civil wars: Bengali in Pakistan in 1971, and Southerners in Yemen in 1994.

Figure 8: Ethnic Group Size and Civil War Aims



Notes: Figure 8 summarizes the relationship between ethnic group percentage of the population and ethnic civil war onset (disaggregated by civil war aims) with local polynomial curves. Panel A uses the same ethnic group sample and years as Figure 2, and the sample in Panel B only contains group-years with an ethnic civil war onset. Appendix A provides additional data details.

Two considerations may explain this relationship. First, small ethnic groups face difficulties mustering sufficient support against numerically superior government forces to win control of the government. By contrast, greater knowledge of terrain and local support may facilitate surviving protracted guerrilla wars in the periphery. Because rebels usually tailor their demands to feasible objectives (Buhaug, 2006; Jenne, Saideman and Lowe, 2007), small groups that fight tend to pursue separatism because the probability of winning is

higher. For example, Cabinda is an enclave province of Angola, which, historically, has created difficulties for the government to control the Cabindan Mayombe (Martin, 1977), and the Cabindan Mayombe's small size inhibits conquering the capital city of Luanda. Second, conditional on winning, capturing the government tends to offer a greater prize than gaining an autonomous or independent state. Consequently, for equivalent probabilities of winning each type of civil war, rebel groups should prefer center-seeking. Large ethnic groups can viably contend for the center, which often pushes them toward this civil war type.

5.3 Formal Logic

Given these assumptions, G will tend to have high commitment ability θ when interacting with challengers whose ethnic group is large and therefore their optimal civil war aims are center-seeking rather than separatist. Therefore, showing that the effect of θ on $\frac{dB^*}{dO_i}$ (see Proposition 2) is positive can account for why oil production tends to exert a stronger conflict-inducing effect on small groups that prefer separatist over center-seeking civil wars than on larger groups that prefer center-seeking over separatist. Equation 8 formally evaluates comparative statics for the substantively interesting oil location-war aims cases in which oil production generates a predation effect.[20] An increase in G's commitment parameter affects the magnitude of the oil effect in two ways. The direct effect decreases the magnitude of the predation effect (Equation 7) because, in future periods, G can commit to transfer more government oil to C and to tax regional oil at lower levels. Therefore, greater political representation substitutes for the easy-revenue properties of oil production that lower C's consumption in the status quo regime relative to fighting, which decreases the amount that G needs to transfer in period 1 to buy off C. Formally:

Conditioning effect of commitment ability. If $(1-\mu^*)\cdot(1-\gamma)=0$, then:

$$\frac{d^2B^*}{dO_i d\theta} = \frac{\delta}{1-\delta}\cdot\Bigg\{\underbrace{\mu^*\cdot p_c(m^*)+(1-\mu^*)\cdot p_s(m^*)}_{\text{Direct effect}}$$

$$\underbrace{-\left[\mu^*\cdot p_c'(m^*)\cdot\frac{dm^*}{d\theta}+(1-\mu^*)\cdot p_s'(m^*)\cdot\frac{dm^*}{d\theta}\right]\cdot(1-\theta)}_{\text{Indirect effect}}\Bigg\}\cdot\left(-\frac{de_i}{dO_i}\right) \tag{8}$$

There is also a countervailing indirect substitution effect that increases the magnitude of the predation ef-

[20] There is no predation effect if government oil increases and C's aims are separatist (see Equation 7).

fect. Because higher θ lessens C's fighting constraint, G lowers its equilibrium military spending m^* (see Appendix Equations B.6 and B.7). This substitution effect increases C's equilibrium probability of winning, $\mu^* \cdot p_c(m^*) + (1 - \mu^*) \cdot p_s(m^*)$. However, assuming that the probability of winning function $p_j(\cdot)$ exhibits steep-enough diminishing marginal returns implies that the direct effect outweighs the indirect effect in magnitude—oil production does not cause G to substitute so much from military investments to counteract the negative direct effect of higher θ on the predation effect. Proposition 3 formalizes this intuition.

Proposition 3 (Ethnic minorities selection effect and civil war aims)**.** *An increase in commitment ability—which corresponds to majority group challengers whose optimal civil war aims are center-seeking rather than separatist—modifies the oil effect to decrease the likelihood that a civil war occurs in equilibrium. Formally, if* $(1 - \mu^*) \cdot (1 - \gamma) = 0$*, then for* $i \in \{G, C\}$ *and* $\frac{dB^*}{dO_i}$ *defined in Proposition 2:*

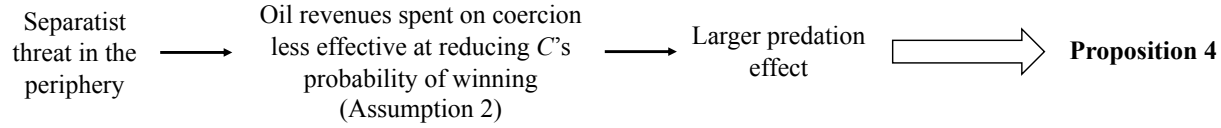
$$\frac{d^2 B^*}{dO_i d\theta} > 0$$

[Go to proof]

6 Explaining the Mixed Oil Curse: Geography of Rebellion Effect

The model offers a second explanation for the mixed oil-conflict pattern based on the geography of coercion and rebellion. Geographic factors related to civil war aims imply that G's coercive efficiency is lower—and therefore the predation effect is larger in magnitude—if C separates rather than seeks the center (Assumption 2). After presenting empirical evidence to motivate this key assumption, I combine this insight with the logic of the model to explain why the predation effect of oil is larger in magnitude for challengers that choose separatist aims, which links oil production to separatist but not center-seeking civil wars. Figure 9 summarizes the logic.

Figure 9: Oil, Geography of Rebellion, and Civil War Aims



6.1 Motivation for Geography of Rebellion Assumption

Many scholars have studied how geographical factors affect the likelihood of civil war (Fearon and Laitin, 2003; Buhaug, Cederman and Rød, 2008; Buhaug, 2010; Roessler and Ohls, 2018), although most existing

empirical tests aggregate conflicts. I build off these insights but apply them to studying disparate civil war aims by assuming that an increase in government military capacity lowers the probability of success for a center-seeking civil war by a greater magnitude than for a separatist civil war, formalized earlier as Assumption 2. The rationale for this assumption is that if the government builds military strongholds, deploys tanks, and sends a large army into the field, then rebel groups should face great difficulties to defeating the government in the capital. However, these same military tools less effectively combat separatists in the periphery. In other words, the marginal effect of buying a tank on diminishing the challenger's probability of winning is larger in magnitude if the government defends the capital than if it fights in the periphery. This logic relates to Buhaug's (2010) empirical finding that regimes with greater coercive strength tend to fight battles farther from the capital. Rebels only stand a chance against strong regimes by fighting in areas that minimize power differential.

Divergent military aims of center-seeking and separatist campaigns also support this logic. Whereas center-seeking rebels usually need to actively engage the government to capture specific targets, separatist rebels can use classic irregular guerrilla tactics such as hit-and-runs and ambushes to avoid direct confrontation with a larger and better equipped government military. Appendix Section C.2 presents regression results using data from Kalyvas and Balcells (2010) that support this contention. They analyze rebel tactics—but not civil war aims—and conceptualize technologies of rebellion based on rebel and government strength. This includes irregular conflicts between weak rebels and a strong government, and conventional conflicts between strong rebels and a strong government. Appendix Table C.1 shows that adding an indicator for separatist aims to their regressions yields a negative and statistically significant correlation between separatism and conventional conflicts, as opposed to to irregular conflicts.

6.2 Formal Logic

Equation 9 evaluates comparative statics for the effect of β_j on $\frac{dB^*}{dO_i}$ (see Proposition 2) for the substantively interesting oil location-war aims cases in which oil production generates a predation effect (see Equation 7). The coercive effectiveness parameter β_j alters the magnitude of the oil effect in two ways. The direct effect decreases the magnitude of the predation effect because G more efficiently translates oil revenues into military capacity. This mechanism decreases C's probability of winning and, consequently, decreases the transfer amount needed to buy off C. The indirect substitution effect reinforces the direct effect. Higher

β_j increases the marginal benefit of arming (see Appendix Equations B.6 and B.7), which increases G's equilibrium military spending m^* and therefore decreases C's equilibrium probability of winning, $\mu^* \cdot p_c(m^*) + (1-\mu^*) \cdot p_s(m^*)$. This logic yields Proposition 4.

Conditioning effect of the geography of rebellion. If $(1-\mu^*) \cdot (1-\gamma) = 0$, then:

$$\frac{d^2B^*}{dO_i d\beta_j} = \frac{\delta}{1-\delta} \cdot \Bigg\{ \underbrace{-\left[\mu^* \cdot \frac{\partial p_c(m^*)}{\partial \beta_c} + (1-\mu^*) \cdot \frac{\partial p_s(m^*)}{\partial \beta_s}\right]}_{\text{Direct effect}}$$

$$\underbrace{-\left[\mu^* \cdot \frac{\partial p_c}{\partial m} \cdot \frac{dm^*}{d\beta_c} + (1-\mu^*) \cdot \frac{\partial p_s}{\partial m} \cdot \frac{dm^*}{d\beta_s}\right]}_{\text{Indirect effect}} \Bigg\} \cdot (1-\theta) \cdot \left(-\frac{de_i}{dO_i}\right) \tag{9}$$

Proposition 4 (Geography of rebellion and civil war aims)**.** *An increase in coercive efficiency—which occurs if C fights for the center rather than separates—modifies the oil effect to decrease the likelihood that a civil war occurs in equilibrium. Formally, if $(1-\mu^*) \cdot (1-\gamma) = 0$, then for $i \in \{G, C\}$ and $\frac{dB^*}{dO_i}$ defined in Proposition 2:*

$$\frac{d^2B^*}{dO_i d\beta_j} > 0$$

[Go to proof]

7 Summary of Theoretical Logic

To recap the theoretical logic, imagine a country with two ethnic groups that reside in distinct regions. How does oil production—which provides additional revenues to the government—affect incentives for different types of civil war? On the one hand, the government has more resources to devote to buying off and to coercing the challenger (revenue effect in Equation 6). On the other hand, there is more for the challenger's group to grab by taking the center and to protect by expelling the government from its region (predation effect in Equation 7). The overall effect depends on whether the challenging group is either numerically large or small and, if the group is small, also on within-country oil location.

If the challenger's group is large, then its optimal civil war aims are center-seeking (Assumption 1 and Proposition 1). Two factors diminish the predation effect in this case. First, the government can more credibly commit to transfers and tax concessions toward large groups (Assumption 6), empirically, because large

groups have greater political representation at the center. This yields Proposition 3. Furthermore, because the government defends the center, it can efficiently translate its revenues into a low probability of the challenger succeeding in a civil war (Assumption 2 and Proposition 4). Therefore, oil production anywhere in the country diminishes the likelihood that a center-seeking civil war will occur in equilibrium.

However, if the challenging group is small, then oil production in the challenger's region exerts a different effect. The group prefers to separate if it fights (Assumption 1 and Proposition 1). Two factors raise the magnitude of the predation effect. First, governments can less credibly commit to transfers and tax concessions toward small groups (Assumption 6), yielding Proposition 3. Furthermore, defending the periphery implies that the government can less efficiently use its revenues to lower the challenger's probability of winning (Assumption 2 and Proposition 4). These considerations imply that if the challenger's ethnic group is small, then oil production in its region raises the likelihood of separatist civil war. By contrast, oil located in the government's region does not create a predation effect because successfully seceding would not capture the oil (Equation 7).

8 Additional Empirical Implications and Evidence

Although in broad strokes the theory can account for the mixed oil-conflict pattern, the logic of Propositions 3 and 4 is inherently conditional. After discussing three key conditional hypotheses produced by the theory, this section summarizes oil-civil war cases and presents simple interactive regression models that support the conditional implications. Qualitative evidence from Saudi Arabia and Angola additionally supports the main mechanisms.

8.1 Conditional Empirical Implications

Separatist civil wars. The main propositions offer important scope conditions for when regional oil production should cause separatist civil wars. The first conditional hypothesis follows from Proposition 3. In the model, oil production only triggers separatist civil war if it is present in regions populated by small groups, whose members prefer separatism and have low political representation at the center (i.e., low commitment ability θ). By contrast, even if a group is a minority, if they deviate from the general pattern in Figure 7 by

accessing power at the center, then higher government commitment ability θ alleviates the predation effect of oil production and secession is unlikely (although, conditional on fighting, it would be the preferred type of civil war). This hypothesis relates to existing arguments that highlight the conditioning effect of ethnopolitical inclusion (Asal et al., 2016; Hunziker and Cederman, 2017), but differs in two important ways. First, the logic arises from a theory of strategic civil war aims that explains why "redistributive grievance" effects of oil should affect separatist but not center-seeking civil wars. Second, existing ethnicity theories do not explain why ethnopolitical exclusion should complement rather than substitute for the civil war risk induced by oil production. The present theory anticipates complementarities because oil production should only exert net conflict-inducing effects given weak government commitment ability, and oil production does not exert conflict-inducing effects independent of this political condition—which is also a crucial theoretical consideration for explaining the negative empirical relationship between oil production and *center-seeking* civil wars.

> **Hypothesis 1** (Politically excluded minorities)**.** *Only among politically excluded ethnic minorities should regional oil wealth raise separatist civil war propensity.*

The second conditional hypothesis follows from Proposition 4 and has similar theoretical foundations as Hypothesis 1. In general, a coercively strong government less effectively projects power into the periphery to defeat a separatist rebellion than to protect the capital. However, the oil-separatist effect should be strongest in territories that have particularly favorable geographic conditions for separatism (low β_s), which I operationalize in the next section. Similar to the conditioning effect of ethnic minorities, the complementarity between oil production and favorable separatist geography follows because oil production only exerts a net conflict-enhancing effect if the government is ineffective at using oil revenues to lower the challenger's probability of winning. By contrast, with difficult geography to separate (high β_s), even a group denied profits from their region's oil production lacks a recourse to arms.

> **Hypothesis 2** (Favorable separatist geography)**.** *Only among ethnic groups with favorable separatist geography should regional oil wealth raise separatist civil war propensity.*

At the extreme, groups that lack a concentrated territorial location cannot feasibly secede because they lack a natural territory from which to create an independent state or autonomous region (very high β_s). Therefore, to reduce heterogeneity, the sample in the separatist civil war figure below excludes ethnic groups that are not geographically concentrated. Appendix Section D.2 shows that the absence of geographic concentration

nearly perfectly predicts the absence of separatist civil war (but not center-seeking).

The model also offers an intriguing *non*-implication about geography. Many existing resource curse theories focus on rebel finance and offer a prediction about the within-country location of oil reserves: because offshore oil production is difficult for rebels to loot, it should not cause separatist civil wars. By contrast, the present model expects offshore oil to exert similar effects as onshore oil because both cause a predation effect. Appendix Section D.3 discusses existing arguments in more depth and shows empirically that both onshore and offshore oil production positively covary with separatist civil war onset, contrary to existing arguments.

Center-seeking civil wars. Propositions 3 and 4 also suggest a conditional hypothesis for center-seeking civil wars. In contexts where a government is vulnerable (for reasons independent of oil wealth), it may lack consolidated control over any oil produced in its country. If the government is newly oil-rich or if rebels face a (perhaps temporary) mobilization advantage, then large oil revenues will not strongly drive down a challenger's probability of winning a center-seeking war, despite the general ease that governments face to defending the capital relative to fighting in the periphery. In these vulnerability cases, low β_c yields a large-magnitude predation effect.

> **Hypothesis 3** (Government vulnerability)**.** *Only in countries where governments have consolidated control over oil revenues should oil wealth diminish center-seeking civil war propensity.*

8.2 Evidence for Separatist Civil Wars

Qualitative evidence. Before statistically analyzing the relative frequency of civil war onset, verifying whether oil-separatist cases tended to occur under the scope conditions posited by the model provides a transparent first-pass look at the evidence. Table 3 lists every ethnic group with at least one giant oil field in its territory that fought a major separatist civil war between 1946 and 2013. It reveals a straightforward pattern. Almost every separatist civil war over an oil-rich territory has occurred in locations for which the theory anticipates that the predation effect should be large in magnitude because the group is a politically excluded ethnic minority (Hypothesis 1) or faces favorable geography to separate (Hypothesis 2).

In the column for Hypothesis 1, "m" indicates ethnic minority groups (with the group's national population share in parentheses), and "E" indicates groups excluded from power in the central government. Appendix

Table 3: Separatist Civil Wars in Oil-Rich Regions

Ethnic group	Country	Onset year	Politically excluded minorities (H1)	Favorable separatist geography (H2)
Bakongo*	Angola	1992	m(13%), E	-
Cabindan Mayombe*	Angola	1992	m(2%), E	N
Assamese (non-SC/ST)	India	1991	m(1.4%)	D
Acehnese	Indonesia	1989	m(1%), E	M%,N,D
Acehnese	Indonesia	1999	m(1%), E	M%,N,D
East Timorese*	Indonesia	1975	m(0.5%), E	M%,N,D
Kurds	Iran	2004	m(8%), E	M%,D
Kurds	Iraq	1961	m(17%), E	M%
Kurds	Iraq	1974	m(17%), E	M%
Igbo	Nigeria	1967	m(18%), E	-
Baluchis	Pakistan	1973	m(3%), E	M%,D
Baluchis	Pakistan	2004	m(3%), E	M%,D
Chechens	Russia	1994	m(1%), E	M%,D
Chechens	Russia	1999	m(1%), E	M%,D
Dinka	Sudan	1983	m(10%), E	D
Malay Muslims*	Thailand	2004	m(5%), E	D
Southerners	Yemen	1994	- (55%)	M%

Notes: Table 3 lists every year in which an ethnic group with a giant oil or gas field in its territory initiated a separatist civil war. The text describes the various symbols, and Appendix A discusses the data sources. *Only offshore oil.

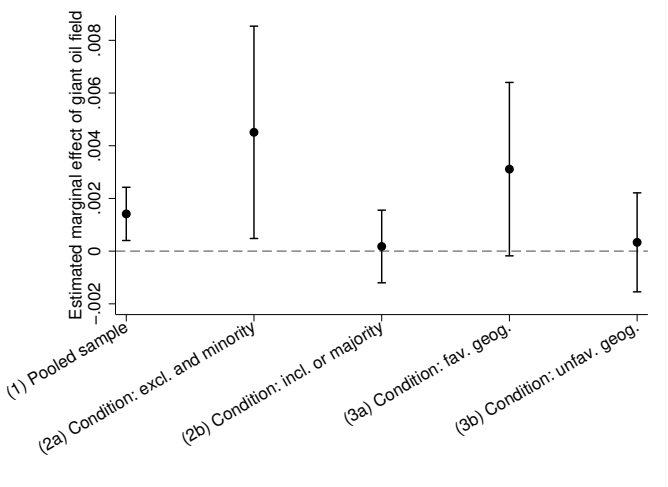
Section D.1 describes the data sources. All but two of the ethnic groups are both excluded and minorities,[21] and only Southerners in Yemen are neither. Yemen is a somewhat exceptional case because majority groups—oil-rich or not—almost never fight separatist civil wars, as mentioned in Section 5.2. The war occurred four years after South Yemen merged with North Yemen. The north was the stronger partner despite having a minority of the population, and southern politicians commanded less important cabinet positions.

The column for Hypothesis 2 in Table 3 contains information on the favorability of separatist geography. "M%" indicates that the percentage of the ethnic group's territory with mountains is higher than the median in the sample, "N" indicates that the ethnic group's territory is noncontiguous from the territory that contains the country's capital city, and "D" indicates that the centroid of the ethnic group's territory is farther than the median distance from the capital in the sample. These variables relate to different aspects of favorable geography for rebellion discussed in the literature (Fearon and Laitin, 2003; Buhaug, Cederman and Rød, 2008). Fifteen of the 17 oil-separatist cases exhibit at least one favorable geography condition.

[21] See also Ross (2012, 155-6). Paine (2019*a*) presents additional evidence consistent with the hypothesis by showing that in most oil-separatist cases, rebel groups espoused concerns specifically about unfair oil redistribution.

Statistical evidence. Adding an interaction term to the model used in Figure 2 (Appendix Equation D.1) enables statistically assessing the conditional hypotheses. Figure 10 and Appendix Table D.1 show that the estimated marginal effect of oil wealth on separatist civil war onset is between 2.4 and 2.9 times larger than in the baseline specification (Column 1) among ethnic groups that either are politically excluded minorities (Column 2a), or have any of the favorable geography conditions (p-value is 0.064 in Column 3a). By contrast, there is no relationship among groups lacking either of these conditions. The results are similar when adding country fixed effects to the models (Appendix Figure D.1), or when disaggregating onshore from offshore oil production (Appendix Figure D.2).

Figure 10: Separatist Civil War Onset (Ethnic Groups)



Notes: Figure 10 presents point estimates and 95% confidence intervals for a series of logit regressions described in Appendix Equation D.1 and Appendix Table D.1. The dependent variable is separatist civil war onset, and the unit of analysis is ethnic group-years.

8.3 Evidence for Center-Seeking Civil Wars

Qualitative evidence. Table 4 lists the 16 center-seeking civil wars that began between 1946 and 2013 in a country producing at least $100 in oil income per capita in the previous year. Eleven oil-center wars occurred in country-years for which the theory anticipates that the predation effect should be large in magnitude because the government should be vulnerable (Hypothesis 3). Several oil-rich countries experienced defeat in warfare and/or violent political transitions within two years prior to their center-seeking civil war ("W" for war), which should correspond with vulnerable governments that lack consolidated control over

oil revenues.[22] Governments should face particular difficulties to deterring rebel groups in violent independence cases where a domestic war that began during foreign occupation was already ongoing (Angola 1975, Algeria 1962, Iraq 2011), or where the rebel group was already organized from a previous civil war, as with SPLA in Sudan in 2011 after South Sudan gained independence. War defeats can also create focal periods for the opposition to organize independent of the government's oil wealth, such as the Shi'a uprisings following Iraq's defeat in the Persian Gulf war in 1991.

Table 4: Center-Seeking Civil Wars in Oil-Rich Countries

Country	Onset year	Oil production per capita	Government vulnerability (H3)
Argentina	1973	$130	S
Algeria	1962	$161	W
Syria	1979	$455	S
Peru	1981	$467	S
Sudan	2011	$479	W
Angola	1975	$543	S,W
Yemen	2004	$592	-
Syria	2011	$651	A
Nigeria	2013	$677	-
Iraq	1959	$701	-
Algeria	1992	$708	-
Congo, Rep.	1997	$788	-
Iraq	1991	$1,814	W
Iraq	2011	$2,451	W,A
Iran	1978	$3,481	S
Libya	2011	$9,007	A

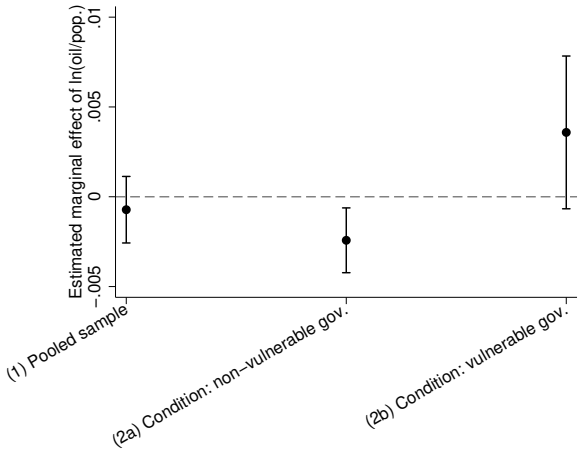
Notes: Table 4 lists every country-year with a center-seeking civil war onset and at least $100 in oil and gas income per capita in the previous year. It uses the same country sample and years as Figure 1. "W" denotes that any of the following conditions were true in the country within the past two years: defeat in international warfare, government defeat in a civil war, or independence gained amid a domestic war (typically, a war fought to gain independence from a European power or the United States). "S" denotes the conflict occurred during the oil shock period between 1973 and 1982. "A" denotes Arab Spring, specifically, MENA countries in 2011.

Regarding other conditions that correspond with vulnerable governments, Peru crossed the $100 oil income per capita threshold the year before its war began, and Argentina and Syria (1979) within five years, which gave the government little time to consolidate control over oil revenues. These countries' newfound oil wealth occurred in the context of the major oil shock ("S") that lasted roughly a decade after the OPEC oil embargo of 1973, a time in which many countries became (at least temporarily) major per capita oil producers. Finally, although oil-rich countries tended to fare better during the Arab Spring of 2011 ("A") than oil-poor countries (Gause III, 2013), Libya and Syria experienced new civil wars despite their oil wealth as demonstrations that began in Tunisia proved focal for opposition movements across the Middle East and North Africa (MENA) even in the face of repressive and coercively strong governments.

[22] Appendix Section D.4 describes these variables.

Statistical evidence. Appendix Equation D.3 adds an interaction term to the model used in Figure 1. Figure 11 and Appendix Table D.5 show that the predicted probability of center-seeking civil war onset drops by 67% if hypothetically increasing annual oil and gas income per capita from $0 to $1,000 among countries lacking any of the vulnerability conditions listed in Table 4. This is larger in magnitude than the difference after subsetting the sample to pre-2011 years, as in Column 3 of Figure 1. By contrast, there is a positive association between oil production and center-seeking civil war onset among countries that exhibit at least one of the vulnerability conditions. Appendix Figure D.3 shows similar results if we restrict attention only to ethnic center-seeking civil wars.

Figure 11: Center-Seeking Civil War Onset (Countries)



Notes: Figure 11 presents point estimates and 95% confidence intervals for a series of logit regressions described in Appendix Equation D.3 and Appendix Table D.5. The dependent variable is center-seeking civil war onset, and the unit of analysis is country-years.

8.4 Evidence from Saudi Arabia and Angola

Evidence from Saudi Arabia and Angola provides additional support for key mechanisms from the theory. Two aspects of these cases provide opportunities to examine mechanisms in "typical" cases: oil-rich Saudi Arabia has not experienced any major center-seeking civil wars, and Angola's oil-rich Cabinda province has fought a major separatist civil war. However, as Appendix Section D.5 describes, there are also "deviant" aspects of these cases that the theory can help to explain: oil-rich Angola's major center-seeking civil war, and no major separatist civil wars by oil-rich Saudi Shi'a.

Saudi Arabia provides clear evidence of oil-rich rulers using patronage and coercion—key tools from the

formal model—to prevent challenges, and has not experienced any major center-seeking civil wars since becoming oil-rich. Oil companies made their first discovery in 1938, and the country has produced at least $1,000 in oil income per capita in every year since 1951 (Haber and Menaldo, 2011). This initial period coincided with favorable conditions for consolidating control over oil revenues (Hypothesis 3). Ibn Saud had recently asserted military dominance over the modern territory of the Saudi state that spans the Arabian peninsula. This included capturing eastern Arabia in 1913, which produces the bulk of the country's oil. Furthermore, in the interim period between initial discoveries and the onset of major exports, British and U.S. oil companies provided concessionary payments and assistance. King Saud used payments from oil concessions in the 1930s to start building a modern army (Khatani, 1992, 52). Over time, the size of and expenditures on the military have grown considerably (Gause, 1994, 66-8), and the kingdom has employed a large percentage of citizens in the public sector (roughly half in the 1990s) to buy their loyalty (59). Overall, Saudi Arabia has experienced a dramatic transformation from pre-oil periods in which the government relied on tribal leaders for resources and faced occasional tribal revolts (12-14, 24).

Providing another typical case, Angola's Cabinda province exemplifies coercive separation by an exploited oil-rich minority with favorable geography, which Hypotheses 1 and 2 anticipate. Cabinda produces the majority of Angola's oil, and Cabinda's oil revenues have provided roughly half the country's budget since independence (Martin 1977, 57; Porto 2003, 3). The Cabindan Mayombe are a small minority group that, since independence, has never enjoyed political representation in Angola's government (Vogt et al., 2015), supporting Hypothesis 1. Despite experiencing heavy taxation, residents have received few compensating benefits from the central government. Cabinda "remains one of the poorest provinces in Angola. An agreement in 1996 between the national and provincial governments stipulated that 10% of Cabinda's taxes on oil revenues should be given back to the province, but Cabindans often feel that these revenues are not benefiting the population as a whole, largely because of corruption" (Porto, 2003, 3). These failed promises support the presumption that a lack of political representation undermines government commitment ability. Oil exploitation features prominently in separatists' narrative: the words "oil" and "petroleum" appear 62 times on the main page of the Cabinda Free State's website (Cabinda Free State, n.d.).

Cabinda also features favorable geography for rebellion (Hypothesis 2) due to territorial separation from mainland Angola, and Portugal governed Cabinda as a largely distinct colony (Martin, 1977, 54-55). Even during Angola's decolonization struggle, the eventual-government MPLA failed to establish a strong pres-

ence in Cabinda (58). In 1992, following low-intensity fighting since independence, the Cabindan rebel group FLEC launched major separatist operations. Also supportive of favorable conditions for fighting, FLEC escalated its activities in response to intensification of the government's center-seeking war fought in a different part of the country (Porto, 2003, 5), therefore attacking a vulnerable government.

9 Conclusion

This paper presented a foundational theory of strategic civil war aims and applied it to explain an empirical puzzle from the oil-conflict literature: oil wealth correlates positively with separatist civil war onset (among oil-rich ethnic minorities), but negatively with civil wars to capture the center. Future research can build on this theoretical framework to examine civil war aims in other contexts. The model draws mainly from two influential literatures—formal bargaining models of war, and ethnic grievances and civil war—that provide considerable insight into conflict conditions but do not focus on civil war aims. Although many scholars argue that long-term cultural explanations largely account for contemporary ethnic grievances (Cederman, Gleditsch and Buhaug, 2013, 30-54), existing theories implicitly contain a crucial strategic component: political exclusion exacerbates government commitment problems. The formal bargaining literature links commitment inability to conflict. A central insight of the present paper is that low commitment ability not only makes fighting more likely, but also correlates with rebels' strategically chosen civil war aims. One possible implication of the my framework is that Cederman, Gleditsch and Buhaug's (2013) key hypothesis—politically excluded ethnic groups more frequently fight civil wars—may better explain separatist than center-seeking civil wars. Political exclusion indeed should create powerful incentives to fight, but the groups that face the highest risk of exclusion from power tend to prefer separatism.

The theory of strategic civil war aims relates to additional mechanisms from the broader civil war literature, including government coercive capacity and economic incentives to fight (Fearon and Laitin, 2003; Collier and Hoeffler, 2004). Despite extensive debates regarding the importance of these explanatory factors for civil war, scholars have devoted little attention to their specific effects on different types of civil war (although see Buhaug 2006). Strong government coercive capacity may more effectively deter center-seeking than separatist civil wars because of difficulties projecting power into the periphery, as I discussed. Therefore, for example, military aid and other types of foreign aid that funnel directly to the government may

more effectively prevent center-seeking than separatist civil wars. And although oil production yields easy government revenues, other economic causes of war exhibit different properties. For example, rebel groups can more easily loot alluvial diamonds than oil. Perhaps for this and other types of natural resources, the predation effect often outweighs the revenue effect even for center-seeking civil wars, as examples from Liberia and Sierra Leone in the 1990s suggest. Beyond natural resources, the model may also be fruitfully extended by examining dynamic civil war aims, as Appendix Section B.3 discusses.

Overall, the common implicit assumption in much existing civil war research that risk factors equally affect center-seeking and separatist civil wars may limit the usefulness of some theories as well as generate uninformative empirical estimates given underlying causal heterogeneity. Extensions of the present framework should help to guide future theorizing and empirical evaluations of strategic civil war aims.

References

Acemoglu, Daron and James A. Robinson. 2006. *Economic Origins of Dictatorship and Democracy*. Cambridge University Press.

Asal, Victor, Michael Findley, James A. Piazza and James Igoe Walsh. 2016. "Political Exclusion, Oil, and Ethnic Armed Conflict." *Journal of Conflict Resolution* 60(8):1343–1367.

Boix, Carles. 2003. *Democracy and Redistribution*. Cambridge University Press.

Bueno de Mesquita, Ethan. 2013. "Rebel Tactics." *Journal of Political Economy* 121(2):323–357.

Buhaug, Halvard. 2006. "Relative Capability and Rebel Objective in Civil War." *Journal of Peace Research* 43(6):691–708.

Buhaug, Halvard. 2010. "Dude, Where's My Conflict? LSG, Relative Strength, and the Location of Civil War." *Conflict Management and Peace Science* 27(2):107–128.

Buhaug, Halvard, Lars-Erik Cederman and Jan Ketil Rød. 2008. "Disaggregating Ethno-Nationalist Civil Wars." *International Organization* 62(3):531–551.

Cabinda Free State. n.d. "Cabinda Free State.". http://www.cabinda.net. Accessed 7/5/16.

Cederman, Lars-Erik, Kristian Skrede Gleditsch and Halvard Buhaug. 2013. *Inequality, Grievances, and Civil War*. Cambridge, UK: Cambridge University Press.

Collier, Paul and Anke Hoeffler. 2004. "Greed and Grievance in Civil War." *Oxford Economic Papers* 56(4):563–595.

Fearon, James D. 1995. "Rationalist Explanations for War." *International Organization* 49(3):379–414.

Fearon, James D. 2004. "Why Do Some Civil Wars Last So Much Longer Than Others?" *Journal of Peace Research* 41(3):275–301.

Fearon, James D. and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97(1):75–90.

Francois, Patrick, Ilia Rainer and Francesco Trebbi. 2015. "How is Power Shared in Africa?" *Econometrica* 83(2):465–503.

Gause, F. Gregory. 1994. *Oil Monarchies*. Council on Foreign Relations.

Gause III, F. Gregory. 2013. "Kings for All Seasons." *Brookings Doha Center Analysis Paper* 8.

Gibilisco, Michael. 2017. "Decentralization and the Gamble for Unity.". Working paper, California Institute of Technology. Available at https://www.dropbox.com/s/h7s0shnbmbloy3x/grievanceGibilisco.pdf?dl=0.

Haber, Stephen and Victor Menaldo. 2011. "Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse." *American Political Science Review* 105(1):1–26.

Humphreys, Macartan. 2005. "Natural Resources, Conflict, and Conflict Resolution." *Journal of Conflict Resolution* 49(4):508–537.

Hunziker, Philipp and Lars-Erik Cederman. 2017. "No Extraction Without Representation: The Ethno-Regional Oil Curse and Secessionist Conflict." *Journal of Peace Research* 54(3):365–381.

Jenne, Erin K., Stephen M. Saideman and Will Lowe. 2007. "Separatism as a Bargaining Posture: The Role of Leverage in Minority Radicalization." *Journal of Peace Research* 44(5):539–558.

Kalyvas, Stathis N. and Laia Balcells. 2010. "International System and Technologies of Rebellion." *American Political Science Review* 104(3):415–429.

Khatani, Hamad. 1992. The Preservation of Civilian Rule in Saudi Arabia. In *Civilian Rule in the Developing World*, ed. Constantine P. Danopoulos. Westview Press pp. 53–72.

Krainin, Colin. 2017. "Preventive War as a Result of Long Term Shifts in Power." *Political Science Research and Methods* 5(1):103–121.

Lacina, Bethany. 2015. "Periphery Versus Periphery: The Stakes of Separatist War." *Journal of Politics* 77(3):692–706.

Le Billon, Philippe. 2005. *Fuelling War: Natural Resources and Armed Conflicts*. Abingdon, VA: Routledge.

Liou, Yu-Ming and Paul Musgrave. 2014. "Refining the oil curse: Country-level evidence from exogenous variations in resource income." *Comparative Political Studies* 47(11):1584–1610.

Martin, Phyllis M. 1977. "The Cabinda Connection." *African Affairs* 76(302):47–59.

Menaldo, Victor. 2016. *The Institutions Curse: Natural Resources, Politics, and Development*. Cambridge, UK: Cambridge University Press.

Morelli, Massimo and Dominic Rohner. 2015. "Resource Concentration and Civil Wars." *Journal of Development Economics* 117:32–47.

Paine, Jack. 2016. "Rethinking the Conflict "Resource Curse": How Oil Wealth Prevents Center-Seeking Civil Wars." *International Organization* 70(4):727–761.

Paine, Jack. 2019*a*. "Economic Grievances and Civil War: An Application to the Resource Curse." *International Studies Quarterly* Forthcoming.

Paine, Jack. 2019*b*. "Ethnic Violence in Africa: Destructive Legacies of Pre-Colonial States." *International Organization* Forthcoming.

Porto, João Gomes. 2003. *Cabinda: Notes on a Soon-to-be-Forgotten War*. Institute for Security Studies. Paper 77.

Powell, Robert. 2004. "The Inefficient Use of Power." *American Political Science Review* 98(2):231–241.

Powell, Robert. 2012. "Persistent Fighting and Shifting Power." *American Journal of Political Science* 56(3):620–637.

Roessler, Philip and David Ohls. 2018. "Self-Enforcing Power Sharing in Weak States." *International Organization* 72(2):423–454.

Ross, Michael L. 2001. "Does Oil Hinder Democracy?" *World Politics* 53(3):325–361.

Ross, Michael L. 2012. *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*. Princeton University Press.

Ross, Michael L. 2015. "What Have We Learned About the Resource Curse?" *Annual Review of Political Science* 18:239–259.

Savimbi, Joseph. 1985. "The War Against Soviet Colonialism." *Policy Review* (35):18–25.

Sorens, Jason. 2011. "Mineral Production, Territory, and Ethnic Rebellion: The Role of Rebel Constituencies." *Journal of Peace Research* 48(5):571–585.

Toft, Monica Duffy. 2005. *The Geography of Ethnic Violence*. Princeton University Press.

Vogt, Manuel, Nils-Christian Bormann, Seraina Rüegger, Lars-Erik Cederman, Philipp Hunziker and Luc Girardin. 2015. "Integrating Data on Ethnicity, Geography, and Conflict: The Ethnic Power Relations Data Set Family." *Journal of Conflict Resolution* 59(7):1327–1342.

Walter, Barbara F. 2009. *Reputation and Civil War: Why Separatist Conflicts are So Violent*. Cambridge University Press.

Wright, Austin L. 2017. "Economic Shocks and Rebel Tactics." Working Paper, Harris School of Public Policy, University of Chicago.

Wucherpfennig, Julian, Philipp Hunziker and Lars-Erik Cederman. 2016. "Who Inherits the State? Colonial Rule and Post-Colonial Conflict." *American Journal of Political Science* 60(4):882–898.

Online Appendix

Contents

List of Tables

List of Figures

A Supporting Information for Section 2

A.1 Country-Level Data and Regressions (Figure 1)

For country index j and year index t, the regression equation for Figure 1 and its corresponding regression table, Table A.1, is:

$$\ln\left(\frac{Y_{jt}}{1-Y_{jt}}\right) = \beta_0 + \beta_O \cdot ln(oil/pop)_{jt} + \beta_P \cdot ln(pop)_{jt} + \boldsymbol{T}'_{jt} \cdot \beta_T + \epsilon_{jt}, \tag{A.1}$$

where Y_{jt} indicates either all civil war onset, center-seeking civil war onset, or separatist civil war onset, and $\boldsymbol{T}'_{jt}$ is a vector of peace years and cubic splines calculated since the last year in a which a conflict of the specified type ended.

Table A.1: Regression Table for Figure 1

Dependent variable:	All CW onset	Center CW onset	Center CW onset	Sep CW onset
	(1)	(2)	(3)	(4)
ln(Oil & gas p.c.)	-0.000873	-0.000721	-0.00186**	-7.65e-05
	(0.00115)	(0.000945)	(0.000932)	(0.000483)
ln(Population)	0.0630***	0.0268***	0.0249***	0.0290***
	(0.0126)	(0.00801)	(0.00801)	(0.00588)
Country-years	6,416	6,828	6,411	6,906
Countries	150	150	149	150
Time controls?	YES	YES	YES	YES
Sample	Full	Full	Pre-2011	Full

Notes: Table A.1 estimates Equation A.1. It summarizes a series of logit regressions with country-clustered standard error estimates. The coefficient estimates are semi-elasticity marginal effects (because oil is logged) evaluated at coefficient means. The dependent variable in each column is civil war onset (either all civil wars, center-seeking, or separatist), and ongoing years are set to missing. Every regression contains peace years and cubic splines generated from the last year in which a war of the specified type was ongoing for each country. The unit of analysis is country-years. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Sample. The unit of analysis is country-years. Among countries with a population of at least 200,000 in the year 2000, the sample contains annual data for all independent non-Western European countries between the later of 1946 and their year of independence, and 2013. Western European countries and their four New World offshoots are excluded because they do not meet a key scope condition of conflict resource curse theories: weakly institutionalized states in which civil war may occur with a non-trivial probability. The 2013 end year corresponds with the last year of ethnic group data (see below). The population threshold for country size is the same as Ross and Mahdavi (2015) use in their oil data. Their population threshold is sensible because it is low enough to include small but substantively important oil producers, such as Qatar and Brunei. Finally, the independent country criterion excludes countries under Western European colonization. This criterion additionally excludes before 1990 all of Eastern Europe (plus Mongolia) besides Russia/Soviet Union, Serbia/Yugoslavia, and Albania because of foreign occupation. Similarly, all country-years under other foreign occupation—such as Iraq under U.S. occupation between 2003 and

2011—are excluded, coded based off Geddes, Wright and Frantz (2014). In foreign occupation cases, wars almost always focus on overthrowing the colonizer rather than a local government, the focus of the formal model.

Civil war data. The main civil war data used for this paper draw from Fearon and Laitin's (2003) updated civil war data through 2009, and further updated by the author through 2013 by adding new conflicts from the Correlates of War database (COW; Dixon and Sarkees, 2015), which also uses a 1,000 death threshold, and the UCDP/PRIO Armed Conflict Database (ACD; Gleditsch et al. 2002). I included every "intra-state war" that COW—which uses a 1,000 battle death threshold for wars—codes as beginning between 2010 and 2013 that ACD also codes as reaching 1,000 battle deaths, one of Fearon and Laitin's key coding rules. I also consulted COW and ACD for conflict termination years for any civil wars that Fearon and Laitin coded as ongoing in 2009. Additionally, Ross and Mahdavi (2015) use a lower population threshold than Fearon and Laitin (2003), which necessitates coding civil wars for smaller countries. ACD does not use a population threshold for deciding which countries to include (see pg. 14 of Version 7.1 of their codebook), therefore providing the needed information—although no civil wars were added through this procedure (Comoros had two conflicts but neither reached 1,000 battle deaths). Finally, I excluded any colonial wars.

Finally, Fearon and Laitin code whether the civil war was center-seeking or separatist. I verified their coding of civil war aims with both COW and ACD, and additional secondary sources when necessary. This enabled assigning aims to the wars that Fearon and Laitin code as mixed or ambiguous. Most cases that they code as mixed are aggregated rebellions that contain distinct rebel groups fighting center-seeking and separatist civil wars (see, for example, the Angola example in the first paragraph of the paper), whereas I further distinguish each case by war aims. By contrast, COW or ACD code each war as *either* center-seeking or separatist, but never both. My coding scheme allows for the possibility of coding a rebellion as exhibiting both aims. However, after disaggregating Fearon and Laitin's civil war entries that contain multiple distinct rebel groups, I only coded two cases as exhibiting both aims (Ethiopia and Sudan, cases that Section B.3 describes). By contrast, in countries such as Burma (coded as mixed war aims by Fearon and Laitin), largely distinct center-seeking and separatist rebellions broke out in 1948, and several other countries such as Angola and India have featured center-seeking civil wars and separatist civil wars at the same time despite not beginning in the same year.

Advantages of Fearon and Laitin's coding scheme. The major advantage of using data based off Fearon and Laitin's (2003) coding procedure rather than ACD is that ACD does not provide a coherent scheme for coding distinct civil wars, and hence civil war *onsets*. Scholars use a lapse rule, typically two years, for translating ACD's incidence data into distinct conflict onsets. If the 25 or 1,000 death threshold (ACD codes both thresholds) is not met for at least two years after being met in the past, then using a two-year lapse rule counts any future year that meets the death threshold as a new civil war. Problematically, this procedure often either undercounts or (more likely) overcounts civil war onsets, especially when applied to the 25 battle death threshold standard in EPR studies. Fearon and Laitin (2013, 25) summarize:

> "They apply a criterion of one year (or two, or ten, for different codings) with no conflict above their 25 death threshold. This has the advantage of being relatively definite, but the disadvantage of making many long-running, low level conflicts that flit above and below the 25 dead threshold look like many distinct civil wars. In our view they often are more naturally seen as a single, long-running but low level civil conflict, that happens often by chance to get above or below the threshold in some years" (25). (Also see Sambanis 2004, 818-9.)

For an example of overcounting, using the standard two-year lapse coding in ACD2EPR, the Bakongo in Angola fought four different civil wars in the 1990s and 2000s even though the same rebel group was operative during the entire period. Solely using a lapse rule to distinguish conflicts can also undercount civil

war onsets. For example, the UCDP Conflict Encyclopedia describes civil wars in the Democratic Republic of the Congo in the 1990s: "In 1996-1997 an armed rebellion led by AFDL and supported by Rwanda and Uganda managed to topple President Mobutu in May 1997. However the new regime was soon at war again [in 1998], this time against RCD and MLC." Although two different sets of governments and rebel groups fought what by any reasonable conceptualization are two distinct wars, the two-year lapse rule does not count a new onset in 1998 for the Tutsi-Banyamulenge because they participated in conflict in the previous year.

Although scholars can also employ lapse rules of other length, coding civil war episodes solely by using lapse rules does not address these problems of undercounting and overcounting. Two of Fearon and Laitin's (2003) coding rules help to guard against these issues. First, "War ends are coded by observation of a victory, wholesale demobilization, truce, or peace agreement followed by at least two years of peace" (Fearon and Laitin 2003, 76, fn. 4; which also states their full set of rules). This directly addresses the concern about overcounting onsets for periodic conflicts, such as Bakongo in Angola, because clear signals of intent to end the current episode of fighting characterize the end of a war. Importantly, this rule still enables coding repeated civil wars with the same rebel group. Second, "If a main party to the conflict drops out, we code a new war start if the fighting continues (e.g., Somalia gets a new civil war after Siad Barre is defeated in 1991)." This addresses the problem of undercounting onsets in cases such as the Democratic Republic of the Congo in the 1990s.

Oil and population data. Ross and Mahdavi (2015) provide annual data between 1932 and 2014 on the total value of oil and natural gas production at the country level, measured in 2014 dollars. The variable has consistent coverage, especially since 1960 (before which many countries in the sample were under colonial rule). For countries with missing data, which in all cases is some period before the first data point, I used the following procedure. If there was less than $2 in oil and gas income per capita in the first year of data, I imputed all previous years as $0. If oil and gas income per capita exceeded this amount in the first year, I used corresponding data from Haber and Menaldo (2011).

Ross and Mahdavi (2015) also provide population data, drawn mostly from World Bank (2017) and from Maddison (2008). I used their data to create a per capita oil variable, and, following Ross (2012), also control for population as a separate covariate in every country-level regression specification. For country-years in the sample during the 1940s, the country's 1950 population data point is used because both of Ross and Mahdavi's (2015) source datasets have sparse coverage before 1950 (only Afghanistan had missing population data for a later point among country-years in the sample, and their 1961 population figure is used for all previous years).

Finally, the regressions lag each of oil and gas income per capita and population by one year. If the country has missing data in their first year in the dataset (because of the lagging), they are assigned the next year's oil and/or population data. Overall, no country-years that meet the sample criteria discussed above are dropped because of missing data.

A.2 Ethnic Group-Level Data and Regressions (Figure 2)

For ethnic group index i, country index j, and year index t, the regression equation for Figure 2 and the corresponding regression table, Appendix Table A.2, is:

$$\ln\left(\frac{Y_{it}}{1-Y_{it}}\right) = \beta_j + \beta_O \cdot Oil_{it} + \boldsymbol{T}'_{it} \cdot \beta_T + \epsilon_{it}, \tag{A.2}$$

where Y_{it} indicates either all civil war onset, center-seeking civil war onset, or separatist civil war onset, and $\boldsymbol{T}'_{it}$ is a vector of peace years and cubic splines calculated since the last year in a which a conflict of the specified ended as well as a lagged country-level civil war incidence variable. The even-numbered specifications include country-level intercepts β_j, and the odd-numbered columns contain a constant intercept.

Table A.2: Regression Table for Figure 2

Dependent variable:	All CW onset		Center CW onset		Separatist CW onset	
	(1)	(2)	(3)	(4)	(5)	(6)
Giant oil/gas field	0.000957	0.00239***	-0.000349	0.00475	0.00108***	0.00166**
	(0.000660)	(0.000832)	(0.000606)	(0.00298)	(0.000412)	(0.000703)
Ethnic group-years	30,741	16,965	31,519	6,035	30,984	13,817
Ethnic groups	762	398	763	168	762	293
Country FE?	NO	YES	NO	YES	NO	YES
Time controls?	YES	YES	YES	YES	YES	YES

Notes: Table A.2 estimates Equation A.2. It summarizes a series of logit regressions with ethnic group-clustered standard error estimates. The coefficient estimates are the marginal effects evaluated at coefficient means. The dependent variable in each column is ethnic civil war onset (either all civil wars, center-seeking, or separatist), and ongoing years are set to missing. Every regression contains peace years and cubic splines generated from the last year in which a war of the specified type was ongoing for each ethnic group, and a lagged country-level civil war incidence variable. The unit of analysis is ethnic group-years. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

Sample. The unit of analysis is ethnic group-years. The sample contains every politically relevant ethnic group with a location polygon in the Ethnic Power Relations (EPR; Vogt et al. 2015) dataset for all non-Western European countries and offshoots between the later of 1946 and their year of independence, and 2013. The start and end years correspond with the start and end years of the 2014 EPR (Update 2) dataset. The previous section discusses additional sample restrictions that are also used for this sample.

Civil war data. Using the list of civil wars described above, I assigned wars to EPR ethnic groups using the following procedure. To my knowledge, this is the first attempt for a global sample to integrate a different civil war dataset than UCDP/PRIO with EPR ethnic groups. First, I matched each Fearon and Laitin (2003) conflict and each post-2009 conflict to the corresponding conflict in the UCDP/PRIO Armed Conflict Database (ACD; Gleditsch et al. 2002). Because Fearon and Laitin use a higher death threshold than the 25 battle deaths per year needed to be included in the ACD, the ACD contains almost all their civil wars. This facilitated using the ACD2EPR dataset (Vogt et al., 2015), which links rebel groups in the ACD to EPR groups and codes whether the rebel group made ethnic claims and recruited within an ethnic group. Ethnic claims and recruitment are individually necessary and jointly sufficient conditions for ACD2EPR to code the ethnic group as involved in an "ethnic" conflict, and I use this same definition to code an ethnic war. By contrast, in every regression table in this paper that uses ethnic groups as the unit of analysis, the dependent variable codes as 0 (i.e., not an ethnic war) any civil war that lacked ethnic aims and recruitment. For Fearon and Laitin wars not included in the Armed Conflict Dataset, the author used Fearon and Laitin's coding of whether or not it was an ethnic civil war and consulted secondary sources to code ethnic participation.

In Fearon and Laitin conflicts with only a single corresponding rebel group and ethnic group in ACD2EPR, I coded that ethnic group as participating in a civil war during the years coded by Fearon and Laitin. Assigning Fearon and Laitin civil wars to EPR ethnic groups for conflicts involving multiple rebel groups and/or multiple ethnic groups required additional considerations. In most cases with multiple ethnic groups participating in the same conflict, I used the PRIO Battle Deaths dataset (Lacina and Gleditsch, 2005) to assess whether that ethnic group was responsible for at least 1,000 battle deaths. This was not possible, however, for center-seeking conflicts featuring multiple ethnic groups because the ACD and the PRIO Battle Deaths

dataset code all rebel groups participating in a center-seeking civil war as part of the same conflict. (By contrast, in countries with multiple separatist civil wars, such as Ethiopia, the dataset provide battle death estimates for each distinct territorial conflict.) For these center-seeking conflicts, I coded any participating EPR group (drawing from ACD2EPR) with ethnic claims and recruitment as experiencing an ethnic civil war. I use ACD2EPR's conflict years for the group rather than Fearon and Laitin's because, in some conflicts featuring multiple ethnic groups, individual ethnic groups only participated in a subset of the years of the overall conflict.

Finally, as discussed above for the country-level data, rebelling ethnic groups have almost always articulated clear aims for either the center or to separate, with Ethiopia and Sudan providing the only exceptions.

Advantages of Fearon and Laitin's coding scheme. Similar to the concerns discussed with country-level data, ACD does not provide a scheme for distinguishing civil war episodes. Conventional procedures using the two-year lapse rule for translating UCDP/PRIO's conflict incidence data into distinct war onsets yield many cases that overcount onsets. Particularly relevant for the present analysis, this includes several separatist conflicts in oil-rich regions such as Angola vs. FLEC/FAC in Cabinda and Iraq vs. PUK in Kurdistan. Although in principle scholars could recode ACD into distinct episodes, in practice, applying this coding procedure is particularly difficult at the ethnic group level. From examining ACD2EPR data, there are frequent gaps in fighting for individual ethnic groups. To measure distinct conflict episodes, it is more sensible to start with a list like Fearon and Laitin's that distinguishes civil wars, and then to code ethnic affiliation—rather than starting with ACD2EPR and trying to classify fighting years into unique civil wars.

Oil data. The oil variable indicates whether the EPR ethnic group has any onshore giant oil or gas fields in its territory, or any giant oil/gas fields located offshore within 250 kilometers of a segment of the group's location polygon that touches a coast and within its country's maritime boundaries. GeoEPR provides the EPR spatial data (Vogt et al., 2015) and Flanders Marine Institute (2016) provides the maritime boundary spatial data.[23] A giant oil field contains ultimate recoverable reserves of at least 500 million barrels of oil equivalent before extraction began. An updated version of Horn's (2003) dataset provides coordinates for every major oil field discovered in the world between 1868 and 2010 (Horn, 2015). Because the source provides data on when the field was initially discovered (with no missing data on this variable), the oil variable can vary over time for ethnic groups.

I use Horn's data, which has been used in recent oil-civil war publications such as Lei and Michaels (2014), rather than an alternative sometimes used in the literature, PETRODATA (Lujala, Rod and Thieme, 2007), for two reasons. First, PETRODATA includes all oil fields, giant or not. Coding groups as oil-rich or not based on giant oil fields ensures that any group coded as oil-rich has (at least potentially) an economically important well, as opposed to a minor oil field that is not of high enough economic value to make the mechanisms posited in the model empirically relevant. Second, PETRODATA has considerable missing data for the year of discovery (38% of its oil fields), which makes it difficult to use this data to code a time-varying variable for oil-richness. Furthermore, although a binary oil-rich variable is somewhat coarse, given data limitations it appears to provide the best option. Annual production data at the oil field level does not exist—in fact, there are many difficulties estimating the value of oil production even at the country level, as Ross and Mahdavi's (2015) codebook discusses. Additionally, as noted, even having a single giant oil field should be sufficient to trigger to oil mechanisms posited in the theory.

[23] Section D.3 discusses differences between onshore and offshore oil.

B Supporting Information for Sections 3 and 4

Section B.1 proves all the formal statements, and the following sections analyze several extensions to the core model.

Table B.1: Summary of Parameters and Choice Variables

Stage	Variables/description
Primitives	• G: government • C: regional challenger • δ: discount factor • t: time • α: C's population share • i: indexes regions; G for government and C for challenger
Production and taxation	• O_i: percent of economic output in region i that is oil • e_i: parameterizes producers' economic exit option in player i's region • θ: G's commitment ability; determines maximum taxes and minimum transfers • R: per-period total government revenues, equals $1 - e_G + (1-\theta) \cdot (1 - e_C)$ • γ: indicator for production in C's territory
Government's period 1 choices	• m: military spending • x: transfers
Challenger's period 1 choices	• μ: C's civil war aims, 1 equals center-seeking and 0 equals separatist • $p_c(\cdot)$: C's probability of winning a center-seeking civil war • $p_s(\cdot)$: C's probability of winning a separatist civil war • j: indexes civil war aims; c for center-seeking and s for separatist • β_j: efficiency with which G's military spending decreases C's probability of winning • d: destructiveness of war
Continuation values	• $V^G_{\text{s.q.}}$: G's future continuation value in the status quo regime • $V^C_{\text{s.q.}}$: C's future continuation value in the status quo regime • V^G_{center}: G's future continuation value following a successful center-seeking civil war • V^C_{center}: C's future continuation value following a successful center-seeking civil war • V^G_{sep}: G's future continuation value following a successful separatist civil war • V^C_{sep}: C's future continuation value following a successful separatist civil war

B.1 Proofs for Formal Results

Proof of Lemma 1.

1. *Definition*. The term π_s expresses the fraction of C's consumption that is lost from winning a separatist civil war relative to winning a center-seeking civil war:

$$\pi_s \equiv \frac{(1-\theta) \cdot (1 - e_C) - \theta \cdot (1 - e_G)}{(1-\theta) \cdot (2 - e_G - e_C)}$$

2. *Preliminary results*. The following two results will be used throughout the remainder of the proof. Assumption 1 implies that:

$$\frac{d}{d\alpha}\Big[p_c(m, \alpha, \beta_c) - p_s(m, \alpha, \beta_s) \cdot \pi_s\Big] = \frac{\partial p_c}{\partial \alpha} - \frac{\partial p_s}{\partial \alpha} \cdot \pi_s > 0 \tag{B.1}$$

Assumption 2 implies that:

$$\frac{d}{dm}\Big[p_c(m,\alpha,\beta_c) - p_s(m,\alpha,\beta_s)\cdot\pi_s\Big] = \frac{\partial p_c}{\partial m} - \frac{\partial p_s}{\partial m}\cdot\pi_s < 0 \tag{B.2}$$

3. *Proof of part a.* Show that there exists a unique $\underline{\alpha} \in (0,1)$ such that:

$$p_c(0,\underline{\alpha},\beta_c) - p_s(0,\underline{\alpha},\beta_s)\cdot\pi_s = 0$$

Satisfying the intermediate value theorem conditions implies there exists at least one such $\underline{\alpha}$:

- Assumption 3, part a states that $p_c(0,0,\beta_c) - p_s(0,0,\beta_s)\cdot\pi_s < 0$.
- Assumption 3, part b and step 2 imply that $p_c(0,1,\beta_c) - p_s(0,1,\beta_s)\cdot\pi_s > 0$.
- $p_c(\cdot)$ and $p_s(\cdot)$ are each assumed to be continuous in α.

Equation B.1 proves the unique threshold claim for $\underline{\alpha}$.

4. *Proof of part c.* Show that there exists a unique $\overline{\alpha} \in (0,1)$ such that:

$$p_c(R,\overline{\alpha},\beta_c) - p_s(R,\overline{\alpha},\beta_s)\cdot\pi_s = 0$$

Satisfying the intermediate value theorem conditions implies there exists at least one such $\overline{\alpha}$:

- Assumption 3, part a and step 2 imply that $p_c(R,0,\beta_c) - p_s(R,0,\beta_s)\cdot\pi_s < 0$.
- Assumption 3, part b states that $p_c(R,1,\beta_c) - p_s(R,1,\beta_s)\cdot\pi_s > 0$.
- $p_c(\cdot)$ and $p_s(\cdot)$ are each assumed to be continuous in α.

Equation B.1 proves the unique threshold claim for $\overline{\alpha}$.

5. *Proof of ordering claim.* Combining the previous two steps and defining $f(m,\alpha) \equiv p_c(m,\alpha,\beta_c) - p_s(m,\alpha,\beta_s)$ yields:

$$\Big[f(0,\underline{\alpha}) - f(R,\overline{\alpha})\Big]\cdot\pi_s + p_c(0,\underline{\alpha},\beta_c) - p_c(R,\overline{\alpha},\beta_c) = 0 \tag{B.3}$$

To prove $\underline{\alpha} < \overline{\alpha}$, suppose instead $\underline{\alpha} \geq \overline{\alpha}$. Given this premise, Assumptions 1 and 2 imply that $f(0,\underline{\alpha}) > f(R,\overline{\alpha})$ and $p_c(0,\underline{\alpha},\beta_c) > p_c(R,\overline{\alpha},\beta_c)$. This generates a contradiction because then the left-hand side of Equation B.3 is strictly positive.

6. *Proof of part b.* First, show that for any $\alpha \in (\underline{\alpha},\overline{\alpha})$, there exists a unique $\hat{m} \in (0,R)$ such that:

$$p_c(\hat{m},\alpha,\beta_c) - p_s(\hat{m},\alpha,\beta_s)\cdot\pi_s = 0 \tag{B.4}$$

Satisfying the intermediate value theorem conditions implies that there exists at least one such $\hat{m}$:

- $p_c(0,\alpha,\beta_c) - p_s(0,\alpha,\beta_s)\cdot\pi_s > 0$ follows from $\alpha > \underline{\alpha}$.
- $p_c(R,\alpha,\beta_c) - p_s(R,\alpha,\beta_s)\cdot\pi_s < 0$ follows from $\alpha < \overline{\alpha}$.
- $p_c(\cdot)$ and $p_s(\cdot)$ are each assumed to be continuous in α.

Proving that $\hat{m}$ strictly increases in α establishes the unique threshold claim. Applying the implicit function theorem to Equation B.4 demonstrates:

$$\frac{d\hat{m}}{d\alpha} = -\frac{\frac{\partial p_c}{\partial \alpha} - \frac{\partial p_s}{\partial \alpha} \cdot \pi_s}{\frac{\partial p_c}{\partial m} - \frac{\partial p_s}{\partial m} \cdot \pi_s} > 0, \tag{B.5}$$

and the sign follows from Equations B.1 and B.2. ■

Lemmas B.1 and B.2 will be used to prove Proposition 1. There are three notable points about these formal statements. First, Assumption 4 enables restricting attention to parameter values in which x^* is interior. Second, although the optimization problems in Lemma B.1 (also see Equation 4) do not bound G's choice set, the Inada-type conditions stated in the model setup generate bounded solutions. Third, none of the optimization problems below explicitly bound the solutions by the budget constraint (Equation 5) because G's lifetime utility maximization problem is equivalent to maximizing B^*. Related, as the proof for Proposition 1 establishes, G's optimization problem conditional on facing a civil war is an affine transformation of the optimization problems stated in these results.

Lemma B.1 (Military expenditures)**.**

Part a. *There exists a unique interior optimizer $m_c^* \in (0, R)$ to G's maximization problem (Equation 4) subject to $\mu = 1$.*

Part b. *There exists a unique interior optimizer $m_s^* \in (0, R)$ to G's maximization problem (Equation 4) subject to $\mu = 0$.*

Part c. $m_s^* < m_c^*$.

Proof of part a. If $\mu = 1$, then G's unconstrained lifetime utility maximization problem is:

$$\max_{m_c} \; R - m_c - x^*(\mu = 1, m_c) + \delta \cdot V^G_{\text{s.q.}}$$

with associated first-order condition:

$$\underbrace{-\frac{\delta}{1-\delta} \cdot \Big[p_c'(m_c^*, \alpha, \beta_c) \cdot (1-\theta) \cdot (2 - e_G - e_C)\Big]}_{\text{MB}} = \underbrace{1}_{\text{MC}} \tag{B.6}$$

Assuming $\lim_{m \to 0} p_c'(m) = -\infty$ and $\lim_{m \to R} p_c'(m) = 0$ implies $m_c^* \in (0, 1)$. Assuming $p_c'' > 0$ suffices to show the second derivative is strictly negative, establishing the unique maximizer.

Proof of part b. If $\mu = 0$, then G's unconstrained expenditure minimization problem is:

$$\max_{m_s} \; R - m_s - x^*(\mu = 1, m_s) + \delta \cdot V^G_{\text{s.q.}}$$

with associated first-order condition:

$$\underbrace{-\frac{\delta}{1-\delta} \cdot \Big[p_s'(m_s^*, \alpha, \beta_s) \cdot \big[(1-\theta) \cdot (1 - e_c) - \theta \cdot (1 - e_G)\big]\Big]}_{\text{MB}} = \underbrace{1}_{\text{MC}} \tag{B.7}$$

Assuming $\lim_{m\to 0} p_s'(m) = -\infty$ and $\lim_{m\to R} p_s'(m) = 0$ implies $m_s^* > 0$. Assuming $p_s'' > 0$ suffices to show the second derivative is strictly negative, establishing the unique maximizer.

Proof of part c. Combining Equations B.6 and B.7 yields:

$$-p_c'(m_c^*, \alpha, \beta_c) = -p_s'(m_s^*, \alpha, \beta_s) \cdot \omega, \tag{B.8}$$

for $\omega = \frac{(1-\theta)\cdot(1-e_c)-\theta\cdot(1-e_G)}{(1-\theta)\cdot(2-e_G-e_C)}$. Assumption 2 implies that $-p_s'(m_c^*, \alpha, \beta_s) < -p_c'(m_c^*, \alpha, \beta_c)$, and $-p_s'(m_s^*, \alpha, \beta_s) \cdot \omega < -p_s'(m_s^*, \alpha, \beta_s)$ follows from $\omega < 1$. Combining these two inequalities with Equation B.8 implies:

$$-p_s'(m_c^*, \alpha, \beta_s) < -p_s'(m_s^*, \alpha, \beta_s)$$

The result follows because $-p_s'(\cdot)$ strictly decreases in m. ■

Lemma B.2 (Population size thresholds)**.**

Part a. *There exists a unique value $\hat{\alpha}_c \in (\underline{\alpha}, \overline{\alpha})$ such that: if $\alpha < \hat{\alpha}_c$, then $\hat{m} < m_c^*$; and if $\hat{m} > m_c^*$ otherwise.*

Part b. *There exists a unique value $\hat{\alpha}_s \in (\underline{\alpha}, \overline{\alpha})$ such that: if $\alpha < \hat{\alpha}_s$, then $\hat{m} < m_s^*$; and if $\hat{m} > m_s^*$ otherwise.*

Part c. $\hat{\alpha}_s < \hat{\alpha}_c$.

Proof of part a. Define $\hat{\alpha}_c$ implicitly as:

$$\hat{m}(\hat{\alpha}_c) - m_c^*(\hat{\alpha}_c) = 0 \tag{B.9}$$

Satisfying the intermediate value theorem conditions implies there exists a least one such $\hat{\alpha}_c \in (\underline{\alpha}, \overline{\alpha})$:

- $\hat{m}(\underline{\alpha}) - m_c^*(\underline{\alpha}) < 0$ follows from $\hat{m}(\underline{\alpha}) = 0$ (see the proof for Lemma 1), and part a of Lemma B.1 shows $m_c^* \in (0, R)$.
- $\hat{m}(\overline{\alpha}) - m_c^*(\overline{\alpha}) > 0$ follows from $\hat{m}(\overline{\alpha}) = R$, and part a of Lemma B.1 shows $m_c^* \in (0, R)$.
- These functions are each continuous in α because each constituent function is continuous in α.

The unique threshold claims follow from applying the implicit function theorem to Equation B.6:

$$\frac{d}{d\alpha}\left[\hat{m}(\alpha) - m_c^*(\alpha)\right] = \underbrace{-\frac{\frac{\partial p_c}{\partial \alpha} - \frac{\partial p_s}{\partial \alpha}\cdot\pi_s}{\frac{\partial p_c}{\partial m} - \frac{\partial p_s}{\partial m}\cdot\pi_s}}_{>0} + \underbrace{\frac{\frac{\partial^2 p_c}{\partial m \partial \alpha}}{\frac{\partial^2 p_c}{\partial m^2}}}_{>0} > 0,$$

where the sign follows from Equation B.5 (see the proof for Lemma 1) and from the second-order partial derivatives stated in the text.

Proof of part b. Define $\hat{\alpha}_s$ implicitly as:

$$\hat{m}(\hat{\alpha}_s) - m_s^*(\hat{\alpha}_s) = 0 \tag{B.10}$$

Satisfying the intermediate value theorem conditions implies there exists a least one such $\hat{\alpha}_s \in (\underline{\alpha}, \overline{\alpha})$:

- $\hat{m}(\underline{\alpha}) - m_s^*(\underline{\alpha}) < 0$ follows from $\hat{m}(\underline{\alpha}) = 0$ (see the proof for Lemma 1), and part b of Lemma B.1 shows $m_s^* \in (0, R)$.
- $\hat{m}(\overline{\alpha}) - m_s^*(\overline{\alpha}) > 0$ follows from $\hat{m}(\overline{\alpha}) = R$, and part b of Lemma B.1 shows $m_s^* \in (0, R)$.
- These functions are each continuous in α because each constituent function is continuous in α.

The unique threshold claims follow from applying the implicit function theorem to Equation B.7:

$$\frac{d}{d\alpha}\left[\hat{m}(\alpha) - m_s^*(\alpha)\right] = \underbrace{-\frac{\frac{\partial p_c}{\partial \alpha} - \frac{\partial p_s}{\partial \alpha} \cdot \pi_s}{\frac{\partial p_c}{\partial m} - \frac{\partial p_s}{\partial m} \cdot \pi_s}}_{>0} + \underbrace{\frac{\frac{\partial^2 p_s}{\partial m \partial \alpha}}{\frac{\partial^2 p_s}{\partial m^2}}}_{>0} > 0,$$

where the sign follows from Equation B.5 (see the proof for Lemma 1) and from the second-order partial derivatives stated in the text.

Proof of part c. Combining Equations B.9 and B.10 and slightly rearranging yields:

$$\hat{m}(\hat{\alpha}_c) - \hat{m}(\hat{\alpha}_s) = m_c^*(\hat{\alpha}_c) - m_s^*(\hat{\alpha}_s)$$

Suppose the claim is false, and $\hat{\alpha}_c \leq \hat{\alpha}_s$. This hypothesis yields the following inequalities, generating a contradiction:

- LHS: $\hat{m}(\hat{\alpha}_c) - \hat{m}(\hat{\alpha}_s) \leq 0$ because $\hat{m}$ strictly increases in α (see step 6 in the proof for Lemma 1).
- RHS: $m_c^*(\hat{\alpha}_c) - m_s^*(\hat{\alpha}_s) > m_c^*(\hat{\alpha}_c) - m_c^*(\hat{\alpha}_s) \geq 0$. The first inequality follows from part c of Lemma B.1 and the second inequality follows because m_c^* strictly decreases in α (see part a of this proof). ■

Figure 4 visually summarizes the different α thresholds and optimal military spending amounts stated in Proposition 1 and Lemmas B.1 and B.2, and provides intuition for proving Proposition 1. It not only states equilibrium military spending, but also optimal military spending when fixing C's civil war aims. Recall that for $\alpha \in \left(\underline{\alpha}, \overline{\alpha}\right)$, G's military spending affects C's civil war aims (see part b of Lemma 1). G's optimization problem (Equation 4) compares expenditures for the optimal amount within the center-seeking range to the optimal amount within the separatist range, and chooses the one that minimizes period 1 expenditures (note that G's lifetime utility maximization problem is identical to minimizing period 1 expenditures).

- *Center-seeking range.* If $\alpha > \hat{\alpha}_c$, then $\mu^*(m_c^*) = 1$, which implies that G can choose its interior optimal military spending amount and still induce $\mu^* = 1$ (i.e., the center-seeking range). However, if $\alpha < \hat{\alpha}_c$, then $\mu^*(m_c^*) = 0$. In words, if G spends that high an amount when facing a smaller ethnic group, then it will deter a center-seeking war. Therefore, to stay within the bounds of the center-seeking range, G must lower its military expenditures to $\hat{m}$.

- *Separatist range.* If $\alpha < \hat{\alpha}_s$, then $\mu^*(m_s^*) = 0$, which implies that G can choose its interior optimal military spending amount and still induce $\mu^* = 0$ (i.e., the separatist range). However, if $\alpha > \hat{\alpha}_s$, then $\mu^*(m_s^*) = 1$. In words, if G spends that low an amount when facing a larger ethnic group, then it will fail to deter a center-seeking civil war. Therefore, to stay within the bounds of the separatist range, G must raise its military expenditures to $\hat{m}$.
- *Combining these considerations.* The key to understanding G's optimal choice as a function of α is that, at $m = \hat{m}$, G is indifferent between facing a center-seeking or separatist civil war. The logic is as follows. By definition, at $m = \hat{m}$, C is indifferent between war aims because $x^*(\mu = 1, \hat{m}) = x^*(\mu = 0, \hat{m})$. This implies that, at $m = \hat{m}$, G's expenditures are also equal for either type of civil war: $\hat{m} + x^*(\mu = 1, \hat{m}) = \hat{m} + x^*(\mu = 0, \hat{m})$. Therefore:
  - If $\alpha < \hat{\alpha}_s$, then the two possible equilibrium choices are $m = \hat{m}$ (center-seeking range) and $m = m_s^*$ (separatist range). G prefers $m = m_s^*$ to $m = \hat{m}$ within the separatist range, and G's utility if $m = \hat{m}$ is not a function of μ. Therefore, G's equilibrium choice must be $m = m_s^*$, which also implies that C's equilibrium civil war constraint is separatist.
  - If $\alpha > \hat{\alpha}_c$, then the two possible equilibrium choices are $m = m_c^*$ (center-seeking range) and $m = \hat{m}$ (separatist range). G prefers $m = m_c^*$ to $m = \hat{m}$ within the center-seeking range, and G's utility if $m = \hat{m}$ is not a function of μ. Therefore, G's equilibrium choice must be $m = m_c^*$, which also implies that C's equilibrium civil war constraint is center-seeking.
  - If $\alpha \in \left(\hat{\alpha}_s, \hat{\alpha}_c\right)$, then the interior optimal spending amounts violate both the center-seeking and separatist ranges: optimal center-seeking spending is high enough to deter C from fighting for the center, and optimal separatist spending is too low to deter C from fighting for the center. This implies that G optimally sets $m = \hat{m}$, which makes C indifferent between civil war aims.

Proof of Proposition 1, part a. The proof proceeds in four steps.

1. Solve G's constrained optimization problem (Equation 4) in the center-seeking range. Define the Lagrangian:

$$\max_{m,\lambda_1,\lambda_2} R - \left[m + x^*(\mu = 1, m)\right] + \delta \cdot V_{\text{s.q.}}^G + \lambda_1 \cdot m + \lambda_2 \cdot \left(\hat{m} - m\right)$$

   The associated KKT conditions are:

$$\frac{\partial \mathcal{L}}{\partial m} = -\left\{1 + \frac{\delta}{1-\delta} \cdot \left[p_c'(m, \alpha, \beta_c) \cdot (1-\theta) \cdot (2 - e_G - e_C)\right]\right\} + \lambda_1 - \lambda_2 = 0,$$

$$m \geq 0, m \leq \hat{m}, \lambda_1 \geq 0, \lambda_2 \geq 0, \lambda_1 \cdot m = 0, \lambda_2 \cdot \left(\hat{m} - m\right) = 0$$

   - If $\alpha < \hat{\alpha}_c$, then one solution is $m = \hat{m}$ with associated multipliers $\lambda_1 = 0$ and $\lambda_2 = -\left\{1 + \frac{\delta}{1-\delta} \cdot \left[p_c'(\hat{m}, \alpha, \beta_c) \cdot (1-\theta) \cdot (2 - e_G - e_C)\right]\right\}$. Part a of Lemma B.2 implies that $\hat{m} < m_c^*$ in this parameter range, and part a of Lemma B.1 establishes that $1 + \frac{\delta}{1-\delta} \cdot \left[p_c'(m, \alpha, \beta_c) \cdot (1-\theta) \cdot (2 - e_G - e_C)\right] < 0$ for any $m < m_c^*$. This implies that the second non-negative multiplier constraint is met, and it is straightforward to verify that this vector satisfies every other KKT condition.

     The following steps prove uniqueness. Setting $m < \hat{m}$ requires $\lambda_2 = 0$ to satisfy the

second complementary slackness condition. Then, for any $\lambda_1 \geq 0$, the first-order condition is violated because $1 + \frac{\delta}{1-\delta} \cdot \left[p_c'(m, \alpha, \beta_c) \cdot (1-\theta) \cdot (2 - e_G - e_C)\right] < 0$ for any $m < m_c^*$ (and we already established that $\hat{m} < m_c^*$ in this parameter range).

- If $\alpha > \hat{\alpha}_c$, then one solution is $m = m_c^*$ (see Lemma B.1) with associated multipliers $\lambda_1 = 0$ and $\lambda_2 = 0$. Because part a of Lemma B.2 implies that $\hat{m} > m_c^*$ in this parameter range, it is straightforward to verify that this vector satisfies every KKT condition.

  The following steps prove uniqueness.

  - We have established that $m_c^* < \hat{m}$ in this parameter range. Therefore, any $m < m_c^*$ requires $\lambda_2 = 0$ to satisfy the second complementary slackness condition. However, for any $\lambda_1 \geq 0$, this violates the first-order condition because $1 + \frac{\delta}{1-\delta} \cdot \left[p_c'(m, \alpha, \beta_c) \cdot (1-\theta) \cdot (2 - e_G - e_C)\right] < 0$ for any $m < m_c^*$.
  - Part a of Lemma B.2 establishes that $m_c^* > 0$. Therefore, any $m > m_c^*$ requires $\lambda_1 = 0$ to satisfy the first complementary slackness condition. However, for any $\lambda_2 \geq 0$, this violates the first-order condition because part a of Lemma B.1 establishes that $1 + \frac{\delta}{1-\delta} \cdot \left[p_c'(m, \alpha, \beta_c) \cdot (1-\theta) \cdot (2 - e_G - e_C)\right] > 0$ for any $m > m_c^*$.

2. Solve G's constrained optimization problem (Equation 4) in the separatist range. Define the Lagrangian:

$$\max_{m,\lambda} \quad R - \left[m + x^*(\mu = 0, m)\right] + \delta \cdot V_{\text{s.q.}}^G + \lambda \cdot \left(m - \hat{m}\right)$$

The associated KKT conditions are:

$$\frac{\partial \mathcal{L}}{\partial m} = -\left\{1 + \frac{\delta}{1-\delta} \cdot \left[p_s'(m, \alpha, \beta_s) \cdot \left[(1-\theta) \cdot (1 - e_c) - \theta \cdot (1 - e_G)\right]\right]\right\} + \lambda = 0,$$

$$m \geq \hat{m}, \lambda \geq 0, \lambda \cdot \left(m - \hat{m}\right) = 0$$

- If $\alpha < \hat{\alpha}_s$, then one solution is $m = m_s^*$ (see Lemma B.1) with associated multiplier $\lambda = 0$. Because part b of Lemma B.2 implies that $\hat{m} < m_s^*$ in this parameter range, it is straightforward to verify that this vector satisfies every KKT condition.

  The following steps prove uniqueness.

  - For any $\lambda \geq 0$, any $m < m_s^*$ violates the first-order condition because part b of Lemma B.1 establishes that $1 + \frac{\delta}{1-\delta} \cdot \left[p_s'(m, \alpha, \beta_s) \cdot \left[(1-\theta) \cdot (1 - e_c) - \theta \cdot (1 - e_G)\right]\right] < 0$ for all $m < m_s^*$.
  - We have established that $\hat{m} < m_s^*$ in this parameter range. Therefore, any $m > m_s^*$ requires $\lambda = 0$ to satisfy the complementary slackness condition. However, this violates the first-order condition because part b of Lemma B.1 establishes that $1 + \frac{\delta}{1-\delta} \cdot \left[p_s'(m, \alpha, \beta_s) \cdot \left[(1-\theta) \cdot (1 - e_c) - \theta \cdot (1 - e_G)\right]\right] > 0$ for any $m > m_s^*$.

- If $\alpha > \hat{\alpha}_s$, then one solution is $m = \hat{m}$ with associated multiplier $\lambda = 1 + \frac{\delta}{1-\delta} \cdot \left[p_s'(m, \alpha, \beta_s) \cdot \left[(1-\theta) \cdot (1 - e_c) - \theta \cdot (1 - e_G)\right]\right]$. Part b of Lemma B.2 implies that $\hat{m} > m_s^*$ in this parameter range, and part b of Lemma B.1 establishes that $1 + \frac{\delta}{1-\delta} \cdot \left[p_s'(m, \alpha, \beta_s) \cdot \left[(1-\theta) \cdot (1 - e_c) - \theta \cdot (1 - e_G)\right]\right] > 0$ for any $m > m_s^*$.

This implies that the non-negative multiplier constraint is met, and it is straightforward to verify that this vector also satisfies every other KKT condition.

The following proves uniqueness. Setting $m > \hat{m}$ requires $\lambda = 0$ to satisfy the complementary slackness condition. Then, the first-order condition is violated because $1 + \frac{\delta}{1-\delta} \cdot \Big[p_s'(m, \alpha, \beta_s) \cdot \big[(1-\theta) \cdot (1-e_c) - \theta \cdot (1-e_G)\big]\Big] > 0$ for any $m > m_s^*$ (and we already established that $\hat{m} > m_s^*$ in this parameter range).

3. To solve the full maximization problem stated in Equation 4, part c of Lemma B.2 implies the need to examine three non-trivial parameter ranges: $\alpha \in \big(\underline{\alpha}, \hat{\alpha}_s\big)$, $\alpha \in \big(\hat{\alpha}_s, \hat{\alpha}_c\big)$, and $\alpha \in \big(\hat{\alpha}_c, \overline{\alpha}\big)$.

   - If $\alpha \in \big(\underline{\alpha}, \hat{\alpha}_s\big)$, then part 1 of this proof shows that $m = \hat{m}$ is the unique optimal solution conditional on facing a center-seeking civil war and part 2 shows that $m = m_s^*$ is the unique optimal solution conditional on facing a separatist civil war. By construction, $\hat{m} + x^*\big(\mu = 1, \hat{m}\big) = \hat{m} + x^*\big(\mu = 0, \hat{m}\big)$. Part 2 of this proof shows that $m_s^* + x^*\big(\mu = 0, m_s^*\big) < \hat{m} + x^*\big(\mu = 0, \hat{m}\big)$, which implies m_s^* is the unique optimal solution.
   - If $\alpha \in \big(\hat{\alpha}_s, \hat{\alpha}_c\big)$, then parts 1 and 2 of this proof show that $m = \hat{m}$ is the unique optimizer.
   - If $\alpha \in \big(\hat{\alpha}_c, \overline{\alpha}\big)$, then part 1 of this proof shows that $m = m_c^*$ is the unique optimal solution conditional on facing a center-seeking civil war and part 2 shows that $m = \hat{m}$ is the unique optimal solution conditional on facing a separatist civil war. By construction, $\hat{m} + x^*\big(\mu = 1, \hat{m}\big) = \hat{m} + x^*\big(\mu = 0, \hat{m}\big)$. Part 1 of this proof shows that $m_c^* + x^*\big(\mu = 1, m_c^*\big) < \hat{m} + x^*\big(\mu = 1, \hat{m}\big)$, which implies m_c^* is the unique optimal solution.

4. Show that G cannot profitably deviate to (x, m) such that $R - m - x < 0$. Using the terms from Table 2 yields the following expression for G's lifetime expected utility if C initiates a civil war in period 1:

$$1-e_G+(1-\theta)\cdot(1-e_C)-m-d+\frac{\delta}{1-\delta}\cdot\Bigg\{\mu^*(m)\cdot\big[1-p_c(m)\big]\cdot\big[(1-\theta)\cdot(1-e_C)+(1-\theta)\cdot(1-e_G)\big]$$

$$+\big[1-\mu^*(m)\big]\cdot\Big[p_s(m)\cdot(1-e_G)+\big[1-p_s(m)\big]\cdot\big[(1-\theta)\cdot(1-e_C)+(1-\theta)\cdot(1-e_G)\big]\Big]\Bigg\}$$

Split the term in braces into the following:

$$\mu^*(m)\cdot\big[(1-\theta)\cdot(1-e_C)+(1-\theta)\cdot(1-e_G)\big]$$

$$-\mu^*(m)\cdot p_c(m)\cdot\big[(1-\theta)\cdot(1-e_C)+(1-\theta)\cdot(1-e_G)\big]$$

$$+\big[1-\mu^*(m)\big]\cdot\big[(1-\theta)\cdot(1-e_C)+(1-\theta)\cdot(1-e_G)\big]$$

$$-\big[1-\mu^*(m)\big]\cdot p_s(m)\cdot\big[(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)\big]$$

Combining the first and third lines, simplifying those terms, and simplifying the term on the second line yields:

$$(1-\theta)\cdot(2-e_C-e_G)$$

$$-\mu^*(m)\cdot p_c(m)\cdot(1-\theta)\cdot(2-e_C-e_G)$$
$$-\big[1-\mu^*(m)\big]\cdot p_s(m)\cdot\big[(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)\big]$$

Therefore, the overall expression is:

$$1-e_G+(1-\theta)\cdot(1-e_C)-m-d$$
$$-\underbrace{\frac{\delta}{1-\delta}\cdot\Big\{\mu^*(m)\cdot p_c(m)\cdot(1-\theta)\cdot(2-e_C-e_G)+\big[1-\mu^*(m)\big]\cdot p_s(m)\cdot\big[(1-\theta)\cdot(1-e_C)-\theta\cdot(1-e_G)\big]\Big\}}_{x^*(m)+d}$$
$$+\underbrace{\frac{\delta}{1-\delta}\cdot(1-\theta)\cdot(2-e_C-e_G)}_{\delta\cdot V^G_{s.q.}} \tag{B.11}$$

Subtracting this term from G's lifetime expected utility to buying off C with G's most-preferred transfer that satisfies Equation 3, $R-m-x^*(m)+\delta\cdot V^G_{s.q.}$, equals $2d>0$.

Part b. Equation B.11 shows that G's objective function if $B^*<0$ is an affine transformation of its objective function if $B^*>0$, therefore yielding identical solutions. By definition of B^* and by construction of G's optimization problem, assuming $B^*<0$ implies that C rejects any feasible offer by G, which also implies that G cannot profitably deviate from any transfer proposal that satisfies the budget constraint (given optimal military expenditures). ■

Proof of Proposition 3. A sufficient condition for the right-hand side of Equation 8 to be strictly positive is:

$$p_j(m^*)>p_j'(m^*)\cdot\frac{dm^*}{d\theta}\cdot(1-\theta) \tag{B.12}$$

Need to solve for $\frac{dm^*}{d\theta}$. Using the generic probability of winning function $p_j(\cdot)$ and setting $(1-\mu^*)\cdot(1-\gamma)=0$ enables rewriting either Equation B.6 or B.7 as:

$$\frac{\delta}{1-\delta}\cdot\big[-p_j'(m^*)\big]\cdot(1-\theta)\cdot(1-e_i)=1 \tag{B.13}$$

Applying the implicit function theorem to Equation B.13 yields:

$$\frac{dm^*}{d\theta}=\frac{p_j'(m^*)}{p_j''(m^*)\cdot(1-\theta)} \tag{B.14}$$

Substituting Equation B.14 into Equation B.12 and rearranging yields:

$$p_j''(m^*)>\frac{\big[p_j'(m^*)\big]^2}{p_j(m^*)}, \tag{B.15}$$

which follows for all m from the assumption that $p_j(\cdot)$ exhibits large enough diminishing marginal returns. ■

Proof of Proposition 4. It suffices to show that the direct and indirect effects in Equation 9 are each strictly positive. The strict positivity of the direct effect follows directly from assuming $\frac{\partial p_j}{\partial \beta_j} < 0$. The strict positivity of the indirect effect follows from assuming $p_j'(m) < 0$ and from applying the implicit function to Equation B.13, which shows:

$$\frac{dm^*}{d\beta_j} = \frac{-\frac{\partial^2 p_j(m^*)}{\partial m \partial \beta_j}}{p_j''(m^*)} > 0,$$

which follows from assuming $\frac{\partial^2 p_j(m)}{\partial m \partial \beta_j} < 0$ and $p_j''(m) > 0$. ■

B.2 Extension: Large Prize of Winning

Another argument from the literature is that oil production contributes to civil war by creating a *large prize of winning*. For example, Collier and Hoeffler (2005, 44) proclaim that one of two major reasons that natural resources might be a powerful risk factor for civil wars is "the lure of capturing resource ownership permanently if the rebellion is victorious." Laitin (2007, 22) proclaims: "If there is an economic motive for civil war in the past half-century, it is in the expectation of collecting the revenues that ownership of the state avails, and thus the statistical association between oil (which provides unimaginably high rents to owners of states) and civil war." Contest function models such as Garfinkel and Skaperdas (2006) and Besley and Persson (2011, ch. 4) also show that larger spoils increase equilibrium fighting likelihood.

These claims can easily be addressed through a simple alteration of my model. Assume economic production in each region is Y_i, for $i \in \{G, C\}$, replacing the assumption from the core model that production equals 1. Also assume that an increase in oil production O_i strictly increases Y_i. This extension produces mechanisms identical to the revenue effect and predation effect from the core model—implying that, contrary to existing arguments, a larger prize does not unambiguously raise the equilibrium likelihood of conflict.

In this extension, the equilibrium budget constraint changes from Equation 5 to:

$$B^*(Y_i) \equiv \underbrace{\big(1 - e_G\big) \cdot Y_G + \big(1 - \theta\big) \cdot \big(1 - e_C\big) \cdot Y_C}_{\approx \text{ Revenue effect}} - m^* - x^* \geq 0, \tag{B.16}$$

with the corresponding equilibrium interior transfer amount changing from Equation 3 to:

$$x^*(m; Y_i) \equiv \frac{\delta}{1-\delta} \cdot \Bigg[\mu^*(m) \cdot p_c(m) \cdot \underbrace{(1-\theta) \cdot \Big[\big(1 - e_G\big) \cdot Y_G + \big(1 - e_C\big) \cdot Y_C\Big]}_{\approx \text{Predation effect (center-seeking)}}$$

$$+ \big[1 - \mu^*(m)\big] \cdot p_s(m) \cdot \underbrace{\Big[(1-\theta) \cdot (1 - e_C) \cdot Y_C - \theta \cdot (1 - e_G) \cdot Y_G\Big]}_{\approx \text{Predation effect (separatist)}} \Bigg] - d \tag{B.17}$$

It is straightforward to see from these two equations that taking the derivative with respect to Y_i would produce mechanisms identical to the revenue effect and to the predation effect in the core model. Therefore, parameterizing production yields the same insights as the core model, contrary to existing arguments that

the spoils of predation effect of oil should unambiguously cause civil war.

B.3 Extension: Evolving Civil War Aims

For simplicity, the model assumes that civil wars last a single period and that civil war aims are fixed throughout this one-period conflict. However, it is also of interest to understand why rebels might change civil war aims during a conflict. Considering how the model could account for this phenomenon (which has occurred in Ethiopia and Sudan) while also acknowledging its empirical rarity may provide deeper insights into civil war aims and open new questions for future research.

B.3.1 Setup

Consider a setup with the following alterations from the core model:

- If C initiates either type of civil war in period 1, with probability $\kappa \in (0, 1)$, the war stalemates after the first period. If this occurs, then fighting necessarily occurs again in period 2, but C chooses civil war aims again (this is the only strategic move in period 2 if a non-decisive war occurs in period 1). The possible war outcomes in period 2 are identical to those in the core model.
- C's group size α_t is a function of time. If C does not fight in period 1 or if the war is decisive after period 1, then $\alpha_t = \alpha_1$ for all t. If instead C fights and the war stalemates, then Nature chooses α_2 from a Bernoulli distribution: α_{low} with probability $q \in (0, 1)$ and α_{high} with probability $1 - q$. The Ethiopia and Sudan cases below interpret changes in group size as alliances formed (or not formed) among multiple ethnic groups during a war to try to capture the center.
- The probability of C winning either type of civil war is a function only of α_t, and G does not make an arming choice. Therefore, I will denote C's probability of winning terms as $p_c(\alpha_t)$ and $p_s(\alpha_t)$. This simplification of the core model does not alter the intuitions from this extension because the logic does not depend on G's arming decision.

B.3.2 Analysis

Lemma B.3 restates Lemma 1 for the special case considered here in which G's military capacity is exogenous.

> **Lemma B.3.** *Small groups' optimal civil war aims are separatist and large groups' optimal civil war aims are center-seeking. Formally, there exists a unique threshold $\tilde{\alpha} \in (0, 1)$ such that:*
>
> > ***Part a.*** *If $\alpha < \tilde{\alpha}$, then C's preferred civil war aims are separatist.*
> >
> > ***Part b.*** *If $\alpha > \tilde{\alpha}$, then C's preferred civil war aims are center-seeking.*
>
> *This threshold is implicitly defined as:*
>
> $$p_c(\tilde{\alpha}) = \frac{(1-\theta)\cdot(1-e_C) - \theta\cdot(1-e_G)}{(1-\theta)\cdot(2-e_G-e_C)} \cdot p_s(\tilde{\alpha})$$

If a war occurs and stalemates after period 1, then C chooses civil war aims in period 2. Its expected utility functions are:

$$E\big[U_C(\text{center}, \alpha_2)\big] = 1 - (1-\theta)\cdot(1-e_C) - d + \delta \cdot \Big\{ p_c(\alpha_2)\cdot V^C_{\text{center}} + \big[1 - p_c(\alpha_2)\big]\cdot V^C_{\text{s.q.}} \Big\} \quad \text{(B.18)}$$

$$E\big[U_C(\text{separatist}, \alpha_2)\big] = 1 - (1-\theta)\cdot(1-e_C) - d + \delta \cdot \Big\{ p_s(\alpha_2)\cdot V^C_{\text{sep}} + \big[1 - p_s(\alpha_2)\big]\cdot V^C_{\text{s.q.}} \Big\}, \quad \text{(B.19)}$$

for the continuation values defined in Table 2 (recall that fighting is necessarily decisive in period 2). The only necessary alteration is to rewrite α as α_t in those functions. Because this structure is identical to that in the core model, Lemma B.3 characterizes C's optimal civil war aims. Assumption A.1 focuses the analysis on the substantively interesting parameter range in which there is a positive probability of C proclaiming either center-seeking $\big(\text{if } \alpha_2 = \alpha_{high}\big)$ or separatist civil war aims $\big(\text{if } \alpha_2 = \alpha_{low}\big)$ following a stalemate in period 1.

Assumption A.1. $\alpha_{low} < \tilde{\alpha} < \alpha_{high}$

Following a stalemated war, given the Nature draw over α_2, C's expected continuation value is:

$$V^C_{\text{stale}} = 1 - (1-\theta)\cdot(1-e_C) - d$$
$$+\delta\cdot\Big\{ q\cdot\Big[p_c(\alpha_{high})\cdot V^C_{\text{center}} + \big[1-p_c(\alpha_{high})\big]\cdot V^C_{\text{s.q.}}\Big] + (1-q)\cdot\Big[p_s(\alpha_{low})\cdot V^C_{\text{sep}} + \big[1-p_s(\alpha_{low})\big]\cdot V^C_{\text{s.q.}}\Big] \Big\} \quad \text{(B.20)}$$

This, in turn, enables writing C's expected utility to its three choices in period 1. Note that the utility to accepting is unchanged from the core model.

$$E\big[U_C(\text{accept } x; \alpha_1, \theta)\big] = 1 - \big(1-\theta\big)\cdot\big(1-e_C\big) + x + \delta\cdot V^C_{s.q.} \quad \text{(B.21)}$$

$$E\big[U_C(\text{center}; \alpha_1, \theta)\big] =$$
$$1 - \big(1-\theta\big)\cdot\big(1-e_C\big) - d + \delta\Big\{ \kappa\cdot\Big[p_c(\alpha_1)\cdot V^C_{\text{center}} + \big[1-p_c(\alpha_1)\big]\cdot V^C_{\text{s.q.}}\Big] + (1-\kappa)\cdot V^C_{\text{stale}} \Big\} \quad \text{(B.22)}$$

$$E\big[U_C(\text{separatist}; \alpha_1, \theta)\big] =$$
$$1 - \big(1-\theta\big)\cdot\big(1-e_C\big) - d + \delta\Big\{ \kappa\cdot\Big[p_s(\alpha_1)\cdot V^C_{\text{sep}} + \big[1-p_s(\alpha_1)\big]\cdot V^C_{\text{s.q.}}\Big] + (1-\kappa)\cdot V^C_{\text{stale}} \Big\} \quad \text{(B.23)}$$

Equations B.22 and B.23 show that adding the additional possibility of stalemates does not alter C's calculus for preferring center-seeking over separatist, and therefore Lemma B.3 characterizes C's optimal civil war aims (for $\alpha = \alpha_1$). Equation B.24 implicitly defines the equilibrium transfer proposal $x^*(\theta)$. This expression can be algebraically rearranged to resemble Equation 3, with the difference that it contains additional terms for the possibility of a stalemate.

$$E\big[U_C(\text{accept } x^*(\theta);\alpha_1,\theta)\big] = \max\Big\{E\big[U_C(\text{center};\alpha_1,\theta)\big], E\big[U_C(\text{separatist};\alpha_1,\theta)\big]\Big\} \tag{B.24}$$

Rather than analyze all possible cases, I highlight the two cases in which we observe C switching civil war aims. As in the core model, low enough θ is necessary to cause C to initiate either type of war.

Proposition B.1. *There exists a unique threshold $\tilde{\theta}$ such that if $\theta < \tilde{\theta}$, then $x^*\big(\tilde{\theta}\big) < R$. If $\theta < \tilde{\theta}$, then:*

> ***Switch from separatist to center-seeking.*** *If $\alpha_1 < \tilde{\alpha}$, the war stalemates after period 1, and $\alpha_2 = \alpha_{high}$, then C initiates a separatist civil war in period 1 and switches to center-seeking aims in period 2.*
>
> ***Switch from center-seeking to separatist.*** *If $\alpha_1 > \tilde{\alpha}$, the war stalemates after period 1, and $\alpha_2 = \alpha_{low}$, then C initiates a center-seeking civil war in period 1 and switches to center-seeking aims in period 2.*

B.3.3 Application to Empirical Cases

Ethiopia provides a case in which rebel groups switched from separatist to center-seeking aims several years before the conflict ended. Between the 1960s and 1980s, Ethiopia experienced distinct separatist rebellions over seven different regions. Four of these generated at least 1,000 battle deaths by 1991: Tigray, Eritrea, Ogaden (Somali), and Oromiya (Oromo). According to the Armed Conflict Database, various rebel groups also harbored center-seeking aims in the 1980s. After over a decade of fighting in various regions, the wars changed decisively in 1989 when TPLF (a rebel group that proclaimed ethnic aims and primarily recruited from ethnic Tigray, 6% of population) joined forces with EPDM (Amhara, 28%) and OPDO (Oromo, 29%) to form the Ethiopian People's Revolutionary Democratic Front (EPRDF) that sought to overthrow the government.[24] The EPRDF also launched joint operations with EPLF (Eritrea, 6%), which retained separatist aims. EPRDF captured Addis Ababa in 1991, and EPLF gained territorial control over Eritrea and voted to secede in 1993.

Although the model does not attempt to explain how these disparate groups achieved unified organization, merging together distinct separatist movements to create a large center-seeking movement corresponds with an increase in α_t between periods 1 and 2, assuming that actions during the war (here, major government losses in 1988; Dixon and Sarkees 2015, 638) engendered a coalition that was not possible at the outset of the war, and also substantiating the relevance of having Nature draw α_2. These major government losses also could have presumably facilitated various regions to gain autonomy or independence, but the larger prize of capturing the center assumed in the model explains why groups would take the center if feasible.

Sudan's second civil war provides an opposite case of switching war aims: a center-seeking rebel group accepted a peace agreement that called for regional autonomy. Prior to the beginning of the second civil war in 1983, Sudan experienced a separatist conflict between 1963 and 1972 in which several different southern ethnic groups participated. Despite this legacy of separatism, when conflict began in the 1980s, war aims differed. John Garang formed the largest rebel group, SPLM/A, and a quote from the 1980s articulates his clear aims for the center: "I would like to reiterate that the SPLA/SPLM is a genuine Sudanese movement

[24] Note that other members of Amhara controlled the government, and the Armed Conflict Database codes EPDM as center-seeking in the 1980s.

that is not interested in concessions for the south, but a movement that is open to all people of the Sudan to join and participate in the building of a new and democratic Sudan" (quoted in Roessler, 2016, 115-116). Early phases of the second civil war can be conceived as period 1 in the model. Yet despite these clear center-seeking aims, SPLM-Garang signed a peace agreement with the Sudanese government in 2005 (period 2) that yielded self-determination for the African south, with a distinct Arab and Muslim government in the north. South Sudan gained independence in 2011 following an earlier referendum.[25]

A plausible explanation for changed civil war aims is that in period 1, Garang expected his appeal to broad Sudanese aims to correspond with an increase in α_t during the conflict, but instead the realization of α_2 was α_{low} rather than α_{high}. Why was Garang's expectation at the outset of the war reasonable? Not only did the mostly African south broadly harbor sharp distaste toward the Arab-dominated Khartoum government, but "[i]n terms of marginalization, Arab groups outside of the Nile River Valley are more similar in terms of their material conditions to non-Arab groups in the periphery than riverain Arabs [the ruling group]" (Roessler, 2016, 117)—creating reasonable expectations that a broadly based rebellion could attract widespread support. However, Roessler (2016, 117) states that "since the war was nationalized in the 1980s, almost all of Sudan's rebel movements have come predominantly from 'African groups' ... In contrast, members of 'Arab groups' have tended to stay on the sidelines or have pre-dominantly fought in pro-government militias." He states that SPLM failed to overcome the government's relatively dense information networks among Arab groups, despite seemingly similar economic incentives to rebel as the south. In-fighting among southern groups further exacerbated organizational difficulties.[26] After two decades of deadly fighting with complicated coalitions among different rebel groups and fluctuating international support, Garang may have concluded that he would not be able to muster significant support to capture the capital, and instead settled for regional concessions. In fact, Garang proclaimed that the comprehensive peace agreement of 2005 yielded a "New Sudan," but the agreement lacked provisions that could have generated true national integration (Young, 2005).

Ethiopia and Sudan are exceptional cases. No other intra-state war in my dataset is classified as containing dual civil war aims. Although some countries feature simultaneous center-seeking and separatist conflicts, usually, clearly distinct rebel groups account for the different aims. Other civil wars also involve complicated alliances among disparate rebel groups—for example, see Christia's (2012) discussion of alliance formation in Afghanistan—but few of these alliances mix groups with center-seeking and separatist aims. This model extension also provides insight into why rebel groups rarely switch war aims or harbor both. Ethiopia combined two rare conditions. First, multiple regions experienced both the motivation and opportunity for rebellion, creating numerous separatist groups, as opposed more typical separatist cases in which only a single separatist movement exists. Second, these separatist groups were able to overcome organizational hurdles to combine forces, as opposed to cases like India where the geographical challenges of coordinating disparate rebel movements alone would seem to be insurmountable. Sudan also featured a relatively large coalition of different ethnic groups (36% of the population, as footnote 26 states) that, through shared pre-colonial and colonial history, composed a politically coherent region (South Sudan). John Garang and rebel factions could draw on the legacy of the earlier separatist movement, while Garang could also plausibly gamble that he could muster enough support to take the center. By contrast, most groups that constitute a geographically concentrated territory—facilitating separatism (see Section D.2)—are too small to contemplate taking the center. Conversely, many center-seeking rebel groups lack a coherent territory that could form the basis for a new state (either in terms of ethnic geographic concentration or historical roots) as a fall-back option if their campaign to take the capital stagnates.

[25] This case also features further complications in war aims, as competing rebel groups or SPLM/A factions articulated separatist aims. Dixon and Sarkees (2015, 390-394) provide additional details.

[26] Collectively, the six ethnic groups that ACD2EPR codes as involved in SLPM composed 36% of the population: 6% Beja, 10% Dinka, 5% Nuba, 5% Nuer, 9% Other Southern groups, and 1% Shilluk.

B.4 Extension: Does Oil Production Influence Civil War Aims?

In the core model, I characterize C's equilibrium civil war aims in terms of the size of its ethnic group's population size (Proposition 1). Although Equation 2 shows that the amount of production in each region affects C's relative preference for each type of civil war, regardless of the amount of taxable production in C's region relative to G's region, for identical probabilities of winning, C prefers center-seeking to separatism because center-seeking yields strictly more resources to consume in future periods.

Altering the setup creates the possibility that an oil-rich C would prefer separatist aims even if the probability of winning is identical to that for center-seeking. This is a relevant consideration not only for thinking more deeply about strategic causes of civil war aims, but also for addressing a possible alternative explanation for the mixed oil-conflict pattern: separatist civil wars in oil-rich regions substitute for center-seeking civil wars that would have occurred if secession was not possible. However, combining the theoretical logic with empirical evidence casts doubt on this possibility.

B.4.1 Setup

Consider a setup with the following alterations to the core model:

- Denoting G's commitment ability in the status quo regime as $\theta_{\text{s.q.}}$, if C wins a center-seeking civil war, the commitment parameter increases to $\theta_{\text{center}} > \theta_{\text{s.q.}}$. This implies that C's per-period consumption following a successful center-seeking civil war is now $1 - \big(1 - \theta_{\text{center}}\big) \cdot \big(1 - e_C\big) + \theta_{\text{center}} \cdot \big(1 - e_G\big)$. That is, the structure of C's consumption following center-seeking victory is identical to that as in the status quo regime, except θ increases. This contrasts with the setup in the core model in which C captures all revenues following a center-seeking victory, $2 - e_G$. All other future-period terms stated in Table 2 are the same as in the core model.
- For simplicity, I assume that the probability that C wins either type of civil war is fixed at $p \in (0, 1)$. Correspondingly, G's only strategic choice is a transfer amount, and it does not invest in the military. This simplification enables isolating the main finding that arises from changing the structure of C's consumption following a center-seeking victory.

B.4.2 Analysis

Given these alterations, we can write C's expected utility to each of its three options:

$$E\big[U_C(\text{accept } x)\big] = 1 - \big(1 - \theta_{\text{s.q.}}\big) \cdot \big(1 - e_C\big) + x + \delta \cdot V^C_{\text{s.q.}} \tag{B.25}$$

$$E\big[U_C(\text{center})\big] = 1 - \big(1 - \theta_{\text{s.q.}}\big) \cdot \big(1 - e_C\big) - d + \delta \cdot \Big[p \cdot V^C_{\text{center}} + (1 - p) \cdot V^C_{\text{s.q.}}\Big] \tag{B.26}$$

$$E\big[U_C(\text{separatist})\big] = 1 - \big(1 - \theta_{\text{s.q.}}\big) \cdot \big(1 - e_C\big) - d + \delta \cdot \Big[p \cdot V^C_{\text{sep}} + (1 - p) \cdot V^C_{\text{s.q.}}\Big], \tag{B.27}$$

for:

$$(1 - \delta) \cdot V^C_{\text{s.q.}} = 1 - \big(1 - \theta_{\text{s.q.}}\big) \cdot \big(1 - e_C\big) + \theta_{\text{s.q.}} \cdot \big(1 - e_G\big) \tag{B.28}$$

$$(1 - \delta) \cdot V^C_{\text{center}} = 1 - \big(1 - \theta_{\text{center}}\big) \cdot \big(1 - e_C\big) + \theta_{\text{center}} \cdot \big(1 - e_G\big) \tag{B.29}$$

$$(1 - \delta) \cdot V^C_{\text{sep}} = 1 \tag{B.30}$$

Rather than analyze all possible cases, the substantively interesting findings arise for parameter values in which C prefers either type of civil war over accepting G's maximum transfer. This is true if and only if:

$$\frac{\delta}{1-\delta} \cdot p \cdot \min\left\{\left(\theta_{\text{center}} - \theta_{\text{s.q.}}\right) \cdot (2 - e_C - e_G),\ (1 - \theta_{\text{s.q.}}) \cdot (1 - e_C) - \theta_{\text{s.q.}} \cdot (1 - e_G)\right\} - d >$$

$$1 - e_G + \left(1 - \theta_{\text{s.q.}}\right) \cdot \left(1 - e_C\right) \tag{B.31}$$

In the core model, if C faces the same probability of winning for center-seeking and separatist civil wars, then it prefers center-seeking. However, this may not be true in the present extension. Separating enables C to consume all production from its territory, whereas it has to share some of these resources with G if it captures the center (unlike in the core model). C prefers separatism to center-seeking if and only if production in its region is sufficiently easy to tax, which increases the opportunity cost of remaining in the same country as G. The preceding equations show that the inequality is:

$$e_C < 1 - \frac{\theta_{\text{center}}}{1 - \theta_{\text{center}}} \cdot \left(1 - e_G\right) \tag{B.32}$$

High regional oil production corresponds with parameter values in which Equation B.32 holds because Assumption 5 states that e_C strictly decreases in O_C. Proposition B.2 presents the main result.

> **Proposition B.2.** *Assume that Equation B.31 holds. There exists a unique threshold $\tilde{e}_C$ such that if $e_C < \tilde{e}_C$, then a separatist civil war occurs in equilibrium; if and if $e_C > \tilde{e}_C$, then a center-seeking civil war occurs in equilibrium.*

Under the conditions stated in Proposition B.2, oil production causes separatist civil wars to substitute for center-seeking civil wars. If C's region does not produce oil, then we would observe a center-seeking civil war in equilibrium; but if it produces oil, we would instead observe a separatist civil war.

B.4.3 Application to Empirical Cases

Although the model alteration highlights the theoretical possibility that oil can cause separatist civil wars to substitute for center-seeking wars, analyzing empirical cases suggests that the scope conditions in which this occurs are not applicable. Specifically, examining the national population shares of oil-rich groups that have fought separatist civil wars suggests that they were unlikely to have sought the center in the absence of oil wealth. Of the 17 wars in Table 3, only six involve fighting by groups with at least 10% of their national population share, and all but one are below the rough threshold in Figure 8 of 25% below which groups are more likely to secede than to seek the center. Furthermore, anecdotal considerations about the three largest groups in Table 3 suggest that center-seeking was not a viable option—or, at least, historical precedents favored secession. In addition to Yemen's southerners, discussed in the text, Nigeria's southeast region (Igbo) was governed as a separate territory from the north (which controlled the state at independence) for much of the colonial era, and Mosul (Kurds) composed a separate Ottoman province from Baghdad prior to Britain colonizing and creating Iraq. Also important for limiting center-seeking possibilities, Igbo had recently been purged from inclusion in the central government in Nigeria after a military counter-coup led by northerners in 1966, and the historical difficulty that Iraq's Kurds faced to constructing durable political organizations suggests that they could more easily fight in the mountains rather than organize an attack on the capital.

C Supporting Information for Sections 5 and 6

C.1 Ethnicity and Civil War

Although in principal the theoretical logic holds for any geographically segregated identity groups, in the real world, ethnic groups are more likely to provide the organizational basis for rebel groups—especially those that seek to separate—than groups organized by class or political ideology. Denny and Walter (2014) propose three main explanatory factors for the ethnicity-conflict relationship: grievances, opportunity, and likelihood of bargaining breakdown. First, regarding grievances, "when political power is divided along ethnic lines, ruling elites can disproportionately favor their own ethnic group at the expense of others. This creates grievances that fall along ethnic lines" (199). Differences and discrimination are particularly likely to occur along ethnic lines because sources of economic and political power argued in the literature to create grievances are frequently distributed along ethnic lines (203). Research such as Cederman, Gleditsch and Buhaug (2013), Roessler (2016), Wucherpfennig, Hunziker and Cederman (2016), and Paine (2019*b*) have discussed historical and strategic factors that motivate exclusion along ethnic lines, and the discussion of Assumption 6 in the present paper discusses how ethnic group size affects this calculus.

Second, regarding opportunity, "ethnic groups tend to live together in concentrated spaces, sharing the same language and customs, and enjoying deep ties with ethnic kin. This means that ethnic groups, if they are aggrieved, will have an easier time mobilizing support to demand change" Denny and Walter (2014, 199). The model implicitly incorporates this aspect of ethnicity by assuming, in period 1, that the challenger has solved the collective action problem that both center-seeking and separatist rebellions pose. As Section D.2 discusses, territorial concentration is a particularly important factor for enabling a group to launch a separatist civil war.

Third, regarding the likelihood of bargaining breakdown, "the fact that ethnic identity tends to be less elastic than other types of identity means that credible commitments to any bargain—before and during a conflict—will be more difficult to make" (Denny and Walter, 2014, 199). Low elasticity arises from the descent-based criteria determining who belongs to which ethnic group, therefore making ethnic identity very difficult to change (Fearon, 1999). Roessler (2011, 313) proposes a related argument that in political environments where ethnicity is believed to be politically salient (which, in many cases, arose from colonial rule and other historical influences), ethnic identity can serve as an "information shortcut" for distinguishing loyalists from disloyal actors even if "competing elites are necessarily motivated by ethnic aims." The model implicitly incorporates this idea by treating members of the government's ethnic group and members of the challenger's ethnic group as distinct actors, although the commitment parameter θ may correspond with cross-cutting cleavages that can mitigate strains caused by membership in distinct ethnic groups.

C.2 Supporting Information for Assumption 2

Kalyvas and Balcells (2010) analyze rebel tactics—but not civil war aims—and conceptualize technologies of rebellion based on rebel and government strength. This includes irregular conflicts between weak rebels and a strong government, and conventional conflicts between strong rebels and a strong government. They provide a series of multinominal logit estimates that examine correlates of civil war tactics (Table 3 on pg. 425 of their article). They do not, however, examine civil war aims, and the interest here is to see if civil war aims correlate with civil war tactics. To do so, I coded civil war aims for each conflict in their list (which is similar to the civil war list used in Figure 1; their years span from 1944 to 2004) and added a separatist civil war indicator to the specifications in their Table 3, which includes a handful of control variables listed

below in Table C.1. They run multinomial logit models and compare the outcomes "conventional tactics" and "symmetric non-conventional wars"—their third category of civil war aims, in which both the rebels and government are weak—to the basis category of irregular tactics. Here, I estimate standard logit models with conventional tactics equaling 1 on the dichotomous outcome variable and irregular tactics equaling 0, thus ignoring symmetric non-conventional wars. The unit of analysis in Table C.1 is civil wars.

The table shows that separatist civil wars covary negatively and significantly with conventional tactics—indicating that separatism and irregular tactics tend to coincide. Using a multinomial logit model that additionally compares symmetric non-conventional wars to the basis category of irregular wars (not shown) yields a null correlation for separatist civil wars, as expected because both symmetric non-conventional wars and irregular wars involve guerrilla tactics.

Table C.1: Replicating Kalyvas and Balcells (2010) with Separatist Indicator

	DV: Civil war fought with conventional tactics					
	(1)	(2)	(3)	(4)	(5)	(6)
Separatist aims	-1.147**	-1.574***	-1.457***	-1.398**	-1.598***	-1.636***
	(0.498)	(0.525)	(0.510)	(0.568)	(0.569)	(0.589)
Rough terrain	0.00306	0.00224	0.00710	0.00184	0.00210	0.00271
	(0.00750)	(0.00383)	(0.00910)	(0.00383)	(0.00348)	(0.00567)
Ethnic war	0.596	0.746	0.135	0.491	0.612	0.125
	(0.493)	(0.477)	(0.540)	(0.510)	(0.496)	(0.555)
GDP/capita	0.104	0.0227	0.347**	0.113	0.0930	0.271
	(0.154)	(0.162)	(0.157)	(0.169)	(0.174)	(0.172)
Post-1990	1.381***			0.947*		
	(0.512)			(0.539)		
New post-communist country		3.255***			1.871	
		(1.211)			(1.394)	
Marxist rebels			-1.873***			-1.499**
			(0.593)			(0.591)
Military personnel				9.12e-05	6.22e-05	4.56e-05
				(0.000192)	(0.000193)	(0.000195)
# of civil wars	120	120	120	108	108	108

Notes: Table C.1 summarizes a series of logit models in which the dependent variable equals 1 if the civil war is fought using conventional tactics and 0 if fought with irregular tactics. The unit of analysis is civil wars, and the sample is all civil wars in Kalyvas and Balcells's (2010) dataset between 1944 and 2004, except symmetric non-conventional wars. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

D Supporting Information for Section 8

D.1 Separatist Civil Wars: Table 3 and Figure 10

Sample. The sample differs slightly from that in Figure 2. Because Figure 10 focuses only on separatist civil wars, it excludes ethnic groups without a concentrated territory to minimize heterogeneity in the estimates (see Section D.2).

The conditioning factors examined in Figure 10 are measured as follows.

Excluded minorities. Minorities are groups that EPR (Vogt et al., 2015) codes as composing less than 50% of their country's population. An ethnic group-year is coded as politically excluded if it is politically relevant and does not score any of the following on EPR's ethnopolitical inclusion variable: "MONOPOLY," "DOMINANT," "SENIOR PARTNER," or "JUNIOR PARTNER." Figure 7 uses the same political representation variable.

Favorable separatist geography. An ethnic group scores 1 on the favorable separatist geography variable if any of the following are true, and 0 otherwise: distance from the capital exceeding the median in the sample, mountainous percentage of territory higher than the median in the sample, and/or noncontiguous territory from the capital. Distance from capital calculated by author by combining GeoEPR with the CShapes dataset (Weidmann, Kuse and Gleditsch, 2010), and is measured using the distance from the ethnic group's centroid to the capital city. Percent mountainous is from Hunziker and Cederman (2017), who used Blyth (2002) for the source mountain data. The author coded noncontiguous territory from the country's capital.

Regression equation. For ethnic group index i, country index j, and year index t, the regression equation for Columns 2 and 3 of Table D.1 is:

$$\ln\left(\frac{Y_{it}}{1-Y_{it}}\right) = \beta_0 + \beta_O \cdot Oil_{it} + \beta_C \cdot Cond_{it} + \beta_{OC} \cdot Oil_{it} \cdot Cond_{it} + \boldsymbol{T}'_{it} \cdot \beta_T + \epsilon_{it}, \tag{D.1}$$

where $Cond_{it}$ is a conditioning variable that differs by column.

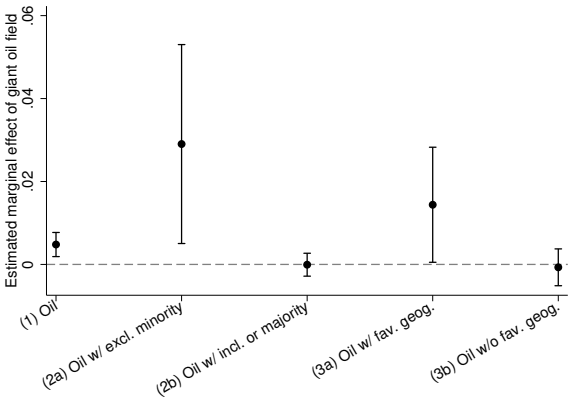
Table D.1: Regression Table for Figure 10

	DV: Separatist civil war onset		
	(1)	(2)	(3)
Giant oil/gas field	0.821***	0.208	0.280
	(0.304)	(0.775)	(0.727)
Excluded minority		1.114***	
		(0.367)	
Giant oil/gas field*Excluded minority		0.875	
		(0.828)	
Favorable geography			0.781**
			(0.328)
Giant oil/gas field*Favorable geography			0.591
			(0.794)
Ethnic group-years	24,552	24,552	24,552
Ethnic groups	599	599	599
Country FE?	NO	NO	NO
Time controls?	YES	YES	YES
		Marginal effects	
Giant oil/gas field, unconditional	0.00161**		
	(0.000654)		
Giant oil/gas field| Excluded minority		0.00451**	
		(0.00206)	
Giant oil/gas field | Included and/or majority		0.000176	
		(0.000703)	
Giant oil/gas field | Favorable geography			0.00311*
			(0.00168)
Giant oil/gas field | Unfavorable geography			0.000333
			(0.000958)

Notes: Table D.1 estimates Equation D.1. It summarizes a series of logit regressions by presenting the coefficient estimates for the substantive variables, with ethnic group-clustered standard errors in parentheses. Every regression contains peace years and cubic splines generated from the last year in which a separatist civil war was ongoing for each ethnic group, and a lagged country-level civil war incidence variable. The unit of analysis is ethnic group-years. The bottom of the table reports marginal effect estimates for different values of the conditioning variables, evaluated at coefficient means ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

Figure D.1 and Table D.2 estimate a regression equation identical to Equation D.1 except a country-specific intercept β_j replaces the constant intercept β_0.

Figure D.1: Figure 10 with Country Fixed Effects



Notes: Figure D.1 presents point estimates and 95% confidence intervals for a series of logit regressions described in Equation D.1 with an country-level intercept added, and Table D.2 provides the corresponding regression table.

Table D.2: Regression Table for Figure D.1

	DV: Separatist civil war onset		
	(1)	(2)	(3)
Giant oil/gas field	1.020***	-0.0349	-0.220
	(0.363)	(0.768)	(0.774)
Excluded minority		1.253**	
		(0.533)	
Giant oil/gas field*Excluded minority		1.757**	
		(0.783)	
Favorable geography			0.634
			(0.459)
Giant oil/gas field*Favorable geography			1.389
			(0.847)
Ethnic group-years	11,755	11,755	11,755
Ethnic groups	252	252	252
Country FE?	YES	YES	YES
Time controls?	YES	YES	YES
	Marginal effects		
Giant oil/gas field, unconditional	0.00582***		
	(0.00213)		
Giant oil/gas field | Excluded minority		0.0290**	
		(0.0122)	
Giant oil/gas field | Included and/or majority		-6.44e-05	
		(0.00141)	
Giant oil/gas field | Favorable geography			0.0144**
			(0.00708)
Giant oil/gas field | Unfavorable geography			-0.000694
			(0.00227)

Notes: Table D.2 estimates Equation D.1 with a country-level intercept added. It summarizes a series of logit regressions by presenting the coefficient estimates for the substantive variables, with ethnic group-clustered standard errors in parentheses. Every regression contains peace years and cubic splines generated from the last year in which a separatist civil war was ongoing for each ethnic group, and a lagged country-level civil war incidence variable. The unit of analysis is ethnic group-years. The bottom of the table reports marginal effect estimates for different values of the conditioning variables, evaluated at coefficient means $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

D.2 Territorial Concentration and Civil War Aims

Toft (2014, 191) summarizes existing evidence on the importance of territorial concentration for facilitating separatist civil war: "[R]egional concentration of a group within a circumscribed territory serves as a practically necessary condition for a self-determination movement and secessionist war to emerge (Toft, 2005). Why is this? It appears to be the case that group concentration (1) makes political organization easier over a compact territory, thus overcoming the collective action problem; (2) facilitates military operations; and (3) defines the territory over which claims can be made (Toft, 2005; Weidmann, 2009)."

Table D.3 presents two specifications. Using the same ethnic group sample as Figure 2, Column 1 regresses separatist civil onset on an indicator variable for territorial concentration, coded by EPR, and temporal dependence controls. The Column 2 specification is identical except the dependent variable is center-seeking civil war onset. The table shows that although territorial concentration is strongly and positively correlated with separatist civil war onset, there is no systematic relationship among center-seeking civil wars (p=0.697). The Column 1 regression shows only one case of a non-territorially concentrated launching a separatist civil war, Sahrawis in Morocco in 1976. The different correlations for the two types of war suggest that among Toft's proposed explanations for the importance of territorial concentration in facilitating separatism, the third is the most important, because center-seeking civil wars claim territory beyond that in which the group resides (however, this observation does not rule out that Toft's first two factors could also be more relevant for separatist than center-seeking wars: only separatist wars primarily involve fighting over the territory in which the group resides).

Table D.3: Territorial Concentration and Civil War Aims

Dependent variable:	Sep. CW onset	Center CW onset
	(1)	(2)
Territorially concentrated	0.00310***	0.000186
	(0.000827)	(0.000478)
Ethnic group-years	30,984	31,519
Ethnic groups	762	763
Time controls?	YES	YES

Notes: Table D.3 presents the marginal effect estimates from regressions of civil war onset (either separatist or center-seeking, with ongoing years set to missing) on a territorial concentration indicator using logit models with ethnic group-level clustered standard errors. Every regression contains peace years and cubic splines generated from the last year in which a war of the specified type was ongoing for each ethnic group, and a lagged country-level civil war incidence variable. $***p < 0.01$, $**p < 0.05$, $*p < 0.1$.

D.3 Rebel Finance Theories and Evidence for Onshore/Offshore Oil

The theory also offers a new explanation for why oil location matters, an important theme in recent research (Ross, 2015, 251). Most existing arguments posit that oil located near potential rebel groups makes conflict likely by providing rebels with an opportunity to steal oil production to finance their rebellion (Lujala, 2010; Ross, 2012). However, despite exceptional cases such as ISIS in Iraq and Syria, and the Niger Delta in the 2000s, rebel groups have rarely engaged in large-scale looting of oil production to finance an insurgency (Paine, 2016, 2019*a*). Instead, the present theory follows the better substantively grounded premise that governments control the preponderance of oil revenues (Colgan, 2015, 8), which follows from core properties of oil production such as high capital-intensity and fixed location (Le Billon, 2005, 34). Oil location matters in the present theory because oil production in a region with a politically excluded minority group is likely to trigger separatist conflict. Furthermore, in the theory, within-country location should not affect center-seeking civil wars because groups that consider fighting for the center are likely to have better

political representation.

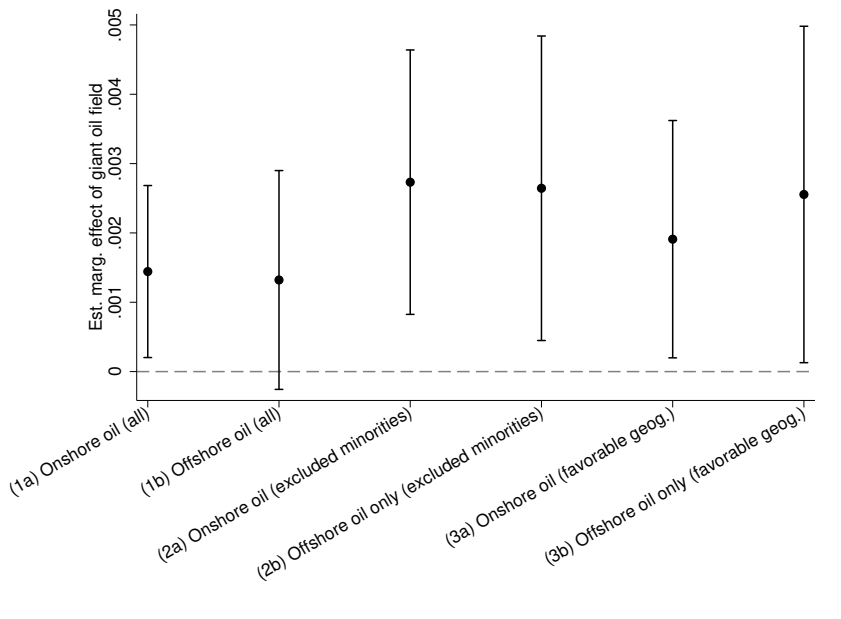
One different implication between the present theory and rebel finance theories that can be assessed statistically arises from distinguishing onshore versus offshore oil. The present theory suggests that this distinction should not matter because both should generate distributional grievances and separatist war if located near a politically excluded minority. By contrast, existing location theories anticipate no relationship between offshore oil production and separatist civil war because offshore oil is very difficult to loot (Lujala, 2010; Ross, 2012). This section shows that the oil-separatist findings are largely similar for onshore and offshore oil when assessing Hypotheses 1 and 2, and evidence from Angola (see Section D.5) provides additional evidence. However, because groups with only offshore oil production are empirically rare, the offshore correlation is based on a small number of cases.

More specifically, the results to this point have used a group-level oil indicator that codes a group as oil rich if it contains either an onshore oil field in its territory or a nearby offshore field. Figure D.2 disaggregates the oil variable into onshore oil and offshore oil. An ethnic group is coded as 1 on the offshore oil (only) variable if it contains at least one giant oil or gas field within 250 kilometers of a segment of the group's location polygon that touches the coast, and the group's territory contains no onshore giant oil or gas fields; and 0 otherwise. Horn (2003; 2015) provides giant oil and gas field data and GeoEPR (Vogt et al., 2015) provides ethnic group location. An ethnic group is coded as 1 on the onshore oil variable if it contains at least one giant onshore oil or gas field in its territory, and 0 otherwise. The regression equation for Figure D.2 and Table D.4 is:

$$\ln\left(\frac{Y_{it}}{1-Y_{it}}\right) = \beta_0 + \beta_N \cdot Onshore_{it} + \beta_F \cdot Offshore_{it} + \boldsymbol{T}'_{it} \cdot \beta_T + \epsilon_{it}, \tag{D.2}$$

where β_N is the coefficient estimate for onshore oil and β_F is the coefficient estimate for offshore oil.

Figure D.2: Disaggregating Onshore and Offshore Oil for Separatist Civil War Onset



Notes: Figure D.2 presents point estimates and 95% confidence intervals for a series of logit regressions described in Equation D.2, and Table D.4 provides the corresponding regression table. The dependent variable is separatist civil war onset, and the unit of analysis is ethnic group-years.

In Figure D.2 and Table D.4, Column 1 uses the same sample as in Figure 10, and Columns 2 and 3 consider more theoretically relevant samples by subsetting the data, respectively, to either excluded minorities (Hypothesis 1) or favorable separatist geography (Hypothesis 2). The figure shows that, among either excluded minorities or favorable separatist geography groups, onshore oil and offshore oil each positively and significantly covary with separatist civil war onset, and in the full sample specification (Column 1) the p-value for offshore oil is 0.101. The positive correlation for offshore oil goes against existing theories positing that it should not trigger separatism because offshore oil is difficult for rebels to loot. However, the positive offshore oil correlation is consistent with the present framework based on governments rather than rebel groups controlling oil revenues because the taxability of oil production does not depend greatly on whether it is onshore or offshore.

An important caveat for interpreting the results in Figure D.2 is that separatist civil war in oil-rich territories (onshore or offshore) is itself a rare event, and separatist civil wars in territories rich only in offshore oil are even rarer: Bakongo in Angola, Cabindan Mayombe in Angola, East Timorese in Indonesia, and Malay Muslims in Thailand (see Table 3). Therefore, although civil wars have occurred relatively more frequently in offshore oil-rich territories than in oil-poor territories (0.7% of group-years compared to 0.3% among excluded minorities), the offshore oil correlation is based on a small number of onset cases.

Table D.4: Regression Table for Figure D.2

	DV: Separatist civil war onset		
	(1)	(2)	(3)
Giant onshore oil field	0.00144**	0.00273***	0.00191**
	(0.000633)	(0.000973)	(0.000873)
Giant offshore oil field (only)	0.00132	0.00264**	0.00255**
	(0.000805)	(0.00112)	(0.00124)
Ethnic group-years	24,552	14,824	14,692
Ethnic groups	488	355	280
Time controls?	YES	YES	YES
Sample	Full	Excluded minorities	Favorable geography

Notes: Table D.4 estimates Equation D.2. It summarizes a series of logit regressions by presenting the coefficient estimate for the substantive variables, and ethnic group-clustered standard errors in parentheses. Every regression contains peace years and cubic splines generated from the last year in which a separatist civil war was ongoing for each ethnic group, and a lagged country-level civil war incidence variable. The unit of analysis is ethnic group-years. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

D.4 Center-Seeking Civil Wars: Table 4 and Figure 11

The government vulnerability variable used in Figure 11 is coded as follows.

Government vulnerability variable. A country-year is scored as 1 on the government vulnerability variable if any of the following three conditions are true, and 0 otherwise:

- *Lost war or violent independence.* This variable equals 1 if any of the following are true within the previous two years: defeat in international war (Correlates of War; Dixon and Sarkees 2015); executive turnover caused by government defeat in a center-seeking civil war (coded by author drawing from the list of civil wars used throughout the paper); government defeat in a separatist civil war, meaning rebels get significant autonomy concessions, de facto autonomy, or an independent state (coded from Fearon and Laitin's 2003 dataset); or independence from foreign occupation in which an internal war (i.e., war fought within the country's territory) occurred in the lead-up to independence (coded by author).
- *Oil shock decade.* Any year between 1973 and 1982, inclusive.

- *Arab Spring.* Any country in the Middle East and North Africa in 2011.

Regression equation. The regression equation for Column 2 in Table D.5 is:

$$\ln\left(\frac{Y_{jt}}{1-Y_{jt}}\right) = \beta_0 + \beta_O \cdot ln(oil/pop)_{jt} + \beta_V \cdot V_{jt} + \beta_{OV} \cdot ln(oil/pop)_{jt} \cdot V_{jt} + \beta_P \cdot ln(pop)_{jt} + \boldsymbol{T}'_{jt} \cdot \beta_T + \epsilon_{jt}, \tag{D.3}$$

where V_{jt} is an indicator variable for government vulnerability.

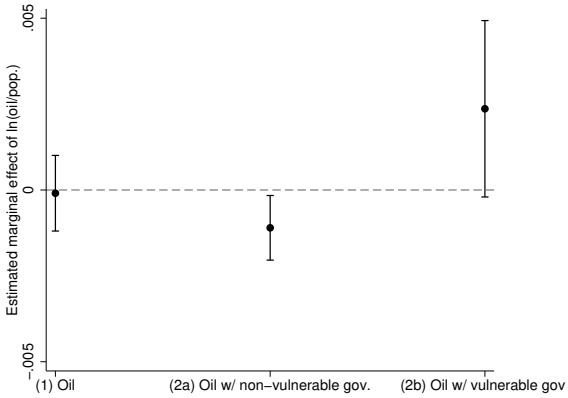
Table D.5: Regression Table for Figure 11

	DV: Center-seeking CW onset	
	(1)	(2)
ln(Oil & gas p.c.)	-0.0345	-0.163**
	(0.0457)	(0.0691)
Vulnerable		0.465
		(0.363)
ln(Oil & gas p.c.)*Vulnerable		0.250***
		(0.0894)
ln(Population)	0.187***	0.209***
	(0.0536)	(0.0560)
Country-years	6,828	6,828
Countries	150	150
Time controls?	YES	YES
	Marginal effects	
ln(Oil & gas p.c.), unconditional	-0.000721	
	(0.000945)	
ln(Oil & gas p.c.) | Vulnerable=0		-0.00242***
		(0.000921)
ln(Oil & gas p.c.) | Vulnerable=1		0.00358*
		(0.00217)

Notes: Table D.5 estimates Equation D.3. It summarizes a series of logit regressions by presenting the coefficient estimates for the substantive variables, with country-clustered standard errors in parentheses. Every regression contains peace years and cubic splines generated from the last year in which a center-seeking civil war was ongoing. The unit of analysis is country-years. The bottom of the table reports semi-elasticity marginal effects (because oil is logged) for different values of the conditioning variables, evaluated at coefficient means (note that the marginal effect estimate in Column 1 is identical to that in Column 2 of Table A.1).***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

The center-seeking civil war measure used in Figure 11 includes both ethnic—i.e., the rebel group made claims for and selectively recruited from a particular ethnic group—and non-ethnic center-seeking civil wars. Although the theoretical framework concentrates mainly on identity-based rebellions, the country-level implications are similar even for rebellions not organized around ethnicity: greater oil wealth provides the government with revenues it can use to spend on coercion and patronage. However, Appendix Figure D.3 shows that the marginal effect estimates are similar to those in Figure 11 when only analyzing ethnic center-seeking civil wars. The regression equation for Figure D.3 and Table D.6 is identical to Equation D.3, except the dependent variable is ethnic center-seeking civil war onset, and the peace years and cubic splines are generated from this variable.

Figure D.3: Ethnic Center-Seeking Civil War Onset



Notes: Figure D.3 presents point estimates and 95% confidence intervals for a series of logit regressions. Table D.6 is the corresponding regression table.

Table D.6: Regression Table for Figure D.3

	DV: Ethnic center CW onset	
	(1)	(2)
ln(Oil & gas p.c.)	-0.0121	-0.248**
	(0.0719)	(0.123)
Vulnerable		0.451
		(0.460)
ln(Oil & gas p.c.)*Vulnerable		0.389**
		(0.152)
ln(Population)	0.173**	0.219**
	(0.0841)	(0.0927)
Country-years	7,271	7,271
Countries	150	150
Time controls?	YES	YES
		Marginal effects
ln(Oil & gas p.c.), unconditional		-9.48e-05
		(0.000562)
ln(Oil & gas p.c.) | Vulnerable=0		-0.00110**
		(0.000480)
ln(Oil & gas p.c.) | Vulnerable=1		0.00236*
		(0.00131)

Notes: Table D.6 estimates Equation D.3 with the dependent variable changed to ethnic center-seeking civil war onset. It summarizes a series of logit regressions by presenting the coefficient estimates for the substantive variables, with country-clustered standard errors in parentheses. Every regression contains peace years and cubic splines generated from the last year in which an ethnic center-seeking civil war was ongoing. The unit of analysis is country-years. The bottom of the table reports semi-elasticity marginal effects (because oil is logged) for different values of the conditioning variables, evaluated at coefficient means.***$p < 0.01$, **$p < 0.05$, *$p < 0.1$.

D.5 Additional Evidence from Saudi Arabia and Angola

Offshore oil in Cabinda. Another intriguing aspect of the Cabinda case is that nearly all its oil is produced offshore (Le Billon 2007, 106; Porto 2003, 4), consistent with the findings in Figure D.2. In fact, the offshore location of Angola's oil may have been crucial for facilitating government control, given the country's major center-seeking civil war between independence in 1975 and 2002, by "insulat[ing] the industry from local communities and hostilities" (Le Billon, 2007, 106).

"Deviant" aspects of Angola. In additional to the "typical" aspects of the cases, Angola and Saudi Arabia also represent seemingly deviant patterns that the theory can help to reconcile. Angola was relatively oil-rich at independence, at $543 in oil income per capita, but experienced a center-seeking war. However, considering vulnerable governments' difficulties to accruing oil revenues to deter and buy off challengers (Hypothesis 3), the theory expects that oil will be ineffective at preventing attacks on the center. Various Angolan rebel groups fought Portugal for independence between 1961 and 1974. Although these groups struck a brief truce at independence, the opposition group UNITA never disarmed (Warner, 1991, 38-9), and major hostilities resumed after independence in 1975—in essence, continuing the decolonization struggle. Further contributing to government vulnerability, UNITA received considerable support from neighboring countries, including South Africa.

"Deviant" aspects of Saudi Arabia. The theory also provides insight into the absence of major separatist civil wars in Saudi Arabia's eastern province, which has produced the overwhelming majority of the country's oil wealth since discovery in the 1930s (Jones, 2010, 91-92). Although the region lacks any of the favorable geography conditions from Table 3—suggesting inherent difficulties to organizing a rebellion—the Shi'a are a politically excluded minority, which should encourage separatism. Despite theoretically ambiguous predictions—because Hypothesis 1 anticipates fighting but Hypothesis 2 does not—a closer look reveals considerable support for key model mechanisms. Failed labor strikes in the 1950s preceded widespread protests and demonstrations in 1979 and 2011 (Matthiesen, 2012). Jones (2010, 138-216) details how the unequal distribution of the country's oil wealth provided a central catalyst. For example, "Both before and after the [1979] uprising, oil and the Shiites' exclusion from oil wealth dominated the political discourse" (185). However, despite these grievances—as anticipated by political exclusion—the central government commanded considerable coercive ability in the region that dampened prospects for a broader rebellion, as anticipated by unfavorable geography for rebellion. "Although it is unlikely that local anxieties about the dislocations and failures of modernization had faded" during the peaceful period between the 1950s and 1979, "[t]he Saudi state became increasingly proficient at rooting out and oppressing dissenters" (176), including arresting and exiling many Shi'a political activists. Similarly, in 1979, the government used "overwhelming force to crush the Shiites" and responded by bolstering its police and intelligence forces—causing dozens of deaths among the thousands of protesters (218-9). Although the Iranian revolution in 1979 (led by Iranian Shi'a) and the Arab Spring in 2011 provided coordination devices that enabled temporary mobilization by Saudi Arabia's Shi'a to protest their frustrations over oil, repressive strength afforded by extracting oil revenues from the region enabled the government to prevent a major war.

References

Besley, Timothy and Torsten Persson. 2011. *Pillars of Prosperity: The Political Economics of Development Clusters*. Princeton, NJ: Princeton University Press.

Blyth, Simon. 2002. *Mountain Watch: Environmental Change & Sustainable Development in Mountains*. Number 12 UNEP/Earthprint.

Cederman, Lars-Erik, Kristian Skrede Gleditsch and Halvard Buhaug. 2013. *Inequality, Grievances, and Civil War*. Cambridge, UK: Cambridge University Press.

Christia, Fotini. 2012. *Alliance Formation in Civil Wars*. Cambridge University Press.

Colgan, Jeff D. 2015. "Oil, Domestic Conflict, and Opportunities for Democratization." *Journal of Peace Research* 52(1):3–16.

Collier, Paul and Anke Hoeffler. 2005. The Political Economy of Secession. In *Negotiating Self-Determination*, ed. Hurst Hannum and Eileen F. Babbitt. Lanham, MD: Lexington Books pp. 37–60.

Denny, Elaine K. and Barbara F. Walter. 2014. "Ethnicity and Civil War." *Journal of Peace Research* 51(2):199–212.

Dixon, Jeffrey S. and Meredith Reid Sarkees. 2015. *A Guide to Intra-State Wars: An Examination of Civil, Regional, and Intercommunal Wars, 1816-2014*. Washington, DC: CQ Press.

Fearon, James D. 1999. "Why Ethnic Politics and "Pork" Tend to Go Together." Working Paper, Department of Political Science, Stanford University. Available at http://fearonresearch.stanford.edu, accessed 7/4/18.

Fearon, James D. and David D. Laitin. 2003. "Ethnicity, Insurgency, and Civil War." *American Political Science Review* 97(1):75–90.

Fearon, James D. and David D. Laitin. 2013. "How Persistent is Armed Conflict?". Working paper, Department of Political Science, Stanford University. Available at https://web.stanford.edu/group/fearon-research/cgi-bin/wordpress/wp-content/uploads/2013/10/persistenceofarmedconflict.pdf. Accessed 11/16/17.

Flanders Marine Institute. 2016. "Shapefiles: Maritime Boundaries.". Dataset available at http://www.marineregions.org/downloads.php. Accessed 7/17/17.

Garfinkel, Michelle R. and Stergios Skaperdas. 2006. Economics of Conflict: An Overview. In *Handbook of Defense Economics, Vol. 2: Defense in a Globalized World*, ed. Todd Sander and Keith Hartley. Amsterdam: North-Holland pp. 649–710.

Geddes, Barbara, Joseph Wright and Erica Frantz. 2014. "Autocratic Breakdown and Regime Transitions: A New Data Set." *Perspectives on Politics* 12(2):313–331.

Gleditsch, Nils Petter, Peter Wallensteen, Mikael Eriksson, Margareta Sollenberg and Håvard Strand. 2002. "Armed Conflict 1946-2001: A New Dataset." *Journal of Peace Research* 39(5):615–637.

Haber, Stephen and Victor Menaldo. 2011. "Do Natural Resources Fuel Authoritarianism? A Reappraisal of the Resource Curse." *American Political Science Review* 105(1):1–26.

Horn, Mike. 2015. "Giant, Supergiant & Megagiant Oil and Gas Fields of the World.". Dataset available at https://worldmap.harvard.edu/data/geonode:giant_oil_and_gas_fields_of_the_world_co_yxz. Accessed 7/17/17.

Horn, Myron K. 2003. Giant Fields 1868-2003 (CD-ROM). In *Giant Oil and Gas Fields of the Decade, 1990-1999*, ed. M.K. Halbouty. Houston: AAPG Memoir 78.

Hunziker, Philipp and Lars-Erik Cederman. 2017. "No Extraction Without Representation: The Ethno-Regional Oil Curse and Secessionist Conflict." *Journal of Peace Research* 54(3):365–381.

Jones, Toby Craig. 2010. *Desert Kingdom: How Oil and Water Forged Modern Saudi Arabia*. Cambridge, MA: Harvard University Press.

Kalyvas, Stathis N. and Laia Balcells. 2010. "International System and Technologies of Rebellion." *American Political Science Review* 104(3):415–429.

Lacina, Bethany and Nils Petter Gleditsch. 2005. "Monitoring Trends in Global Combat: A New Dataset of Battle Deaths." *European Journal of Population/Revue européenne de Démographie* 21(2):145–166.

Laitin, David D. 2007. *Nations, States, and Violence*. New York: Oxford University Press.

Le Billon, Philippe. 2005. *Fuelling War: Natural Resources and Armed Conflicts*. Abingdon, VA: Routledge.

Le Billon, Philippe. 2007. Drilling in Deep Water: Oil, Business and War in Angola. In *Oil Wars*, ed. Terry Lynn Karl Mary Kaldor and Yahia Said. London, UK: Pluto Press pp. 100–129.

Lei, Yu-Hsiang and Guy Michaels. 2014. "Do Giant Oilfield Discoveries Fuel Internal Armed Conflicts?" *Journal of Development Economics* 110:139–157.

Lujala, Päivi. 2010. "The Spoils of Nature: Armed Civil Conflict and Rebel Access to Natural Resources." *Journal of Peace Research* 47(1):15–28.

Lujala, Päivi, Jan Ketil Rod and Nadja Thieme. 2007. "Fighting Over Oil: Introducing a New Dataset." *Conflict Management and Peace Science* 24(3):239–256.

Maddison, Angus. 2008. "Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD.". Available at http://www.ggdc.net/maddison/oriindex.htm. Accessed 4/10/16.

Matthiesen, Toby. 2012. "A "Saudi Spring?": The Shi'a Protest Movement in the Eastern Province 2011–2012." *Middle East Journal* 66(4):628–659.

Paine, Jack. 2016. "Rethinking the Conflict "Resource Curse": How Oil Wealth Prevents Center-Seeking Civil Wars." *International Organization* 70(4):727–761.

Paine, Jack. 2019*a*. "Economic Grievances and Civil War: An Application to the Resource Curse." *International Studies Quarterly* Forthcoming.

Paine, Jack. 2019*b*. "Ethnic Violence in Africa: Destructive Legacies of Pre-Colonial States." *International Organization* Forthcoming.

Porto, João Gomes. 2003. *Cabinda: Notes on a Soon-to-be-Forgotten War*. Institute for Security Studies. Paper 77.

Roessler, Philip. 2011. "The Enemy Within: Personal Rule, Coups, and Civil War in Africa." *World Politics* 63(2):300–346.

Roessler, Philip. 2016. *Ethnic Politics and State Power in Africa: The Logic of the Coup-Civil War Trap*. Cambridge University Press.

Ross, Michael L. 2012. *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations*. Princeton University Press.

Ross, Michael L. 2015. "What Have We Learned About the Resource Curse?" *Annual Review of Political Science* 18:239–259.

Ross, Michael L. and Paasha Mahdavi. 2015. "Oil and Gas Data, 1932–2014. Harvard Dataverse.". Harvard Dataverse. Accessed 7/17/17.

Sambanis, Nicholas. 2004. "What is Civil War? Conceptual and Empirical Complexities of an Operational Definition." *Journal of Conflict Resolution* 48(6):814–858.

Toft, Monica Duffy. 2005. *The Geography of Ethnic Violence*. Princeton University Press.

Toft, Monica Duffy. 2014. "Territory and War." *Journal of Peace Research* 51(2):185–198.

Vogt, Manuel, Nils-Christian Bormann, Seraina Rüegger, Lars-Erik Cederman, Philipp Hunziker and Luc Girardin. 2015. "Integrating Data on Ethnicity, Geography, and Conflict: The Ethnic Power Relations Data Set Family." *Journal of Conflict Resolution* 59(7):1327–1342.

Warner, Rachel. 1991. Historical Setting. In *Angola: A Country Study*, ed. Thomas Collello. Washington, D.C.: Federal Research Division, Library of Congress pp. 1–52.

Weidmann, Nils B. 2009. "Geography as Motivation and Opportunity: Group Concentration and Ethnic Conflict." *Journal of Conflict Resolution* 53(4):526–543.

Weidmann, Nils B., Doreen Kuse and Kristian Skrede Gleditsch. 2010. "The Geography of the International System: The CShapes Dataset." *International Interactions* 36(1):86–106.

World Bank, The. 2017. "Population, total.". Dataset available at http://data.worldbank.org/indicator/SP.POP.TOTL. Accessed 7/17/17.

Wucherpfennig, Julian, Philipp Hunziker and Lars-Erik Cederman. 2016. "Who Inherits the State? Colonial Rule and Post-Colonial Conflict." *American Journal of Political Science* 60(4):882–898.

Young, John. 2005. "John Garang's Legacy to the Peace Process, the SPLM/A & the South." *Review of African Political Economy* 32(106):535–548.