ECONOMIC HORIZONTAL INEQUALITY, COLLECTIVE GRIEVANCES, AND THE DURATION OF CIVIL WAR 1990-2009

Abstract: Why do some civil wars last longer than others? This thesis answers this question by utilizing the database by Cederman et al. (2015a) which combines group-level information on the deviation of the average income of ethnic groups from the national average (economic horizontal inequality) with civil war onset data from 1990-2009. Combining the onset date with the termination date provided by UCDP/PRIO this thesis finds statistically significant evidence, when performing a linear regression analysis, for the assertion that higher degrees of economic horizontal inequality between ethnic groups are related to longer civil war duration. Such disadvantaged groups create conditions conductive to long term rebel viability due to lower opportunity costs for rebel recruitment, and increased in-group solidarity as a result of group inequality. This thesis also test the proposition that differing degrees of economic group inequality impacts rebel (and government) preferences for either bargaining or conflict, however I fail to find any statistically significant effect applying a t-test analysis.
Introduction

The notion that war is destructive is self-evident. Civil war appears to be especially catastrophic. In the post-World War II - 2002 period the cumulative death toll as a consequence of civil war is approximately 20 million (Lacina and Gleditsch 2005). The socio-economic consequences are equally pernicious and often persist after conflicts officially come to an end. Public health (Ghobarahba et al. 2004), human capital (Chamarbagwala and Morán 2010), and economic growth and productivity (Collier 1999) are all negatively affected as a consequence. The longer such conflicts persist the more cumulative the negative consequences. For this reason the study of the underlying mechanisms related to the perpetuation of civil war should not only be of interest to academics, but even more so to policy makers invested in preventing and lessening the destructive consequences of civil wars. The pressing nature of this phenomenon is illustrated in figure 1 which shows that the incidence and duration of civil war has been steadily increasing since World War II. In this thesis the focus will be on the question why certain civil wars last longer than others.

Figure 1: Number and Duration of Civil Wars in Progress (duplicated from: Fearon 2004: 276).
Literature review on the duration of civil war

Literature review overview

Scholars used to regard the study of the continuation of civil war to be of secondary importance to research concerning the variables driving onset of civil war (Bleaney and Dimico 2011: 146), although the last two decades have produced a substantial body of scholarly work on this subject. There are three overarching themes that explain both theoretically and empirically the reasons why some civil war last longer than others. First, I discuss conditions that are favorable to rebel warfare. Second, the literature is discussed from a bargaining perspective. Third, I explain how changes in the balance of power between parties can prolong or shorten hostilities.

Rebel viability: economic and ethnic perspectives

A first set of conditions are those that ensure longer conflicts by increasing the (economic) viability of rebel groups. Conflict is costly and rebel recruitment organizations compete economically against other forms of employment. Lootable resources such as drugs, diamonds and oil are potentially a significant revenue stream which supports the viability and survivability of rebel groups, and provides an individual economic participation incentive for rebels (Lujala 2010: 15-7, DeRouen and Sobek 2004: 307). Ohmura refines the relation between resources and duration of civil war by differentiating between lootable and non-lootable resources such as off-shore hydrocarbon and primary diamonds. He argues successfully that non-lootable resources “provide a government with sufficient financial resources to reinforce its power. If natural resources change the balance of power in favor of the government, the duration of civil war is shortened” (Ohmura 2012: 9). Ethnic groups are theoretically more economically viable than non-ethnic groups due to their greater control over resources resulting from being geographically concentrated and from the financial support they receive from rich diaspora’s (Denny and Walter 2014: 204). Finally, poverty, measured as either low per capita income or high inequality, is also related to protracted civil war because of the lower opportunity costs of rebellion and recruitment (Collier et al. 2004: 255, 268, Cunningham et al. 2009: 587 among others).

Non-economic viability is also important. Denny and Walter identify several factors in the literature, which are especially but not exclusively conductive to groups based on ethnicity: geographical concentration provides for safe heaven, and common norms, culture and language translates into less incentives for free riding and a better ability to detect and punish transgressions (2014: 204, see also
Selway 2010: 112-3). Collier et al. find that ethnic fractionalization is related non-monotonically to duration (2004:263)\(^1\). “[P]olarized societies have longer wars [...] because they face lower within-group costs of coordinating a rebellion as compared to the same costs in highly diverse societies” (Sambanis 2002: 222, see also Gubler and Selway 2012: 209-10). An alternative explanation connects ethnicity and increased duration to exclusionary policies by dominant ethnic groups which leads to increased in-group solidarity and cost-resilience (Wucherpfennig et al. 2012: 111).

**Bargaining failures: information and commitment problems**

An additional perspective on the duration of civil conflict is to interpret war in general as a failure of bargaining. War occurs despite the fact that a bargaining solution would be less costly for both parties than war. The process of war is thought to reveal privately held information necessary for reaching a bargaining solution (Fearon 1995, Wagner 2000: 471-3). However, parties often have an incentive to misrepresent or withhold private information (Powell 2006: 170, Regan and Aydin 2006: 740). This problem is especially acute in civil wars because information on rebel capability is hard to obtain (especially in guerilla wars; see Walter 2009: 253), and rebels have strong incentives to keep this information private as it can be easily exploited by the government in repressive and combative efforts (Walter 2009: 244-5). In relation to civil war specifically there are two primary ways to overcome or minimalize information problems: with the guidance of third party mediation (Regan and Aydin 2006: 739-40, 747-54), and to decrease the amount of veto-arrangements (Cunningham 2006: 877-81, see also Tsebelis 2002 for the game theoretical argument) such as external third party interventionists (Cunningham 2006: 890-1), or various institutional constraints on (executive) power (Thyne 2012: 309-10).

An additional issue in the bargaining literature is the problem of commitment. Commitment problems occur when at least one of the parties has an incentive to renege on the bargaining agreement. The cause for this problem is fluctuations in future bargaining power (Powell 2006: 171-2). This problem is especially acute in civil wars due to often vast differences in relative capabilities in favor of the government, and because rebels are expected to demobilize and transfer territory back to the state after settlement. Why would the government honor the settlement after rebel disarmament and not

\(^1\) See Brandt et al. 2008 for an expanded model of the effect of ethnic (and religious) fractionalization on duration and civil war outcomes.
renge on the agreement (Walter 2009: 246, 254, DeRouen and Sobek 2004: 307)? Certain domestic institutions can intensify or diminish the commitment problem in relation to civil war duration (see, e.g., Hartzell et al. 2001: 202-3, Metternich 2011: 914-5, 930-1, Cunningham et al. 2009: 585, Thyne 2012: 311-2, Uzonyi and Wells 2016: 307, Elbadawi and Sambanis 2002: 10, 16). Rebel group characteristics can also be used to explain duration from the perspective of commitment problems. Ethnic wars last longer than non-ethnic ones because group membership is relatively fixed and changes in predictable ethnic demographics over time effects future bargaining power (Denny and Walter 2014: 206-7). The principal way to overcome commitment problems is by third party verification and settlement enforcement, (Walter 2009: 255, Uzonyi and Wells 2016: 295).

**Balance of power and power parity**

A third set of variables and theories deals with the balance of relative capabilities. The intuitive idea of external intervention in civil wars is to decrease duration by tipping the scales overwhelmingly to one side so that the other is forced to settle or capitulate (Regan 1996: 340). Regan identifies several conditions for successful intervention in civil wars: a mixed strategy of both economic and military methods, and supporting the government side instead of the rebels (1996: 349-52). The reason for this is that economic (Escribà-Folch 2010: 131-3, 140) and military sanctions (Elbadawi and Sambanis 2002: 2) can reduce civil war duration by decreasing optimistic forecast errors of victory. Factors which appear to increase duration include conventional weapons transfer to government forces (Moore 2012: 335-6, 342), media reporting on human rights abuses (Burgoon et al. 2015: 231, 250), and signaling of intervention by interstate rivals on the side of the rebels (Akcinaroglu and Radziszewski 2005: 350-1, 369). One of the other insights in relation to the balance of relative capabilities is that situations of power parity are actually conductive to settlement resulting in decreased duration (Hultquist 2013: 625-6), because both parties are thought to be in a mutually hurting stalemate (see Zartman 2001: 8-9) after private information becomes public as a result of war and information asymmetries between them dissolve.

**Horizontal inequality and the duration of civil war**

The factors described above have all been theoretically and empirically connected to the duration of civil war. Some of these factors also explain the onset of civil war. However, Collier et al. (2004) were
among the first to theorize and empirically demonstrate that the causes frequently associated with the *onset* of civil war are often different from the factors driving the *duration* of civil war. Most factors associated with increased risk of onset of civil war have already been applied with both qualitative and quantitative methods on research designs regarding the duration of civil war. One factor which has already been associated with the onset of civil war but to my knowledge not yet with duration is economic horizontal inequality. The research question is: what is the effect of economic horizontal inequality on the duration of civil war?

**Relative deprivation and (group) inequality**

Horizontal inequality is linked to collective acts of violence such as civil war by the theory of relative deprivation. Relative deprivation is the individual experience of a negative comparison vis-à-vis another person on the basis of a discrepancy between actual achieved welfare and expected welfare which they feel justifiably entitled to. If this inequality is deemed to be illegitimate, or more precisely, to be caused by the *other* frustration occurs and there is a potential for aggression. Frustration, anger and resulting aggression are understood to be a function relative to the *degree* of relative deprivation. The more extreme the deprivation and inequality the more potential for aggression (towards the frustrating agent) (Gurr 1968: 252-5). This argument is famously sets forth by Gurr in his seminal work *Why Men Rebel* (2016 [original: 1970])². Gurr links individual relative deprivation to group mobilization into collective acts of protest and rebellion under the condition that they have a shared cultural identity and experience collective grievances as a result of oppression (1993a: 166-7³). Although Gurr did not use the term this is where horizontal inequality comes into play⁴. Horizontal inequality is the degree of disparity between pre-defined groups in regards to a certain condition or dimension (Stewart 2010: 2). These pre-defined groups are for the most part ethnic groups, especially because limited mobility between ethnic groups makes horizontal inequality more critical (Østby 2003: 3-4, 21). As discussed in the literature review ethnic groups are uniquely qualified to overcome collective action problems and

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² Some trace the implicit origins of the link between frustration-aggression and relative deprivation to Dollard et al. (1939) (see Džuverovic 2013: 118, Gurney and Tierney 1982: 36), or even to Marx and Tocqueville (Gurney and Tierney 1982: 33).
³ See Gurney and Tierney 1982: 37 for an overview of authors who question the assumption of homogeneity among group members regarding motivation and action. Also see Walker and Pettigrew 1984: 302-5 for a conceptual critique against the idea of consolidating egoistic (individual) and fraternalistic (collective) relative deprivation.
⁴ See Stewart 2000, and 2002 for the initial conceptualization and collection of case studies regarding horizontal inequality.
ensure long term rebel viability. Their shared identity facilitates group mobilization necessary for organizing collective violence and prospective bargaining. Ethnic identity in combination with the suffering and oppression by the other, which they experience collectively, can actually be mutually reinforcing (Gurr 1993b: 127).

The effect of inequality and relative deprivation has been thoroughly empirically investigated. Inequality and relative deprivation have been connected to differing expressions of individual or collective acts of frustration and (potential) aggression. It has been linked to e.g., the intention to engage in collective protest (Grant and Brown 1995: 208), individual desirability for revolution (MacCullouch 2005: 114), and violent crime rates (Fajnzylber et al. 2002: 25-6) including homicide (Jacobs and Richardson 2008: 37-41). And most importantly for our purposes, it is also related to collective acts of violence such as civil war onset (Stewart 2002, Cederman et al. 2015a among others), and civil war casualties (Mancini 2005: 31-2, Murshed and Gates 2004: 12-3, Østby et al. 2011: 395). The question that I will attempt to answer in this thesis is if this relation to civil war is similarly relevant for the dynamics surrounding civil war duration.

The difference between relative deprivation and horizontal inequality is that those groups that are at the top and relatively well-off don’t experience relative deprivation (in contrast to relatively poor groups), but can equally well start civil wars due to their high degree of horizontal inequality (Stewart 2009: 6, see also Cederman et al. 2015a: 814). The data sources on horizontal inequality (see below) allows one to differentiate between these relatively rich and relatively poor groups. I make this distinction because I expect the mechanisms driving civil war duration to be different between these kinds of groups. I expect that the argument (see below) for lower opportunity costs and greater in-group solidarity in groups with higher horizontal inequality to be valid for poor groups and not for rich groups, while I expect the framework regarding prospective payoff structures to be equally valid for both types of groups.

**Horizontal inequality, opportunity costs, and in-group solidarity**

Our main argument in this thesis is that not only is collective relative deprivation often at the root of incidences of collective violence like civil wars, but a high degree of these horizontal inequalities actually perpetuates protracted conflict. The first proposition is that higher horizontal inequalities increase the
economic viability of rebel groups due to lower opportunity costs for rebel recruitment, and as a consequence increases duration of civil wars. An opportunity cost is: “[t]he value of the good, service, or time forgone to obtain something else” (Brue et al. 2010: 4). The core idea is that the opportunity costs for joining a rebel group are lower for individuals that are part of poor groups than for those are closer to or even above the average in terms of income. In an international context this means the following: the average Burmese earned 1,161.5US$ per year (in 2015), while the average American earned 56,115.7$ per year (in 2015) (World Bank 2017). Provided that the costs of rebellion are equal between these cases, the American has higher opportunity costs in that he has to forego more income in order to join the rebellion. The same logic applies within groups: the poor farmer has more economic incentive to join the rebellion than the rich banker of the same ethnic group. Thus, the costs of rebel recruitment are lower the greater this inequality (Collier et al. 2004: 255). Cheap labor increases the economic viability of rebel groups and increases prospects for victory, or at least preventing complete defeat, by using scarce funds for other critical purposes.

Also, the lower the average income of the group the higher the chance that rebellion itself is actually more profitable than employment as a civilian. This is especially true in cases where rebels can exploit natural resources for financial gain. This idea of rebellion-as-predation has a long empirically well-established history. Resource predation is linked to both onset of civil war (see Collier and Hoeffler 2002 among others) and increased duration (see literature review above). Predation by rebel groups does not have to focus on resources alone, but can also take the form of e.g., looting, pillaging and extortion of the local civilian population (see Keen 2005). In these kind of situations rebels are less interested in settlement because they already personally profit from the civil war and have a vested interest in its continuation. Such situations are more likely if horizontal inequalities are more extreme. The critical difference between Collier et al. (2004) and my own research regarding the claim that inequality effects duration negatively is the selected unit of analysis. They use aggregated country-level data, while I use group-level data. The core theoretical argument is similar.

Non-economic motivations are likewise of importance in relation to individual considerations of joining the rebellion as horizontal inequalities between groups can be exploited as a recruitment tool to

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5 The interplay between inter- and intragroup inequality also theoretically effects rebel recruitment and costs, but is beyond the scope of this thesis due to data limitations.
capitalize on grievances that need not be of a strictly individualistic economic nature. Witnessing the suffering and oppression of those that are part of your in-group is likely to boost rebel recruitment (Gurr 1993a: 189). In-group solidarity combined with oppression by the other promotes recruitment and resilience to costs (Wucherpfennig et al. 2012: 111). As discussed above frustration, anger and resulting aggression are understood to be a function relative to the degree of relative deprivation. For this reason I expect that groups with higher relative horizontal inequality experience stronger in-group solidarity.

The result is increased civil war duration as demonstrated by Wucherpfennig et al. in their study on state repression of ethnic groups (2012: 111). Macours also provides evidence for this claim in her case study on the Nepalese civil war (1996-2006). She concludes that “Maoist leadership targeted recruitment efforts to districts where inequality [in terms of landholdings] had increased, to maximize the returns to their recruitment. A remaining question is whether this targeting was successful in generating high returns” (2011: 18). The supporting evidence for the theory is indirect in the sense that rebel leaders increased recruitment efforts while its relation to actual recruitment could not be observed directly.

I expect both economic incentives in the form of low opportunity costs and in-group solidarity to work in conjunction to ensure long term rebel viability, and thus as a consequence, longer civil war duration. It is obvious that the expectations as described above are valid for those groups with an average income below the national average, especially in relation to lower opportunity costs. It is not apparent that the analysis also applies to rich groups with an average income above the national average as they don’t experience the relative deprivation necessary for increased in-group solidarity. For this reason the hypotheses are summarized as follows:

\[ H_1: \text{Relatively poor ethnic groups are more likely to be involved in civil wars with a longer duration than those whose average income is closer to the country average.} \]

\[ H_2: \text{Relatively wealthy ethnic groups are not more likely to be involved in civil wars with a longer duration than those whose average income is closer to the country average (null hypothesis).} \]

**Horizontal inequality and payoff structures**

Our second argument is that horizontal inequalities effect prospective payoff structures. In the literature review I discussed how information and commitment problems can prevent civil war parties from
reaching a bargaining agreement. In contrast, the relation between horizontal inequalities and civil war duration concerns the changes in the costs and benefit analysis associated with the two alternatives to the status quo (war): the status quo ante (ceasefire), and bargaining (settlement). See table 1 below for the stylized version of the argument. I take my cue from Collier et al. who argue that high inequality makes reaching a bargaining agreement less likely than in a situation of low inequality because the gains from a prospective victory are higher (2004: 255). In other words: the winner takes all, and the reward for continuing hostilities and attempting to achieve total victory is larger if the initial negotiating position of the parties are more divergent.

The last outcome of civil war is a return to the status quo ante. This outcome is also unlikely under high horizontal inequality because of commitment problems that would result in a return to the demobilized rebels being oppressed again. According to Balch-Lindsay and Enterline severe political grievances, expressed in the theoretical framework as high economic horizontal inequality, are expected to undermine the political legitimacy of the government and so rebels are less likely to agree to a return to the status quo ante, thereby increasing civil war duration (2000: 622). If they do decide to participate in negotiations with the government they are more likely to demand additional compensation for past injustices and oppression on top of the claim for more equality in the future. Hegre echoes this statement: “[i]f for instance the goal is release from repression, wars should be longer the more severe is the prewar repression” (2004: 245). The move towards equality as a result of settlement is more costly from the perspective of the government the higher the initial inequality, especially if compensation for past injustices is demanded. Such a deal is less stable due to more divergent starting positions, and due to the fact that the incentives to renege are much higher as a function of the high costs associated with enforcing the peace agreement and the relatively low opportunity costs of returning to a state of war.

Suppose e.g., a settlement is just reached between a government and an incredibly poor ethnic group which includes the introduction of strict measures of progressive taxation in favor of the poor ethnic group in an effort to decrease extreme economic horizontal inequalities. This places an enormous financial burden on the state which is now contractually obligated to use its coercive powers in favor of extreme income distribution. These costs are dependent on the initial degree of economic horizontal inequality. The situation with an incredibly rich ethnic group is equally problematic in terms of prospects.
for settlement, because the government will be worse off as the rich group will now demand a bigger piece of the pie in the form of e.g., greater resource rents. The prospective agreement becomes inherently less stable because the increased costs for the government raises its incentive to renege on the bargaining agreement. It is also likely that the poor or rich ethnic groups have an understanding of this incentive to rebel and as a result will not enter into negotiations with the government in the first place. In general I make the claim that the higher the costs associated with option x (settlement), the lower the opportunity costs for staying with or returning to option y (war) and the more likely it is that both parties favor continued warfare.

<table>
<thead>
<tr>
<th>X</th>
<th>Status quo (war)</th>
<th>Status quo ante (ceasefire)</th>
<th>Bargaining (settlement)</th>
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<tbody>
<tr>
<td>High HI</td>
<td>More likely (+)</td>
<td>Less likely (-)</td>
<td>Less likely (-)</td>
</tr>
<tr>
<td>Low HI</td>
<td>Less likely (-)</td>
<td>More likely (+)</td>
<td>More likely (+)</td>
</tr>
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Table 1: Expected changes in payoff structures for groups experiencing high or low horizontal inequality (HI).

There is no reason to suspect that relatively poor or rich groups would respond differently to payoff structures. The hypothesis is thus summarized as follows:

\[ H_3: \text{Civil wars characterized by high economic horizontal inequality are more likely to result in continued warfare}^6 \text{ instead of bargaining solutions}^7 \text{ than those that are characterized by low economic horizontal inequality.} \]

**Measurements and data**

**Concept validity**

Measuring horizontal inequalities is not a straightforward process, because it is a multidimensional concept. Stewart identifies four dimensions: economic, social, political, and cultural (2010:2). For a researcher to a-priori decide that certain dimensions are more salient than others without directly interviewing the individual regarding his/her subjective perspective on the relative importance of horizontal inequality dimensions results in decreased validity. In absence of such facts, there are

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6 Resulting in rebel wins/losses, or conflicts dying down due to low activity.

7 Resulting in peace and cease fire agreements.
satisfactory theoretical reason to assume high correlation between the different dimensions of horizontal inequality as there is a certain degree of interdependence between them (Brown and Langer 2010: 30). E.g., economic means can provide access to health services and political access. Political access can result in establishing favorable hiring practices for ones in-group. However, due to data restrictions (see below) I am only able to include economic horizontal inequalities in terms of average group income.

**Unit of analysis: group- or country-level**

The second difficulty in measuring horizontal inequalities concerns the unit of analysis. Measurements of vertical inequality naturally take an aggregate form and are constructed at the country level unit of analysis. With horizontal inequality there is also the option of doing a group level analysis. Country level approaches to the analysis of the duration of civil war have been critiqued from the understanding that civil war is above anything else a conflict between groups (dyads) (Sambanis 2002: 239, Hulquist 2013: 633, Cunningham et al. 2009: 571). Country level aggregates are therefore considered inadequate or at a minimum incomplete. A crucial way in which they are incomplete is because they are system-level indicators of inequality in the same manner vertical measures of inequality in aggregated country form are. Without additional information on which groups or individuals actually engage in conflict one can never directly demonstrate their impact on civil war duration. This is an often repeated error in inequality research in general where e.g., homicide rates are correlated with overall inequality in the entire population instead of an indicator comprised of only the aggregated inequality position of murder suspects/convicts (see e.g., Jacobs and Richardson 2008). Whenever one finds himself in the situation where information regarding the inequality of specific groups/individuals exists one should preference such an approach.

**Data sources for economic horizontal inequality indicators**

Aside from theoretical considerations options are limited from the perspective of data availability. The study of horizontal inequality is relatively new and for this reason databases on this subject are scarce. This is especially true when one considers my demand for a large-N research design which incorporates the following elements: worldwide coverage, data from, at a minimum, the end of the Cold War,

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8 For an exception to this assertion of interconnectedness see Justino et al. 2004.
9 For a discussion on the issues surrounding the construction of country-level indices of horizontal inequality see Mancini et al. 2008.
collected from reputable, and ideally, multiple data sources. Earlier attempts to create large databases on horizontal inequalities were either regional in scope (Østby et al. 2009), or limited to developing countries only (Østby 2008). Østby (et al.) (2008, 2009) constructs country-level variables for horizontal inequality based on the Demographic and Health Survey Program. Using this survey data is problematic because the Demographic and Health Survey Program data quality is not consistent across countries (Cederman et al. 2011: 483), especially those that have experienced civil war, and is prone to problems surrounding standardization due to self-reporting of ethnicity (Cederman et al. 2015a: 808). Due to the advances in data collection and analysis regarding horizontal inequality I will not be using Østby’s data. This forces me to forego a country-level approach because the databases created by other scholars (Cederman et al. 2011, Cederman et al. 2013, Cederman et al. 2015a) use (ethnic) groups as their unit of analysis. Although it is possible to construct country-level indices from group level data (see Jayaraj and Subramanian 2006: 127-32) the absence of data on intra-group inequality from the public database makes this impossible as one would need to have access to the raw data. For these reasons I choose an exclusive group-level analysis and use the most up-to-date database by Cederman et al. (2015a).

Independent variable: economic horizontal inequality

The independent variable is economic horizontal inequality. To my knowledge the dataset by Cederman et al. (2015a) is the most extensive dataset with worldwide coverage over an extended period of time on economic horizontal inequalities in the context of civil war. They have created an economic horizontal inequality indicator comprised of three separate datasets: survey data, G-Econ data, and night light emissions data. Cederman et al. (2015a) overlap this economic geocoded data with the Ethnic Power Relations dataset which combines statistics on ethnicity and geo-location. In circumstances where ethnicity cannot be accurately geocoded due to ethnic overlap such as in urban areas (Cederman et al. 2015a: 812) they use survey data from the Demographic and Health Survey Program, the Luxemburg Income Study, the World Values Survey, and the Afrobarometer which

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10 This dataset is publicly available at https://www.prio.org/JPR/Datasets/.
11 http://gecon.yale.edu/ See also Nordhaus 2006.
12 https://ngdc.noaa.gov/eog/
13 For details regarding the weighing of these data sources see Cederman et al. 2015a: 811. And for details concerning data weaknesses and measurement complications see Chen and Nordhaus 2010: 1-2, 7, 13, and Cederman et al. 2015a: 808-9.
14 https://icr.ethz.ch/data/epr/geoepr/
15 https://dhsprogram.com/Data/
combines self-identified survey results of (household) income and ethnicity. The last step is to actually calculate economic horizontal inequality for each group. “Since our inequality measure is a ratio, we log-transform it before computing the weighted sum, and re-transform it afterwards ... [W]e use a straightforward group-level measure of economic horizontal inequality. Letting $y_g$ denote per capita income of the ethnic group, and $y_c$ average per capita income of all groups in the country, we measure inequality asymmetrically with two variables that correspond to groups that are poorer and wealthier than the country average, respectively:

$$
Low = \begin{cases} 
\frac{y_c}{y_g}, & \text{if } y_g > y_c \\
1, & \text{otherwise}
\end{cases}
$$

$$
High = \begin{cases} 
\frac{y_g}{y_c}, & \text{if } y_g < y_c \\
1, & \text{otherwise}
\end{cases}
$$

This operationalization guarantees that deviations from the country mean are always positive numbers above 1. For example, a group that is twice as wealthy as the average has $Low = 1$ and $High = 2$, and a group that is three times poorer, has $Low = 3$ and $High = 1^{-}$ (Cederman et al. 2015a: 811). They have now calculated the economic horizontal inequality, understood as the group-deviation from the national average per capita income, of ethnic groups. Ethnic groups are linked to rebel groups based on significant participation of the former in the latter and statements of representation of the interests of the former by the latter (Cederman et al. 2011: 484)\(^{19}\). It is important to note that these measures of economic horizontal inequality are static and not time varying as a result of the limited research design by Cederman et al. (2015a: 811-2). They justify this decision by the relatively fixed position of economic horizontal inequality over time (Cederman et al. 2015b: 9-10, see also Stewart 2010: 4).

**Dependent variable: duration of civil war**

The dependent variable is the duration of civil war. As argued above duration is measured at the dyadic level. I measure duration in the smallest possible time-frame: days. In order to measure duration in days one needs to know two data points: when do civil wars begin, and when do they end? Bleaney and Dimico identify five different definitions of civil war onset prominent in the literature. The constant between these five definitions is that they “define civil war as a conflict between the government and an

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\(^{17}\) [http://www.worldvaluessurvey.org/WVSOnline.jsp](http://www.worldvaluessurvey.org/WVSOnline.jsp)

\(^{18}\) [http://www.afrobarometer.org/data](http://www.afrobarometer.org/data)

\(^{19}\) This step is not made explicit in Cederman et al. 2015a. I assume it was accidentally omitted. Database used: Non-State Actor dataset (Cunningham et al. 2009).
organized rebel group, but they differ mainly with respect to the death-threshold applied to define a civil war” (2011: 147). The most minimal definition has a threshold of 25 battle related deaths per year (UCDP/PRIO Armed Conflict Dataset\(^\text{20}\)), while the most strict definition has a threshold of 1000 battle related deaths over the duration of the conflict (COW\(^\text{21}\)). The average correlation between the five datasets regarding onset is 0.42, and 0.59 for the civil war end date (Bleaney and Dimico 2011: 147-8). Bleaney and Dimico interpret these results as suggesting these five definitions practically measure the same concept. A claim which they also back up empirically by testing the robustness across datasets of commonly used control variables on the duration of civil war (Bleaney and Dimico: 2011: 147-8, 150).

For this reason this thesis will use the most inclusive minimal definition of the dyadic version of the UCDP Conflict Termination Dataset version 2-2015\(^\text{22}\) for data regarding civil war onset and termination. They define civil war as: “a contested incompatibility that concerns government and/or territory where the use of armed force between two parties, of which at least one is the government of a state, results in at least 25 battle-related deaths” (Harbom: 2009: 1). The conditions for establishing termination depend on whether a conflict results in: a peace agreement, ceasefire, victory for either rebels or the government, dies down due to low activity, or due to actor transformations (see Kreutz 2016: 2-4)\(^\text{23}\).

Control variables
I include two control variables from Cederman et al. (2015a) which are often incorporated in civil war duration analysis on the country level:

- “GDP per capita of the country, logged and lagged, see Penn World Table 7.0 (Heston [et al.] 2011).
- Population size of the country, logged and lagged, see Penn World Table 7.0 (Heston [et al.] 2011)” (2015a: 812).

See Appendix 1 for the coding rules constructed for the variables.

\(^{20}\) https://www.prio.org/Data/Armed-Conflict/UCDP-PRIO/
\(^{21}\) http://www.correlatesofwar.org/data-sets/COW-war
\(^{22}\) http://ucdp.uu.se/downloads/ (Kreutz 2010)
\(^{23}\) For a detailed overview of the measurement, estimation and modeling issues surrounding duration such as the violation of observation independence as a result of reoccurrence of civil war and selection bias issues see Gates and Strand 2004.
Results

Civil war duration analysis

Table 2 reports the results of the duration analysis for ethnic groups below the country’s average per capita income. A simple linear regression analysis is used. Model 1 shows strong support for the first hypothesis. For every cumulative 50% decrease in average group income from the country average the expected duration increases with 428.19 days with a standard error of 227.08 days. This result is statistically significant at p < .1. The effect of both control variables on duration for poor ethnic groups are statistically insignificant. The results improve significantly if a single outlier is removed from the analysis (Model 2). On January 19, 1990 the former Soviet Union declared a state of emergency in the city of Baku in what is currently known as the country of Azerbaijan due to fears of a move towards Azerbaijani independence. The UCDP database codes this event as a brief two day civil war between the Soviet Union and the Azerbaijani Popular Front. Although the event is technically coded as a civil war I question this coding on the basis that this observation is frequently referred to as the January Massacre and is better classified as a violent Soviet crackdown executed in order to prevent a civil war which resulted in the massacre of upward of 137 civilians and 700-800 injured (Halilov 2001). The problem with this observation is that it decreases the explanatory power of the model substantially as the event itself is the opposite of what hypothesis 1 predicts: extreme short duration (2 days, average: 1172, standard deviation 1199.67) in combination with extreme high economic horizontal inequality (3.73 times below the country’s average, average: 1.62, standard deviation: 0.94). Removing this outlier improves the results in the following manner. For every cumulative 50% decrease in average group income from the country average the expected duration increases from 428.19 days (model 1) to 564.69 days (model 2) with a standard error of 202.36 days. This result is statistically significant at p < .05. Explained variance (R²) increases from .252 to .445. Both control variables are again statistically insignificant. I understand that not all readers will agree with my decision to remove this outlier, but I believe I established a convincing case in favor of its removal from the model.

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24 All statistical analyses have been conducted using IBM SPSS Statistics 20.
ECONOMIC HORIZONTAL INEQUALITY, COLLECTIVE GRIEVANCES, AND THE DURATION OF CIVIL WAR 1990-2009

<table>
<thead>
<tr>
<th></th>
<th>model 1</th>
<th>model 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group average deviation from the country’s average per capita income</td>
<td>428.194* (227.081)</td>
<td>564.686** (202.335)</td>
</tr>
<tr>
<td>GDP per capita (log, t–1)</td>
<td>133.922 (169.683)</td>
<td>249.921 (152.487)</td>
</tr>
<tr>
<td>Population (log)</td>
<td>113.095 (125.024)</td>
<td>172.623 (110.177)</td>
</tr>
<tr>
<td>Constant</td>
<td>-1946.872 (1765.791)</td>
<td>-3616.271 (1639.95)</td>
</tr>
<tr>
<td>Observations</td>
<td>24</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 2: Civil war duration analysis of poor ethnic groups below the country’s average per capita income 1990-2009. Standard errors in parentheses. *p < 0.1, **p < 0.05.

Table 3 reports the result of the duration analysis for ethnic groups above the country’s average per capita income. The null hypothesis (model 3) is confirmed on the basis that none of the variables has a statistically significant influence on duration.

<table>
<thead>
<tr>
<th></th>
<th>model 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Group average deviation from the country’s average per capita income</td>
<td>-84.818 (401.127)</td>
</tr>
<tr>
<td>GDP per capita (log, t–1)</td>
<td>180.819 (412.987)</td>
</tr>
<tr>
<td>Population (log)</td>
<td>-92.538 (303.348)</td>
</tr>
<tr>
<td>Constant</td>
<td>1398.983 (4234.462)</td>
</tr>
<tr>
<td>Observations</td>
<td>23</td>
</tr>
</tbody>
</table>

Table 3: Civil war duration analysis of rich ethnic groups above the country’s average per capita income 1990-2009. Standard errors in parentheses. *p < 0.1, **p < 0.05.

Civil war outcome analysis

A dichotomous variable based on civil war outcome is created and I also combine economic horizontal inequality measures for poor and rich ethnic groups into one newly created variable. This allows one to test hypothesis 3 regarding the relation between outcome and degree of economic horizontal inequality. I predicted that civil wars characterized by high economic horizontal inequality are more likely to result in continued warfare\(^{25}\) instead of bargaining solutions\(^{26}\) than those that are characterized by low economic horizontal inequality. This hypothesis was rejected on the basis that the means of the outcome groupings were not statistically significantly different from each other\(^{27}\).

\(^{25}\) Resulting in rebel wins/losses, or conflicts dying down due to low activity.

\(^{26}\) Resulting in peace and cease fire agreements.

\(^{27}\) Hypothesis 3. Independent sample t-test (two-tailed): The mean economic horizontal inequality for peace and ceasefire agreements is 1.873, and 1.9018 for outcomes involving rebel wins, losses or low activity endings. Levene's Test for Equality of Variances is not statistically significant (.873) at p < .05, and consequently indicates homogeneity of variance between groups. t = -.102 and not statistically significant (.919) at p < .05. (n=49).
Conclusion

This thesis finds strong statistical support for the claim that high degrees of economic horizontal inequality for relatively poor ethnic groups increases civil war duration. The effect size is particularly impressive (model 1: $R^2 = .252$, model 2: $R^2 = .445$), especially when one considers that none of the control-variables were statistically significant. These findings increase confidence in the claim that low opportunity costs and in-group solidarity are important mechanisms in ensuring long term rebel viability. Within the academic literature regarding civil war duration this thesis made an important contribution in establishing further evidence for these mechanisms. This thesis also adds important contributions to the scholarly work on horizontal inequalities as this body of work is predominantly characterized by research designs focused on qualitative case studies. My quantitative research design and methodology allows one to confirm larger trends and increase external validity by investigating the entire domain of cases. This is not to claim that this research is without limitations. In exchange internal validity is somewhat sacrificed by not being able to directly observe these mechanisms in each individual case. There is also another more interesting limitation. The main issue with these results in relation to the first and second hypothesis is that I put forth two theories in order to explain the same outcome. Given my research design there is no way to differentiate between low economic opportunity costs or increased in-group solidarity as a result of high levels of horizontal inequality other than the fact that both these theories are supposed to ensure and strengthen long term rebel viability. Individual effect size cannot be determined because both operationalization’s used the same dependent and independent variable. It is important to note that there was already other scholarly evidence for both opportunity costs and in-group solidarity to be positively related directly or indirectly to civil war duration (see above). The results of this thesis strengthen these conclusions but fail to provide additional arguments for their relative or contextual importance.

Our second argument focused around the relation between horizontal inequality and civil war outcome in the form of either bargaining or continued conflict. The data suggest a rejection of the hypothesis that civil wars characterized by high economic horizontal inequality are more likely to result in continued warfare instead of bargaining solutions than those that are characterized by low economic horizontal inequality. This rejection can either be the result of a faulty theory or incorrect operationalization. I suggest that the latter possibility is plausible. The reason for this assertion is that the core of the issue in
regards to payoff structures is that what this thesis is attempting to capture is the concept of subjective collective grievances, while actually measuring objective horizontal inequality. Not all situations of inequality between individuals or groups are regarded by those at the bottom as illegitimate or as the result of oppression by those at the top and are thus unlikely to result in conflict in the first place (Brown and Langer 2010: 30). Judging inequality as actually unjust and illegitimate seems to be a better indicator for grievances than perceived horizontal inequality (Must and Rustad 2016: 25-6). Some research also shows that: subjective perceptions of inequality strengthens the receptivity to violence (Miodownik and Nir 2015: 17), individual subjective perceptions of inequality distort perceived group inequality, and in some instances there is a “large discrepancy between ... ‘objective’ and subjective measures of inequality” (Langer and Mikami 2012: 26). These findings problematize the relation between subjective grievances and objective horizontal inequality. The statement that horizontal inequalities result in collective grievances and are therefore the primary issue that must be resolved during bargaining is an assumption. Economic horizontal inequality is therefore a proxy for collective grievances in this study. The theory might be saved by subjugating subjective collective grievances for objective horizontal inequality and adjusting measurements accordingly.

Discussion

Policy prescriptions

The conclusion that economic horizontal inequality increases civil war duration has several policy implications. Policy makers interested in decreasing both feasibility for and negative consequences of protracted civil war should take note and convince legislators and other political power brokers to decrease group inequalities. Stewart suggests several policies designed to decrease civil war feasibility. The key concept here is inclusivity. Politically, policy makers should strive for inclusivity in every aspect of state power and representation including “all levels of the civil service, the army and the police” (Stewart 2000: 256). Economically, policy makers should ensure equal access and distribution of e.g., government aid and expenditure, land holdings, education and employment opportunities etc. (Stewart 2000: 257-8). Direct approaches are mainly focused around group based quota, while in-direct ones e.g., progressive taxation, include more non-discriminate policies directed at reducing horizontal inequality in a manner which reveals their intention by their effect on outcome instead of their explicit legislative wording. The use of direct horizontal inequality reducing approaches is more effective but their
utilization should be limited in time and impact as they are easily exploited by a corrupt civil service and opposition to these policies is expected to be more extreme due to their explicit discriminate nature (Stewart 2010: 5-6). Finally, post conflict preventative policies include giving rebel leaders and recruits a stake in their country’s future. Former rebel leaders should be offered high political positions in the post-civil war political system, while mid-level rebel participants should be facilitated with other government employment opportunities in e.g., the bureaucracy. Low level rebel recruits should be allowed to return to civilian life and legal employment should be financially supported and facilitated by the new inclusive government (Stewart 2000: 258-9). Whatever approach is chosen it is apparent that initial opposition to change will be substantial in political systems characterized by a monopolization of power. If moral arguments will not suffice one could convince political leaders of the necessity of these policies with an appeal to their self-interest by referencing the predicted effect of these proposed policies on reducing the feasibility and destructive effects of civil war in which they could potentially lose everything instead of a fraction of their wealth and power.

Limitations and future research

Every study has its shortcomings and ours is no exception. Below I will discuss those that are the most pertinent. The first issue is in regards to missing data. The database on horizontal inequality which was used is riddled with missing data. For 34/111 observations in the 1990-2009 time period no information on economic horizontal inequality was available. Granted, 10 of those observations were applicable to a single civil war in Russia in 2007. All 10 groups were minor in the sense that none of them had a population exceeding 500,000. If it was actually possible to include them in the analysis one could make the counter-argument that this single civil war would have an unfair influence over the results if it was not weighted accordingly. A second issue concerns the inclusion of groups beyond those based on ethnicity. Although I expect ethnically based groups to be the most important ones at least in terms of quantity for conflicts relating to horizontal inequalities, groups formed around a common language or religion such as in Northern Ireland or the Balkans should also be included and not be dismissed a priori. A third subject of concern is the fact that the measure of horizontal inequality is not time-varying. As discussed above this is justified by their apparent relatively inactive nature over time. However to get a complete picture on the relation between horizontal inequality and civil war duration one needs longitudinal measurements. This is something which is also recognized by the creators of the database on economic horizontal inequality (Cederman et al. 2015a: 818) which was utilized for my own research.
Successfully addressing one or several of these issues in future research will result in increased confidence and validity of the initial preliminary conclusions regarding the relation between economic horizontal inequality and civil war duration.

Appendix 1: Coding rules for “Economic Horizontal Inequality, Collective Grievances, and the Duration of Civil War 1990-2009” database

Coding rules for durationlow:
Link the onset observation (onset_do_flag) for groups with below average national income (low1_overlap > 1) in Cederman et al. 2015a database to conflict duration in the dyadic version of the UCDP Conflict Termination Dataset version 2-2015 and use StartDate as the date of onset. Use (in order of importance if available): PeAgDate > CfireDate > EpEndDate for the end date.

- If StartDate year is lower than the year of observation enter 1-januari-year-of-observation as date of onset.
- If a conflict continues within four years of low activity code it as continuous. In the case of a peace or ceasefire agreement breaking down within four years also code the conflict as continuous (as is customary and suggested by Fearon 2004: 278-929). Code it as separate conflicts if, in the meantime, the rebel group was defeated.

Coding rules for durationhigh:
Link the onset observation (onset_do_flag) for groups with above average national income (high1_overlap > 1) in Cederman et al. 2015 database to conflict duration in the dyadic version of the UCDP Conflict Termination Dataset version 2-2015 and use StartDate as the date of onset. Use (in order of importance if available): PeAgDate > CfireDate > EpEndDate for the end date.

- If StartDate year is lower than the year of observation enter 1-januari-year-of-observation as date of onset.
- If a conflict continues within four years of low activity code it as continuous. In the case of a peace or ceasefire agreement breaking down within four years also code the conflict as continuous (as is customary in the literature and thus suggested by Fearon 2004: 278-9). Code it as separate conflicts if, in the meantime, the rebel group was defeated.

Coding rules for outcome:
Link the onset observation in Cederman et al. 2015a database to DyadId in the dyadic version of the UCDP Conflict Termination Dataset version 2-2015.
1: Peace agreement
2: Ceasefire agreement
3: Victory for government side/Side A

Database available from author on request.

A five year coding rule decreased the number of valid observations to such an extent that statistical analysis would be inappropriate according to some, especially considering the fact that the number of missing data from the Cederman et al. 2015a database was already substantial. As I have already stated previously rival explanations on dates of civil war onset and termination might affect the outcome of this research. Future research should ensure that the results are robust over multiple definitions.
4: Victory for rebel side/Side B
5: Low activity (UCDP battle-deaths threshold [25] during a certain year is not reached)
6: Actor transformation

**Coding rules for dyadid:**
Link the onset observation in Cederman et al. 2015a database to DyadId in the dyadic version of the UCDP Conflict Termination Dataset version 2-2015.

**Coding rules for rebelgroup:**
Link the onset observation in Cederman et al. 2015a database to SideB in the dyadic version of the UCDP Conflict Termination Dataset version 2-2015.

**Missing values for variables durationlow, durationhigh, outcome, dyadid, and rebelgroup:**
-1: Irrelevant observation (economic horizontal inequality understood as the group-deviation from the national average per capita income is coded by Cederman et al. 2015a as a missing value)
-2: Observation is pre-1990
-3: Observation is contaminated by pre-1990 conflict
-4: Conflict observation continues after 2009
-5: Both -3 and -4 conditions apply
-6: Presumed mislabeled by Cederman et al. 2015a
-7: If onset cases are interdependent and part of a continuous war (see above) code all of the cases except one as -7
-8: If durationlow >1 code durationhigh as -8, if durationhigh > 1 code durationlow as -8

**References**


33. Gurr, Ted Robert. 1968. “Psychological Factors in Civil Violence”. In World Politics. Volume 20, number 2. 245-278.


