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Horizontal Inequalities and Ethnonationalist Civil War: A Global Comparison

LARS-ERIK CEDERMAN *ETH Zürich*
NILS B. WEIDMANN *Yale University*
KRISTIAN SKREDE GLEDITSCH *University of Essex*

Contemporary research on civil war has largely dismissed the role of political and economic grievances, focusing instead on opportunities for conflict. However, these strong claims rest on questionable theoretical and empirical grounds. Whereas scholars have examined primarily the relationship between individual inequality and conflict, we argue that horizontal inequalities between politically relevant ethnic groups and states at large can promote ethnonationalist conflict. Extending the empirical scope to the entire world, this article introduces a new spatial method that combines our newly geocoded data on ethnic groups' settlement areas with spatial wealth estimates. Based on these methodological advances, we find that, in highly unequal societies, both rich and poor groups fight more often than those groups whose wealth lies closer to the country average. Our results remain robust to a number of alternative sample definitions and specifications.

Although logistical and power-related conditions—such as low state-level per capita income, weak state institutions, and peripheral and inaccessible territory—enjoy near-consensus support as explanations of civil war onset, most of the contemporary literature regards explanations rooted in political and economic grievances with suspicion (Blattman and Miguel 2010). In fact, the debate over the status of grievances in such explanations dates back at least to the 1960s, with the introduction of relative deprivation theory. Inspired by psychological theories of conflict, Gurr (1970) and his colleagues argued that economic and other types of inequality increase the risk of internal strife through frustrated expectations. In contrast, today's most influential quantitative studies of civil war give short shrift to grievance-based accounts, based on reports that unequal individual wealth distributions have no statistically distinguishable relationship to internal conflict (e.g., Collier and Hoeffler 2004; Fearon and Laitin 2003).

Yet, despite these alleged nonfindings, the debate over grievances is far from dead. Indeed, inequality continues to occupy a prominent place in the qualitative literature on civil wars and has repeatedly been linked to conflict processes (Sambanis 2005, 323; Stewart 2008b; Wood 2003). Moreover, in the last few years, some quantitative studies have started to appear that argue that the current literature's failure to connect distributional asymmetries with conflict behavior may actually be due to inappropriate conceptualization and imperfect measurements, rather than reflecting a fundamental absence of any causal effect (Østby 2008b; see also Stewart 2008b).

Also relying on quantitative evidence, we join these recent contributions in shifting the explanatory focus from individualist to group-level accounts of inequality and conflict. Because formidable problems of data availability associated with the uneven coverage and comparability of surveys have stood in the way of assessing such "horizontal inequalities" (HIs), most scholars have had to content themselves with selective case studies or statistical samples restricted to particular world regions.

To overcome these difficulties, we combine our newly geocoded data on politically relevant ethnic groups' settlement areas with Nordhaus's (2006) spatial wealth measures, both with global coverage. Based on this novel strategy, we present the first truly worldwide comparison of horizontal inequality and ethnonationalist civil wars. Controlling for political power access, we show that both advanced and backward ethnic groups are more likely to experience such conflict than groups whose wealth lies closer to the national average. Moreover, in agreement with a broad conception of horizontal inequalities, we find that both political and economic inequalities contribute to civil war. Extensive

Lars-Erik Cederman is Professor, Center for Comparative and International Studies, Swiss Federal Institute of Technology (ETH) Zürich, IFW D 49.2, 8092 Zürich, Switzerland (lcederman@ethz.ch).

Nils B. Weidmann is Postdoctoral Fellow, Jackson Institute for Global Affairs, Yale University, P.O. Box 208206, New Haven, CT 06520 (nils.weidmann@yale.edu).

Kristian Skrede Gleditsch is Professor, Department of Government, University of Essex, Wivenhoe Park, Colchester, Essex, UK CO4 3SQ (ksg@essex.ac.uk).

All authors are also affiliated with Centre for the Study of Civil War, PRIO, Oslo, Norway.

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sensitivity analysis confirms that our findings are robust to various model specifications, alternative inequality measures, and sample definitions.

We proceed as follows: First, we review the extensive literature on inequality and conflict before narrowing down the scope to our own theoretical framework, which connects HIs with collective violence through grievance-based mechanisms. Based on this approach, we derive our main hypotheses on the effect of HIs on civil war onset. To test the hypotheses, we then introduce the datasets and describe our spatial method of wealth estimation in detail, including how to use the contours of the ethnic groups' settlement areas as "cookie cutters," which allows us to extract the relevant wealth estimates from the spatial wealth map. After specifying the variables used in our empirical analysis, we then expose the hypotheses to systematic tests in the main models, followed by another section that assesses the robustness of our findings. Finally, concluding at least tentatively that both economic and political inequality at the group level increase the risk of ethnonationalist civil war, we argue that the civil war literature's tendency to downplay the importance of grievances as a source of internal conflict is both premature and misguided.

INEQUALITY IN THE CIVIL WAR LITERATURE

Intimately related to issues of power and wealth distribution in society, inequality plays a central role in classical theories of conflict. In an influential article, Davies (1962) argued that revolutions were motivated by frustration resulting from an evolving gap between individual aspirations and actual economic status. Also adopting an explicitly psychological perspective, Gurr's (1970) well-known theory of relative deprivation characterizes various types of collective violence as reactions to frustrations stemming from unfulfilled aspirations, usually related to material well-being (see review in Brush 1996). Such a perspective differs radically from earlier sociological theories of mob behavior that explained collective violence as a societal pathology (e.g., Le Bon 1913). Instead, relative deprivation theorists argue that individuals' widespread discontent with their social situation triggers conflict, especially where modernization fuels a "revolution of rising expectations" (Davies 1962).

Although related indirectly to inequality through this psychological mechanism, relative deprivation theory does not explicitly focus on interpersonal or intergroup wealth comparisons (Hogg and Abrams 1988; Regan and Norton 2005; cf. Gurr and Duvall 1973). Other theories adopt a structural perspective, linking various types of inequality explicitly to structural imbalances in society, such as uneven income or land distribution (Acemoğlu and Robinson 2005; Muller 1985; Muller and Seligson 1987; Russett 1964). Partly under the inspiration of Marxist principles, the literature on peasant rebellions explains violent collective action as a response to unequal wealth allocation (Moore 1966; Scott 1976). Frustrated with their lot, the peasant masses and other underprivileged groups are expected to take up arms as a way to seize power and redistribute wealth in their favor.

Relative deprivation theory remains perhaps the most prominent explanation that connects grievances with conflict, but has a very mixed record as regards empirical evidence (Brush 1996; Oberschall 1978). Early on, the theory attracted criticism from Snyder and Tilly (1972), who argued that opportunity-based mobilization rather than grievances causes internal conflict and revolutions. Contending that all societies contain a number of aggrieved and frustrated individuals, they did not think "there is any general connection between collective violence and hardship such that an observer could predict one from the other" (Tilly 1972, 520; see also Skocpol 1979; Tilly 1978). Along similar lines, a series of studies challenged the results pertaining to income inequality, which was usually seen as closely connected to the notion of relative deprivation (see, e.g., Weede 1987). By the end of the 1980s, the debate remained unresolved, with virtually all possible causal connections—negative, positive, curvilinear, or none—being represented in the literature (Lichbach 1989).

As the end of the Cold War brought with it a new wave of conflict, most of which was ethnonationally motivated, Gurr (1993, 2000a, 2000b) extended his previous theory and began to study ethnic minorities' reactions to state-imposed disadvantages and discrimination. In agreement with Horowitz' (1985) seminal study of ethnic groups in conflict, Gurr found that ethnic grievances contributed indirectly to collective violence through ethnic mobilization.

In contrast, the contemporary civil war literature has been pioneered by scholars who take issue with such reasoning. Positioning themselves explicitly against grievance-based theories in political science and sociology, Collier and Hoeffler (2004) follow in the footsteps of earlier critics of relative deprivation (although without referring to them explicitly). Very much as Snyder and Tilly had done three decades earlier, Collier and Hoeffler (2004, 564) point to the ubiquity of frustration around the world, asserting that this fact deprives the theory of explanatory value: "Misperceptions of grievances may be very common: All societies may have groups with exaggerated grievances. In this case, as with greed-rebellion, motive would not explain the incidence of rebellion." Explicitly classifying inequalities as grievance-related indicators, these authors rely on the Gini coefficient to measure the income distribution among individuals. Having found no statistical effect for this and other hardship proxies, Collier and Hoeffler feel vindicated in their wholesale rejection of grievances and inequality as causes of civil war. In his best-selling book *The Bottom Billion*, Collier (2007, 18) confirms these doubts:

> So what causes civil war? Rebel movements themselves justify their actions in terms of a catalogue of grievances: repression, exploitation, exclusion. Politically motivated academics have piled in with their own hobbyhorses, which

> usually cast rebels as heroes. I have come to distrust this discourse of grievances as self-serving.[1]

In another influential study that stresses political and institutional causes of civil war, Fearon and Laitin (2003) present findings that cast doubt on ethnic and political grievances as explanations of conflict onset. Like Collier and Hoeffler, Fearon and Laitin rely on a series of individual-level statistical proxies, including the Gini coefficient, which provide no evidence of economic inequality increasing the risk of conflict. Summing up these and other studies, Laitin (2007, 23) concludes that

> ethnic grievances are commonly felt and latent; the factors that make these grievances vital and manifest differentiate the violent from the nonviolent cases. *Ex ante* measures of grievance levels are not good predictors of the transformation of latent grievances into manifest ones. And it is the factors that turn latent grievances into violent action that should be considered as explanatory for that violence.

Despite these negative findings, a number of scholars find the rejection of grievances and inequalities premature. Although the poor quality of distributional economic data within and across countries should perhaps be reason for pause by itself,[2] the main reason that grievance-based arguments cannot be so easily rejected is that these studies largely miss their theoretical target. Insisting that conflict-inducing inequality cannot be reduced to household-level measures of income distribution such as the Gini coefficient, Cramer (2003) calls for an alternative that is explicitly relational and theoretically grounded.[3] In the concluding chapter of a two-volume compilation of case studies testing Collier and Hoeffler's (2004) model, Sambanis (2005) draws the same inference. Noting that there is a major discrepancy between the quantitative nonfinding and the repeated references to inequality in the case studies, Sambanis (2005, 324) considers a number of explanations, including problems relating to interpretation and sampling of case evidence, as well as the fundamental issue of aggregation level:

> There may exist a relationship between inequality and popular revolutions or class conflict, which is another reason to consider disaggregating the cases of civil war. But ethnic or secessionist wars should, in theory, be driven more by group-based inequality . . . than by interpersonal inequality.

A more promising way to capture the link between uneven wealth distributions and conflict has been proposed by Stewart (2008b) and her colleagues, who contrast vertical, or individual-level inequalities, with horizontal inequalities. Defining the latter as "inequalities in economic, social or political dimensions or cultural status between culturally defined groups," Stewart (2008a, 3) argues that to a large extent, scholars have failed to find evidence of inequality's war-causing effect because of their reliance on individualist, rather than group-based, measures of income and power differences:

> But the majority of internal conflicts are *organized group* conflicts—they are neither exclusively nor primarily a matter of individuals committing acts of violence against others. What is most often involved is group mobilization of people with particular shared identities or goals to attack others in the name of the group. (Stewart 2008a, 11)

Following the lead of Horowitz and Gurr, Stewart (2008a) conceptualizes horizontal inequality broadly by considering political, economic, social, and cultural dimensions explicitly. Political HIs entail blocked or limited access to central decision-making authority within the state. The economic dimension taps the distribution of wealth among households. Social HI measures primarily groups' uneven social access, for example, in terms of education and societal status. Finally, the cultural aspect captures group-level inequalities with respect to cultural policies and symbols, including national holidays and religious rights.

Recognizing the difficulties of measuring HIs, Stewart's team has so far primarily relied on case studies rather than large-*N* comparisons. The picture that emerges from this research suggests that both disadvantaged and advanced groups have a higher likelihood of getting involved in internal conflict than groups closer to the country average (Stewart 2008b). Yet some quantitative researchers have attempted to generalize from the case studies to a larger set of countries. In a pioneering statistical test, Barrows (1976) detected an influence of group-level differences on conflict in sub-Saharan Africa. Relying on household surveys conducted in 39 developing countries, Østby (2008b) finds evidence that social horizontal inequality causes civil war, although the economic dimension appears to be weaker (see also Østby 2008a). In a follow-up study based on geocoded conflict and survey data from sub-Saharan Africa, Østby, Nordås, and Rød (2009) reach firmer conclusions, showing that both economic and social group-level differences are likely drivers of conflict behavior.

THEORIZING HORIZONTAL INEQUALITIES

We now turn to our own account of inequality and conflict. The starting point of our approach to ethnonationalist warfare is the realization that ethnic groups find themselves in radically different situations for various historical reasons. Whereas some ethnic groups came out on top of the geopolitical game, others were conquered early on, and therefore lost out in the competition for wealth and influence. Moreover, the uneven spread of nationalism delayed mass-level political

[1] In more recent research, Collier, Hoeffler, and Rohner (2009) maintain that civil wars are caused by factors associated with "feasibility" rather than by grievances and other types of motivations.

[2] Using a different conceptualization of vertical inequality conditioned on factor mobility, Boix (2008) reports a strong effect on internal conflict.

[3] Likewise arguing against misplaced individualism, Cederman and Girardin (2007) criticize the use of the ethnolinguistic fractionalization index as a general proxy for ethnonationalist frustration.

mobilization in many parts of the world, thus creating differences in both economic and political development that were often exploited by alien rulers (Gellner 1964). As argued by Tilly (1999), nationalism can be thought of as a case of "categorical inequality" because

> it asserts and creates paired and unequal categories, either (a) rival aspirants to nationhood or (b) members of the authentic nation versus others. It involves claims to prior control over a state, hence to the exclusion of others from that priority. It authorizes agents of the nation to subordinate, segregate, stigmatize, expel, or even exterminate others in the nation's name. (172)

Adopting Stewart's definition of HI, we focus on the political and economic dimensions of HI.[4] Although these two types of inequality are often likely to be related, we follow Stewart in treating the distribution of power and of wealth as conceptually separate components. Previous quantitative research has examined the role of political exclusion of ethnic groups on the risk of civil war, but has not considered explicitly the economic aspect of exclusion and the relationship between the two (see e.g., Cederman, Buhaug, and Rød 2009; Cederman and Girardin 2007; Cederman, Wimmer, and Min 2010; though see Gurr 1993, 2000b). By contrast, some critics of the role of ethnicity, such as Woodward (1995), argue that alleged ethnic conflicts are really driven by underlying economic inequalities that lead ethnic identities to become politicized. A strong version of this argument would hold that ethnic political inequalities are irrelevant in the absence of economic inequalities.

Building on our previous work, we view HIs as structural asymmetries that make ethnonationalist civil war more likely and adopt an indirect research strategy that explains the effect of inequality by postulating a set of causal mechanisms. To close the gap between the structural background conditions and behavioral patterns, we propose intermediate analytical steps.[5] First, we postulate that objective political and economic asymmetries can be transformed into grievances through a process of group comparison driven by collective emotions. Second, we argue that such grievances trigger violent collective action through a process of group mobilization.

From Horizontal Inequalities to Grievances

As opposed to objective conditions such as horizontal inequalities, grievances are intersubjectively perceived phenomena. As we have noted earlier in the text, this makes them very hard to measure, but we can draw on an extensive experimentally supported literature in social psychology as a way to construct plausible mechanisms connecting structural asymmetries with collective violence. Obviously, it may be possible to find ways to connect HIs with conflict through causal mechanisms that do not feature grievances, but we leave this possibility to other researchers to explore.[6]

Before grievances can be acted upon, they need to be cognitively linked to social identities through self-categorization (Hogg and Abrams 1988, 21). Clearly the salience of ethnic distinctions varies over time and from case to case (Gurr 2000b), but once group identities become salient, members of the involved groups are prone to make social comparisons that hinge on the distinction between in-group and out-group categories (Turner 1981). According to "realistic conflict theory," conflicting claims to scarce resources, including power, prestige, and wealth, are likely to produce ethnocentric and antagonistic intergroup relations (Tajfel and Turner 1979). In stratified social systems, social comparison reflecting superiority or inferiority should be especially likely to trigger conflict (see Horowitz 1985).[7]

These processes of social comparison and intergroup evaluation are far from emotionally neutral. As argued by Kalyvas (2006) and Petersen (2002), attempts to reduce the violent excesses of civil wars to entirely calculative and cognitive processes fly in the face of countless testimonies of the emotional escalation processes leading to the outbreak of collective violence.[8] In particular, violations of norms of justice and equality will typically arouse feelings of anger and resentment among members of the disadvantaged group.[9] As observed in a pioneering study by T. H. Marshall, such emotional responses are present in class systems, which "are based structurally on chronic asymmetries of power and reward" (Barbalet 1992, 153).

What is true for cases of class resentment also applies to inequalities among ethnic groups. In agreement with Petersen (2002), we postulate that resentment based on intergroup comparisons involving HIs often

[4] As we have seen, HIs also involve social and cultural policies (see Stewart 2008a). We acknowledge that these aspects may be linked to conflict, but these conflict mechanisms fall outside the scope of this article.

[5] See Gurr (2000b, Chap. 3) for a similar theory based on four conditions, namely the salience of ethnocultural identity, collective incentives for action, collective-action capacity, and environmental opportunities.

[6] It should be noted that the presence of HIs presupposes the existence of well-defined groups (Stewart 2000), which is not a trivial precondition (e.g., Kalyvas 2006). Although it is undoubtedly true that modern politics is to a large extent group-based, and social life hinges on social categories (Gellner 1964; Hogg and Abrams 1988), we argue that the extent to which cohesive groups can actually be said to exist is ultimately a matter of empirical analysis. Yet, because our goal is to evaluate the conflict-inducing effect of HIs, we join Horowitz (1985), Gurr (1993; 2000b) and others in adopting a self-consciously group-based framework, although restricting our substantive focus to groups defined through ethnic categorization rather than through other cleavages.

[7] In addition to such direct consequences of objective differences, "social identity theory" tells us that mere awareness of social outgroups may be sufficient to provoke competitive behavior even in the absence of objective issues of contention (Tajfel and Turner 1979).

[8] Indeed, although social identity theorists stress the cognitive component of group behavior, they allow for an important element of emotional engagement, as group membership is assumed to be intimately associated with self-esteem (Hogg and Abrams 1988).

[9] Modern sociological theories of emotions tell us that, contrary to the views of early crowd theorists, and contrary to lingering popular belief, emotions are not irrational, but serve distinctly goal-directed purposes in social and political life (e.g., Emirbayer and Goldberg 2005; Petersen 2002).

provokes ethnic mobilization. Inspired by Horowitz's (1985) "positional psychology," Petersen explains that "resentment is the feeling of being *politically* dominated by a group that has no right to be in a superior position. It is the everyday experience of these perceived status relations that breeds the emotion" (40).

From Grievances to Collective Action

Clearly, emotions do not automatically trigger violent behavior. Under some institutional circumstances, redress can be sought through peaceful means (Hogg and Abrams 1988). Yet most governmental incumbents will only reluctantly abandon their advantaged positions by sharing power or letting minorities secede. Without resources and organization, anger alone can do little to challenge powerful defenders of the status quo (Tilly 1978). Moreover, since Olson's classic treatment of the free-rider problem, we know that collective action cannot be taken for granted, especially where the costs incurred by volunteering individuals may be high (Lichbach 1995). However, there are good reasons to believe that the collective-action dilemma may have been overstated in the context of civil wars. As convincingly argued by Kalyvas and Kocher (2007), the existence of a dilemma hinges on the questionable assumption that participation in combat is costlier than nonparticipation. Although armed conflict undoubtedly poses acute risks to members of rebel organizations, there is no guarantee that staying away from the fighting is the safer option, especially where collateral violence affects civilians more than combatants, or where noncooperating civilians are at risk for targeted punishment for nonparticipation.

Collective-action theorists may object that punishment is also costly and should be subject to free riding, but experimental evidence shows that individuals are often more than willing to invest in costly punishment of free riders and norm violators (Fehr and Gächter 2000; see also references in Blattman and Miguel 2010). Thanks to preexisting social networks, ethnic groups may also provide organizational structure at the micro-level that can be used to overcome free riding (Hechter and Okamoto 2001). Moreover, a number of studies show that collective identities, such as those constituting ethnic groups, facilitate collective action (e.g., Gates 2002; Simpson and Macy 2004).

Even though organizational and cognitive factors are central to mobilization, it would be a mistake to overlook the contribution of emotionally charged grievances. Indeed, "emotional ties and investments are a potential source of power in their own right, alongside social-structural sources of power" (Emirbayer and Goldberg 2005, 507). As we have seen, the perception of injustice generates grievances that serve as a formidable tool of recruitment. In addition, detailed studies of social movements, including those that fight civil wars, demonstrate that "injustice frames" play a central role in mobilization processes and are reflected in organizations' media messages and grassroots participants' justifications of action (Gamson 1992). Thus, rather than classifying inequality as a pure "grievance" factor, we view its impact as a mobilizational resource.

DERIVING TESTABLE HYPOTHESES ON HORIZONTAL INEQUALITIES AND CIVIL WAR

Having postulated our causal mechanisms, we now return to the macro-level to perform the actual empirical analysis. It is in principle possible to measure directly grievances (Petersen 2002) and to trace mobilization processes (e.g., Beissinger 2002), but such detailed analysis is beyond the scope of the current study. As will become clear later, collecting and evaluating structural data on economic HIs is a major challenge in its own right.

What are the observable implications of our analytical framework? The first, and most obvious, hypothesis expects a positive effect of economic HIs on civil war onset. If the causal chain operates as we have postulated, there should be a statistically discernible signal indicating that ethnic groups with GDP per capita far from a country's average have a higher risk of experiencing conflict:

H1. *Economic HIs increase the likelihood of civil war.*

However, as we have seen, an uneven wealth distribution is not the only possible type of structural asymmetry. Drawing on Stewart's multidimensional conceptualization of HIs, we hypothesize that both economic and political HIs contribute jointly to the outbreak of civil war. Even controlling for political HIs, such as groups' exclusion from political power, income inequalities among ethnic groups should increase the risk of civil war. These theoretical expectations dovetail with Stewart's (2008a, 18) hypothesis that "political mobilization is especially likely when there are consistent HIs, that is both political and economic HIs run in the same direction." Based on statistical evidence from sub-Saharan Africa, Østby (2008b) finds support for a strong effect of interaction between interregional asset inequality and political exclusion. Case studies of Côte d'Ivoire (Langer 2005) and Nepal (Murshed and Gates 2005) confirm this finding (see also Stewart, Brown, and Langer 2008, 289–90; cf. Hegre, Østby, and Raleigh 2009).[10] Our second hypothesis summarizes these theoretical expectations:

H2. *Economic and political HIs both increase the likelihood of civil war.*

So far, we have not differentiated between advanced and backward groups' conflict-proneness. As Horowitz

[10] See also Hechter's (1975) notion of "internal colonialism." Hechter argues that economically peripheral ethnic groups are less likely to become integrated in larger nation states and more likely to maintain or reinforce separate identities.

(1985) explains, arguments can be advanced for both types of economic HIs leading to a higher risk of conflict. Poorer groups, especially those residing in backward and peripheral regions, often desire to break away from the cores of their countries regardless of the cost, because they perceive themselves to be systematically disadvantaged compared to their wealthier compatriots in terms of economic development and distribution of public goods. Perceptions of disadvantage also characterize members of some relatively wealthy groups, especially if they feel that state-level redistribution denies them the fruits of their success: "Advantaged regions usually generate more income and contribute more revenue to the treasury of the undivided state than they receive. They believe that they are subsidizing poorer regions" (Horowitz 1985, 249–50). Because these groups have more to lose, and are sometimes demographically represented outside their original settlement areas, however, they can be more cost-sensitive as regards secession, but such cases do occur, as illustrated by Slovenia and Croatia (cf. Gourevitch 1979). Nevertheless, there is no reason to assume that the effect of group inequality is perfectly symmetric around relative equality. Remaining agnostic as to the relative frequency of HIs in either direction, we therefore submit these arguments to separate tests by dividing H1 into two subhypotheses:

H1a. *Relatively poor ethnic groups are more likely to experience civil war.*
H1b. *Relatively wealthy ethnic groups are more likely to experience civil war.*

GLOBAL DATA ON HORIZONTAL INEQUALITIES AND OTHER DIMENSIONS

Our theoretical expectations must now be confronted with empirical evidence. As we have seen, data availability constitutes a major stumbling block in studies of inequality and conflict. So far, virtually all existing statistical studies of HIs have used survey data on economic welfare by households, as collected by the Demographic and Health Surveys (DHS) project.[11] Although these data offer a relatively direct measure of well-being, and are therefore useful as grievance indicators, the information source and survey approach are associated with a number of practical limitations. The DHS project is limited to a selection primarily of developing countries, and information on ethnic affiliation or the geographic location of households is only available in some of the surveys.[12] Although the surveys are constructed to be nationally representative, the number of responses for an ethnic group or location may often be very low, and there is no guarantee that the samples will be representative. Finally, survey data are subject to a host of potential response biases, both conscious and unconscious. For example, aggregate responses from surveys may well be systematically biased against finding evidence of inequality if poorer individuals overstate their assets and richer individuals consistently understate theirs. In sum, survey data may be helpful for many purposes, but the DHS data do not provide a plausible alternative for evaluating the role of horizontal inequalities on a global basis.

Given these difficulties, it makes sense to consider spatial datasets as an alternative to survey-based methods. In fact, the only broadly available cross-national data source on variation in wealth within countries is the G-Econ data, developed by Nordhaus (2006; see also Nordhaus and Chen 2009).[13] The G-Econ dataset tries to assemble the best available data on local economic activity within countries for geographical grid cells, and convert these to comparable figures in purchasing power parity to allow meaningful comparisons. The resolution of the spatially explicit data set is 1° grid cells. The data are constructed from a variety of sources, including regional gross product data for the lowest available political subdivision, estimates of regional income by industry, and estimates of rural population and agricultural income. The specific methodologies differ by countries and data availability (see Nordhaus et al. 2006 for a detailed discussion). The database has global coverage, but the temporal scope is limited to a single year, 1990.[14] We therefore restrict our analysis to the post–Cold War period, although we present supplementary results extending back to 1946 in the sensitivity analysis that follows. Because it is well known that relative inequality, as opposed to absolute wealth, is characterized by considerable inertia, these assumptions would seem plausible (Stewart and Langer 2008; Tilly 1999).[15]

Despite their relatively broad coverage, there are a number of disadvantages to the Nordhaus data for testing propositions on HIs. Any measure of the value of economic production is strictly speaking a "flow" measure and hence an imperfect proxy for the "stock" of wealth, although this criticism obviously applies with equal force to national-level productivity measures. Because the quality varies considerably across countries, the data are likely to understate the extent of inequality in countries with poor data coverage. Indeed, in some countries the official data may be of such poor quality that the variance is suppressed and accuracies

[11] For these data, see http://www.measuredhs.com/.

[12] See, e.g., Baldwin and Huber (2010), who draw on survey data from 46 countries to evaluate the impact of ethnic diversity on public goods provision. As noted earlier, Østby (2008a, 2008b) also uses survey data in her studies of HIs and conflict in sub-Saharan Africa (see also Østby, Nordås, and Rød 2009).

[13] Another promising avenue is to use light emissions as a proxy for economic activity; see, e.g., Min (2008). Chen and Nordhaus (2010) report that the usefulness of this data source may be mostly limited to cases where official statistics are especially poor.

[14] G-Econ 2.2 provides separate estimates for gross cell products in 1995 and 2000. A closer inspection of the documentation (see Chen 2008), however, indicates that these estimates simply adjust the 1990 estimates for updated population figures for 1995 and 2000. As such, the 1995 and 2000 figures contain no independent economic data over the 1990 values.

[15] Time-varying data from the Minorities at Risk (MAR) dataset and time series on the relative wealth of Yugoslav and Indian regions confirm that this is a reasonable assumption. See Section 1.5 of the supplemental online Appendix, available at http://www.journals.cambridge.org/psr2011010.

of survey reports may be questionable. We will return to these issues in the section on sensitivity analyses.

Based on the G-Econ data, Buhaug et al. (n.d.) present the first global results on the relationship between spatial inequalities and civil war violence. However, their research design focuses on local measures of inequality across geographic grid cells and the specific locations where conflict first breaks out, and does not capture group-level participation or wealth differences. Another useful approach estimates the wealth of regional subunits of states (Sambanis and Milanovic 2009). A more direct assessment of HIs requires geocoded data on ethnic groups, and in view of H2, also information about their access to executive power. Fortunately, the Ethnic Power Relations dataset (EPR), together with its recent geocoded extension, GeoEPR, fulfills these requirements.

The EPR dataset identifies all politically relevant ethnic groups around the world and measures how access to state power differs among them in all years from 1946 to 2005 (Cederman, Wimmer, and Min 2010). Based on an online expert survey, the sample includes 733 politically relevant ethnic groups in 155 sovereign states.[16] The coding rules define as politically relevant all ethnic groups for which at least one political organization exists that promotes an ethnically oriented agenda in the national political arena, or ethnic groups that are subject to political discrimination. This dataset improves significantly on previous efforts to code ethnic groups' access to power, such as the Minorities at Risk (MAR) dataset (Gurr 1993), which restricts the sample to mobilized and/or discriminated-against minorities and thus largely overlooks the ethnopolitical constellation of power at the center, and Cederman and Girardin (2007), who rely on preliminary, static measures of the political status of ethnic groups and limit their sample to Eurasia and North Africa.

Because the politically relevant groups and their access to political power may change over time, the EPR dataset provides separate coding for subperiods from 1946 to 2005. For each such time period, the demographic size and access to power enjoyed by representatives of an ethnic group are specified. Focusing on executive power only, i.e., representation in the presidency, the cabinet, and senior posts in the administration, including the army, the coding rules categorize all politically relevant ethnic groups according to whether (1) their representatives enjoyed absolute power through monopoly or a dominant position in the executive branch,[17] (2) they shared power with other groups in a junior or senior role,[18] or (3) they were excluded altogether from executive decision making but enjoyed regional or separatist autonomy, or were powerless or discriminated against.[19] In our analysis that follows, we drop category 1, because according to our conflict coding, dominant and monopoly groups cannot by definition stage rebellions against themselves, and base the dummy variable of exclusion on the difference between categories 2 and 3.

To obtain spatial estimates of economic performance for EPR groups based on the Nordhaus grid, we need information on their settlement areas or regions. Because this overlay operation requires data on the precise extent of these regions rather than a simple textual description, existing datasets such as Minorities at Risk (Gurr 1993) are insufficient. We therefore rely on the recently completed GeoEPR dataset, a comprehensive geocoded version of the EPR groups (Wucherpfennig et al. n.d.). GeoEPR provides two types of information about ethnic groups. First, for each group in EPR, the dataset categorizes the type of settlement pattern, distinguishing between regional, urban, and migrant groups (plus mixed categories). For all groups with regional bases, GeoEPR represents the settlement area of a group as a polygon (or a set of polygons, if there is more than one group region in a country). In contrast to earlier geocoding attempts, GeoEPR also tracks major changes in the settlement pattern of a group over time, including those resulting from ethnic cleansing.

Our analysis requires conflict coding at the group level. Because groups as a whole typically do not participate in conflict (e.g., Kalyvas 2006), we use a refined procedure that codes whether a group has links to a rebel organization that was actively involved in fighting. These new data represent an improvement on previous group-level conflict coding used with the EPR data (cf. Cederman, Wimmer, and Min 2010). More precisely, we code our dependent variable as "1" if a rebel organization expresses its political aims (at least partly) in the name of the group *and* a significant number of members of the group were participating in the conflict. For a full sample of rebel groups and their conflict involvement, we rely on the Non-State Actors dataset (Cunningham, Gleditsch, and Salehyan 2009) that identifies the fighting organizations involved in civil wars (according to the Uppsala/PRIO Armed Conflicts Data, see Gleditsch et al. 2002). The link between these organizations and our EPR groups is provided by NSA2EPR, a new conflict resource that identifies organizations fighting for, and recruiting from, particular EPR groups. We provide a list of the conflict onset cases in the article.

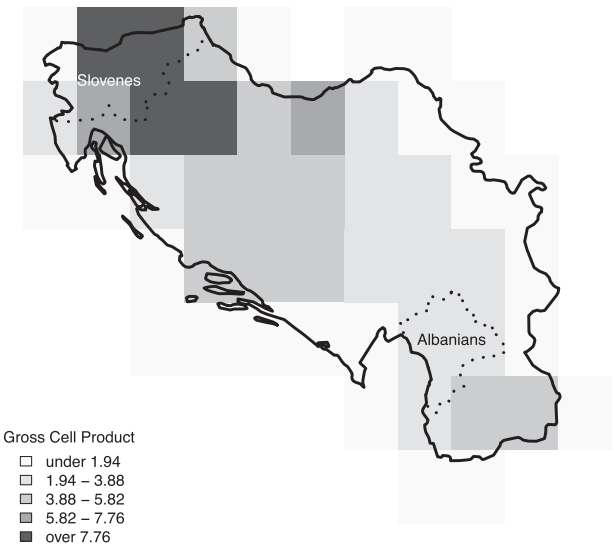
[16] The dataset includes all 155 sovereign states with a population of at least 1 million and a surface area of at least 5,000 square kilometers as of 2005. Countries in which no meaningful ethnic cleavage exists in national politics were coded as having no politically relevant ethnic groups and are thus not included in the group-level sample used in this article. See http://dvn.iq.harvard.edu/dvn/dv/epr. An updated version of the EPR and GeoEPR datasets valid through 2009 will be made available at http://www.icr.ethz.ch/data.

[17] As opposed to *Monopoly*, which excludes any executive representation of other groups, *Dominance* applies to situations where elite members of the group hold dominant power in the executive but there is some limited inclusion of "token" members of other groups.

[18] A group is classified as playing a *Senior* or *Junior* role in a power-sharing regime depending on the relative importance of the positions controlled by group representatives.

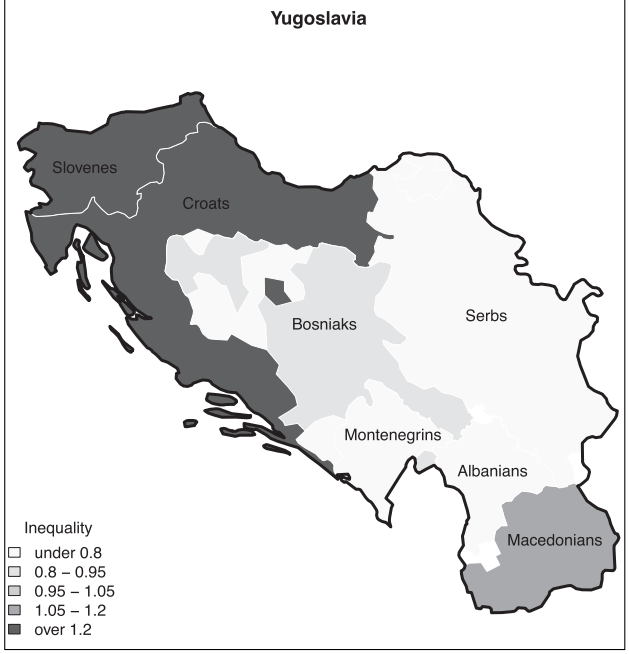
[19] *Regional Autonomy* applies if the group is excluded but enjoys autonomous power at the regional level granted by the government. In the case of *Separatist Autonomy*, the group has unilaterally declared autonomy in opposition to the center. *Powerless* groups hold no political power at either the national or regional level. *Discriminated-against* groups are not only excluded but also subjected to targeted discrimination with the intent of excluding them from power.

FIGURE 1. G-Econ Cells for Yugoslavia, Overlaid with GeoEPR Group Polygons for Slovenes and Albanians



Note: The darker the shading, the wealthier the cells.

FIGURE 2. Result of Spatial Wealth Estimation for Groups in Yugoslavia



DERIVING OPERATIONAL MEASURES

The G-Econ data allow deriving ethnic group–specific measures of wealth by overlaying polygons indicating group settlement areas with the cells in the Nordhaus data. Dividing the total sum of the economic production in the settlement area by the group's population size enables us to derive group-specific measures of per capita economic production, which can be compared to either the nationwide per capita product or the per capita product of privileged groups.

A visual illustration helps explain the estimation of group GDP from Nordhaus data. Figure 1 shows the G-Econ estimates as gray cells; darker shadings indicate wealthier cells. The map shows the spatial variation in wealth across the Yugoslav federation in 1990, based on the CShapes dataset for the historical boundaries (Weidmann, Kuse, and Gleditsch 2010). Relatively wealthy pockets appear primarily in the northwest of the country, in the constituent republics of Slovenia and Croatia. Compared to the other parts of the country, Serbia shows up as a generally poor region.

Together with the settlement areas of GeoEPR, the G-Econ data can now be used to estimate group wealth spatially. Figure 1 also shows the settlement regions for the Slovenes and the Albanians. Using techniques similar to those pioneered in Cederman, Buhaug, and Rød (2009), we derive an indicator of group wealth by summing up the (population-weighted) proportions of the Nordhaus cells covered by a group.[20] For example, as a result of this procedure, the Slovenes get a high score, because their settlement region is located in the rich parts of Yugoslavia. Figure 2 shows horizontal inequality for Yugoslavia, measured as the ratio of the group's GDP per capita estimate to the average value for the entire country, depicting wealthier groups in darker shades and poorer ones in brighter shades. Slovenes and Croats receive high scores, but the opposite is true for the Albanians in Kosovo, which are among the poorest groups in the country.

As a further illustration, Figure 3 shows the same information for the Sudan. Unsurprisingly, the southern and western groups, the latter including the Fur, emerge as the most impoverished in that state. Extending the comparison to Myanmar, we also illustrate the limitations of our spatial approach (see Figure 4). Despite considerable wealth discrepancies between peripheral and central areas, the Nordhaus data exhibit very limited variation, because of underlying data quality issues. To the extent that similar measurement problems afflict other countries that

[20] This spatial aggregation process retrieves all the G-Econ cells that are covered by a group polygon and computes the total wealth estimate as the sum of the cell values. However, in a number of cases cells do not align perfectly with group polygons, and there is only partial overlap between a cell and a group polygon. For these cases, only the overlapping area's wealth should enter the group wealth computation. We estimate the wealth of a partial G-Econ cell by distributing its total value as given in the dataset to much finer cells of 2.5 arc-minutes (approximately 5 km, 1/24 of the size of a G-Econ cell). This distribution is population-weighted; i.e., it assumes that wealth is proportional to the number of people in each of the smaller cells. This weighting was done using the *Gridded Population of the World* dataset (Version 3, available at http://sedac.ciesin.columbia.edu/gpw/).

FIGURE 3. Result of Spatial Wealth Estimation for Groups in the Sudan

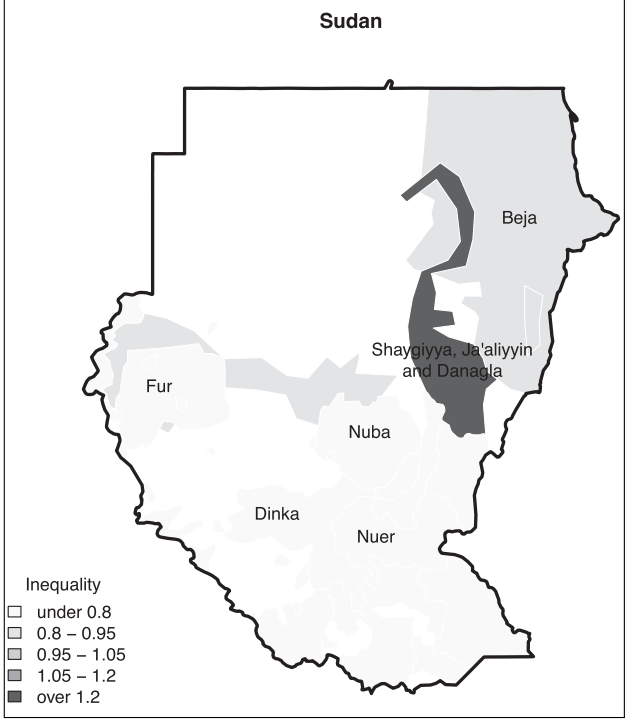
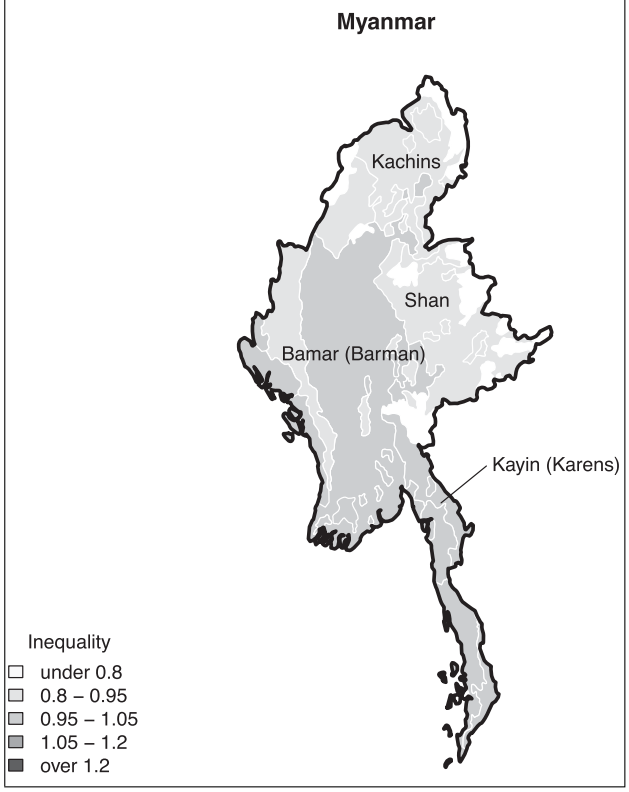


FIGURE 4. Result of Spatial Wealth Estimation for Groups in Myanmar



experienced conflict, we can expect the effect of inequality to be underestimated by our study.

As explained by Mancini, Stewart, and Brown (2008), there are many different ways to operationalize horizontal inequalities, most of which apply to entire countries. In this article, we use two group-level measures of inequality, namely a symmetric logged form (see H1) and an asymmetric, nonlogged form (see H1a, 1b). The former indicator defines inequality as the square of the logarithmized ratio between g, the GDP per capita of the ethnic group, and G, the average GDP per capita of all groups in the country:

$$lineq2 = [\log(g/G)]^2.$$

This definition captures deviations from the country average symmetrically and is zero for groups at the country average. As a complement to this symmetric indicator, we also measure inequality asymmetrically with two variables that correspond to groups that are poorer and wealthier than the country average, respectively:

$$\begin{aligned} low\_ratio = \;& G/g \quad \text{if } g < G, \\ & 0 \quad \text{otherwise;} \\ high\_ratio = \;& g/G \quad \text{if } g > G, \\ & 0 \quad \text{otherwise.} \end{aligned}$$

This operationalization guarantees that deviations from the country mean are always positive numbers greater than one. For example, a group that is twice as wealthy as the average has $low\_ratio = 0$ and $high\_ratio = 2$, and a group that is three times poorer has $low\_ratio = 3$ and $high\_ratio = 0$. See Table 1, which offers descriptive statistics for these indicators and all other independent variables used in the analysis that follows.[21]

We use the nonspatial EPR dataset to derive variables capturing political HIs and group sizes. As we have seen earlier, the EPR dataset provides a time-varying indicator for groups' exclusion from central power. In addition, we measure the group's demographic power balance with the ethnic group(s) in power (EGIP) as its share of the dyadic population.[22] We use a combination of the linear and squared terms to capture the logic of bargaining theory, according to which intermediate power levels are the most conflict-prone, given that weaker groups stand no chance of prevailing in contests, whereas stronger ones do not necessarily have to resort to violence to get concessions (see Wucherpfennig 2011).

At the country level, we control for GDP per capita, based on nonspatial, time-varying statistics drawn from

[21] We offer summary statistics for the restricted sample as used in Models 2–9. For summary statistics based on the unrestricted sample, see Section 1.6 in the supplemental online Appendix.

[22] Formally, denoting the populations of the group and the EGIP as s and S, respectively, the power balance is defined as $s/(s+S)$ if the group is excluded, and as s/S otherwise. Small groups thus have close to a zero share of the dyadic population, whereas those groups that are larger than the EGIP have a power balance greater than 0.5.

TABLE 1. Summary Statistics for Independent Variables

Variable	Mean	Std. Dev.	Min	Max
Inequality (*lineq*)	−0.067	0.303	−1.799	1.207
Inequality (*lineq2*)	0.096	0.291	0.000	3.238
Ineq. (*low_ratio*)	0.766	0.766	0.000	6.046
Ineq. (*high_ratio*)	0.496	0.614	0.000	3.344
Excluded	0.528	0.499	0.000	1.000
Power balance	0.248	0.262	0.000	1.000
Power balance (sq.)	0.130	0.222	0.000	1.000
GDP per capita (log)	7.944	1.060	5.231	10.494
No. excluded groups	8.405	13.706	0.000	46.000
Year	1998.093	4.300	1991.000	2005.000
Peace years	34.421	18.118	0.000	59.000

the Penn World Tables and World Bank sources, and *num_excl*, the total number of excluded groups in the country, as defined by EPR. Both measures should have a negative impact on conflict probability. A large number of studies find a negative association between national GDP per capita and civil war onset (see Hegre and Sambanis 2006). According to Walter's (2006) strategic argument, the *num_excl* variable can be expected to be negatively related to the risk of conflict, because governments facing many ethnic groups fear domino effects and will thus be less willing to make concessions to single groups, as illustrated by Moscow's hard line in dealing with the Chechens' claims. This firmness can be expected to deter other groups from challenging the government. In addition, we also control for the calendar year, because we anticipate a declining trend in terms of conflict probability during the Cold War, thanks to benign effects in the international environment such as peaceful international norms and institutions (Gurr 2000b). Finally, the models also contain nonparametric corrections for temporal dependence based on the *peace_years* variable, which measures the number of years a group has lived in peace, as proposed by Beck, Katz, and Tucker (1998).[23]

EMPIRICAL ANALYSIS

We are now ready to present the results. Given the limited temporal availability of inequality data, we restrict the sample to group years after the Cold War, from 1991 through 2005. All groups represented in GeoEPR are included, except the dispersed ones that cover their respective countries' entire territory. This leaves us with about 450 groups per year or a total of 6,438 group years, with only 52 conflict onsets (see the supplemental online Appendix available at http://www.journals.cambridge.org/psr2011010). Unless otherwise stated, our analysis therefore relies on rare-events logit models. We compensate for country-level dependencies by estimating clustered standard errors.

Table 2 presents the main results. Our starting point is Model 1, which subjects the inequality hypothesis H1 to a first test based on the *lineq2* variable. The result is both substantively and statistically significant, suggesting that groups with wealth levels far from the country average are indeed more likely to experience civil war.[24] Moreover, the other variables behave as expected. The coefficients of the variables measuring the demographic power balance point in the right direction, but fail to reach statistical significance. At the country level, both GDP per capita and calendar year have strongly negative effects on the probability of conflict, as theoretically expected. The coefficient for the variable capturing the number of ethnic groups is also negative, but nowhere near statistical significance at conventional levels. Finally, the temporal controls do not seem to make much of a difference, but are retained for comparative purposes.

To improve the precision of our inequality measures, Model 2 discards ethnic groups with a spatially estimated population less than 500,000. Although this censoring limits the number of group-year observations to 3,967 and the conflict onsets to 42, we prefer to rely on this specification.[25] Our spatial method becomes unreliable for small population sizes, primarily because of the low resolution of the G-Econ data and the limited precision of the population estimates for tiny groups.[26] Consequently, the group-size restriction almost triples the inequality coefficient reported in Model 2 without affecting the size of the standard error. Except for this important change, there are few other surprises,

[23] This method also features three cubic splines.

[24] We refrain from including the nonsquared term, because its effect cannot be separated from zero and should be nil according to H1.

[25] This sample restriction drops a number of tiny groups, especially in China and Russia, for which no reliable spatial estimate can be computed. See also Section 1.6 in the supplemental online Appendix for further details.

[26] Although the lack of comparable group-level data makes it difficult to assess measurement error for the spatial GDP per capita estimates, it is possible to compare the spatial group-size values with those based on the EPR expert survey. By successively increasing the lower size threshold, it can be established that 500,000 is the value where the reduction in the standard deviation between spatial and nonspatial flattens out, thus suggesting that this threshold is appropriate for population estimation. A further increase of the threshold would lead to serious information loss, thus making it difficult to discern the measured effect.

TABLE 2. Explaining Onset of Group-level Conflict

	Model 1	Model 2	Model 3	Model 4	Model 5
			Group-level variables		
Inequality (*lineq2*)	0.6661**	1.7463***	1.7342***		
	(0.2402)	(0.2484)	(0.2641)		
Inequality (*smooth*)				1.948***	
Ineq. (*low_ratio*)					1.1255***
					(0.1792)
Ineq. (*high_ratio*)					1.0875***
					(0.2305)
Excluded			1.1680**	1.241**	1.2066**
			(0.3394)	(0.3905)	(0.3702)
Power balance	3.4193	3.0782	5.0982*	5.966*	5.2988*
	(2.4250)	(2.6083)	(2.4433)	(2.789)	(2.4244)
Power balance (sq.)	−4.3510	−4.8846	−6.7212	−8.176*	−7.0736*
	(3.0444)	(3.5827)	(3.5345)	(4.038)	(3.5706)
			Country-level variables		
GDP/capita (log)	−0.4501*	−0.8442***	−0.8639***	−0.9106***	−0.8873***
	(0.1840)	(0.2254)	(0.2237)	(0.2351)	(0.2313)
No. excluded groups	−0.0132	−0.0399*	−0.0524**	−0.0578**	−0.0511**
	(0.0171)	(0.0185)	(0.0158)	(0.2955)	(0.0168)
Year	−0.1772**	−0.2166**	−0.2146***	−0.2213***	−0.2111***
	(0.0568)	(0.0602)	(0.0590)	(0.4816)	(0.0592)
			Group-level conflict history		
Peace years	−0.0190	0.1434	0.1482	0.1601	0.1540
	(0.1071)	(0.1106)	(0.1040)	(0.109)	(0.1038)
Spline 1	0.0007	0.0022	0.0025*	0.0026*	0.0026*
	(0.0010)	(0.0012)	(0.0011)	(0.0011)	(0.0011)
Spline 2	−0.0005	−0.0013	−0.0016*	−0.0017*	−0.0016*
	(0.0007)	(0.0008)	(0.0008)	(−0.0008)	(0.0007)
Spline 3	0.0001	0.0002	0.0003	0.0004	0.0004
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Constant	353.3482**	434.7015***	429.9920***	443.7***	422.0450***
	(113.5753)	(120.2728)	(117.9401)	(96.18)	(118.2983)
Observations	6,438	3,967	3,967	3,967	3,967

Notes: Robust, country-clustered standard errors in parentheses.
***$p < .001$. **$p < .01$. *$p < .05$.

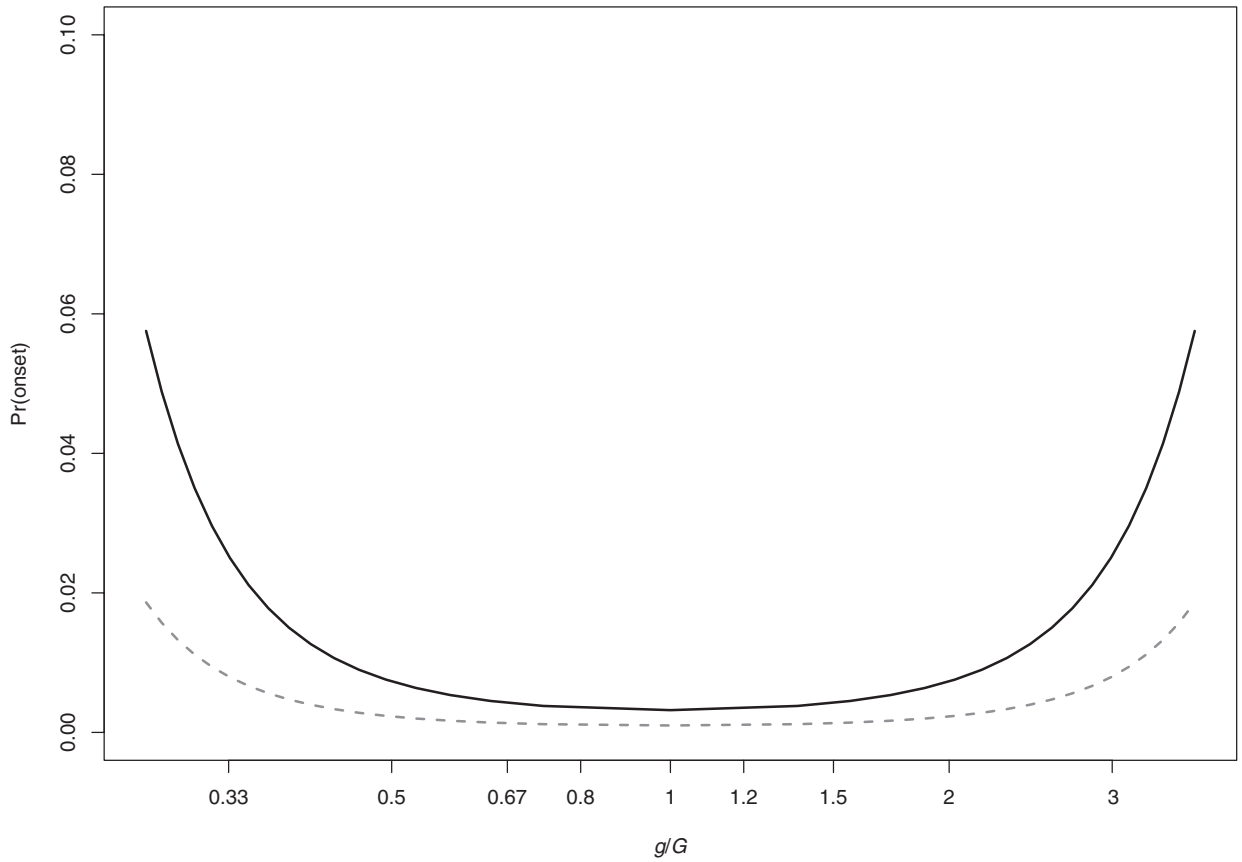
except that the coefficient for the *num_excl* variable now becomes significant.

Having considered H1, we now test H2, which postulates that both economic and political HIs increase the risk of internal conflict. Retaining the size restriction of the previous specification, Model 3 introduces a dummy variable for excluded groups that has a strong and statistically discernible impact on onset likelihood. However, this does not undermine the results with regard to economic inequality. This is an important result that strengthens our confidence that different types of grievances operate together and enables us to rule out the possibility that economic inequality could be an artifact of groups' access to executive power (and vice versa). Moreover, it is clear that the addition of the exclusion dummy either preserves or increases the effect of the other variables.[27] We illustrate the effect of inequality in Figure 5, which indicates how the predicted probability of conflict increases as the group's wealth level deviates from the country average in both directions, for a median observation for the post-1990 sample, for excluded and included groups, respectively. The figure reveals that, other things being equal, excluded groups (see the solid curve) are much more likely to experience conflict than included ones (see the dashed curve). However, the increases in risk from greater relative deviations in economic wealth are also substantial, especially for an excluded group, consistent with our argument that both political and economic grievances increase the risk of conflict.

So far we have made the simplifying, but questionable, assumption that the effect of inequality is the same for groups below and above the country's average level of wealth. We therefore need to test Hypotheses

[27] Although both the inequality indicators and the exclusion dummy have a strong, independent effect in this model specification, adding a multiplicative interactive term does not yield a statistically significant coefficient. Inequality and exclusion appear to have additive effects, and the effect of one feature does not depend on the level of the other.

FIGURE 5. Predicted Effect of Horizontal Inequality on Probability of Civil War (See Model 3 of Table 2)



Note: The solid line corresponds to a median profile for excluded groups; the dashed one to the median profile for included groups. The horizontal axis is on a log scale, with tick marks indicating specific values of the *g/G* ratio.

H1a and H1b separately. As a way to do so, Model 4 relaxes the assumption of a parabolic functional form by relying on a smoothed, spline-based local regression specification with three knots. Even if not perfectly symmetric, the estimated functional form shown in Figure 6 tells us that both relatively poorer and wealthier groups are more likely to experience civil war, thus confirming both H1a and H1b. The error bands are relatively broad but clearly separate from zero, at least for the poorer groups.[28]

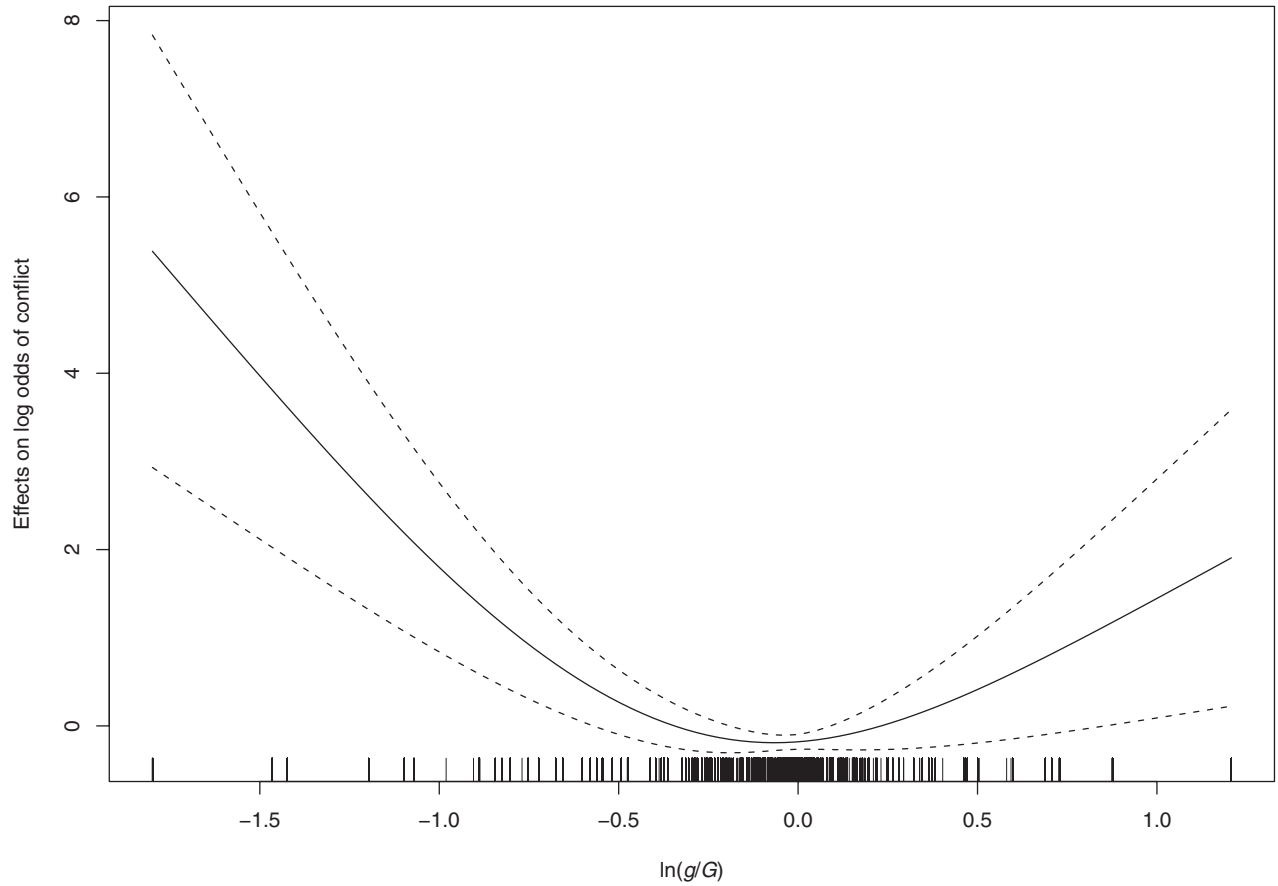
Further increasing our confidence in the separate effects, Model 5 uses the two linear ratio indicators *low_ratio* and *high_ratio* while still controlling for political exclusion. The results are strongly positive for both directions of inequality, lending further support to H1a and H1b. With this model specification, the demographic measures of power balance also become significant in the expected direction. Furthermore, the impact of the control variables at the country level also becomes stronger compared to Model 3.

[28] Because Model 4 was estimated as a GAM in R without clustered standard errors, these cannot be directly compared with the other models.

SENSITIVITY ANALYSIS

Because the number of onsets is quite limited, our findings need to be treated with some caution. Therefore, the current section presents the results of several robustness checks. Table 3 introduces four models that evaluate different sensitivity aspects. As noted earlier, the GDP per capita data used in the article include all economic activity, including exploitation of raw material. This in itself does not necessarily undermine a grievance interpretation, especially where disadvantaged groups are deprived of the riches extracted from their homelands (Østby, Nordås, and Rød 2009, 307; Stewart, Brown and Langer 2008, 346). Examples include the Aceh in Indonesia (Ross 2005) and the Ijaw in Nigeria (Osaghae 2008). Although our data sources do not enable us to separate a pure grievance effect from the *low_ratio* and *high_ratio* variables, Model 6 reports the coefficients of these variables, excluding wealth deriving from oil production, based on data from Nordhaus's dataset. The results tell us that the conflict-proneness of wealthy groups is not primarily driven by oil income. In fact, once oil income has been subtracted, the coefficient of

FIGURE 6. Effect of Logged Horizontal Inequality on the Probability of Civil War (See Model 4 of Table 2)



high_ratio increases considerably compared to that in Model 5.[29]

We continue the sensitivity analysis by extending the sample back to 1946. Although we prefer to base our conclusions on the period explicitly following the point of measurement, this backward projection of inequality values is not completely unreasonable, because of the already noted durability of inequality. In any case, this rough robustness test tells us whether the findings should be seen as an artifact of the post–Cold War sample or whether they can be potentially generalized beyond this time period. Extending the sample of Model 3 to the entire post-WWII period, Model 7 reveals that the main inequality result holds in this case as well.[30]

Because the Nordhaus data represent a temporal snapshot, there are also reasons to be concerned that endogeneity could have distorted the results. We therefore discard all groups that were experiencing ongoing conflict in 1990, which could have affected these groups' relative wealth estimates. The results of this test are presented in Model 8, which indicates that the inequality effect reported in Model 3 cannot be dismissed as being driven by endogenous influences. In fact, the coefficient of *lineq2* hardly changes at all and remains discernibly greater than zero, and the other variables behave in a fashion very similar to that in the original model.[31]

Finally, to rule out potentially distorting temporal dependencies, we present a static model that uses the group list in 1992 as the basis of comparison, while coding the dependent variable as one if there is any group-level onset from 1992 through 2005.[32] Again, we find that the inequality result in Model 8 becomes even stronger than in the dynamic models. As would be expected, however, the exclusion dummy loses significance, because this measure is sensitive to shifts of groups' power access that cannot be captured by the static analysis. We find no positive result for the power

[29] A simple test (not shown) based on a dummy variable that indicates whether the group's settlement area intersects with oil fields also fails to make any substantial difference in the effect of the inequality variables (see data at http://www.prio.no/CSCW/Datasets).

[30] Similar results can be derived by extending the sample in Model 5 (see Model 11 in the supplemental online Appendix).

[31] Despite this result, endogeneity may of course still undermine causal inference, although we believe this to be less likely given the stability of economic HIs (see Section 1.5 in the supplemental online Appendix).

[32] Very similar results can be obtained based on the 1991 and 1993 data, but we prefer to focus on 1992 because this is the first year after the collapse of the Soviet Union (cf. Models 18a and 18b in the supplemental online Appendix).

TABLE 3. Explaining the Onset of Group-level Conflict (Sensitivity Analysis)

	Model 6	Model 7	Model 8	Model 9
		Group-level variables		
Ineq. (*low* excl. oil)	1.2498***			
	−0.2045			
Ineq. (*high* excl. oil)	1.5140***			
	−0.4134			
Inequality (*lineq2*)		0.6586***	1.7217***	2.0801***
		(0.1377)	(0.2570)	(0.4978)
Excluded	1.2285***	1.3844***	1.0372**	0.7021
	(0.3493)	(0.2551)	(0.3679)	(0.4422)
Power balance	5.4835*	0.8590	4.8040	−1.3843
	(2.6084)	(1.9322)	(2.7512)	(2.5962)
Power balance (sq.)	−7.4488	−0.8995	−6.2409	1.2222
	(3.9224)	(2.1901)	(3.7091)	(3.0177)
		Country-level variables		
GDP/capita (log)	−0.9385***	−0.4880***	−0.7987**	−0.901**
	(0.2391)	(0.1478)	(0.2660)	(0.2606)
No. excluded groups	−0.0573**	−0.0199	−0.0508**	−0.0880*
	(0.0184)	(0.0123)	(0.0148)	(0.0370)
Year	−0.2079***	0.0515**	−0.2242**	
	(0.0596)	(0.0172)	(0.0685)	
Post–Cold War period		362.526***		
		(86.3212)		
Year × Post–Cold War		−0.1819***		
		(0.0433)		
		Group-level conflict history		
Peace years	0.1620	−0.0797	−0.0108	
	(0.1068)	(0.0899)	(0.1046)	
Spline 1	0.0026*	0.0006	0.0012	
	(0.0011)	(0.0007)	(0.0011)	
Spline 2	−0.0016*	−0.0008	−0.0008	
	(0.0007)	(0.0004)	(0.0008)	
Spline 3	0.0004	0.0004*	0.0001	
	(0.0003)	(0.0002)	(0.0003)	
Constant	415.5265***	−102.798**	449.2955**	4.6684*
	(118.9090)	(33.6938)	(137.1074)	(1.9423)
Observations	3,967	13,550	3,743	286

Notes: Robust, country-clustered standard errors in parentheses.
***$p < .001$. **$p < .01$. *$p < .05$.

balance, but the two remaining country-level variables retain a statistically significant negative effect.

Obviously, this set of sensitivity tests does not exhaust all possibilities. We refer the reader to our supplemental online Appendix for detailed results, but report here on the most important findings. For example, disaggregation of the dependent variable into territorial and governmental conflict, based on the contested incompatibility, shows that it is really the former type that is influenced by our inequality indicators. This is to be expected, because our method is explicitly geography-dependent, and it therefore cannot be excluded that HIs trigger governmental onsets. However, confirming this would require complementing the current measurements with nonspatial information, for example, from surveys.[33]

We also conducted several sensitivity tests by removing extreme values, both among the (resource-)richest groups, such as the Ijaw in Nigeria and Arabs in Iran, and among the relatively poorest groups, such as the Chechens in Russia. Even if discarding these groups separately or together weakens the results, the inequality effect remains statistically significant and strong. We also ran models controlling for world regions, which further confirm the robustness of our findings. Furthermore, another test that entails replacing the dummy variable for excluded groups with the full set of EPR

[33] See specifically the multinomial analysis presented in Model 10 in the supplemental online Appendix. Another potential concern is that the inequality effect could be driven by the difference between urban and rural communities. Yet this distinction does not in principle contradict our theory, and even though the GeoEPR data do not trace the ethnic compositions of major urban areas, adding a control variable for whether a group is "rural and urban" as opposed to merely "rural" does not affect our results (cf. Section 1.3 in the supplemental online Appendix).

categories also makes little difference to the impact of inequality.

CONCLUSION

Although there is plenty of room for further data refinement in future research, we believe that the results presented in this article are both of considerable theoretical importance and of direct policy relevance. To our knowledge, this is the first study of civil wars that compares economic horizontal inequality at the global level. Our main result shows that ethnic groups both above and below the country average in terms of per capita income are overrepresented in civil conflict, thus confirming what previous studies have already found within a more limited scope based on case-study research, survey data, and other sources.

In keeping with previous studies, our empirical analysis also detects a strong influence of political horizontal inequality based on measures of ethnic groups' access to central executive power (see, e.g., Cederman, Wimmer, and Min 2010). This effect, which operates along with the influence of economic HIs, confirms Stewart's multidimensional notion of HI and strengthens our confidence in grievance-based explanations of conflict in general. Although such explanations have partly fallen out of favor in recent civil war research, this finding will hopefully contribute to convincing scholars of civil war that the frustrations driving ethnonationalist mobilization and violence cannot be separated easily from economic factors. If it were correct that grievances do not matter because of their alleged omnipresence, then there should be no statistical link between structural inequalities and civil war onsets. However, our research shows that there is such a connection, thus implying that it is premature to reject grievance-based explanations of civil war onset.

Yet it should be kept in mind that, even though our study is more disaggregated than the customary country-level proxies used in quantitative civil war research, the group-level analysis presented here also hinges on theoretical interpolation to connect structural inequalities with collective-level violence. Although our proposed causal mechanisms are potentially capable of closing this explanatory gap, we cannot provide direct evidence of their operation in this article. Beyond citing separate case studies in confirmation of these mechanisms, it would be desirable to improve and expand existing datasets such that interactions between incumbent governments and their challengers can be traced in greater detail, while relying on systematic information on repression and mobilization before violence breaks out (see, e.g., Sambanis and Zinn 2006). Building on the pioneering efforts of Gurr (1993; 2000b) and his team, who have also collected extensive data on social and cultural HIs, such information would help disentangle the process at lower levels of aggregation and help us establish whether the causal imputations remain robust to such scrutiny. Fine-grained temporal measurements could also help developing an explicitly endogenous account of HIs, which have been kept exogenous in this study.

Another important caveat concerns the dependency on imperfect, geocoded data. Although innovative, our spatial method is limited to territorially segregated groups, and therefore cannot measure nonspatial, economic HI, as in the case of the Hutu and Tutsi in Rwanda. Although survey-based information has limited scope, it could be used to extend and validate our measurements (see Baldwin and Huber 2010).

To a large extent, our research agenda coincides with Blattman and Miguel's (2010, 18) recommendation:

> At present, the economic motivations for conflict are better theorized than psychological or sociological factors. Individual preferences in existing models typically include only material rewards and punishments. One key implication is that we have not derived the falsifiable predictions that distinguish between material and nonmaterial theoretical accounts. Yet the greater degree of existing theory on economic factors does not imply that researchers should discard non-economic explanations for conflict.

Rejecting "messy" factors, such as grievances and inequalities, may lead to more elegant models that can be more easily tested, but the fact remains that some of the most intractable and damaging conflict processes in the contemporary world, such as the conflicts afflicting the Sudan or the former Yugoslavia, are to a large extent about political and economic injustice. It is very unlikely that such conflicts can ever be understood, let alone durably solved, without taking seriously the claims of marginalized populations.

APPENDIX

Cases of Conflict Onset

Country	Group	Year	Type	>500k
Afghanistan	Pashtuns	1992	GOV	*
Afghanistan	Tajiks	1992	GOV	*
Afghanistan	Uzbeks	1992	GOV	*
Afghanistan	Tajiks	1996	GOV	*
Afghanistan	Hazaras	1996	GOV	*
Afghanistan	Uzbeks	1996	GOV	*
Angola	Bakongo	1991	TERR	*
Angola	Cabindan Mayombe	1991	TERR	
Azerbaijan	Armenians	1992	TERR	
Bosnia and Herzegovina	Serbs	1992	TERR	
Bosnia and Herzegovina	Croats	1993	TERR	*
Central African Republic	Yakoma	2001	GOV	
Congo	Lari/Bakongo	1998	GOV	
Cote d'Ivoire	Northerners (Mande and Voltaic/Gur)	2002	GOV	*
Cote d'Ivoire	Northerners (Mande and Voltaic/Gur)	2004	GOV	*
Croatia	Serbs	1992	TERR	
DRC	Tutsi Banyamulenge	1996	GOV	*
DRC	Tutsi Banyamulenge	1998	GOV	*
Eritrea	Muslims	1997	GOV	*
Eritrea	Muslims	2003	GOV	*
Ethiopia	Afar	1996	TERR	*
Ethiopia	Somali (Ogaden)	1996	TERR	*
Ethiopia	Oroma	1999	TERR	*
Georgia	Abkhazians	1992	TERR	
Georgia	Ossetians (South)	1992	TERR	
India	Indigenous Tripuri	1992	TERR	
India	Naga	1992	TERR	*
Indonesia	East Timorese	1992	TERR	*
Indonesia	East Timorese	1997	TERR	*
Indonesia	Achinese	1999	TERR	*
Iraq	Shi'a Arabs	1991	GOV	*
Macedonia	Albanians	2001	GOV	
Mali	Whites (Tuareg and Arabs)	1994	TERR	*
Mexico	Indigenous peoples	1994	GOV	*
Moldova	Transnistrians	1992	TERR	*
Myanmar	Muslim Arakanese	1991	TERR	*
Myanmar	Mons	1996	TERR	*
Myanmar	Wa	1997	TERR	*
Nepal	Ethnic communities (Adivasi/Janajati)	1996	GOV	*
Niger	Tuareg	1992	TERR	*
Niger	Toubou	1996	TERR	
Niger	Tuareg	1997	TERR	*
Nigeria	Ijaw	2004	TERR	*
Pakistan	Mohajirs	1995	GOV	
Russia	Chechens	1994	TERR	*
Russia	Chechens	1999	TERR	*
Spain	Basques	1991	TERR	*
Tajikistan	Uzbeks	1998	GOV	*
Togo	Kabré (and related groups)	1991	GOV	*
Uganda	Langi/Acholi	1994	GOV	*
United Kingdom	Catholics in Northern Ireland	1998	TERR	
Yemen	Southerners	1994	TERR	*
Yugoslavia	Croats	1991	TERR	*
Yugoslavia	Slovenes	1991	TERR	*
Yugoslavia	Albanians	1998	TERR	*

* Onset involving groups with population larger than 500,000 (see Models 2–9).

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