The Dynamics of Horizontal Economic Inequality in Countries Affected by Ethnic Conflict

Michel Armel Ndayikeza

Research Paper 450

AFRICAN ECONOMIC RESEARCH CONSORTIUM
CONSORTIUM POUR LA RECHERCHE ÉCONOMIQUE EN AFRIQUE

Bringing Rigour and Evidence to Economic Policy Making in Africa

The Dynamics of Horizontal Economic Inequality in Countries Affected by Ethnic Conflict[1]

By

Michel Armel Ndayikeza
Department of Economics, University of Burundi

1 I would like to thank the following persons for their constructive feedback on earlier versions of this paper: Janvier Nkurunziza, Anke Hoeffler, Léonce Ndikumana and other resource persons in Group B of the African Economic Research Consortium (AERC) biannual workshops; and Brian Dillon, Daniel Posner, Kim Yi Dionne, Amanda Lea Robinson and other attendees of the July 2019 annual WGAPE conference. Many thanks also to all the participants at the AERC biannual workshops in June 2019, December 2018 and June 2018. I acknowledge, with thanks, funding for this project provided by the AERC.

AERC Research Paper 450
African Economic Research Consortium, Nairobi
July 2021

THIS RESEARCH STUDY was supported by a grant from the African Economic Research Consortium. The findings, opinions and recommendations are those of the author, however, and do not necessarily reflect the views of the Consortium, its individual members or the AERC Secretariat.

Published by: The African Economic Research Consortium
P.O. Box 62882 - City Square
Nairobi 00200, Kenya

ISBN 978-9966-61-148-2

Contents

List of tables

List of figures

Abstract

This paper examines the dynamics of horizontal inequality in countries that have experienced ethnic conflict. This contrasts with previous studies which have focused on the effect of inequality on conflict. Understanding how conflict affects inequality serves to shed light on reasons behind conflict recurrence and slow economic development. The complex relationship between inequality and conflict is analyzed using both quantitative information, i.e. DHS data from 36 countries for the time period 1986-2018, and qualitative information, i.e. 6 country case studies. The focus throughout is on conflicts in which a rebel group claimed to fight the government on behalf of an ethnic group. The study also compares different inequality indicators suggested by the literature and provides arguments for why some of them should be preferred to others. Overall, the analysis shows that ethnic conflicts generally raise ethnic inequality. Furthermore, the way a conflict ends does not entirely determine the dynamics of horizontal inequality thereafter. The country case studies suggest that for a country to witness declining horizontal inequality following an ethnic conflict, these three conditions are important: (1) a swift victory of the rebel group; (2) financial resources to redistribute; and (3) a firm determination by the winner to redistribute. However, these conditions do not guarantee inequality decline. Therefore, the study suggests that it is important for policy makers to emphasize horizontal inequality reduction in the post-conflict period irrespective of how the conflict ended to avoid conflict recurrence.

Key Words: Economic inequality; Ethnic inequality; Civil conflict; Post-conflict reconstruction

JEL Classification: O11, O55, O57, D63, D74

1. Introduction

Since the end of the Second World War, many countries have experienced ethnic conflicts especially in Africa. Indeed, among 148 ethnic[1] conflicts[3] identified in this study from 1946 to 2016, 45% took place on the African continent compared to 20% in Asia, 18% in the Middle-East, 13% in Eastern Europe, 3% in South America and 1% in Western Europe. In each of these conflicts, "a rebel group has made an exclusive claim to fight on behalf of an ethnic group" Vogt et al. (2015) and has engaged in a confrontation with the government, which has resulted in at least 25 battle-related deaths within a year. Today, a good number of the 148 conflicts have ended. This paper examines the effect some of them had on ethnic economic inequality with a goal of deriving germane policies for more inclusive societies.

Previous studies on the inequality-conflict nexus have focused predominantly on the effect of inequality on conflict. It has been argued that horizontal inequality, or inequality that coincides with certain groups of people, matters more in explaining conflict than vertical inequality, or inequality between individuals (Østby, 2008; Cederman et al., 2011; Morelli and Rohner, 2015, Hillesund et al., 2018). In particular, Guariso and Rogall (2017) and Panza and Swee (2020) suggest that horizontal inequality between ethnic groups is an important driver of conflict.

Regarding the conflict-to-inequality causal chain, the first study to assess the causal link between conflict and inequality is Bircan et al. (2017). The study focuses on vertical inequality (and not horizontal inequality). Analyzing a panel of 128 countries over the time period 1960-2005, the authors find that income inequality rises during conflict and more so in the first five years after the conflict, and then gradually declines to pre-war levels. More recently, Dahlum et al. (2019) have analyzed the effect of conflict on horizontal inequality proxied by regional inequality in infant mortality rates. The latter authors use a dataset on 120 countries for the period 1989 to 2018 and find that high-intensity conflicts are associated with higher levels of horizontal inequality in the post-conflict phase.

A number of case studies which covered Guatemala, Liberia, Nepal and other countries have focused on how horizontal inequalities have been addressed in the post-conflict contexts (Stewart et al., 2012). Some of these case studies are subject to more attention below, with the hypothesis that the nature of conflict termination determines the dynamics of inequality in the post-conflict period. For instance, a conflict between a rebel group and a government resulting in a rebel victory[5] should

not produce the same dynamics of inequality as another similar conflict but in which the government is the winner.

Therefore, this study mainly asks the following questions. How does ethnic conflict affect horizontal inequality? How does the nature of conflict termination affect the dynamics of horizontal inequality? The effect of conflict on inequality is estimated using a regression analysis. The potential influence of conflict termination on the dynamics of inequality is analyzed using six (6) country case studies.

This study is important for at least two reasons: (1) Inequality negatively affects economic development through bad institutions and low human capital investment (Easterly, 2007). If ethnic conflict increases inequality, this can partially explain why some countries which experienced such conflict in the past remain in the low-income group; (2) Since previous studies suggest that horizontal inequality causes conflict, understanding how conflict in turn affects inequality is important for post-conflict policies which seek to reduce conflict recurrence. Indeed, research has shown that approximately half of all internal armed conflicts break out again during the first twelve years of the post-conflict period (Hoeffler, 2019).

In theory, one expects a conflict to have an effect on inequality during and after conflict. During a conflict, horizontal inequality should increase if the costs of war (for example death, displacement, prevention from attending school) are borne especially by the poor. However, this is not necessarily the case. The rich may lose more than the poor if, for instance, property destruction mainly affects the wealthiest. After conflict, the dynamics of inequality could depend on the way conflict ends, whether it terminates with a peace agreement or victory of either the rebel side or the government side.

Although this study focuses on economic inequality, this is not to say that political inequality, health inequality, inequality rooted in gender and other dimensions may not matter. The study postulates, however, that access to material resources is an important steppingstone to achieving other forms of equality.

This study focuses on a list of ethnic conflicts, instead of heterogeneous conflicts, which I compiled from two sources: the ACD2EPR dataset on ethnicity by Vogt et al. (2015) and the conflict termination dataset by Kreutz (2010). The effect of these ethnic conflicts on ethnic inequality is then estimated using data from 36 countries. The data on inequality is calculated from the Demographic Health Survey (DHS) micro data. Data availability for both the inequality and conflict data has restricted the econometric part of the study to the period 1986 to 2018.

The study finds that inequality between ethnic groups rises in the period starting from conflict outbreak until ten years after conflict termination. The way a conflict ends does not say much about how inequality will evolve thereafter. However, an analysis of past ethnic conflicts suggests that the golden combination for the disadvantaged side to see an improvement of its relative economic situation following a conflict is: (1) a swift victory of the rebel group; (2) financial resources; and (3) a firm determination to redistribute. A simple victory of rebels does not necessarily secure them higher economic well-being in the aftermath of conflict, especially if the rebels are ethnically

heterogeneous while peace agreements are typically accompanied with power sharing clauses which may limit quick redistributions. In the post-Cold War era, the chances of a victory are low due to a more effective international mediation. Indeed, data shows that 34% of ethnic conflicts in this last period ended in a peace agreement or ceasefire agreement, 9% in a government victory, and 5% in a rebel victory[6]. As these results reveal, the analysis assumes that the group which starts a rebellion is the disadvantaged one. Although this assumption could be challenged in some situations, it is supported by country case studies presented in Section 5.

The rest of this paper proceeds as follows. Section 2 documents the prevalence of ethnic conflicts around the world since 1946 and provides information on how they terminated. Section 3 reviews previous studies on the conflict-inequality nexus with an emphasis on the conflict to inequality causal link and provides a conceptual framework. Section 4 empirically examines the effect of conflict on inequality. Section 5 analyses the dynamics of inequality in the post-conflict depending on conflict termination. Section 6 concludes.

2. Ethnic Conflicts and How they Ended: 1946–2016

Annex Table A1 lists ethnic conflicts recorded around the world from 1946 to 2016 along with their duration and how they ended using information from Kreutz (2010) for conflict termination and Vogt et al. (2015) for information on ethnic conflicts. For the purpose of this study, I have regrouped conflict episodes for which different rebel groups fought for the same ethnic group. There are 148 ethnic conflicts in total. In all the conflicts considered, the rebel group made an exclusive claim to fight on behalf of an ethnic group, directly (for instance through a press release) or indirectly (for instance through the rebel). A conflict is considered to be terminated if there is either a peace agreement, a victory for the government side or a victory for the rebel side.

For conciseness, Table 1 below summarizes information in Annex Table A1. Table 1 shows that close to 40% of the civil conflicts have ended in peace agreements or victory for either the government side or the rebel side, and most victories were for the government side. More than 60% of ethnic conflicts do not terminate *stricto sensu*. Close to a fifth of conflicts remained in "low activity", meaning that they stayed below the Uppsala Conflict Data Programme (UCDP)[7] threshold of 25 battle-related deaths per year[8]. Conflicts may remain in low activity because of various factors, including intra-rebel fighting, internal reorganization, and a change of combat tactics (from outright fighting to terrorism or non-fatal methods) to push for negotiations. 11% of conflicts have ended with ceasefire agreements which do not include any resolution of the incompatibility but are rather concerned with ending the use of force. Less frequently, conflicts ended with state dissolution (dissolution of the Soviet Union in the case of Armenians) or state partition (partition of Sudan in the case of the Dinka, Shilluk and Nuer ethnic groups). For the rest of the conflicts (30%), there is no decisive outcome.

Table 1: Conflict termination and duration (1946–2016)

Period	Type of termination	Number	Percentage (%)		Duration (Years)
1946 - 2016	Peace agreement	23	19		8
	Victory for government	15	13		8
	Victory for rebels	7	6		5

	Ceasefire agreement	13	11		7
	Low activity	22	18		13
	State partition/dissolution	4	3		20
	Other	36	30		10
				Average:	10
1946 - 1989	Peace agreement	5	15		
	Victory for government	7	21		
	Victory for rebels	3	9		
	Ceasefire agreement	2	6		
	Low activity	10	29		
	State partition/dissolution	0	0		
	Other	7	21		
1990 - 2016	Peace agreement	18	21%		
	Victory for government	8	9%		
	Victory for rebels	4	5%		
	Ceasefire agreement	11	13%		
	Low activity	12	14%		
	State partition/dissolution	4	5%		
	Other	29	34%		

Data sources: Vogt et al. (2015) for ethnic conflicts and Kreutz (2010) for type of termination

A number of studies have argued that since the end of the Cold War, the international community has been more active and effective in mediation of conflicts (Mack, 2008; Kreutz, 2010; Gowan and Stedman, 2018), which should increase the number of conflicts that end in peace agreements and reduce the number of victories. Table 1 distinguishes pre- and post-Cold War terminations. Indeed, victories were the predominant type of conflict termination from 1946 to 1989 (30% of terminations). In the period after 1989[9], peace agreements and ceasefire agreements became much more prevalent compared to victories. The latter period also witnessed the first partition and dissolution of countries.

On average, conflicts lasted 10 years during the period of 1946 to 2016. This seems like a long enough period for the conflicts to have a detrimental effect on livelihoods through channels discussed in the theoretical framework below. In the few cases where rebels won, this usually occurred after relatively short periods of conflict. This was the case for instance in Liberia and Rwanda where rebels fought, respectively, for 1 year and 5 years before taking control of respective governments. Unsurprisingly, ethnic conflicts that have ended in state partition (case of Sudan) are the ones that have lasted the longest, on average. However, some of the longest conflicts were not taken into account in the calculation of duration in Table 1 because they had not terminated by 2016. The longest conflict in this last group involves the Kurds in Iran. This last conflict has been going on for more than 73 years. It is followed by the conflict between Palestinian Arabs and the government of Israel, which started in 1949.

3. Effect of Conflict on Horizontal Inequality: A Conceptual Framework

This section starts with a small digression which argues that horizontal inequality, more than vertical inequality, is likely to trigger civil conflict and discusses the channels through which inequality affects conflict. I then discuss how conflict can in turn affect inequality throughout its duration and thereafter.

The literature on conflict identifies two causes of rebellion: feasibility or "greed" and grievance (Collier and Hoeffler, 2004; Collier and Hoeffler, 2007))[10]. In the greed theory, rebels seek to profit from exploiting opportunities for financing rebellion, such as extortion of natural resources, donations from diasporas and hostile governments' subventions. In the grievance theory, violent protest occurs in the case of severe grievances due to different causes, such as high inequality, lack of political rights and ethnic divisions. This theory is close to the more traditional one of relative deprivation by Gurr (2016), which emphasizes that it is not absolute poverty that causes violence but rather the comparison of individuals of their current situation to their previous one or to that of others.[11]

Group grievances are arguably more consequential that individual ones. An individual, even if bitterly frustrated by his relative economic position in a society, still needs to coordinate with others to engage in violent actions. Mobilization for conflict might thus be easier in the case of individuals who share grievances. Grievances shared within an ethnic group, for instance, can enhance group cohesion by reducing collective action problems such as mutual suspicion and thus facilitate mobilization for conflict (Østby, 2008). Therefore, conflict might be more likely in countries with sharp disparities in income and wealth between identity groups.

Inequalities between groups may also have a social dimension. A dominant group in control of the State apparatus can erect discriminatory educational policies that limit access of other groups' members to the school system. These barriers then restrict economic opportunities of the disadvantaged group and particularly reduce its chances of access to public sector employment, often the main source of formal employment in developing countries[12].

Conflict in turn can affect inequality. During civil conflict, economic activity is hampered by an unsafe business environment. Capital stock adjusts through capital flight as agents shift their property out of the country (Collier, 1999). High skill labour is likely to react the same way as capital resulting in a brain drain (Collier et al., 2004).

Both capital and high skilled labour tend to move out of the relatively risky and low return environments. One expects returns to capital and high skill labour, and low skilled labour, to adjust accordingly. Low skilled labour should face falling wages, under-employment or unemployment while the relative price of capital and high skilled labour rises.[13] These adjustments should then widen the gap between the rich and the poor.

Nkurunziza (2019) further analyses the pattern of physical capital accumulation in conflict and post-conflict situations in Africa. Capital destroyed during war includes bridges, hospitals, schools and forests, either because they are perceived as State symbols or because it helps to slow the advance of the enemy. Belligerents also lay mines on roads or arable lands, making them inaccessible sometimes many years after the conflict has ended. For instance, Mozambique was declared mine free 22 years after the end of civil war in 1992. Furthermore, productive investment is typically reduced during conflict to the benefit of military spending or is simply shifted out of the country (capital flight), leaving the remaining capital to depreciate quickly when it is not destroyed. Estimates show that the average share of investment to GDP for peaceful country-years is 20%, whereas for conflict country-years it is 16%.

In sum, the rate of return to capital (r) should then increase in the conflict period as it becomes scarce while economic growth rate (g) diminishes. With $r > g$, inequalities should increase in the country to the advantage of the group that owns capital (Piketty, 2014).

At the same time, war-torn economies are generally associated with weak or absent state power. In this environment, "war entrepreneurs" thrive off the diminished security by engaging in illicit trade in drugs, arms, oil, minerals and other illegal economic activities, which benefit a small minority with close ties to the government (see Scheidel, 2017 chapter 6 for a general discussion and Davies, 2000 for the case of Liberia). Moreover, in war time, governments tend to bias the allocation of public resources in favor of security and to the disadvantage of infrastructure, education and health, which interferes with its redistribution role. Ndikumana (2005) shows that during the Burundian civil war, military expenditure as a share of GDP doubled, going from approximately 4% of GDP in 1994 to 8% in 2001, while the share of spending on education stagnated at 4% of GDP. The negative distributional effects of lower government spending on education and health during conflict are likely to persist into the post-conflict period.

Small plots of land appear to be the most valuable assets owned by the poor, in addition to very few durable goods such as bicycles and chairs (Banerjee and Duflo, 2007), which means that when they are displaced by conflict, they lose almost everything they have. On the other hand, financial wealth owned by the rich can be shifted abroad in case of conflict (Collier et al., 2004). However, the largest share of private wealth is in the form of physical assets that cannot be shifted abroad (Collier et al., 2004), which means that the rich are not immune to negative consequences of conflict. If the poor are not displaced, they tend to lose access to markets where they previously sold part of their agricultural production (Deininger, 2003) and return to

subsistence farming (McKay and Loveridge, 2005). The longer the conflict lasts, the more these negative shocks could widen the gap between the rich and the poor.

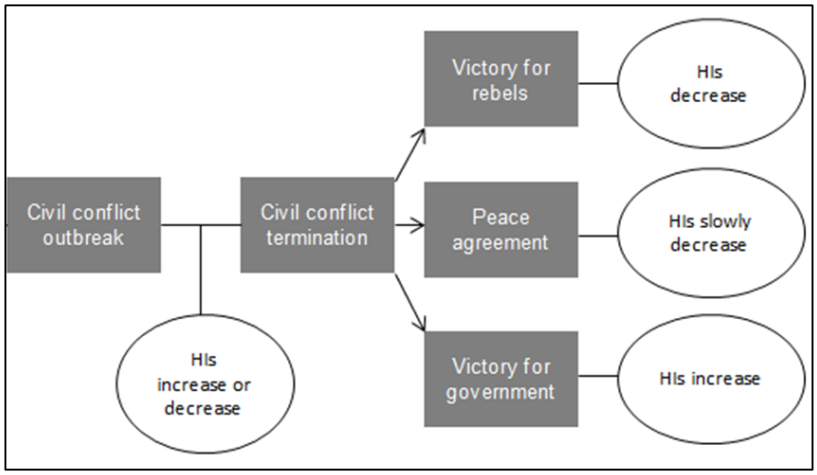
Nevertheless, civil conflict can, at least theoretically, make inequality fall. It can be argued that poor people in developing countries typically live at the subsistence level and therefore have little to lose compared to the rich. This argument echoes the greed and grievance theory which posits that the poor have a relatively low opportunity cost of enlisting to fight. The case of the Russian civil war is given as an example in Collier and Hoeffler (2004) of the poor engaging in conflict because they have relatively little to lose:

> 'Reds and Whites, both rebel armies, had four million desertions (the obverse of the recruitment problem). The desertion rate was ten times higher in summer than in winter: the recruits being peasants, income foregone were much higher at harvest time.' (Page 569)

After civil conflict, one can expect inequality to decrease or to increase depending on how the conflict ends. If the rebel group wins, inequality can be significantly reduced via expropriation, taxation and redistribution, conditional on the victorious party effectively pursuing a redistributive agenda. If there is a peace agreement, inequality may have a chance of going down but not as much as in the previous case due to power sharing agreements. The grieving side should face a much tougher situation if the government wins the war.

I summarize the arguments in this section in the diagram below, which serves as a conceptual framework of the following sections.

Figure 1: A conceptual framework of the effect of conflict on horizontal inequalities (HIs)



Source: Author

The definition of conflict termination is the one used in Section 2, i.e. a conflict is considered to be terminated if there is a peace agreement, a rebel victory or a government victory. Cases of ceasefire agreement, low activity and others are not considered in the analysis that follows since they are not conflict termination *per se*.

To summarize, Figure 1 shows that during an ethnic conflict, horizontal inequality could increase, decrease or remain stable depending on how the conflict affects the poor versus the rich. After conflict, inequalities should follow different trajectories depending on how the conflict ends.

4. Econometrics Analysis

To estimate the effect of ethnic conflict on horizontal inequality, the analysis uses a simple OLS model in which an inequality indicator is regressed on the conflict variable, a set of control variables, and region fixed effects.

$$ln(Y)_i = c + \alpha_1 C_i + \boldsymbol{X}_i \alpha_2 + \mu_i + \varepsilon_i \quad (1)$$

where i indexes countries, Y is a measure of horizontal inequality, and c is a constant. C is the conflict indicator and X is a vector of control variables. The set of controls is limited to variables that are likely to affect both conflict and inequality (i.e. likely confounders) since the objective of the analysis is to isolate the effect of conflict on inequality and not to identify the determinants of inequality. These likely confounders, as I explain below, are GDP per capita, official development aid, natural resources rents and governance. I also control for the effect of previous conflicts through a variable that measures the number of years since the end of the last conflict. μ_i represents region fixed-effects (dummy variables) and ε_i an idiosyncratic error. The coefficient of interest is α_1, which captures the effect of conflict on inequality.

4.1 Control Variables

GDP per capita appears to be systematically included in studies that run regression models with inequality on the left-hand side (see for example Bircan et al., 2017; Lessmann, 2014; Roine et al., 2009) or on the right hand side (see for example Guariso and Rogall, 2017; Morelli and Rohner, 2015; Østby, 2008). This link between inequality and GDP per capita can be traced back to the seminal paper by Kuznets (1955). Kuznets correlates data on the income share of the richest 20% and the poorest 60% of the population with country income per capita for seven developed and two developing countries. His results indicate that during the process of development, inequality first rises for developing countries and then declines for developed economies, suggesting an inverted-U relationship between inequality and development. However, econometric tests have not found the inverted-U hypothesis to be robust and sensitive to model specification. In general, the hypothesis seems to hold for a few countries taken individually and for cross-section regressions, but in panel estimation the inverted-U vanishes when country-specific dummies are included, i.e. the coefficients take opposite signs and are not significant (Ray, 2008).

Furthermore, the model controls for natural resource rents and remittances since the established literature suggests that they should be correlated with conflict through the "opportunity" for rebellion (Collier and Hoeffler, 2004). As the authors argue, rebellion may not only be motivated by grievances but also by the opportunity for rebels to increase their wealth. Natural resources such as diamonds in West Africa and cocaine in Columbia have been linked with conflict through the "opportunity" channel (Collier and Hoeffler, 2004).

The relationship between conflict and inequality may be confounded by governance. The literature has argued that democratic countries are less likely to experience conflict and have lower inequality (Bartusevicius, 2014).

The experience of Nepal after the 1996-2006 civil war shows that aid can have a significant effect on horizontal inequality (see Section 5 for details). Aid may also affect conflict by weakening the support of the population for rebels as evidenced, for instance, in the Philippines (Crost et al., 2014) or in some cases increase the incidence and duration of conflict (Nunn and Qian, 2014) through aid stealing.

4.2 Data

Concerning inequality data, this study uses Demographic and Health Surveys (DHS) data. More specifically, I construct a number of inequality indicators using information of household assets. This is the same data source on ethnic inequality as the frequently cited paper on the empirical investigation of the effect of horizontal inequality on conflict (Østby, 2008). This paper therefore updates the data used in Østby (2008) and uses additional inequality indicators for comparison (see details below).

DHS data is collected through an ongoing project of the United States Agency for International Development (USAID) and provides data and analysis mainly on women's and children's health in more than 90 countries. One of the main drawbacks of the DHS source is that not all countries conduct DHS surveys and, among those which collected the data, not all of them have ethnicity information. This study uses all countries that have ethnicity data (36). One can reasonably suspect that countries where ethnic differences are salient are likely to censor ethnicity data, stripping the sample of some of the most interesting information. In this respect, some interesting case studies such as Angola and Bosnia-Herzegovina are not included in the econometric analysis because data on ethnic inequality is not available. Furthermore, it would have been interesting to investigate how conflict affects inequality between the elites who finance the war. However, DHS data does not capture well household wealth of elites because: (1) informal discussions with researchers involved in collecting DHS data has revealed that the wealthiest households tend not to respond to the surveys; (2) even if they do, the information on household assets collected during surveys does not capture their wealth well (for instance, the data provides information on whether a household has a radio or not but does not give information on the value of the radio). Annex Table A3 shows DHS datasets used in regressions.

4.2.1 *Calculation of inequality indicators*

There are different ways of measuring horizontal inequality. Each inequality indicator has its strengths and weaknesses. The simplest way to measure horizontal inequality is perhaps to divide the average wealth of one group by the average wealth of another group. This is essentially what the Østby (2008) horizontal inequality indicator does. The Østby indicator was calculated in Stata using the following formula:

$$HI = 1 - (exp\left(- \left| ln\left(\sum_{i=1}^{M} \frac{A_{i1}/A_{i2}}{M} \right) \right| \right))$$

The formula calculates inequality in household assets between the largest two groups in a country. A_{i1} is the mean asset score (asset *i*) of ethnic group 1. A_{i2} is the score of the other group, and M is the maximum number of household assets. The measure can take values between 0 and 1 (more precisely: $0 \leq HI < 1$). It assumes that inequality between the largest two ethnic groups in the country reflects overall horizontal inequality in the country and that group size does not matter, which of course is contestable.

It is also technically possible to construct the index using the two most rival groups or politically competitive groups but this would entail a significant amount of political knowledge mixed with personal judgement.

The ideal measure of horizontal inequality should take into consideration all groups and their sizes. Such aggregate measures of inequality include the Gini index, the coefficient of variation (COV) and the Theil index. The following Gini index was calculated using information on household assets from DHS and applying the following formula:

$$BGINI = \frac{1}{2\bar{y}} \sum_r^R \sum_s^R p_r p_s BGINI = \frac{1}{2\bar{y}} \sum_r^R \sum_s^R p_r p_s |\bar{y}_r - \bar{y}_s|$$

where $\bar{y}_r = \frac{1}{n_r} \sum_i^{n_r} y_{ir}$ is group r mean value, p_r is the ethnic group r population share, R is the number of ethnic groups, y_{ir} is the value of y for the ith member of group r, and n_r is the population size of group r. This index takes into account all ethnic groups in a country and their group sizes. Other calculated indices are the COV and the Theil index.

$$BCOV = \frac{1}{\bar{y}} \left(\sum_r^R p_r (\bar{y}_r - \bar{y})^2\right)^{\frac{1}{2}}$$

$$BTHEIL = \sum_r^R p_r \frac{\bar{y}_r}{\bar{y}} log \left(\frac{\bar{y}_r}{\bar{y}}\right)$$

As the above formulas indicate, the COV and Theil indices compare group level inequality with the mean while the Gini index compares each group with every other group. For this reason, the preferred indicator in this study is the Gini index. Mancini et al. (2008) discuss in further details the pros and cons of each of these indicators and other measures of horizontal inequality, and make the case for the Gini index, the COV and Theil index.

All these indices were generated in Stata 15 using the datasets listed in Annex Table A3. The following variables were used to calculate household wealth: electricity, radio, television, refrigerator, bicycle, motorcycle and car. In the regressions presented below, these assets were first equally weighted, as shown in the Østby (2008) index. However, it could be argued that this weighting is arbitrary. I therefore, subsequently, used factor analysis to generate household wealth variables following Filmer and Pritchett (2001) and McKenzie (2005).[15]

4.2.2 *Coding of the conflict indicator*

The conflict indicator is equal to 1 from the period when an ethnic conflict starts until 10 years after conflict termination. The rest of the period is coded 0. This coding implies that 36% of observations are conflict years and 63% are peaceful years. It would have been interesting to further decompose the conflict period into the period during conflict and the post-conflict period. This was not done because surveys are typically not conducted during conflict. Furthermore, the kind of conflict coding used reduces potential reverse causality of inequality on conflict, since past conflict is regressed on current inequality through the coding of the post-conflict period the same way as the conflict period. Regarding the choice of the post-conflict period, it is observed that 10 years after the end of a conflict, the post-conflict era can, in most cases, be regarded as having ended (Brown et al., 2011).

Table 2 shows the number of ethnic conflict country-periods in the dataset.

Table 2: Number of ethnic conflict country-periods

Code	Frequency	Percentage
0	79	63%
1	46	36%

Each conflict country-year fulfills the following conditions:

1. The conflict occurred between the government of a State and one or more internal opposition groups.
2. The conflict caused at least 25 battle-related deaths in the year.
3. A rebel group made an exclusive claim to fight on behalf of an ethnic group.

The source of the ethnic conflicts data is Vogt et al. (2015), who integrated ethnic conflict information into the UCDP/PRIO armed conflict dataset (Gleditsch et al., 2002).

4.2.3 *Summary and descriptive statistics*

Table 3 presents summary statistics of all the variables used in regressions along with sources.

Table 3: Summary statistics

Variable	Sources	Obs	Mean	S.D.	Min.	0.25	Mdn	0.75	Max
Between Gini Index	DHS (Author's computations)	125	0.1	0.05	0.01	0.06	0.08	0.13	0.26
Between Theil index	DHS (Author's computations)	125	0.01	0.01	0	0	0.01	0.01	0.07
Between Coefficient of variation	DHS (Author's computations)	125	0.12	0.06	0.03	0.09	0.11	0.14	0.41
Østby (2008) index	DHS (Author's computations)	125	0.31	0.21	0	0.14	0.26	0.42	0.91
Conflict	Vogt et al. (2015)	125	0.37	0.48	0	0	0	1	1
Duration	Vogt et al. (2015)	125	7.11	11.85	0	0	0	12	43
Years since last conflict	Vogt et al. (2015)	125	2.78	6.93	0	0	0	0	35
Natural resources (%GDP)	World Bank (WDI)	125	9.15	8.37	0.46	3.43	6.47	11.62	45.56
ODA per capita (Current US$, net)	World Bank (WDI)	125	47.2	39.67	0.42	24.2	41.64	59.46	346.58
Log GDP per capita (Constant 2010 US$)	World Bank (WDI)	125	6.93	0.8	5.27	6.42	6.8	7.28	9.23
Governance	Polity 5	125	2.57	5.35	-9	-1	5	7	9
Remittances (%GDP)	World Bank (WDI)	125	3.37	4.83	0	0.47	1.45	3.98	31.21

The first four variables are the different inequality measures used alternatively as the dependent variable. The next three variables relate to conflict. The last group of

variables is of potential confounders as explained above. The governance variable was coded as a continuous variable, which ranges from -10 for a full autocracy to +10 for a full democracy. Remittances include personal transfers and compensation of employees. Natural resource rents comprise rents from oil, natural gas, coal, minerals and forests. Annex Table A2 provides more details on the latter variables.

Table 4 shows that most of the different measures of inequality are positively correlated. As expected, the highest correlations are the Gini, Theil and COV. The Østby index, which as explained above is conceptually very different from the other indices shows comparatively low correlations with the rest of the inequality indicators. The preferred index, the Gini index, shows highest correlation with the COV (0.70), then the Theil index (0.64) and lastly the Østby index (0.13). I therefore expect regression results to reflect that similarity/dissimilarity of indices.

Table 4: Correlations between different measures of horizontal inequality

	BGini	**BTheil**	**BCOV**	**Østby**
BGini	1			
BTheil	0.6434	1		
	(0.00000)			
BCOV	0.7037	0.9566	1	
	(0.00000)	(0.00000)		
Østby	0.1466	0.2596	0.3223	1
	(0.1028)	(0.0035)	(0.0002)	

Note: p-values in parentheses

As a preliminary analysis of the relationship between conflict and inequality, Figure B1 in the appendix shows a scatter plot of the two variables. On average, countries which experienced an ethnic conflict have higher levels of ethnic inequality in the period from the beginning of the conflict until ten years after the conflict.

4.2.4 *Regression results*

Table 5 presents the estimates of the effect of ethnic conflict on horizontal inequality. Each column presents results of a different measure of horizontal inequality.

The results suggest that, on average, ethnic conflict increases the level of ethnic inequality in a country, holding constant the amount of natural resource rents, the amount of aid received, GDP per capita, governance, remittances and taking into account the number of years since the last conflict and the region. More precisely, conflict increases ethnic inequality by approximately 20% to 43% in the period following conflict outbreak until ten years after conflict (see columns 1 to 3). This effect is statistically significant at the 1% level for the preferred measure of inequality, the Gini index, and 5% for the Theil and COV indexes. The coefficient on the Østby index is not significant (column 4). As stated earlier, the Østby index differs fundamentally from the first three in considering only the first two ethnic groups in a country in terms

of population while the others take into account all ethnic groups. Furthermore, the Østby index is problematic in the post-conflict period if the two main groups are both on the winning side, on the losing side or on neither side. Including control variables in the model does not affect much the value and the significance of the coefficient on conflict.

Table 5: The effect of ethnic conflict on horizontal inequality

	(1)	(2)	(3)	(4)
Variables	**B Gini**	**B Theil**	**B COV**	**Østby**
Conflict	0.338***	0.358**	0.191**	0.098
	(0.102)	(0.171)	(0.088)	(0.154)
Resources	-0.001	-0.008	-0.005	0.005
	(0.007)	(0.014)	(0.007)	(0.008)
ODA per capita	0.002	0.005**	0.003***	-0.002
	(0.001)	(0.002)	(0.001)	(0.001)
GDP per capita (log)	-0.282	0.768	0.285	0.410
	(1.018)	(2.060)	(1.054)	(1.205)
GDP pc squared (log)	0.020	-0.038	-0.011	-0.038
	(0.069)	(0.141)	(0.072)	(0.082)
Governance	-0.012	-0.035*	-0.018*	-0.036***
	(0.011)	(0.019)	(0.010)	(0.014)
Remittances	-0.013	-0.012	-0.007	-0.054**
	(0.010)	(0.019)	(0.010)	(0.023)
Years since last conflict	-0.009	0.001	0.001	0.026***
	(0.006)	(0.011)	(0.006)	(0.010)
SSA dummy	0.943***	1.099***	0.555***	0.073
	(0.231)	(0.401)	(0.204)	(0.176)
LAC dummy	0.556**	1.232**	0.565**	1.352***
	(0.279)	(0.498)	(0.249)	(0.275)
SA dummy	1.569***	2.349***	1.189***	0.784*
	(0.307)	(0.528)	(0.271)	(0.438)
EAP dummy	0.861***	1.362***	0.650***	0.899***
	(0.260)	(0.393)	(0.199)	(0.304)
Constant	-2.518	-9.955	-4.305	-2.517
	(3.766)	(7.532)	(3.856)	(4.428)
Observations	125	125	125	125
R-squared	0.300	0.174	0.176	0.276
Robust standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				
Note: SSA: Sub-Saharan Africa; LAC: Latin American and Caribbean; SA: South Asia; EAP: East Asia and Pacific. The region omitted to avoid perfect multicollinearity is ECA (Europe and Central Asia).				

These results are close to those of Bircan et al. (2017) who study the effect of conflict on vertical inequality, measured with the Gini index. The authors find that

conflict raises vertical inequality especially in the post-conflict period. The results of this study also go in the same direction as Dahlum et al. (2019). The latter authors use regional differences in infant mortality rates as a proxy for horizontal inequality. They find that long conflicts increase horizontal inequality during and after conflict. They also show that it is not until 10 years after conflict termination that one should expect horizontal inequality to decline.

One could think that rising inequality in the post-conflict period is driven by an increased prevalence of government victories over the disadvantaged groups, which pushes poorer groups into further marginalization (the same for a government victory disguised in a peace agreement). However, this intuition is first not supported by the descriptive statistics on conflict terminations from 1946 to 2016 (Table 1), which show that government victories and peace agreement actually only account for 30% of the types of conflict terminations in the period from 1990 to 2016, down from 36% in the period from 1946 to 1989. Furthermore, Section 5 below shows that the type of conflict termination is not a perfect predictor of the dynamics of inequality in the post-conflict period.

It could be argued that the results in Table 5 may be sensitive to outliers. I therefore run robust regressions where observations are given different weights according to their distance from the others (Hamilton, 1992). The results are presented in Table 6. The effect of conflict hardly changes when the dependent variable is the Gini index and remains statistically significant at 1% (column 1). The effect is not significant for other inequality indicators.

Table 6: The effect of ethnic conflict on horizontal inequality – robust regression

	(1)	(2)	(3)	(4)
Variables	B Gini	B Theil	B COV	Østby
Conflict	0.341***	0.204	0.124	0.146
	(0.107)	(0.145)	(0.075)	(0.145)
Resources	0.000	0.011	0.006	-0.000
	(0.007)	(0.010)	(0.005)	(0.010)
ODA per capita	0.002	0.004**	0.002**	-0.002
	(0.001)	(0.002)	(0.001)	(0.002)
GDP per capita (log)	-0.468	2.727**	1.354**	0.134
	(0.958)	(1.301)	(0.674)	(1.299)
GDP pc squared (log)	0.031	-0.196**	-0.097**	-0.018
	(0.066)	(0.090)	(0.047)	(0.090)
Governance	-0.010	-0.030**	-0.015**	-0.029**
	(0.011)	(0.014)	(0.008)	(0.014)
Remittances	-0.013	-0.008	-0.004	-0.043**
	(0.013)	(0.018)	(0.009)	(0.018)
Years since last conflict	-0.009	-0.011	-0.005	0.025**

	(0.008)	(0.010)	(0.005)	(0.010)
Constant	-1.725	-15.546***	-7.436***	-1.509
	(3.462)	(4.703)	(2.435)	(4.693)
Region dummies	YES	YES	YES	YES
Observations	125	125	125	125
R-squared	0.275	0.262	0.242	0.268
Standard errors in parentheses				
*** p<0.01, ** p<0.05, * p<0.1				

Finally, Table 7 presents the regression results obtained when using factor analysis to calculate household wealth. They are generally close to the ones presented previously. Conflict increases inequality by approximately 19% to 34%.

Table 7: The effect of ethnic conflict on horizontal inequality using factor analysis to calculate household wealth

	(1)	(2)	(3)
Variables	B Gini	B Theil	B COV
Conflict	0.202**	0.286*	0.165**
	(0.096)	(0.161)	(0.079)
Resources	-0.000	-0.004	-0.003
	(0.006)	(0.011)	(0.006)
ODA per capita	-0.001	-0.001	-0.000
	(0.001)	(0.002)	(0.001)
GDP per capita (log)	0.609	1.129	0.415
	(0.932)	(1.822)	(0.907)
GDP pc squared (log)	-0.035	-0.063	-0.021
	(0.062)	(0.123)	(0.061)
Governance	-0.003	-0.034*	-0.017*
	(0.013)	(0.018)	(0.009)
Remittances	-0.001	-0.008	-0.005
	(0.006)	(0.011)	(0.005)
Years since last conflict	-0.003	0.004	0.003
	(0.006)	(0.007)	(0.003)
Constant	-5.516	-10.157	-4.216
	(3.517)	(6.785)	(3.377)
Region dummies	YES	YES	YES
Observations	125	125	125
R-squared	0.135	0.162	0.167
Robust standard errors in parentheses			
*** p<0.01, ** p<0.05, * p<0.1			

5. Dynamics of Horizontal Inequality According to Type of Conflict Termination

The empirical analysis above is limited by data availability on types of conflict termination. More precisely, it did not look at how horizontal inequality evolves in the post-conflict phase depending on how conflict ended. This is because the dataset used for the regressions contains the following number of post-conflict years by type of conflict termination: low activity (5); peace agreement (5); government victory (1); rebel victory (1); ceasefire (1); and other (1). Therefore, this section draws on existing non-econometric studies on the dynamics of horizontal inequalities in post-conflict contexts to supplement the empirical analysis.

Table 7 presents some ethnic conflicts for which there is careful analysis or relevant information on the dynamics of inequality. I consider conflicts which have officially ended in the sense that there has been a peace agreement, or a victory for either the government side or the rebel side.

In theory, the way conflicts end should determine to some extent the dynamics of inequality in the post-conflict period. It is reasonable to think that the type of conflict termination may have an impact on how much the grieving group will benefit from government spending, particularly in education and health, and how much it will gain from available natural resources. Conflict termination could also determine whether foreign aid will flow to the grieving side or not.

Table 8: The dynamics of inequality in the post-conflict period

Country	Ethnicity rebels (the disadvantaged)	Conflict period	Conflict termination	Post-conflict relative economic situation of the disadvantaged
Burundi	Hutu	1965, 1991-1992, 1994-2008	Peace agreement	May have improved (Nkurunziza, 2012)
Nepal	Adibasi Janajati	1996-2006	Peace agreement	Improved moderately (Brown, 2012)
Liberia	Indigenous peoples	1980	Victory for rebel side	Worsened (Author)
Rwanda	Tutsi	1990-1994	Victory for rebel side	Significantly improved (Leander, 2012)

Cameroon	Fulani (and other northern Muslim people)	1984	Victory for government side	Slightly worsened (Author)
Tajikistan	Uzbeks	1997-1998	Victory for government side	Probably worsened (Author)

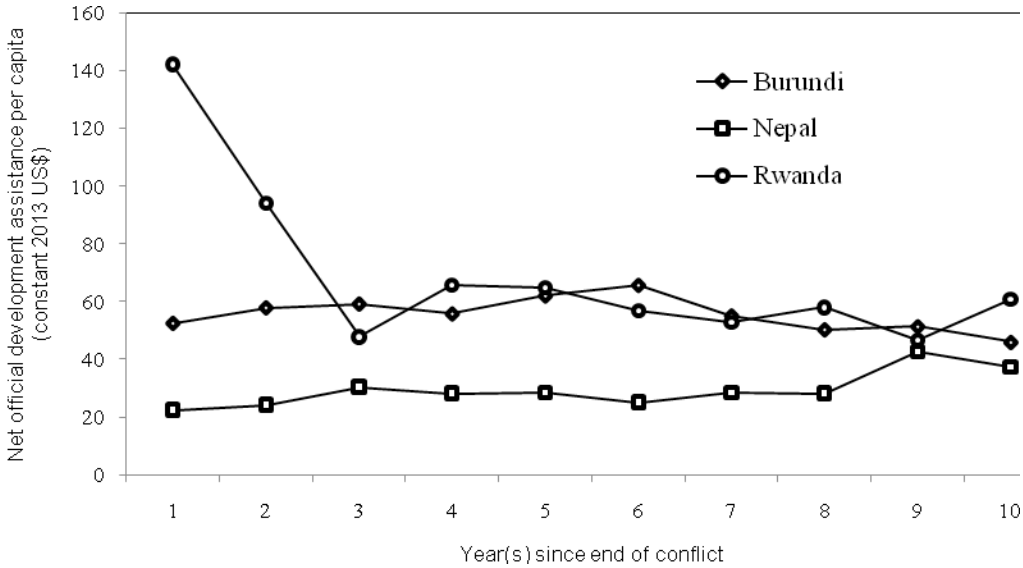
Sources: The information on conflict termination comes from Kreutz (2010). Data on conflict period and ethnicity of rebels is from Vogt et al. (2015)

Peace agreement

One of the main features of the peace agreement signed between the government of Burundi and rebels following the country's most severe civil war (1993-2002) was the establishment of quotas in top government positions, namely 60% for Hutus and 40% for Tutsis, and equal shares of both ethnic groups in the military and police.[16] Prior to this agreement, economic and political power had been concentrated in the hands of the Tutsi minority, particularly from the southern province of Bururi (Nkurunziza, 2012). Horizontal inequality had essentially grown from discrimination in access to education, which naturally limited access of Hutus to the civil service sector, military and police, the main sources of formal employment. The study conducted by Nkurunziza concludes that in the five years following the transfer of power in 2005 to the traditionally excluded group, not much had been achieved in terms of reducing ethnic inequality. The author argues that in the early post-conflict period, the country had taken important social policies aimed at expanding access to education and health to the whole population, but these measures were not sufficiently funded, and that if they should have any significant effect, it would be perceived in a longer term.

A notable difference between the experiences of Burundi and Nepal is that post-conflict aid has played an active role in redressing horizontal inequalities in the latter country (Brown, 2012). For instance, the World Bank in Nepal acknowledged the necessity to improve "fiscal transfers to disadvantaged groups" and to put in place "a civil service that better reflects the gender, caste and ethnic diversity of Nepal" (Cited in Brown, 2012). In this context, deprived groups, notably the Janajati, received relatively more aid per capita for some development programmes, involving a certain reduction of horizontal inequality. Furthermore, Figure 2 suggests that perhaps what is most important to address horizontal inequality is not the amount of aid received but whether it effectively targets the most disadvantaged. In the first 10 years of post-conflict, Nepal received about a third of the amount of aid per capita that Burundi received.

Figure 2: Post-conflict aid per capita in Burundi, Nepal and Rwanda



Source: World Bank, World Development Indicators
Notes: 1) The first year since end of conflict is 2006 for Burundi, 2007 for Nepal and 1995 for Rwanda. The sharp decrease of aid in 1995, 1996 and 1997 in the case of Rwanda was a general trend in Sub-Saharan Africa.
2) "Net Official Development Assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25% (calculated at a rate of discount of 10%)." (World Bank, World Development Indicators)

Victory for rebels

The experience of Rwanda suggests that chances of a substantial improvement of the economic situation of the grieving side are maximized by a combination of winning war, having enough resources to redistribute and being determined to pursue a redistribution agenda. After the Rwandan civil war (1990-1994), horizontal inequalities have been addressed through land reform and urbanization in favour of the previously disadvantaged Tutsis (Leander, 2012). Substantial resources permitting redistribution appeared at the turn of the millennium coming from foreign aid combined with looting of Congo's natural resources (Leander, 2012). In fact, the study by Leander suggests that the relative economic well-being of Tutsis might have increased to the point of threatening another conflict due to grievances especially related to land inequality, this time from the formerly advantaged Hutus.

The threat of conflict recurrence materialized in Liberia following the victory of rebels led by Master Sergeant Samuel Kanyon Doe. The rebels, who claimed to fight for the indigenous people, overthrew president William R. Tolbert Jr., an Americo-Liberian, on 12th April 1980 in a bloody coup in which the president was brutally murdered, and shortly after 13 members of his cabinet publicly executed.[17] However, when the rebels took power, their promises to the indigenous people were not fulfilled. On top of plundering the country's wealth and taking huge loans to prop up a failing government (See examples in Sirleaf, 2010), they favoured a particular ethnic group,

the Krahns, while heavily repressing other ethnic groups. This fueled ethnic tensions even more, tensions which led to the deadliest civil war the country has known nine years after Doe's coup. The experiences of Liberia and Rwanda suggest that the victory of the disadvantaged side can create explosive grievances from the formerly dominant group. Moreover, if there are multiple ethnic groups in the country, even groups which supported the rebellion can lose out in the post-conflict period.

Government victory

The fate of those who choose to rebel but lose the battle can be dramatic but perhaps less so in comparison with the post-conflict situation of the formerly advantaged group after a rebel victory. The cases of Cameroon and Tajikistan are illustrative.

The Northern part of Cameroon, where the Fulani and other Muslims are mostly found, has been poorer than the South at least since the 1980s[18]. While there are multiple ethnic groups in both regions, it is generally admitted that the North is less ethnically heterogeneous than the South. Ethnic tensions heightened in February 1984 following the trial of two northerners for plotting a coup against President Paul Bia, a Southerner. In April 1984, a coup attempt officially caused 70 deaths. The failed coup was followed by a major Cabinet reshuffle and replacements of parastatal heads. Although most of these changes benefited Bia's ethnic group, the Beti, he was careful not to alienate the Northerners too much by retaining a few in top government positions and more generally by using State resources to "mollify" the North (Van de Walle, 1994: 144).

The defeat of the Uzbeks in Tajikistan may have been more consequential. In 1997 and 1998, the forces of the Uzbek leader Khudoberdiyev rebelled against the Government of Tajikistan but lost the battle. The Uzbeks, who form the second largest ethnic group in the country (approximately 15% in 2000) after the Tajiks (almost 80% in 2000), faced political exclusion before the conflict (Fumagalli, 2007). The situation does not seem to have improved in the post-conflict period. During the period 2004-2006, there were only two (2) Uzbeks in the Tajik Parliament which counted 97 seats (CIDCM , 2006).

6. Conclusion and Policy Implications

This paper studies the dynamics of horizontal inequality following ethnic conflicts using Demographic and Health Surveys (DHS) micro data on household wealth, ethnic conflicts data from Kreutz (2010) and Vogt et al. (2015), and a number of case studies. This information was analyzed within a conceptual framework which allows a better understanding of the mechanisms at work. It is acknowledged that the data used in the study, and similar studies on the inequality-conflict nexus, is not ideal as detailed in the paper and this is why it is important to combine a quantitative and a qualitative analysis. Nonetheless, the available information suggests that ethnic conflicts tend to increase ethnic inequalities in the period 1986-2018, which should increase the probability of conflict recurrence. This finding is similar to that obtained by Bircan et al. (2017) and Dahlum et al. (2019) who also point to an inequality increasing effect of conflict. Policy-wise, it is important to pay attention to ethnic inequalities in the post-conflict period, independent of whether the conflict ended in a peace agreement, government victory or rebel victory to avoid conflict recurrence. One avenue that could enrich future work on the effect of ethnic conflict on horizontal inequality would be to explore the role of education, health and other public services in the conflict-inequality nexus.

Notes

1 I follow the definition of ethnicity used for the Ethnic Power Relations dataset by Vogt et al. (2015), which in itself follows the Weberian tradition. Ethnicity is defined as a "subjectively experienced sense of commonality based on a belief in common ancestry and shared culture". In this sense, ethnicity includes ethnolinguistic, ethnoreligious and ethnosomatic ("racial").

2 I follow the definition of ethnicity used for the Ethnic Power Relations dataset by Vogt et al. (2015), which in itself follows the Weberian tradition. Ethnicity is defined as a "subjectively experienced sense of commonality based on a belief in common ancestry and shared culture". In this sense, ethnicity includes ethnolinguistic, ethnoreligious and ethnosomatic ("racial").

3 This study deals with armed civil conflicts only. By civil conflict I mean internal armed conflict even if there may be international forces fighting in the country, which cause at least 25 battle-related deaths in a year, the threshold used by Uppsala Conflict Data Programme (UCDP) to define armed conflicts. Sometimes, war is used as a synonym for conflict to avoid repetition. This is not to be confused with the term "war" sometimes associated in the literature with a conflict that causes 1,000 or more battle-related deaths in year.

4 Throughout the paper, rebel victory means that the rebel group takes over the government.

5 For the rest of the conflicts, either they have not terminated, or it is not clear how they have ended. See Section 2 for more details.

6 https://www.prio.org/Data/Armed-Conflict/UCDP-PRIO/, accessed on 21st October 2019.

7 Nonetheless, these types of conflicts are not considered as ongoing. For instance, it is the case the conflict between the Uighurs and the Government of China in 2008.

8 The year of the fall of the Berlin Wall (1989) is typically considered in the literature as the final year of the Cold War period (Kreutz, 2010; Lundgren and Svensson, 2020).

9 This greed and grievance dichotomy is, however, contested notably because the two are not necessarily distinct. See Humphreys (2003) – the author criticized the working paper version, which remained substantially the same as the published version.

10 It should also be noted that some studies have associated absolute poverty with conflict (See Sambanis, 2004 for a review). It is then argued that the

highest risk of violence occurs when absolute poverty is coupled with ethno-religious cleavages.

11 Discriminatory education policies have been documented for Latin America (Easterly, 2007) and Burundi (Ndikumana, 2005). In both cases, elites opposed mass investment in education probably because they were afraid of the poor majority gaining power and seeking to redistribute income and wealth more equally.

12 The underlying theoretical framework is the neoclassical theory, which hypothesizes that production factors (capital and labour) are remunerated according to their marginal productivity. Therefore, when the quantity of factors reduces, in this case because of conflict, marginal productivity rises.

13 The Stata code used to generate the variables is available upon request.

14 The peace agreement, called "The Arusha Peace and Reconciliation Agreement", was actually signed in 2000 and provided for a transitional period of 3 years. The Burundian civil war is usually considered to have ended in December 2002 when the main rebel group, the CNDD-FDD, signed a ceasefire agreement with the government of Burundi. The CNDD-FDD then came to power following the general election of 2005. Therefore, the year 2005 is commonly regarded as the beginning of the post-conflict period. However, the last rebel group, Palipehutu-FNL, stopped fighting in 2008 as coded in the conflict termination dataset by Kreutz (2010).

15 Only four members of Tolbert's Cabinet survived the coup and its aftermath. One of them is former president Ellen Johnson Sirleaf (2006-2018), at the time Minister of Finance (Sirleaf, 2010).

16 See, for example, (Fearon and Laitin, 2005 and the World Bank's Cameroon overview: https://www.worldbank.org/en/country/cameroon/overview

References

Banerjee, A. V. and E. Duflo. 2007. "The economic lives of the poor". *Journal of Economic Perspectives, 21*(1): 141-168.

Bartusevicius, H. 2014. "The inequality–conflict nexus re-examined: Income, education and popular rebellions". *Journal of Peace Research, 51*(1): 35-50.

Bircan, Ç., T. Brück and M. Vothknecht. 2017. "Violent conflict and inequality". *Oxford Development Studies, 45*(2): 125-144.

Brown, G., A. Langer and F. Stewart. 2011. A typology of post-conflict environments. CRPD Working Paper, 1, 1-22.

Brown, G. K. 2012. "Nepal: First steps towards redressing HIs?" In *Horizontal Inequalities and post-conflict Development*, pp. 275–296. Springer.

Cederman, L.-E., N. B.Weidmann, and K. S. Gleditsch. 2011. "Horizontal inequalities and ethnonationalist civil war: A global comparison". *American Political Science Review, 105*(3): 478-495.

Collier, P. 1999. "On the economic consequences of civil war". *Oxford Economic Papers, 51*(1): 168-183.

Collier, P. and A. Hoeffler. 2004. "Greed and grievance in civil war". *Oxford Economic Papers, 56*(4): 563-595.

Collier, P. and A. Hoeffler. 2007. "Civil war". *Handbook of Defense Economics, 2*: 711–739.

Collier, P., A. Hoeffler and C. Pattillo. 2004. "Africa's exodus: Capital flight and the brain drain as portfolio decisions". *Journal of African Economies, 13* (suppl_2), ii15–ii54.

Crost, B., J. Felter, and P. Johnston. 2014. "Aid under fire: Development projects and civil conflict". *American Economic Review, 104*(6): 1833-56.

Dahlum, S., H. M. Nygård, S. A. Rustad, and G. Østby. 2019. The Conflict-Inequality Trap: How Internal Armed Conflict Affects Horizontal Inequality. United Nations Development Programme.

Davies, V. A. 2000. "Sierra Leone: Ironic tragedy". *Journal of African Economies, 9*(3): 349-369.

Deininger, K. 2003. "Causes and consequences of civil strife: Micro-level evidence from Uganda". *Oxford Economic Papers, 55*(4): 579-606.

Easterly, W. 2007. "Inequality does cause underdevelopment: Insights from a new instrument". *Journal of Development Economics, 84*(2): 755-776.

Fearon, J. and D. Laitin. 2005. Cameroon.

Fearon, J. D. and D. D. Laitin. 2003. "Ethnicity, insurgency, and civil war". *American Political Science Review, 97*(1): 75-90.

Filmer, Deon and Lant H. Pritchett. 2001. "Estimating wealth effects without expenditure data-or tears: An application to educational enrolments in States of India". *Demography*, 38(1):115-132.

Fumagalli, M. 2007. "Framing ethnic minority mobilization in Central Asia: The cases of Uzbeks in Kyrgyzstan and Tajikistan". *Europe-Asia Studies, 59*(4): 567-590.

Gowan, R., Stedman, S.J. 2018. "The international regime for treating civil war, 1988–2017". *Dædalus*, 147(1): 171-184.

Gleditsch, N. P., P. Wallensteen, M. Eriksson, M. Sollenberg and H. Strand. 2002. "Armed conflict 1946-2001: A new dataset". *Journal of Peace Research, 39*(5): 615-637.

Guariso, A. and T. Rogall. 2017. Rainfall inequality, political power, and ethnic conflict in Africa. LICOS Discussion Paper Series No. 391/2017, Available at SSRN: https://ssrn.com/abstract=2961694 or http://dx.doi.org/10.2139/ssrn.2961694 Accessed October 25, 2020.

Gurr, T. R. 2016. *Why men rebel*. Routledge. Abingdon, Oxon New York.

Hamilton, L. C. 1992. *Regression with graphics: A second course in applied statistics*. Brooks/Cole Publishing Company. Pacific Grove, California.

Hillesund, S., K. Bahgat, G. Barrett, K. Dupuy, S. Gates, H. M. Nygard, S. A. Rustad, H. Strand, H. Urdal and G. Østby. 2018. "Horizontal inequality and armed conflict: A comprehensive literature review". *Canadian Journal of Development Studies*, 39(4): 463-480.

Hoeffler, Anke. 2019. "Post-conflict stabilization in Africa". *Review of Development Economics*, 23, No. 3: 1238-1259.

Humphreys, M. 2003. Economics and violent conflict. *Program on Humanitarian Policy and Conflict Research, Harvard University, February*.

Justino, P. and P. Verwimp. 2013. "Poverty dynamics, violent conflict, and convergence in Rwanda". *Review of Income and Wealth,* 59(1): 66-90.

Kreutz, J. 2010. "How and when armed conflicts end: Introducing the UCDP conflict termination dataset". *Journal of Peace Research,* 47(2): 243-250.

Kuznets, S. 1955. "Economic growth and income inequality". *The American Economic Review*, 45(1): 1-28.

Leander, S. S. 2012. "Structural violence and conflict: Vertical and horizontal inequality in post-genocide Rwanda". In *Horizontal inequalities and post-conflict development*, pp. 230–248. Springer.

Lessmann, C. 2014. "Spatial inequality and development—Is there an inverted-U relationship?" *Journal of Development Economics,* 106: 35-51.

Lundgren, Magnus and Isak Svensson. 2020. "The surprising decline of international mediation in armed conflicts". *Research and Politics*, 7, No. 2.

Mack, Andrew (ed). 2008. "Human security brief 2007". Vancouver: Human Security Report Project.

Mancini, L. F. Stewart and G. K. Brown. 2008. "Approaches to the measurement of horizontal inequalities". In *Horizontal Inequalities and Conflict*, pp. 85-105. Springer.

CIDCM. Center for International Development and Conflict Management | University of Maryland. https://cidcm.umd.edu/research/mar. Accessed October 25, 2020.

McKay, A. and S. Loveridge. 2005. Exploring the paradox of Rwandan agricultural household income and nutritional outcomes in 1990 and 2000. Technical Report, Michigan State

University, Department of Agricultural, Food and Resource Economics.

McKenzie, David J. 2005. "Measuring inequality with asset indicators". *Journal of Population Economics*, 18(2): 229-260.

Morelli, M. and D. Rohner. 2015. "Resource concentration and civil wars". *Journal of Development Economics, 117*: 32-47.

Ndikumana, L. 2005. "Distributional conflict, the state and peace building in Burundi". *The Roundtable, 94* (381): 413-427.

Nkurunziza, J. D. 2012. "Inequality and post-conflict fiscal policies in Burundi". In *Horizontal inequalities and post-conflict development*, pp. 209–229. Springer.

Nkurunziza, J. D. 2019. "Growth in fragile states in Africa: Conflict and post-conflict capital accumulation". *Review of Development Economics* 23, no. 3 (2019): 1202-1219.

Nunn, N. and N. Qian. 2014. "US food aid and civil conflict". *American Economic Review 104* (6): 1630-66.

Østby, G. 2008. "Polarization, horizontal inequalities and violent civil conflict". *Journal of Peace Research 45* (2): 143-162.

Panza, L. and E. Swee. 2020. "Inter-ethnic income inequality and conflict intensification in mandate Palestine." London, Centre for Economic Policy Research. https://cepr.org/active/publications/discussion_papers/dp.php?dpno=14366 Accessed October 25, 2020.

Piketty, T. 2014. *Capital in the twenty-first century*. Harvard: Harvard University Press.

Ray, Debraj.1998. *Development economics*. Princeton University Press. Princeton, New Jersey.

Rodrik, D. 1999. "Where did all the growth go? external shocks, social conflict, and growth collapses". *Journal of Economic Growth,* 4(4): 385-412.

Roine, J., J. Vlachos and D. Waldenström. 2009. "The long-run determinants of inequality: What can we learn from top income data?" *Journal of Public Economics* 93(7-8): 974-988.

Sambanis, N. 2004. "Poverty and the organization of political violence". In *Brookings Trade Forum*, pp. 165–211. JSTOR.

Scheidel, W. 2017. *The great leveler: Violence and the history of inequality from the Stone Age to the twenty-first century*. The Princeton Economic History of the Western World. Princeton University Press.

Sirleaf, E. J. 2010. *This child will be great: Memoir of a remarkable life by Africa's First Woman President*. HarperCollins e-books.

Stewart, F., R. Venugopal and A. Langer. 2012. *Horizontal inequalities and post-conflict development*. Springer.

van de Walle, Nicholas. 1994. Neopatrimonialism and Democracy in Africa, with an Illustration from Cameroon. In *Economic Change and Political Liberalization in Sub-Saharan Africa*, edited by J. A. Widner. Baltimore: Johns Hopkins.

Vogt, M., N.-C. Bormann, S. Rüegger, L.-E. Cederman, P. Hunziker and L. Girardin 2015. "Integrating data on ethnicity, geography, and conflict: The ethnic power relations data set family". *Journal of Conflict Resolution,* 59(7): 1327-1342.

Annex

Table A1: Ethnic conflicts from 1946 to 2016, duration and type of termination

Country	Ethnicity of rebels	Conflict period	Duration (Years)	Conflict termination
	Hazara	1989-1995, 1996-2001	13	Other
	Tajiks	1996 - 2001	6	Other
1. Afghanistan	Uzbeks	1996 - 2001	6	Other
	Pashtuns	1995 - 2016	22	Missing
	Bakongo	1991 - 2002	12	Peace agreement
2. Angola	Cabindan Mayombe	1991 - 2009	19	Low activity
3. Azerbaijan	Armenians	1991 - 2016	26	Missing
4. Bangladesh	Tribal-Buddhists	1975 - 1991	17	Ceasefire agreement
	Serbs	1992 - 1995	4	Peace agreement
5. Bosnia and Herzegovina	Croats	1993 - 1994	2	Peace agreement
6. Burundi	Hutu	1965, 1991-1992, 1994 – 2006	15	Peace agreement
7. Cameroon	Fulani (and other northern Muslim people)	1984	1	Victory for government
	Yakoma	2001	1	Other
8. Central African Republic	Goula	2006	1	Peace agreement
	Muslim Sahel groups	1966 - 1970	5	Other
	Toubou	1966 - 1970	5	Other
9. Chad	Zaghawa, Bideyat	1989	1	Other
	Hadjerai	1989, 1991	2	Other
	Sara	1992 – 1994	3	Low activity
	Uyghur	2008	1	Low activity
10. China	Tibetans	1950 – 1959	10	Victory for government
11. Comoros	Nzwani Comorans	1997	1	Victory for rebels
12. Congo	Lari/Bakongo	1998 - 2016	19	Missing
	Ngbandi	1998 - 2000	3	Other
	Luba Kasai	1960 – 1962, 2016	4	Missing
	Mongo	1998 - 2000	3	Other
	Luba Shaba	2013	1	Other
13. Congo, DRC	Bakongo	2007 - 2008	2	Victory for government

	Lunda-Yeke	1961 - 1962, 2013 - 2014	4	Other
	Mbandja	1998 - 2000	3	Other
	Ngbaka	1998 - 2000	3	Other
	Tutsi-Banyamulenge	1996 - 1997, 1998 – 2001, 2006 – 2008, 2012 - 2013	11	Other
	Northerners (Mande and Voltaic/Gur)	2002, 2004	2	Peace agreement
14. Cote d'Ivoire	Southern Mande	2002 - 2003, 2004	3	Peace agreement
15. Croatia	Serbs	1992 - 1995	4	Peace agreement
16. Djibouti	Afar	1991 - 1994, 1999	5	Peace agreement
	Afar	1975 - 1976, 1996	3	Low activity
	Tigry	1976 - 1988	13	Other
17. Ethiopia	Somali (Ogaden)	1964, 1976 - 1983, 1991, 1993 - 2016	34	Missing
	Muslim Eritreans	1964 - 1991	28	Victory for rebels
	Oroma	1977 - 2016	40	Missing
	Ossetians (South)	1992 - 2008	17	Ceasefire agreement
18. Georgia	Abkhazians	1992 - 1993	2	Peace agreement
19. Ghana	Ewe	1981	1	Victory for rebels
20. Guatemala	Maya	1975 - 1995	21	Peace agreement
	Punjabi-Sikhs (non-SC/ST)	1983 - 1993	11	Low activity
	Scheduled Tribes	2012 - 2014	3	Other
	Assamese (non-SC/ ST/OBCs)	1990 – 2010, 2015 – 2016	23	Missing
	Kashmiri Muslims	1990 - 2016	26	Missing
21. India	Bodo	1989 - 1990, 1994 - 2004, 2009 - 2010, 2013 - 2016	19	Missing
	Naga	1956 - 1968, 1992 - 2000, 2015 - 2016	23	Missing
	Indigenous Tripuri	1979 - 1988, 1992 - 2004	23	Low activity
	Mizo	1966 - 1968	3	Other
	Manipuri	1982 - 2009, 2015 - 2016	30	Missing
	Acehnese	1990 - 2005	16	Peace agreement
	East Timorese	1975 - 1999	25	Peace agreement
22. Indonesia	Amboinese	1950	1	Victory for government
	Papuans	1965 - 1984	20	Victory for government
	Azeri	1946	1	Victory for government
	Baloch	2006 - 2010	5	Other
23. Iran	Arabs	1979 - 1980	2	Low activity
	Kurds	1946 - 2016	70	Missing
	Shi'a Arabs	1982 - 1996, 2004 - 2008	20	Other
	Sunni Arabs	2004 - 2011	8	Other

24. Iraq	Kurds	1961 - 1996, 2004 - 2011	44	Other
	Sunni Arabs	2004 - 2016	13	Missing
25. Israel	Palestinians (Arab)	1949 - 2014	66	Other
26. Laos	Hmong	1989 - 1990	2	Victory for government
27. Lebanon	Maronite Christians	1986, 1989 - 1990	3	Victory for government
	Sunnis (Arab)	1958, 1976	2	Ceasefire agreement
	Shi'a Muslims (Arab)	1983 - 1984	2	Other
	Gio	1989 - 1990	2	Peace agreement
28. Liberia	Indigenous Peoples	1980	1	Victory for rebels
	Mano	1989 - 1990	2	Peace agreement
29. Macedonia	Albanians	2001	1	Peace agreement
	Arabs/Moors	1994	1	Ceasefire agreement
30. Mali	Tuareg	1990, 2007 - 2009, 2012 - 2015	8	Missing
31. Mexico	Maya	1994	1	Ceasefire agreement
32. Morocco	Sahrawis	1975 - 1989	15	Low activity
	Buddhist Arakanese	1948 - 1957, 1964 - 1973	20	Other
	Karenni (Red Karens)	1957 - 2005	49	Low activity
	Shan	1959 - 1983, 1985 - 2015	56	Missing
	Wa	1997	1	Victory for rebels
33. Myanmar	Kayin (Karens)	1949 - 2013	65	Low activity
	Mons	1949 - 1990, 1996	43	Victory for government
	Muslim Arakanese	1948 - 1961, 1973 - 1978, 1991 - 1994, 2016	25	Missing
	Kachins	1949 - 1950, 1961 - 2016	58	Missing
34. Nepal	Adibasi Janajati	1996 - 2006	11	Peace agreement
	Sumus	1982 - 1990	9	Ceasefire agreement
35. Nicaragua	Miskitos	1982 - 1990	9	Ceasefire agreement
	Tuareg	1991 - 1992, 1994, 1997	4	Ceasefire agreement
36. Niger	Toubou	1995	1	Low activity
37. Nigeria	Ijaw	2004	1	Ceasefire agreement
	Igbo	1967 - 1970	4	Victory for government
	Baluchis	1974 - 2016	43	Missing
38. Pakistan	Mohajirs	1990 - 1996	7	Low activity
	Bengali	1971	1	Victory for rebel
39. Papua New Guinea	Bougainvilleans	1990 - 1996	7	Ceasefire agreement
40. Philippines	Moro	1970 - 2016	47	Missing
	Estonians	1946 - 1948	3	Low activity
	Latvians	1946	1	Low activity
	Chechens	1994 - 2015	22	Missing

41. Russia	Ukrainians	1946 - 1950	5	Low activity
	Lithuanians	1946 - 1948	3	Low activity
	Azeri	1990	1	Victory for government
	Armenians	1990 - 1991	2	State partition/ dissolution
	Tutsi	1990 - 1994	5	Victory for rebels
42. Rwanda	Hutu	1996 - 2016	21	Missing
43. Senegal	Diola	1990 - 2011	22	Low activity
	Croats	1991 - 1994	4	Other
44. Serbia and Montenegro	Albanians	1998 - 1999	2	Peace agreement
	Slovenes	1991	1	Ceasefire agreement
	Coloreds	1981 - 1988	8	Low activity
45. South Africa	Asians	1981 - 1988	8	Low activity
	Blacks	1981 - 1988	8	Low activity
	Nuer	2011 - 2016	6	Missing
46. South Sudan	Murle	2013	1	Other
	Anyuak	2013	1	Other
47. Spain	Basques	1978 - 1991	14	Low activity
48. Sri Lanka	Sri Lankan Tamils	1984 - 2009	26	Victory for government
	Dinka	1963 - 1972, 1983 - 2004, 2011	33	State partition/ dissolution
	Latoka	1963 - 1972	10	Peace agreement
	Zaghawa	2003 - 2011	9	Other
	Masalit	2003 - 2011	9	Other
	Nuba	1983 - 2004, 2011	23	Other
49. Sudan	**Azande**	1963 - 1972	10	Peace agreement
	Shilluk	1983 - 2004, 2011	23	State partition/ dissolution
	Fur	2003 - 2011	9	Other
	Nuer	1983 - 2004, 2011	23	State partition/ dissolution
	Bari	1963 - 1972	10	Peace agreement
	Beja	1983 - 2004	22	Other
50. Suriname	Maroons	1987	1	Ceasefire agreement
	Kurds	2012 - 2015	4	Missing
51. Syria	Sunni Arabs	1979 - 1982, 2011 - 2016	10	Missing
52. Tajikistan	Uzbeks	1997 - 1998	2	Victory for government
53. Thailand	Malay Muslims	2003 - 2016	14	Missing
54. Togo	Ewe (and related groups)	1986	1	Victory for government
55. Trinidad and Tobago	Blacks	1990	1	Victory for government
56. Turkey	Kurds	1984 -2016	33	Missing

	Far North-West Nile (Kakwa-Nubian, Madi, Lugbara, Alur)	1971, 1981 - 1983, 1996 - 1997	6	Other
57. Uganda	Langi/Acholi	1986 - 2014	29	Other
58. Ukraine	Russians	2014 - 2016	3	Missing
59. United Kingdom	Catholics In N. Ireland	1971 - 1991, 1998	22	Ceasefire agreement
	Southerners	1994	1	Other
	Northerners	1962 - 1970	9	Peace agreement
60. Yemen	Sunni Shafi'i (Arab)	1979 - 1982	4	Low activity
	Northern Zaydis	2014 - 2015	2	Missing
61. Zimbabwe	Africans	1967 - 1979	13	Peace agreement

Table A2: Detailed descriptions of some control variables

Variable	Source	Description
Governance	Polity 5 Project	The variable is called POLITY2. It ranges from -10 for a full autocracy to +10 for a full democracy. According to the Polity 5 Project Dataset Users' Manual, democracy is conceived as: (1) "the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders"; (2) "the existence of institutionalized constraints on the exercise of power by the executive"; (3) the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation". Autocracy is viewed as political system in which there is a "lack of regularized political competition and concern for political freedoms".
Remittances	World Bank (WDI)	"Personal remittances comprise personal transfers and compensation of employees. Personal transfers consist of all current transfers in cash or in kind made or received by resident households to or from non-resident households. Personal transfers thus include all current transfers between resident and non-resident individuals. Compensation of employees refers to the income of border, seasonal, and other short-term workers who are employed in an economy where they are not resident and of residents employed by non-resident entities. Data are the sum of two items defined in the sixth edition of the IMF's Balance of Payments Manual: personal transfers and compensation of employees."
Natural Resources	World Bank (WDI)	"Total natural resources rents are the sum of oil rents, natural gas rents, coal rents (hard and soft), mineral rents, and forest rents. The estimates of natural resources rents are calculated as the difference between the price of a commodity and the average cost of producing it. This is done by estimating the world price of units of specific commodities and subtracting estimates of average unit costs of extraction or harvesting costs (including a normal return on capital). These unit rents are then multiplied by the physical quantities countries extract or harvest to determine the rents for each commodity as a share of Gross Domestic Product (GDP)."

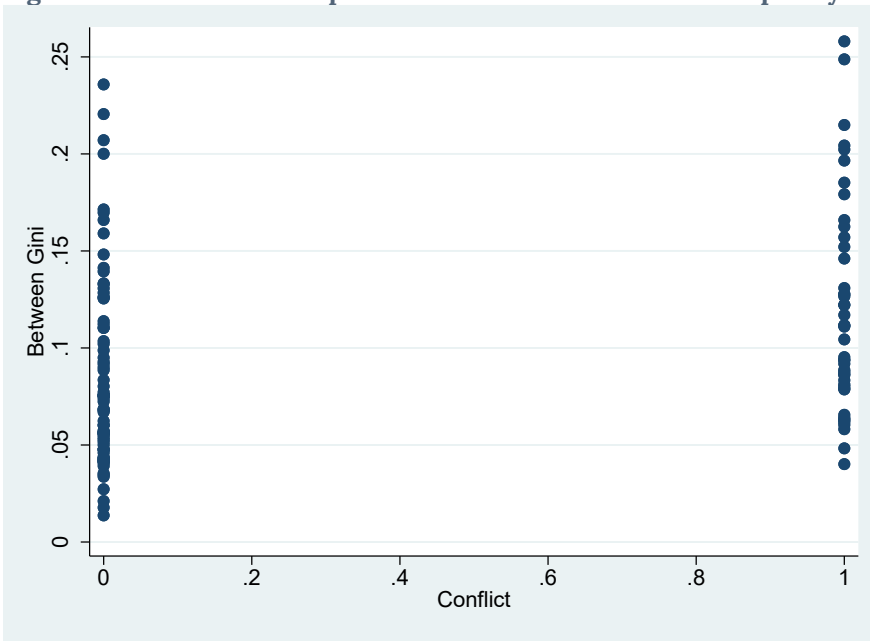
Variable	Source	Description
ODApc	World Bank (WDI)	"Net official development assistance is disbursement flows (net of repayment of principal) that meet the DAC definition of ODA and are made to countries and territories on the DAC list of aid recipients. Net Official Development Assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25% (calculated at a rate of discount of 10%)."

Table A3: DHS surveys used in regressions

Country	**Year**	**Country**	**Year**	**Country**	**Year**
Benin	1996	Guinea	1999	Niger	1992
	2001		2005		1998
	2006		2012	Peru	1991
	2012		2018		2000
	2018	Kazakhstan	1995		2005
Bolivia	2003		1999		2009
Brazil	1991	Kenya	1989		2012
	1996		1993	Philippines	1993
Burkina Faso	1992		1998		1998
	1999		2003		2003
	2003		2008		2008
	2010		2014		2013
	2014		2015		2017
	2018	Kyrgyz Republic	1997	Rwanda	1992
Cameroon	1998	Liberia	1986	Senegal	1986
	2004		2008		2006
	2011		2011		2008
	2018		2013		2010
Central African Republic	1994	Malawi	2000		2012
Chad	1996		2004		2015
	2004		2010		2016
	2015		2012		2017
Cote d'Ivoire	1994		2014		2018
	1998		2016	South Africa	1998

	2005		2017	Sri Lanka	1987
	2011	Mali	1987	Togo	1988
Ethiopia	2003		1996		1998
	2008		2001	Trinidad and Tobago	1987
Gabon	2000		2006	Uganda	1988
	2012		2012		1995
Ghana	1988		2015		2011
	1993		2018		2014
	1998	Mozambique	1997		2016
	2003	Namibia	1992	Uzbekistan	1996
	2008		2000	Vietnam	1997
	2014	Nepal	1996		2000
	2016		2001		2005
Guatemala	1987		2006	Zambia	1992
	1995		2011		1996
	1999		2016		2002
	2015		2001		2007
					2013
				Zimbabwe	1988
					1994

Figure B1: The relationship between conflict and ethnic inequality



Mission

To strengthen local capacity for conducting independent, rigorous inquiry into the problems facing the management of economies in sub-Saharan Africa.

The mission rests on two basic premises: that development is more likely to occur where there is sustained sound management of the economy, and that such management is more likely to happen where there is an active, well-informed group of locally based professional economists to conduct policy-relevant research.

www.aercafrica.org

Learn More

www.facebook.com/aercafrica

www.instagram.com/aercafrica_official/

twitter.com/aercafrica

www.linkedin.com/school/aercafrica/

Contact Us
African Economic Research Consortium
Consortium pour la Recherche Economique en Afrique
Middle East Bank Towers,
3rd Floor, Jakaya Kikwete Road
Nairobi 00200, Kenya
Tel: +254 (0) 20 273 4150
communications@aercafrica.org