

Do Horizontal Inequalities Matter for Civil Conflict?*

Gudrun Østby

Centre for the Study of Civil War (CSCW)

International Peace Research Institute, Oslo (PRIO)

Fuglehauggata 11

NO-0260 Oslo, Norway

gudrun@prio.no

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Abstract:

Recent large-N studies of civil war conclude that inequality does not increase the risk of internal armed conflict. This paper argues that such conclusions may be premature because existing studies, which usually measure inequality as income inequality between individuals, neglect the *group* aspect of inequality and social organization. Case studies suggest that what matters for conflict is so-called ‘horizontal inequalities’ – systematic inequalities that coincide with ethnic cleavages – and that in addition to economics one should also consider other dimensions of inequality. The main objective of this paper is to explore whether horizontal inequalities affect the probability of civil conflict when tested quantitatively across many cases. Using data from the Demographic and Health Surveys (DHS) for 33 developing countries, I construct aggregated macro-indicators on inequality between the two largest ethnic groups in each country, along three dimensions: social, economic and health-

related. I also generate measures of ethnic fractionalization and polarization based on the DHS survey data. The main finding is that social horizontal inequality seems to be positively related to conflict outbreak. Variables for ethnic composition and inequality between individuals are not significant. I conclude that it is too early to reject the inequality–conflict nexus, and that future conflict studies should also explore the concept of ‘horizontal polarization’.

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Introduction

... simple inequality between rich and poor is not enough to cause violent conflict. What is highly explosive is ... 'horizontal' inequality: when power and resources are unequally distributed between groups that are also differentiated in other ways – for instance by race, religion or language. So-called 'ethnic' conflicts occur between groups which are distinct in one or more of these ways, when one of them feels it is being discriminated against, or another enjoys privileges which it fears to lose. (Kofi Annan, 1999)

Recent large-N studies of civil war conclude that inequality does not increase the risk of internal civil conflict (e.g. Collier & Hoeffler, 2004; Fearon & Laitin, 2003; Hegre, Gissinger & Gleditsch, 2003).

This paper argues that such studies may be wrong because they neglect the group aspect of inequality and social organization. Civil wars are *organized group* conflicts, not 'a matter of individuals randomly committing violence against each other' (Stewart, 2000: 3). Hence, the focus should be on inequality between identity groups, and not on inequality between individuals. Many authors (e.g. Gurr, 2000; Hauge, 2003; Murshed & Gates, 2004; Stewart, 2000, 2002a) argue that inequalities that coincide with ethnic cleavages may enhance both grievances and group cohesion among the relatively deprived, and thus facilitate mobilization for conflict. Such systematic inequalities between ethnic groups are often referred to as inter-group, or *horizontal inequalities*, and should be distinguished from *vertical inequality*, which relate to class, or inequality between individuals (see Stewart, 2000). Moreover, the vast majority of inequality–conflict studies tend to concentrate exclusively on economic inequality, usually operationalized as income inequality or inequality in land distribution, thus failing to capture the multidimensional nature of inequality.

In a series of case studies, Stewart (2002a) found that various dimensions of horizontal inequalities (HIs) provoked some kind of conflict, ranging from a high level of criminality in Brazil to civil war in Uganda and Sri Lanka. Case studies are of course valuable, providing deep insight into the specific cases. However, generalizing to a universal relationship between horizontal inequalities and violent conflict based on few cases is problematic. For this purpose, a systematic, large-N quantitative research design is needed.

The main objective of this paper is to take into consideration the lessons derived from case studies in order to explore whether various dimensions of horizontal inequalities affect the

probability of domestic armed conflict, when tested quantitatively across many cases. In order to pursue this goal, I develop a new preliminary dataset on horizontal inequalities. Using data from the Demographic and Health Surveys (DHS) for 33 developing countries, I construct aggregated macro-indicators of inequalities between the two largest ethnic groups in each country along three dimensions: economic, social and health-related. Horizontal economic inequality is measured as the ratio between the group means in terms of household asset ownership (such as whether the household owns a car, television or a fridge). The social dimension of HI is constructed on the basis of educational and occupational opportunities. The health-related dimension of HI measures group inequality in infant mortality rates (IMR) and the access of children's health cards. Based on these three indicators I analyze whether horizontal inequalities influence the likelihood of civil conflict.

The paper is structured as follows: I first discuss the most relevant problems with the inequality-conflict literature, and explain more thoroughly the concepts of vertical vs. horizontal inequalities. I next present a theoretical framework for studying horizontal inequalities and civil conflict. Before presenting my research design, I briefly review some previous attempts of studying horizontal inequalities and discuss some measurement issues. Finally, I present my empirical results, and discuss their interpretation. Consistent with Collier & Hoeffler (2004) and Fearon & Laitin (2003), I find that grievances as traditionally operationalized – by vertical income inequality and various measures of ethnic composition, such as fractionalization and polarization – have no effect on the likelihood of conflict. The results, however, provide robust evidence that one of my dimensions of horizontal inequalities, social HI, is positively related to civil conflict in developing countries. My study demonstrates that it is too early to reject the inequality–conflict nexus.

Problems with the Inequality–Conflict Literature

At least since Aristotle theorists have believed that political discontent and its consequences – protest and instability – depend not only on the absolute level of economic wealth, but also its distribution (Nagel, 1974: 453). A remarkably diverse literature, ancient and modern, theoretical as well as empirical, has coalesced on the proposition that political violence is a function of economic

inequality.¹ There are, in theory, five possible relationships between economic inequality and political conflict: positive, negative, convex (inverted U-shaped), concave (U-shaped), or null. Reviewing the empirical literature, we can find examples of all. Since the publication of a seminal paper by Russett in 1964, scholars have performed statistical analyses in an effort to determine the relationship between vertical inequality and political conflict. Despite the persistence of this theme, however, the literature has produced contradictory results, leaving us no closer to understanding whether there is a – and, if so, what is – the relationship between inequality and conflict (see e.g. Parvin, 1973; Nagel, 1974; Sigelman & Simpson, 1977; Weede, 1981; Muller & Seligson, 1987; Alesina & Perotti, 1996; Auvinen & Nafziger, 1999).

Most traditional studies of inequality and conflict relate somehow to the theory of relative deprivation (see Gurr, 1970). This theory argues that while absolute poverty may lead to apathy and inactivity, comparisons with those in the same society who do better may inspire radical action and even violence. Recent literature on civil war has distinguished between so-called ‘greed-driven’ and ‘grievance-driven’ rebellion. Collier & Hoeffler (2004) discuss several grievances (such as inequality, lack of political rights and ethnic divisions) as well as opportunities for forming a rebel organization (such as access to finance, natural resources and geographical factors like mountains and forests). Inequality is among the grievance factors largely dismissed by Collier & Hoeffler, as are various measures of ethnic composition. Similarly, Fearon & Laitin (2003) and Hegre, Gissinger & Gleditsch (2003) find no evidence for a significant relationship between income inequality and conflict. The ‘greed-grievance’ (or opportunity-frustration) debate merits further examination. It is not my intention, however, to frame the debate in ‘either-or’ terms, as the key seems to be in understanding the interaction between the two. Rather, I follow Gurr (1970) and Ellingsen (2000) who see the outbreak of civil war as a combination of *frustration* (repression; suffering), *opportunity*

¹ Lichbach (1989) was able to locate 43 aggregate quantitative studies, within nations and cross-national, of the economic inequality-political conflict nexus, and many more have been conducted in the years following Lichbach’s review (e.g. Alesina & Perotti, 1996; Auvinen & Nafziger, 1999; Collier & Hoeffler, 2004; Fearon & Laitin, 2003; Hegre, Gissinger & Gleditsch, 2003).

(freedom to mobilize) and a shared *identity* (group cohesion which enhances shared grievances and facilitates mobilization).

While a standard critique about lacking control variables, poor data², and statistical shortcomings would probably apply to many of the studies mentioned above, I contend that there is a more fundamental and conceptual problem that produces the conflicting results concerning the inequality–conflict nexus. First, all these studies take an individualistic approach to inequality, concentrating exclusively on vertical inequality among individuals even though what they are trying to explain is group conflict.³ This may explain why so many researchers have failed to find a relationship between relative deprivation and conflict. According to Walker & Smith (2002: 92), ‘feeling deprived can inspire participation in collective behavior, but only if the person feels deprived on behalf of a relevant reference group’. Horizontal inequalities capture the collective aspect of relative deprivation. Furthermore, shared group grievances may enhance the group cohesion and thus facilitate group mobilization (Gurr, 2000; Stewart, 2002a).

The second problem with the inequality–conflict literature is that most studies only consider *economic* inequality, operationalized as income or land inequality. This is also true for the most recent inequality–conflict studies, of which almost everyone uses the inequality data provided by Deininger & Squire (1996).⁴ In this regard, Sen (1992) asks an essential question: ‘Equality of what?’ Given the fact that the human population is different in many respects, it is important to remember that inequality can be much more than just income inequality measured by e.g. the Gini

² A serious problem with the data on income inequality is the high level of missing observations. Strand & Gates (2002) argue that worse than the problem of missing data itself, is the problem that arises when the pattern of missing data is non-random, or biased. If we are less likely to have income inequality data for countries with civil war, this may bias the effect of inequality on conflict.

³ Though some studies argue that societies with coincidental ethnic cleavages and inequalities may be more conflict prone than others (e.g. Sigelman & Simpson, 1977; Auvinen & Nafziger, 1999), they do not test this assumption empirically.

⁴ One study of the relationship between vertical inequality and conflict, however, stands out in this regard: de Soysa & Wagner (2003) test the effect of vertical schooling inequality rather than income inequality on conflict, using data from Castelló & Doménech (2002) on differences in educational attainment. The authors even argue that this vertical measure

index. Sen focuses on three different categories (or spaces) of equality: equality of income or other financial assets; equality of welfare; and equal rights and liberties. He argues that the various categories of equality cannot be combined perfectly, since the differences in environmental factors and human capacities influence the final outcome. Stewart (2002a: 3) also stresses that inequalities may occur in various dimensions: ‘Horizontal inequalities are multidimensional – with political, economic and social elements’. In sum, then, the primary message we may draw from the existing research literature is not that inequality is necessarily unrelated to conflict, but that it may depend on which level of analysis we choose, and what dimension of inequality we try to measure.

Vertical vs. Horizontal Inequality

According to Stewart (2000: 13) vertical inequality is a measure that ‘takes everyone in a society from “top” to “bottom” and measure their incomes and the consequent inequality’. In other words, vertical inequality is a summary measure of the general level of inequality between rich and poor people in a society, regardless of ethnic affiliation or other group characteristics of the population. Such inequality is usually measured by the Gini or the Theil coefficients.⁵

Horizontal inequalities, on the other hand, are ‘systematic inequalities between culturally formed groups’ (Stewart, 2002a).⁶ One could of course relate the concept of horizontal inequalities to other classifications of groups, such as gender, age cohorts and rural vs. urban groups. However, since the focus of this paper is the relationship between inequality and violent conflict, and because it

captures some of the logic of horizontal inequalities, due to the assumption that dominant ethnic groups control state resources and often use education policies to discriminate against minorities.

⁵ The most common measure of income inequality is the Gini coefficient – an index between 0 and 1 (or 0 and 100) where 0 implies an egalitarian distribution (perfect equality) and 1 (or 100) indicates total concentration (perfect inequality). Egalitarian countries like Sweden and Japan have Gini scores around 0.25. Highly unequal countries, like South Africa, have Gini scores around 0.60 and more. The Gini coefficient is defined graphically as the area of concentration between the Lorenz curve and the line of perfect equality. The Lorenz curve is a graphical representation of the proportionality of a distribution (the cumulative percentage of the values). For an introduction, see Lorenz (1905). See also Firebaugh (2003) for a comprehensive overview of different inequality measures.

⁶ This phenomenon is closely related to Stein Rokkan’s (1967) concept of reinforcing vs. cross-cutting cleavages. In societies where ethnic and economic differences coincide, social cleavages are reinforcing each other, and may further split critical groups. Cross-cutting cleavages, on the other hand, may shore up existing divisions.

is frequently asserted that most domestic conflicts today are of ethnic character (Gurr, 2000), this paper focuses exclusively on horizontal inequalities between ethnic groups.

Horizontal inequalities often have their origin in historical circumstances, such as colonial policies, which privileged some groups over others. Sometimes, however, horizontal inequalities are not caused by deliberate agency at all but simply become evident for example when traditional peoples on the periphery of modernizing societies are drawn into closer contact with the more powerful and technologically proficient groups (Gurr, 2000). An initial advantage often leads to long-term cumulative advantages, as resources and education allow the more privileged groups to secure further advantages. Likewise, group deprivation tends to be reproduced over time.

Ethnic affinity can be a factor with substantive influence on many aspects of people's lives, varying from securing employment and receiving medical attention to being fairly treated by the police (Sen 1992: 122). For example, in Guatemala, Mayan communities are largely excluded from the legal, political, economic and social systems of the country (Minority Rights Group International, 1997: 93). In South Africa under apartheid nonwhites were excluded from most skilled and professional occupations (Stewart, 2002a). These are just a few examples of the diverse kinds of practices and policies that create, maintain or reinforce socio-economic inequalities between ethnic groups.

A country can have systematic income inequality between ethnic groups, despite the fact that the overall (vertical) income inequality is rather low (as is the case in Rwanda), and vice versa; a country can have a high vertical income inequality score, even though the structural differences between ethnic groups might be low (which seems to be the case in Brazil). Besides, a country can have both vertical and horizontal inequality at the same time, or neither of the two. These four situations are described in Figure 1.

– Figure 1 in here –

Section A shows a graph of the incomes of people in a country with a rich North and a poor South. This country has low vertical inequality, but high horizontal inequality. Section B depicts the

opposite situation, a graph of incomes in a country with the same average income in the North and the South. This country has high vertical inequality, but low horizontal inequality. A country with both vertical and horizontal inequality is presented in Section C. Finally, in Section D there is neither vertical nor horizontal inequality. Below I provide a theoretical framework for studying whether sections A and C may be especially prone to conflict.

Theory of Horizontal Inequalities and Civil Conflict

Civil conflicts are group conflicts, not a matter of individuals fighting randomly against each other, or ‘a single individual who runs amok with a machine gun’ (Duclos, Esteban & Ray, 2004: 1737).

Accepting that groups are central, the question is why and how groups are mobilized. Social identity theorists (e.g. Tajfel, 1978) attempt to explain under which conditions people feel collectively motivated to maintain or change their group membership or their inter-group situation. For a group to mobilize, it first needs a common identity (Tilly, 1978; Gurr, 2000). What makes ethnic identity particularly conflict prone is that it is based on fundamental factors like language, history, race and religion, factors that often seem more important than territorial boundaries and seldom matches these perfectly (Ellingsen, 2000). Ethnic cleavages that coincide with systematic socio-economic inequalities may enhance both collective grievances and group cohesion among the relatively deprived. A common cultural identity can thus become a powerful mobilizing agent that can lead to a range of political disturbances (Gurr, 2000; Stewart, 2002a).

According to Stewart (2002a: 3) disturbances arising from horizontal inequalities may take the form of sporadic riots or more extreme manifestations like massacres, terrorism or civil war (such as the Eritrean attempt to gain independence from Ethiopia). Midlarsky (1999: 265) also claims that if the (economic) inequality in a society is severe and if it follows a fixed pattern, political violence may result. Why and how do horizontal inequalities breed conflict? There are various answers to this question. The most obvious answer relate to the effect of collective grievances. Members of

disadvantaged groups are likely to feel frustration and antagonism, especially when their relative deprivation is the result of actual exploitation and discrimination, which is apparently often the case.⁷

Aristotle said that ‘Inferiors revolt in order that they may be equal, and equals that they may be superior’ (quoted in Sigelman & Simpson, 1977: 106). If this is the case, one cannot assume that it is only resentment by the deprived that causes political instability – although this certainly seems to be the case in many disputes (for example the Hutus in Rwanda or race riots in industrialized countries). The relatively privileged can also attack the unprivileged, fearing that they may demand more resources and political power. Privileged groups that are geographically concentrated may also demand independence, such as the Basques in Spain (Stewart, 2002a). Conclusively, the initiative to conflict may come from the richest and most privileged groups as well as the poorest and most deprived ethnic groups. Both types of reactions point in the direction that a society of high horizontal inequalities has a higher risk of civil war than societies without such inequalities. Furthermore, group leaders may use horizontal inequalities in order to achieve their own political or economic goals. No matter whether the initiative to conflict comes from the most deprived or most favored groups, Stewart (2002a) argues that the sharper the horizontal inequalities in a society, the greater the risk of violent conflict between ethnic groups.

Ethnic group comparison may arise from the presence of inequalities in many different areas, not only income. This paper focuses on horizontal inequality in the dimensions of economic assets, social status and the access to health services.⁸ Why should we be concerned about inequality in these three dimensions, and distinguish between them? Deaton (1999: 1) argues that because of the multidimensional nature of human well-being, univariate indices of economic inequality may give a misleading picture of the extent of inequality between different groups of people. Hicks (1997) has a similar argument, stressing that the case of inequality in each of the dimensions is distinct.

⁷ Gurr’s Minorities at Risk dataset (CIDCM, 2002) produces a correlation of .76 between the severity of economic discrimination of 275 ethnic groups in 1992–93 and the severity of their economic disadvantages two years later.

⁸ It could be argued that these three dimensions are too closely related to each other. Ideally, one should have included the political dimension of horizontal inequalities. It is not included here due to lack of such data.

Seeking to ‘put people back at the center of development’, the last decade’s UNDP *Human Development Reports* (see e.g. UNDP, 2001) have helped expand the focus of development to include wider questions of human well-being and quality of life. The choice of the socio-economic indicators incorporated into the Human Development Index (HDI) – adult literacy rates and educational enrolment ratios, life expectancy at birth, as well as a specially adjusted income-per-capita measure – was intended to illuminate the deficiencies of resources and opportunities of the world’s population (Hicks, 1997). In dimensions of life such as income, education and health, inequality is significant for ethical analyses. Hicks takes as a point of departure the main indicators from the HDI index in order to construct measures of vertical inequality. Theoretically, similar dimensions of *horizontal* inequality can be assumed to affect the probability of armed conflict in a country. Below, I present three hypotheses on the relationship between civil conflict and economic, social and health-related horizontal inequalities respectively. I also formulate hypotheses regarding the effect of the consistency between different dimensions of horizontal inequalities.

Horizontal Economic Inequality

Ethnic groups are often subject to economic discrimination to the extent that their members have been systematically limited in access to desirable economic goods and conditions (Gurr, 2000: 109). Whether such inequalities are due to overt discrimination policies or not, the unequal access to economic resources by different ethnic groups can reduce the welfare of the individuals in the relatively deprived groups, provoking collective grievances, and in the worst case, rebellion against the more privileged groups, or the state (Stewart, 2002a,b). Alternatively, as previously discussed, the relatively privileged economically can also attack the unprivileged, fearing that they demand more resources (Stewart, 2002a: 3). Both of these scenarios point to my first hypothesis:

H1: The higher the level of horizontal economic inequality in a country, the higher the risk of domestic armed conflict.

Horizontal Social Inequality

Governments and dominant ethnic groups may often use discriminatory educational policies in order to oppress minorities (de Soysa & Wagner, 2003: 26). Also, in poor countries, the public sector is

usually relatively large and often the main source of professional employment. Discriminatory barriers to minority recruitment thus restrict the economic opportunities of individual members of the group and help perpetuate its material disadvantages (Gurr, 2000: 125). For example, Sri Lanka has tilted university admission policies against Tamils (Gurr, 2000: 109). The absence of social opportunities associated with ethnically based unequal access to education and skills contributes to the risk of civil war (Murshed & Gates, 2004). Further, the lack of normal occupations amongst young males contributes significantly to similar effects (Collier & Hoeffler, 2002). Where social differences reflect and maintain ethnic stratifications, they may sharpen people's desires for redress and revenge (Gurr, 2000). Consequently, I assume that:

H2: The higher the level of horizontal social inequality in a country, the higher the risk of domestic armed conflict.

Horizontal Health Inequality

Deaton (1999: 6) describes health inequalities between groups as 'deeply offensive, more so than the economic and social inequalities to which they are related'. Deaton's conclusion is based on differences in health across socio-economic groups (ibid: 4–5). Booysen (2003) explores urban-rural inequalities in health. Although these studies focus on collective relative deprivation of health status for socio-economic classes and rural/urban groups, I assume that similar or even stronger feelings of frustration will occur when systematic health inequalities coincide with the ethnical cleavages in a country.

Even though the violence potential of ethnically based horizontal health-related inequalities has not been tested empirically before (at least not to my knowledge), one study at least finds some evidence of the presence of such inequalities: Brockerhoff & Hewett (2000) in a study of inequality of child mortality among ethnic groups in Sub-Saharan Africa, found that there were significant differentials between ethnic groups in the odds of dying during infancy or before the age of 5. I assume that societies where people in certain ethnic groups are deprived of equal opportunity in health services will experience a high level of frustration. In turn, the deprived groups may revolt against the regime. This leads to my third hypothesis:

H3: The higher the level of horizontal health inequality in a country, the higher the risk of domestic armed conflict.

How to Measure Horizontal Inequalities

Although I am not aware of any other quantitative large-N study of civil conflict that has applied systematic and objective data on horizontal inequalities at the national level, a handful of scholars have attempted to study structural differences between ethnic groups. Frances Stewart was the first analyst to use the term horizontal inequalities. In nine qualitative case studies (Stewart, 2002a) she found that horizontal inequalities have provoked some kind of political violence, including civil war (Uganda, Sri Lanka, S. Africa, N. Ireland), less severe rebellion (Chiapas), coups (Fiji), periodic riots and criminality (USA), occasional racial riots (Malaysia) and a high level of criminality (Brazil). Her studies provide depth and insight, but may also be criticized for selecting on the dependent variable since she exclusively looks at rather violent countries. Moreover, her analysis does not systematically measure dimensions of horizontal inequalities across countries.

Blau & Blau (1982) found that socio-economic inequality between races in the US increased rates of criminal violence. In a quantitative analysis of subnational data of Nepal Murshed and Gates (2004) found that systematic socio-economic inequalities between different regions and ethnic groups were associated with violent conflict. Barrows (1976) analyzed the determinants of political instability in Africa during the 1960s. He found that inequality was a consistent predictor of political instability when measured along a scale of ‘ethnic group inequality’ based on ‘the size of ethnic groups and their share of political power and/or other values [wealth, education and the like]’ (1976: 154–155). Barrows’ study is particularly noteworthy since it appears to be the first attempt of measuring horizontal inequalities quantitatively. A major problem with his index, however, is that the researcher’s personal judgment was the only source for determining the group inequality scores for each country.

Based on the ‘Minorities at Risk’ (MAR) database, Gurr (2000) found that where there are strong identities *together with* large group grievances (i.e. major political, economic, or cultural differences/discrimination), protest is more likely. Gurr’s data provide strong support to the

hypothesis that horizontal inequalities are liable to lead to political violence. MAR is the only worldwide dataset with inequality data on the group level. Despite its wide use and great potential, however, MAR suffers from some fundamental flaws. One is the selection bias of the dependent variable: Gurr and his colleagues only consider groups that are 'at risk', and do not include information on groups with very low or negligible risk of war (Sambanis, 2002).

A New Approach: Aggregating Data from the DHS Surveys

Many of the studies reviewed above have serious methodological and operational flaws in their attempt to measure horizontal inequalities. This study tries to avoid some of these caveats by constructing objective indicators on horizontal inequalities based on the Demographic and Health Surveys (DHS). In short, for each national survey, I compute group averages for various welfare indicators, and then calculate the ratios between the two largest ethnic groups.

DHS is an on-going research project initiated by the U.S. Agency for International Development (USAID) to provide data and analysis on the population, health, and nutrition of women and children in developing countries. Over the last 20 years, the DHS project has coordinated close to 200 surveys in more than 70 developing countries. Surveys typically take place every five years. In a DHS survey, a sample of households is selected throughout the entire country and then interviewed using a household questionnaire to collect housing characteristics. Women between the ages 15 and 49 are interviewed using a women's questionnaire to collect information mainly on background characteristics, children and women's health and other issues, such as household assets and education level. Samples vary considerably in size, ranging from less than 5,000 women (e.g. Ghana DHS 1998) to almost 30,000 (e.g. Peru DHS 2000). The DHS surveys are based on clustered sampling. For each dataset, the actual country is divided into between 100 and 521 areas, and 25 households are randomly drawn from each area. This provides us with a rich and reliable dataset, from which one can potentially construct exceptionally good group inequality indicators. More details of the indicators used in this study are provided below.

Research Design

The study includes all countries where a Demographic and Health Survey was undertaken between 1986 and 2001, given that (1) the survey included information on the ethnic affinity of the respondents or, if not, that (2) the country in question was ethnically homogenous.⁹ According to these criteria, I ended up with a sample consisting of 33 countries of which national DHS surveys contained information on ethnic affinity and thus made it possible to construct indicators on horizontal inequalities, and 10 ethnically homogenous countries, serving as additional control cases, or ‘zero cases’, based on the assumption that ethnically horizontal inequalities are not markedly present in homogenous countries. The total number of observations in the dataset adds up to 664 country-years. However, when consecutive years of conflict are censored from the analysis, 496 country-years remain. See Appendix A for a list of all the countries, periods, conflict years and conflict onsets included.

Dependent Variable: Domestic Armed Conflict

Instead of using the threshold of 1,000 battle-related deaths required by the Correlates of War project (Singer and Small 1994), I include conflicts with a threshold of 25 battle-related deaths per year from the PRIO/Uppsala Conflict Dataset (Gleditsch et al., 2002). I follow Buhaug & Gates’ (2002: 423) coding criteria for the onset of armed domestic conflict: The conflict observations in the PRIO/Uppsala dataset were merged if less than three years passed from one conflict unit to the next. Also, I merged ‘subconflicts’ that only differed in type (internal vs. internationalized internal). The variable takes the value 1 for years when a conflict starts, and 0 otherwise. Consecutive years of conflict are censored from the analysis.

Independent Variables

The calculations of horizontal inequalities used in this study are based on information about ethnic affinity as well as various distributional resources derived from DHS surveys. I constructed aggregated macro-indicators for horizontal inequalities between the two largest ethnic groups in each

country, along three dimensions of inequality (economic, social and health-related), based on factors such as economic household assets, educational and vocational opportunities, infant mortality rates and the possession of children's health cards.

Because many of the countries in my study contain numerous ethnic groups (for instance, over 50 in Zambia), reliable estimation of socio-economic trends for each group is problematic, if not impossible. Instead, partly following Brockerhoff & Hewett (2000), I focus on the two largest groups in each country,¹⁰ assuming that in most cases, the level of inequalities between the two largest ethnic groups largely reflect the general HIs in the country. This choice also enables me to test the consistency hypotheses (H4a and H4b).

The DHS data present both a golden opportunity and a challenge as for the measurement of economic inequalities between ethnic groups. The opportunity is a rich set of large, representative surveys with nearly identical questionnaires. The challenge is that the DHS surveys generally lack information on income or consumption expenditures.¹¹ I overcome the absence of such data by using the information collected on household assets and characteristics.¹² More specifically, my first indicator of horizontal inequalities, *horizontal economic inequality* was generated on the basis of the following variables from the DHS surveys: *v131* (ethnicity) and *v119–v125* (dummies for whether or not each household has electricity, a radio, a television, a refrigerator, a bicycle, a motorcycle and/or a car).

⁹ A country is defined as ethnically homogenous if the largest ethnic group constitutes at least 95% of the total population, according to the *CIA World Factbook*, various editions.

¹⁰ Brockerhoff & Hewett (2000: 31) in a study of ethnic differences of child mortality, compare two 'relatively large groups' in each country, not necessarily the two largest groups. Other possibilities could be to compare the best and the worst group in terms of each welfare indicator, or the best group vs. the rest of the population.

¹¹ Stifel & Sahn (1999) note that the lack of developing-country capacity to conduct household consumption expenditure surveys is an important explanation for their poor quality. This provides impetus for searching for simpler and less expensive ways of both measuring household welfare and examining inequalities over time and space.

¹² This operational solution is supported by a study by Golden & Messner (1987) who found that when racial inequality is defined in terms of general economic well-being rather than income alone, the likelihood of inter-group violence increased significantly. The ownership of economic assets indicates whether people have a decent standard of living, reflecting what Hicks (1997: 1258) calls 'basic-commodity opportunity'.

First, I registered the percentage within each of the two largest ethnic groups that owned each of the different assets. Secondly, I calculated the ratios between the percentages of the largest and second largest group for each of the seven assets. Finally, I calculated the mean ratio for each pair of groups. The ratio 0.5 between two groups indicates the same level of inequality as the ratio 2. (In the first case, one group is half as privileged as the other, and in the second case the picture is turned upside-down, with one group being twice as privileged as the other). In order to avoid values outside the 0–1 interval, I divided 1 by all values that exceeded 1. That is, e.g. I transformed the value of 2 to the value of 0.5 ($1/2=0.5$). Finally, since the ratio of 1 means no inequality and that the inequality increases with values close to 0, I chose to turn the scale to make it more logically interpretable, applying the formula $1-X_i$, where X is the inequality ratio for each i . This provides a continuous variable of economic horizontal inequalities ranging from 0 (the lowest level of such inequality) to 0.92 (the highest actual level of such inequality, though the scale potentially goes to 1). In sum, my measure of horizontal economic inequality (HEI) was calculated on the basis of the formula:

$$HEI = 1 - \frac{1}{M} \exp \left(\frac{1}{M} \ln \left(\frac{A_{i1}}{A_{i2}} \right) \right)$$

where M is the number of household assets and A_{i1} refers to the share of group 1 (the largest ethnic group) that owns asset i and A_{i2} is the corresponding share of group 2 (the second largest ethnic group).

For each country, the score from the actual DHS survey was copied to the rest of the years in the period 1986–2001.¹³ For the zero cases, each country-year was coded with the value 0. The reasoning behind this is that homogenous countries are logically not cursed by horizontal inequalities

¹³ It would of course have better to have real time-series information on horizontal inequalities, with separate measures for each year than simply assign the value from one survey year to the rest of the country-years in the analysis (1986–2001). However, I believe that the level of horizontal inequalities is quite stable over time. Some countries had more than one DHS survey in the period with questions about ethnic affiliation, such as Namibia, which had surveys in both 1992 and 2000. I calculated HI measures along the three dimensions for both years and the scores hardly changed at all (with the biggest change being in terms of Social HI – from 0.16 in 1992 to 0.04 in 2000).

between ethnic groups. See Appendix B for a complete list of each country's scores in horizontal inequalities and ethnic composition based on the DHS data.

My dimension for horizontal social inequality reflects people's educational and vocational opportunities. It is based on three variables from the DHS surveys: *v131* (Ethnicity), *v106* (Highest education level attended by the respondent) and *v705* (Partner's occupation type). I recoded these variables into dummies for whether each woman had any formal education or not, and whether she had a partner with a modern occupation¹⁴. The variable *horizontal social inequality* is generated along the same lines as economic horizontal inequalities, both with regard to calculations and to imputation (filling in missing country-years with the value from the actual DHS survey). The index for social horizontal inequalities implies ethnic differences in terms of educational and occupational opportunities and the scale ranges from 0 (no social HIs) to 0.69 (severe social HIs).

My proxy for *horizontal health inequality* measures ethnic differences in children's viability and access to medical services. I construct a summary measure for horizontal health inequality based on Infant Mortality Rate (IMR) and the extent to which children are equipped with health cards. Information on IMR is not readily available from DHS, but using the variable *v131* (ethnicity), and two other key variables from the DHS surveys to calculate horizontal inequalities of IMR: *b2* (Year of birth of child) and *b7* (Age at death of the child in completed months), I calculated the IMR for the two largest ethnic groups in each country applying Newell's (1988: 64) definition and formula of

$$IMR = (Deaths\ under\ age\ 1\ in\ year\ X / Live\ births\ in\ year\ X) * 1000^{15}$$

¹⁴ In the DHS surveys, the variable *v705* originally has the following values: 0: 'Did not work', 1: 'Professional, technical, managerial', 2: 'Clerical', 3: 'Sales', 4: 'Agricultural self-employed' 5: 'Agricultural employee', 6: 'Household & domestic', 7: 'Services' 8: 'Skilled Manual', 9: 'Unskilled Manual' 96: 'Other', 98: 'Don't know'. Following Brockerhoff & Hewett (2000) I constructed a dummy variable for whether or not the husbands had a modern occupation assigning values 1, 2 and 8 to the new value 1: 'Husband with modern occupation' vs. values 0, 3–7 and 9 to the new value 0 (Husband without a modern occupation). 'Don't know' and 'Other' responses were deleted.

¹⁵ Though it is common to calculate IMR for one given year at the time, I chose to follow Brockerhoff & Hewett (2000: 35) and generate the IMR based on births in the 10 years preceding each DHS survey, in order to get enough respondents (in this case mothers) for the disaggregated ethnic groups. In order to check the reliability of my calculations and codings, I ran a correlation check between my aggregated index of IMR for the whole country and Urdal's (2002) data on IMR. The correlation between the two was quite high ($r=.87$), which should strengthen both the reliability and validity of my data.

The inequality of IMR between ethnic groups was calculated by dividing the IMR of the largest ethnic group by the IMR of the second largest ethnic group.

The second variable from DHS that is included in my summary measure of health related horizontal inequalities is *hl* (whether the respondent has a health card for the child and whether she could produce it for the interviewer). The index for health-related horizontal inequalities implies ethnic differences in terms of IMR and health cards and ranges from 0 (no health HIs) to 0.37 (severe health HIs).

Since collective grievances are traditionally operationalized with variables such as ethnic composition and vertical inequality, this study also include such variables to see how they perform compared to my measures of horizontal inequalities. The theoretical basis for including such variables is usually theories of ethnic hatred and relative deprivation. Based on the DHS data on ethnic affiliation I constructed two variables of ethnic identity, applying measures that are widely used in the literature—fractionalization and polarization. First, I computed a variable measuring ethnic fractionalization, defined as the probability that two individuals selected at random from a country will be from different ethnic groups, using a formula presented by Fearon (2003: 208):

$$F = 1 - \sum_{i=1}^N p_i^2$$

The scale goes from 0 (totally homogenous) to 1 (totally fractionalized country).

An alternative measure of ethnic diversity is polarization (Garcia-Montalvo & Reynal-Querol, 2002). It is often argued that group leaders use ethnic identities to achieve their own political and financial objectives. If this is the case, it should be easier for group leaders to mobilize groups in societies with few rivaling groups because few groups imply clearly defined ethnic divisions, and because the recruitment pool becomes larger with few groups. The degree of ethnic polarization increases when there are few (equally) large groups with homogenous characteristics within each group, and differences in a cluster of characteristics among groups. Groups of insignificant size (e.g., isolated individuals) carry little weight. Indices of polarization are highest when there are two relatively large groups of exactly the same size. I applied the formula presented in Garcia-Montalvo

& Reynal-Querol (2002: 4) to the DHS data, calculating country-specific values for ethnic polarization.

$$RQ_i = 1 - \frac{\sum_{i=1}^N \left(\frac{1/2 - p_i}{1/2} \right)^2 p_i}{\sum_{i=1}^N p_i}$$

Two measures of vertical inequality are also included to contrast their effect on conflict with that of horizontal inequalities. I used the Gini coefficient of vertical income inequality, which measures the concentration of incomes between 0 (absolute equality) and 100 (maximum inequality). The data were taken from The World Income Inequality Database (UNU/WIDER & UNDP, 2000) for the period 1986–99, supplied with data from the *World Development Indicators (WDI)* (World Bank, 2003) for the years 2000–01. Unfortunately, the data on vertical income inequality suffer from a great number of missing observations. Since I do not believe that a country's income inequality changes radically over time, I interpolated and extrapolated observations where possible. Yet, this left me with 14% missing observations since 6 countries in my sample totally lack such data (Haiti, Benin, Liberia, Togo, Chad, and Rwanda). I also included a variable that measures vertical schooling inequality from a dataset by Castello & Doménech (2002). The Gini coefficient for schooling inequality measures the concentration of years of education among individuals in a country between 0 (absolute equality) and 1 (maximum inequality). Again, observations were interpolated and extrapolated, but 11 countries did not have any observation at all (Armenia, Ivory Coast, Guinea, Burkina Faso, Chad, Ethiopia, Namibia, Morocco, Kazakhstan, Kyrgyzstan, and Uzbekistan), which implies 23% missing observations. I include a set of control variables that measure other important causes of domestic armed conflict. This also better enables me to compare my results with other studies of the inequality-conflict nexus. To proxy level of development I used GDP per Capita measured in constant 1995 US\$ from the *WDI* (World Bank, 2003). I also included a measure of GDP growth. The annual growth rate was calculated based on the previous year as the difference $X_t - X_{t-1}$. Both variables are lagged with one year.

Data on regime type were taken from the widely used Polity IV data (Marshall & Jagers, 2003). Like Jagers & Gurr (1995) I compute one single regime indicator, subtracting the score of

autocracy from that of democracy. The values for the combined regime variable thus potentially varies from -10 (most autocratic) to 10 (most democratic). I also included a squared term for regime type, and a variable for regime transition. A regime transition is defined as a six-point or greater change in the combined Polity score over a period of three years or less. Following Hegre et al. (2001), I then coded the proximity of regime transition as $2^{-(\text{years since regime transition}/1)}$, assuming that the impact of a regime transition on the probability of domestic armed conflict is initially high and then reduced at a constant rate with a half-life of one year. Data on population size were taken from the *Penn World Tables* (PWT) 6.1. (Heston, Summers & Aten, 2002). This version covers the period 1950–2000. Data on population size for 2001 were taken from the *World Factbook* (CIA, annual). I filled missing years in the series of a few countries with linear interpolation. The variable is log-transformed.

Statistical Model

Since the dependent variable in this study is dichotomous, I employ a logistic regression model. To account for autocorrelation in the series due to the lack of variation in the measures of horizontal inequalities and ethnic composition, I follow Buckley & Westerland (2002) and others, and run the analyses with country-clustered standard errors, an extension of robust variance estimation. As suggested by Beck, Katz & Tucker (1998), I control for temporal dependence through a variable measuring time since last conflict and cubic splines. Time since the last conflict counts the number of whole years since the end of the last conflict (peaceyears). The splines were constructed with the BTSCS program (Tucker, 1998). The statistical program STATA, version 8.2 (StataCorp, 2003) was used to run the analyses. Descriptive statistics for the dependent and independent variables are presented in Table 1.

– Table 1 in here –

Empirical Analysis / Results

In this section, I test the effect of my three indicators of horizontal inequalities – economic, social and health-related – on domestic armed conflict, contrasting their impact with that of more common measures of ethnic composition (identity) and vertical inequalities. Since I argue that it is the level of horizontal inequalities rather than separate effects of multiethnicity or vertical inequalities that should be relevant for conflict, I first separate between the two sets of variables in the analysis. However, in order to see whether measures of multiethnicity and vertical inequality may influence the effect of horizontal inequalities, I also run a model with terms from each concept. All the models contain a number of relevant control variables, frequently used by other studies of inequality and conflict (see e.g. Collier & Hoeffler, 2004; Fearon & Laitin, 2003; Hegre, Gleditsch & Gissinger, 2003).

Do Horizontal Inequalities Matter for Conflict?

The most crucial question of this paper is whether horizontal inequalities between ethnic groups in developing countries increase the likelihood of a domestic armed conflict onset. Previously, it was argued that it is important to consider different types, or dimensions, of such inequalities as well. Models 1–3 in Table 2 below report the effects of economic, social and health-related horizontal inequalities, respectively.

– Table 2 in here –

My first hypothesis, assuming a higher risk of conflict with higher levels of economic inequalities between ethnic groups is not supported in Model 1. As expected, the term for horizontal economic inequality has a positive sign, but the relationship is far from statistically significant. The variable measuring social horizontal inequality, on the other hand, is positively and significantly related to conflict. This provides support for my expectation that the higher the level of horizontal social inequality, the higher the risk of domestic armed conflict (Hypothesis 2). The finding is also consistent with conclusions drawn from a number of case studies where social inequalities between ethnic groups have contributed to increased tensions between the groups, and in some cases, to civil war (see Stewart, 2002a). Contrary to my third hypothesis, horizontal health inequalities are

negatively related to armed conflict in Model 3. This could lead one to assume that members of ethnic groups that are deprived in terms of health are ‘too weak to revolt’. However, this is a rather far-fetched speculation, and nonetheless the effect is statistically insignificant.

In Model 4 I include all the three terms for horizontal inequalities simultaneously. The effects of both economic and health-related HI now turn negative, but remain statistically insignificant. I find, however, strong support that the social dimension of horizontal inequality is positively related to conflict, also when included with the other two dimensions. The linear relationship between armed conflict onset and horizontal social inequality is graphed in Figure 2 below:

- Figure 2 in here -

Figure 2 reveals a strong positive relationship between horizontal social inequality and conflict: The likelihood of conflict for a country with weak or irrelevant social horizontal inequality (10th percentile value: 0) is about 84% smaller than for a country with strong social inequality (90th percentile value: 0.5).

The difference in the results for economic and social horizontal inequalities in Model 4 is somewhat surprising, but may indicate that inequality in outcomes in terms of educational and occupational opportunities is more crucial with regard to collective group grievances than inequality in inputs in terms of access to household assets. However, it is also quite possible that the summary measure for Economic HI relating to the ownership of various household assets does not capture the general structural economic differences between ethnic groups in a country. On the one hand, goods other than household assets may be more important indicators of ethnically based economic distribution in many developing countries, as for example land tenure. On the other hand, visible status symbols (cars, motorcycles etc.) might matter more to some ethnic groups than to others, and such differences in cultural preferences do not necessarily reflect actual differences in general economic resources, like income.

The different impact of economic and social horizontal inequalities could also be related to the fact that the correlation between the two variables is very high ($r=.74$). It could of course, then,

be questioned whether the two dimensions differ sufficiently, or whether they represent the *same* underlying dimension. Naturally, economic assets ownership on the one hand and social access (educational and vocational opportunities) on the other, are expected to be interdependent. This means that even though each dimension may be important in itself, each of them may also be instrumental for achieving the other. However, this need not always be the case. Stewart (2002a) argues that equality of inputs (access to economic assets) may not result in equality of outcomes (e.g. educational/occupational opportunities and health status), either because people in different groups may not make the same use of the access provided, or because their conversion from inputs to outputs differs. Moreover, the esteem of a group arises from the relative position of the group in a large number of areas. In pre-transition South Africa, HIs in terms of education and jobs were among the top grievances, while in Northern Ireland housing inequality was at the top of the Catholic economic agenda (Stewart, 2002a).

In Models 5–8 in Table 3 I replace the terms for horizontal inequalities with variables measuring various aspects of multiethnicity (fractionalization and polarization) and vertical inequality (in terms of income and schooling), in order to see how these indicators that are typically used to operationalize group grievances perform in relation to my alternative measures of horizontal inequalities. Since both the variables for vertical inequality have a large amount of missing, I first run a model without these variables in order to maximize the number of observations in the analysis.

– Table 3 in here –

Models 5 and 6 demonstrate that none of my indicators of ethnic identity seems to be of great importance for armed conflict onset in developing countries. The estimates for the effect of ethnic fractionalization have positive signs, but are substantively and statistically insignificant. Nor are countries that are ethnically polarized more likely to experience civil conflict. This finding is in line with the studies by Collier & Hoeffler (2004); Fearon & Laitin (2003); and Hegre, Gissinger & Gleditsch (2003), but different from Ellingsen (2002), who finds that multiethnicity does increase the propensity of conflict. Because the two measures of vertical inequality have missing observations for many countries, which hardly overlap with each other, I introduce the terms separately in Models 7

and 8. In Model 7 I include the terms for vertical income inequality. Like Collier & Hoeffler (2004), Fearon & Laitin (2003) and others I find no evidence that vertical income inequality is related to the outbreak of internal armed conflict. In fact vertical income inequality has a negative sign in my model, but the effect is far from significant. I include the second indicator of vertical inequality, schooling inequality, in Model 8. Like de Soysa & Wagner (2003) I also fail to find a significant relationship between schooling inequality and conflict.)

In short then, Models 3–8 demonstrate that neither ethnic identity nor individual relative deprivation seem to matter for internal conflict. Looking at the log likelihood scores for Model 4 vs. Models 5 and 6, both which were run with the same samples, we see that Model 4 which includes variables that in my opinion better capture the phenomenon of collective grievances (horizontal inequalities), performs better than Models 5 and 6 which contains only measures of ethnic compositions without any information of the distribution of goods between the groups. The models are not nested, however, and one could still argue that the effect of horizontal inequality would disappear when controlling for ethnic identity and vertical inequality. To test this assumption, I finally run a model including terms from each aspect (horizontal inequality, vertical inequalities, and ethnic composition). Model 9 shows the impact of social horizontal inequality, controlling for the two measures of ethnic identity as well as vertical income and schooling inequality. Model 9 demonstrates that the effect of social horizontal inequality remains substantive and significant, even when the terms for vertical inequality and ethnic fractionalization and polarization are included in the model. All the other for terms remain statistically insignificant, and the sign for ethnic polarization turns negative.

As for the control variables included in Models 1–9 I find strong evidence for a negative relationship between the level of development (GDP per Capita) and conflict. This robust finding is in fact a bit surprising, given that my sample that consists of only low- and medium-income countries (significance only drops in Model 8 and 9, but this is probably due to the dramatic reduction of observations when both measures of vertical inequality are included). GDP growth, however, appears insignificant in all the models. I also fail to find a significant relationship between regime type and

transition, but this could be due to my restricted sample of cases. The size of the population is most often found to have a positive effect on conflict, but this does not seem to be the case for my sample.¹⁶ The significant effect of some of the splines symbolizes that conflict history, or time since the last conflict is of importance, a general finding in the literature of civil war.

Conclusion – The Way Forward

This study has demonstrated that one of my three indicators of horizontal inequalities seems to matter for the risk of civil conflict in developing countries: Societies with strong social HIs were found to have a higher likelihood of conflict onset than countries with weak or no such inequalities, whereas the terms for economic and health-related HIs were statistically insignificant. It could be that social HI, in terms of educational and occupational opportunities, is more often a direct result from open discrimination than are economic and health-related HIs. If that is the case, the social dimension of HI would be particularly relevant to the perception of collective grievances and a common group identity.

The main conclusion one can draw from the study presented here is that other recent studies of the inequality–conflict nexus (Collier & Hoeffler, 2004; Fearon & Laitin, 2003; Hegre, Gissinger & Gleditsch, 2003) may be wrong when concluding that inequality is unrelated to conflict. Even though my data are preliminary, this study has demonstrated that the inequality-conflict nexus needs to be investigated both vertically and horizontally, with more refined measures of various dimensions of inequality.

¹⁶ It could be discussed whether some of these results, or lack of such is due to my very restricted sample. The fact that I look at conflict onsets instead of incidence may also complicate matters, both because censoring consecutive years of conflict implies the loss of a substantial number of observations in the analysis, and because some variables may matter more for conflict incidence, or duration, than for onset. Turkey and Sri Lanka drop out from the sample because both countries had ongoing conflicts in the entire period 1986–2001, and thus no conflict onset from a state of peace according to my definition. When experimenting with a dynamic probit model (see Przeworski et al., 2000), making the dependent variable ‘1’ for all conflict years and interacting independent variables with a lagged dependent variable, maximized the sample, and I found that population size seems to matter more for the continuation (duration) of conflict than for conflict initiation. For my main explanatory variables however (horizontal inequalities), the results did not change significantly.

A lot of work remains to be done to capture the true relationship between inequality and conflict. Using national surveys as a starting point for generating various measures seems a promising way to go since the researcher herself or himself is able to aggregate a rich and reliable dataset with information based on representative populations of individual respondents. This procedure implies several advantages. First, it is a way of generating new data that are difficult to find elsewhere. Secondly, horizontal inequalities (and vertical ones as well) can be a politically sensitive matter, and thus national governments are likely to report biased data. Biased information is very unlikely when data are generated from national surveys like the DHS, as the original intention behind these was far from assessing socio-economic inequalities between ethnic groups. Thirdly, the aggregation of survey data ensures *descriptive* rather than *evaluative* data. That is, researchers do not need to rely on their personal judgment as the sole source for determining group inequality scores (which is done by e.g. the coders in the Minorities at Risk project). Finally, survey data provide a source for calculating not only inequalities between given identity groups, but also open up for the possibility of calculating inequalities *within* the groups.

Some scholars (Bredel, 2003; Stewart, 2000, 2002a) stress the importance of exploring how intra-group inequalities may affect the consequences of inter-group inequalities. Stewart (2000, 2002a) outlines two alternative scenarios relating to this: On the one hand, strong intra-group differentials may reduce a group's cohesiveness and hence its ability to take collective action, if different social classes identify with their counterparts in other groups rather than their own ethnic group membership. On the other hand, strong intra-group inequalities could provide leaders with an incentive to exploit horizontal inequalities to avoid discontent being directed at themselves.

Bredel (2003) theorizes that the combination of weak intra-group and strong inter-group inequalities has the highest violent conflict potential, and vice versa, that strong intra-group inequalities may reduce the violent consequences of inter-group inequalities. His reasoning behind this assumption, however, is different from that of Stewart. Stewart (2000, 2002a) argues that vertical inequalities may reduce the potential for inter-group conflict for any given degree of horizontal inequalities because it may be more difficult to get group cohesion where there is high intra-group

inequality. Bredel's (2003: 11–14) explanation, on the other hand, is related to so-called 'better-off perceptions' of group leaders, and not inability to achieve group cohesion. According to Bredel, if group leaders are abusing group identities for their own goals (as assumed by the instrumentalist view of ethnicity and theories focusing on opportunities and greed in civil war) there is no plausible explanation as to why they should not resort to opportunist elite cooperation with leaders from other ethnic groups, provided they deem such cooperation better to suit their private interests.¹⁷

The complex relationship between inter-group and intra-group inequalities in a society is highly relevant for the discussion of polarization and conflict. Zahng & Kanbur (2001) proposes that one way of measuring polarization in a society is to divide the level of inter-group inequalities by the level of intra-group inequalities. Zhang and Kanbur apply this measure to one country, China. However, with the DHS surveys it seems to be possible to calculate such polarization measures for *many* countries. One could for example use the method provided by Castelló and Doménech (2002) to calculate Gini or Theil coefficients¹⁸ for the vertical inequality within the groups, e.g. with regard to household assets, and then calculate the ratio between intergroup asset inequality and intragroup asset inequality.

In a recent article, Duclos, Esteban & Ray (2004: 1759) encourage future research to adopt a multidimensional approach to polarization, exploring various measures of 'social polarization' that permit group alienation to depend on different characteristics than the one that defines group identity. This idea seems to be closely related to the concept of horizontal inequalities between ethnic groups, but also to the debate with regard to the impact of intra-group inequalities. In line with Duclos, Esteban & Ray's, I would argue that what we need is a measure of 'horizontal polarization'; a measure that would take into account both the distribution of various welfare indicators internal to

¹⁷ In my previous work (Østby, 2003: 97–100) I tested the combined effects of inter-group inequalities (horizontal inequality) and intra-group inequalities on conflict *incidence*, and found some evidence that greater vertical inequalities reduce the positive effect of horizontal inequalities on conflict. However, intra-group inequality was simply proxied by vertical inequality at the national level, not accounting for different levels of inequality within the groups.

the group and between the groups, as well as social clusters of ethnic identity. On the empirical side, aggregating such data from national surveys like the DHS seems to be a promising avenue for future studies. With data on 'horizontal polarization' one would indeed be better suited to test whether Horowitz (1985/2000: 197) is right when saying that 'ethnic conflict is, at bottom, a matter of comparison'.

¹⁸ Firebaugh (2003) notes that whereas the Gini coefficient cannot be decomposed into two measures of inequality between and within nations, this is possible with the Theil coefficient. The same logic should apply to inequality between and within groups.

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Table 1. Descriptive Statistics, 1985–2001, Developing Countries

Variables	<i>N</i>	<i>Mean</i>	<i>St.d.</i>	<i>Min</i>	<i>Max</i>
Armed Conflict Onset	664	0.04	0.20	0	1
Armed Conflict Onset*	496	0.06	0.23	0	1
Horizontal Economic Inequality	664	0.25	0.24	0	0.92
Horizontal Social Inequality	664	0.21	0.20	0	0.69
Horizontal Health Inequality	664	0.14	0.12	0	0.37
Ethnic Fractionalization	664	0.55	0.33	0.02	0.93
Ethnic Polarization	664	0.46	0.26	0.04	0.93
Vertical Income Inequality	373	47.32	9.14	27	71
Vertical Schooling Inequality	512	0.56	0.19	0.23	0.92
GDP per Capita (ln)	664	6.44	1.03	3.90	8.58
GDP Growth	657	0.0025	0.08	-0.73	0.70
Regime Type	664	-0.13	6.04	-9	10
Regime Type, sq	664	36.43	25.60	0	100
Proximity of Transition (1 year half-life)	664	0.11	0.25	0	1
Population (ln)	664	9.34	1.11	7.02	12.07

NOTE: * Consecutive conflict years omitted (coded as missing).

Table 2. Domestic Armed Conflict 1985–2001, Developing Countries

	Model 1	Model 2	Model 3	Model 4
Horizontal Economic Inequality	0.83 (0.75)			-1.29 (1.45)
Horizontal Social Inequality		2.36** (1.12)		3.69** (1.69)
Horizontal Health Inequality			-0.42 (1.95)	-1.24 (2.31)
GDP per Capita (ln)	-0.79*** (0.28)	-0.67** (0.27)	-0.86*** (0.29)	-0.69** (0.31)
GDP Growth	-0.46 (1.12)	-0.66 (1.20)	-0.45 (1.22)	-0.60 (1.43)
Regime Type	0.023 (0.034)	0.029 (0.035)	0.018 (0.035)	0.026 (0.037)
Regime Type, sq	0.00086 (0.0095)	0.0026 (0.0089)	-0.00026 (0.0097)	0.0024 (0.0089)
Proximity of Transition	0.074 (0.87)	0.042 (0.91)	-0.00070 (0.85)	-0.039 (0.91)
Population (ln)	-0.18 (0.28)	-0.12 (0.29)	-0.15 (0.27)	-0.056 (0.29)
Peaceyears	-0.26 (0.45)	-0.24 (0.45)	-0.26 (0.45)	-0.22 (0.45)
Spline 1	-0.13 (0.095)	-0.14 (0.096)	-0.13 (0.094)	-0.13 (0.096)
Spline 2	0.13* (0.077)	0.13* (0.077)	0.13 (0.077)	0.13* (0.077)
Spline 3	-0.047* (0.024)	-0.047** (0.024)	-0.046* (0.024)	-0.046* (0.023)
Constant	3.75 (3.04)	1.90 (3.16)	4.19 (2.88)	1.61 (3.29)
N	484	484	484	484
Number of countries	41	41	41	41
Number of onsets	28	28	28	28
Log Likelihood	-93.54	-91.50	-93.93	-90.65
Pseudo R ²	0.13	0.14	0.12	0.15

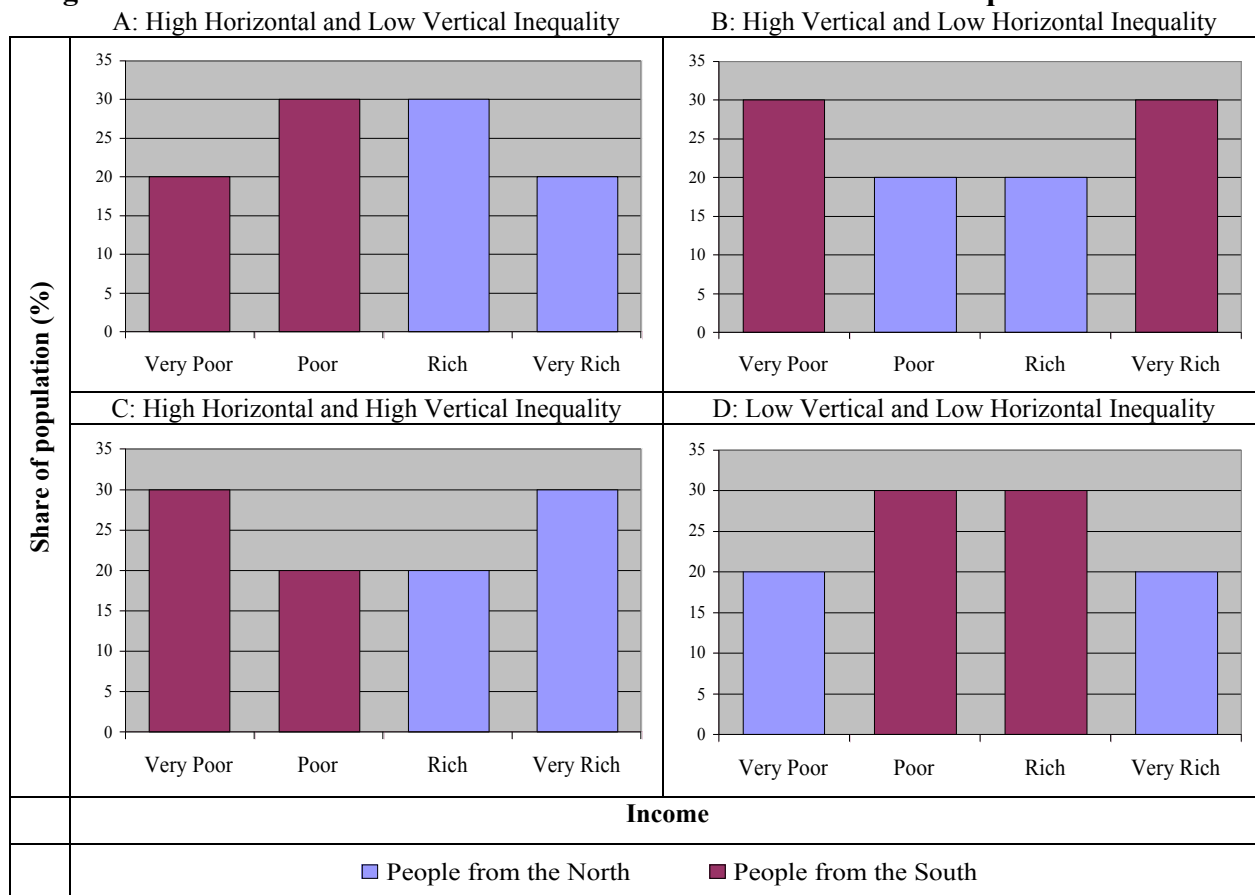
NOTE: Robust standard errors in parentheses. *p < 0.10; **p £ 0.05; ***p £ 0.01.

Table 3. Domestic Armed Conflict 1985–2001, Developing Countries

	Model 5	Model 6	Model 7	Model 8	Model 9
Horizontal Social Inequality					4.39** (2.11)
Ethnic Fractionalization	0.29 (0.74)		0.35 (1.08)	0.15 (1.24)	0.90 (1.44)
Ethnic Polarization		0.54 (0.77)	1.18 (0.96)	0.058 (1.16)	-1.03 (1.24)
Vertical Income Inequality			-0.022 (0.023)		-0.034 (0.027)
Vertical Schooling Inequality				0.22 (1.92)	1.89 (2.84)
GDP per Capita (ln)	-0.80*** (0.31)	-0.82*** (0.28)	-0.61* (0.34)	-0.62 (0.38)	0.30 (0.40)
GDP Growth	-0.58 (1.23)	-0.42 (1.20)	2.31 (3.55)	-1.74 (1.65)	-1.75 (6.08)
Regime Type	0.019 (0.035)	0.017 (0.032)	0.023 (0.038)	0.034 (0.041)	0.040 (0.055)
Regime Type, sq	0.000030 (0.0097)	-0.000056 (0.0096)	0.0053 (0.011)	-0.0041 (0.011)	0.0077 (0.013)
Proximity of Transition	0.028 (0.86)	0.042 (0.87)	0.36 (1.22)	0.39 (0.88)	0.91 (1.29)
Population (ln)	-0.13 (0.27)	-0.12 (0.28)	0.14 (0.28)	-0.46 (0.43)	-0.058 (0.34)
Peaceyears	-0.26 (0.45)	-0.27 (0.45)	-0.19 (0.66)	0.012 (0.69)	0.70 (1.22)
Spline 1	-0.13 (0.094)	-0.13 (0.095)	-0.094 (0.12)	-0.17 (0.15)	-0.030 (0.19)
Spline 2	0.13 (0.077)	0.13 (0.077)	0.091 (0.091)	0.17 (0.12)	0.066 (0.14)
Spline 3	-0.046* (0.024)	-0.046* (0.024)	-0.035 (0.024)	-0.069 (0.043)	-0.041 (0.037)
Constant	3.38 (3.20)	3.36 (3.16)	-0.36 (3.30)	4.60 (4.95)	-6.50 (5.05)
N	484	484	414	370	304
Number of countries	41	41	35	30	25
Number of onsets	28	28	18	20	12
Log Likelihood	-93.89	-93.80	-65.97	-65.87	-41.86
Pseudo R ²	0.12	0.12	0.11	0.15	0.17

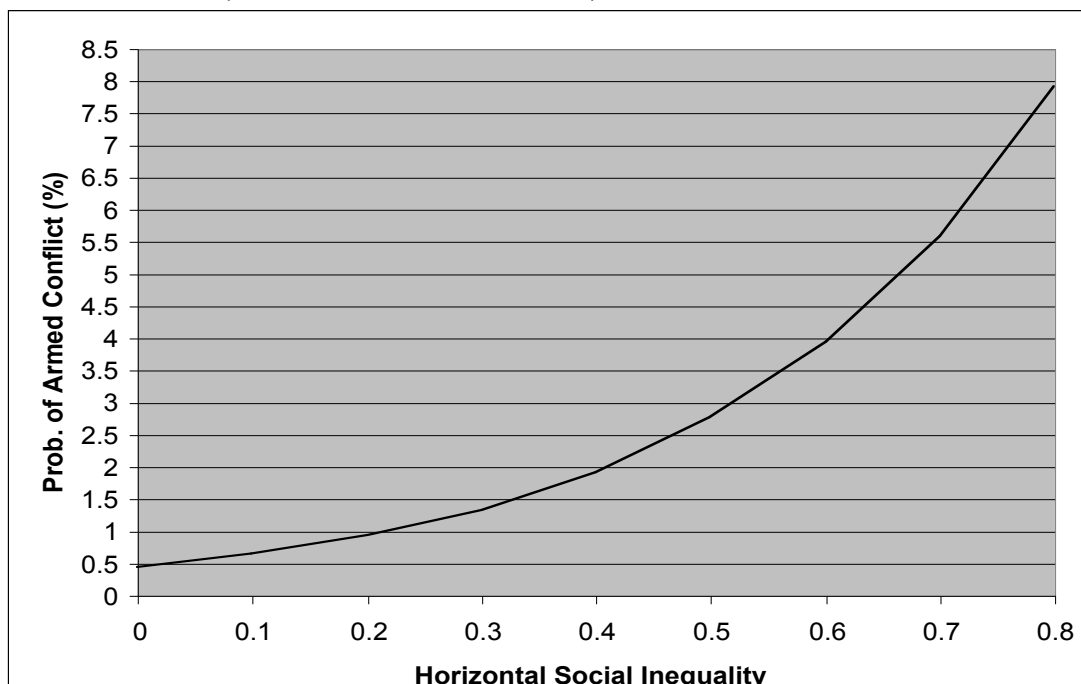
NOTE: Robust standard errors in parentheses. *p < 0.10; **p £ 0.05; ***p £ 0.01.

Figure 1 Four Different Combinations of Horizontal and Vertical Inequalities



Source Sections A and B: Humphreys (2002: 3). C and D: Author

Figure 2. The Effect of Horizontal Social Inequality on the Probability of Domestic Armed Conflict (Based on Model 4, Table 2).



Appendix A. Countries, Periods, Armed Conflict Years and Onsets Included

Country	Period	Armed Conflict Years	Armed Conflict Onsets
Armenia*	1991–2001		
Bangladesh*	1986–2001	1986–92	
Benin	1986–2001		
Botswana*	1986–2001		
Brazil	1986–2001		
Burkina Faso	1986–2001	1987	1987
Cameroon	1986–2001		
Central African Rep.	1986–2001	2001	2001
Chad	1986–2001	1986–94, 1997–2001	1991, 1997
Egypt*	1986–2001	1992–98	1992
Ethiopia	1986–2001	1986–91, 1996–2001	1989, 1996, 1999
Ghana	1986–2001		
Guatemala	1986–2001	1986–95	
Guinea	1986–2001	2000–01	2000
Haiti*	1986–2001	1991	1991
Ivory Coast	1986–2001		
Jordan*	1986–2001		
Kazakhstan	1991–2001		
Kenya	1986–2001		
Kyrgyzstan	1991–2001		
Liberia	1986–2001	1989–96, 2000–01	1989, 1996, 2000
Malawi	1986–2001		
Mali	1986–2001	1990, 1994	1990, 1994
Morocco*	1986–2001	1986–89	
Mozambique	1986–2001	1986–92	
Namibia	1990–2001		
Nepal	1986–2001	1997–2001	1997
Niger	1986–2001	1990–92, 1994, 1996–97	1990, 1996
Paraguay*	1986–2001	1989	1989
Peru	1986–2001	1986–99	
Philippines	1986–2001	1986–2001	1994
Rwanda	1986–2001	1990–94, 1998–2001	1990, 1998
Senegal	1986–2001	1990, 1992–93, 1995, 1997–2001	1990
South Africa	1986–2001	1986–93	
Sri Lanka	1986–2001	1986–2001	
Togo	1986–2001	1986, 2001	1986, 2001
Trinidad	1986–2001	1990	1990
Tunisia*	1986–2001		
Turkey	1986–2001	1986–2001	
Uganda	1986–2001	1986–91, 1994–2001	1994
Uzbekistan	1991–2001	2000	2000
Zambia	1986–2001		
Zimbabwe*	1986–2001		

Note: Countries marked with an asterisk refer to ‘zero cases’ selected due to their level of ethnic homogeneity.

Appendix B. Horizontal Inequality Scores and Ethnic Composition (based on DHS)

Country and DHS survey year (group, group size, %)	Economic HI	Social HI	Health HI	Ethnic Fraction- alization	Ethnic Polarization
Armenia	.00	.00	.00	.04	.08
Bangladesh	.00	.00	.00	.04	.08
Benin, 1996 Fon (37.2) Adja (16.5)	.28	.41	.08	.80	.56
Botswana	.00	.00	.00	.09	.19
Brazil, 1996 Mixed (56.3) White (38.8)	.20	.03	.26	.53	.93
Burkina Faso, 1999 Mossi (59.7) Gourmatche (7.10)	.92	.69	.24	.63	.64
Cameroon, 1998 Bamilike-central (18.8) Betii (12.7)	.18	.06	.35	.93	.25
Central Afr. Rep., 1994 Gbaya (28.4) Banda (29.2)	.01	.01	.18	.82	.55
Chad, 1996 Sara (29.2) Arab (11.2)	.14	.61	.04	.86	.44
Egypt/UAR	.00	.00	.00	.02	.04
Ethiopia, 2000 N4 (28.8) N60 (27.1)	.51	.46	.15	.82	.52
Ghana, 1998 Asante (13.9) Ewe (13.3)	.02	.07	.23	.75	.72
Guatemala, 1998 Latin (63.4) Indian (36.6)	.67	.46	.14	.46	.93
Guinea, 1999 Peluh (32.9) Malinke (29.4)	.14	.10	.15	.75	.70
Haiti	.00	.00	.00	.09	.19
Ivory Coast, 1994 Baoulé (18.2) Burkina Faso (10.2)	.39	.60	.10	.93	.25
Jordan	.00	.00	.00	.04	.08
Kazakhstan, 1995 Kazak (51.4) Russian (31.2)	.19	.09	.24	.64	.80
Kenya, 1998 Kalenjin (16.7) Kikuyu (15.9)	.37	.21	.29	.88	.41
Kyrgyzstan, 1997 Kyrgyz (66.5) Russian (12.8)	.30	.18	.30	.53	.70
Liberia, 1986 Kru/Sapo (19.8) Kpelle (12.6)	.22	.39	.37	.90	.35
Malawi, 2000 Chewa (26.7) Lomwe (19.6)	.10	.12	.09	.84	.51

Appendix B, Continued.

Country and DHS survey year (group, group size, %)	Economic HI	Social HI	Health HI	Ethnic Fraction- alization	Ethnic Polarization
Mali, 1995 Bambara (27.8) Peluh (13.5)	.00	.13	.03	.86	.46
Morocco	.00	.00	.00	.02	.04
Mozambique, 1997 Cisena (27.2) Xitsonga (24.1)	.37	.14	.20	.79	.63
Namibia, 1992 Oshiwambo (45.2) Damara (12.1)	.11	.16	.05	.74	.65
Nepal, 1996 Chhetri (20.0) Brahmin (53.9)	.42	.35	.26	.89	.39
Niger, 1998 Haoussa (53.9) Djerma (26.3)	.35	.45	.30	.63	.78
Paraguay	.00	.00	.00	.09	.19
Peru, 2000 Spanish (86.7) Quechua (11.3)	.91	.55	.36	.24	.45
Philippines, 1998 Cebuano (29.3) Tagalog (18.6)	.32	.14	.02	.81	.58
Rwanda, 1992 Hutu (89.10) Tutsi (10.10)	.51	.32	.07	.20	.38
Senegal, 1997 Wolof/Lebou (37.8) Poular (23.4)	.27	.34	.13	.77	.65
South Africa, 1998 Black/African (76.6) Colored (13.1)	.35	.04	.26	.39	.63
Sri Lanka, 1987 Low Sinhalese (49.9) Up Sinhalese (33.7)	.49	.27	.01	.63	.84
Togo, 1998 Adja-Ewe (31.4) Kabye, tem (33.5)	.23	.23	.10	.75	.72
Trinidad, 1987 Indian (47.0) African (35.3)	.10	.05	.28	.63	.89
Tunisia	.00	.00	.00	.04	.08
Turkey, 1993 Turkish (87.0) Kurdish, zaza (10.2)	.32	.51	.36	.23	.43
Uganda, 1995 Baganda (20.0) Basoga (9.9)	.65	.28	.14	.92	.29
Uzbekistan, 1996 Uzbek (75.8) Russian (6.5)	.39	.16	.08	.41	.60
Zambia, 1996 Bemba (20.1) Tonga (11.2)	.24	.32	.23	.92	.27
Zimbabwe	.00	.00	.00	.04	.07

Note: The shaded areas indicate zero cases for which no horizontal inequalities are assumed.