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Queen Elizabeth House, University of Oxford

# Horizontal Inequality and Communal Violence: Evidence from Indonesian Districts

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CRISE WORKING PAPER No. 22

November 2005



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## Horizontal Inequality and Communal Violence: Evidence from Indonesian Districts

### *Abstract*

Existing research by experimental psychologists, qualitative sociologists and economics theorists agree on the importance of intergroup bias both in access to inputs and in observed outcomes to explain out-group behaviour, group mobilisation and, ultimately, social unrest. However, between-group or horizontal inequalities (HIs) have received little attention in the lively empirical literature on civil conflict. To an extent, this is not surprising given the daunting task of measuring distances between groups whose boundaries are typically based on non-economic dimensions. The aim of the paper is twofold: to situate HIs within the existing strands of literature on inequality, ethnic diversity and conflict and to investigate empirically the link, if any, between HIs and ethno-communal violence. Using district-level data from Indonesia, the paper finds that horizontal inequality in child mortality rates and its change over time are positively associated with the occurrence of deadly ethno-communal violence, after controlling for a number of intervening factors including population size, ethnic diversity and economic development. The estimated effects are found to be robust to a number of sensitivity tests. Results also suggest that violent conflict is more likely to occur in areas with relatively low levels of economic development and greater religious polarisation. Standard measures of (vertical) income inequality as well as other purely demographic indicators of ethnic diversity are found to have no significant impact on the likelihood of communal violence.

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## Horizontal inequality and communal violence: evidence from Indonesian districts

By Luca Mancini<sup>1</sup>

### 1. Introduction

Sixteen years after Mark Lichbach's (1989) extensive survey of the empirical literature on the inequality-political conflict nexus, evidence remains controversial. Recent cross-country econometric research has produced mixed results. Whereas some studies found that socio-political instability increases with income inequality (Alesina and Perotti, 1996; Auvinen and Nafziger, 1999), other studies found no causal effect on civil conflict onset at standard levels of significance (Collier and Hoeffler, 1998; Fearon and Laitin, 2003).

One reason for the inconsistency of the findings is that typically the definition of violent conflict differs across the datasets used in these studies. For instance, some only include episodes of violence where the state or government is one of the factions involved (Armed Conflict Dataset, see Strand, Wilhelmsen and Gleditsch, 2003), while others also consider incidents between non-government factions (Minorities at Risk, see Gurr, 1993); some account for internal displacement as well as death toll in measuring the severity of violence; some exclude genocides (Auvinen and Nafziger, 1999).

A second reason not as much for the elusiveness as for the absence of a causal link between inequality and political violence is that inequality is conventionally measured using Gini coefficients based on individual income or wealth. This approach has been challenged on two main accounts: a) it fails to capture other crucial dimensions of inequality pertaining to access to politically sensitive inputs such as political participation, employment, education, land, and housing, and b) it neglects group membership as a vital dimension of human well-being and social stability. Horizontal inequality (Stewart, 2000 and 2002; HI henceforth), socially-embedded inequality (Figueroa, 2003; Mogues and Carter, 2004), durable inequality (Tilly, 1999), intergroup differentials (Gurr, 1993) are alternative ways to define a similar concept: culturally defined groups are central to civil strife, and it is their perceived relative deprivation in the economic, social and political spheres that buttresses group identity and cohesion to become a powerful mobilizing agent.

Theories of civil conflict share the common conviction that ethnic identity facilitates collective action and as such it plays a key role in the understanding of civil violence. Schock (1996) observes that the major sources of political cleavages in most modern societies tend to be segmental rather than functional. The fading of ideological differences following the end of the Cold War and the effect of global migration patterns in bringing people of different cultures into physical proximity have undoubtedly contributed to bring ethnicity and religion back with a vengeance as factors that deeply shape political and social life in many parts of the world (Stewart, 2002; Milanovic, 2003). As a consequence, in plural societies ethnic identity is often a more accurate predictor of political behaviour than class identity. These claims have been substantiated by evidence that the large majority of intra-state violence has ethnic roots

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<sup>1</sup> This paper has benefited significantly from comments made by participants in the Economics Research Seminar at ISS in The Hague (March 2005) and in the CRISE Workshop 2005 in Oxford (June) where earlier versions were presented. I am particularly indebted to Frances Stewart, Graham Brown and Yvan Guichaoua for the many insightful discussions and suggestions. Responsibility for any of the results and claims found in the paper is entirely my own.

(Fearon and Laitin, 1996). By the mid-1980s, ethnic violence had already claimed over ten millions lives since World War II (Horowitz, 1985). More recent evidence suggests that between 1960 and 1999 conflicts over “identity” accounted for more than 70% of all civil wars started in this period (Sambanis, 2001).

Not surprisingly, measuring the impact of ethnic diversity on a range of outcomes such as education quality (Miguel, 2001), growth (Easterly and Levine, 2000; Alesina *et al.*, 2003), aid effectiveness (Burnside and Dollar, 2000), political instability and violence (Montalvo and Reynal-Querol, 2005; Collier and Hoeffler, 1998; Elbadawi and Sambanis, 2001) has attracted considerable attention in quantitative research. Milanovic ironically notes that

“the study of ethnic minorities has now become a growth industry for academics, security experts and international lawyers. Communist elites may have made an easy switch to new roles as nationalist figureheads, but their Western observers were not far behind them, expertly retooling their Cold War analytic skills. [...] To econometricians, ethnicity presents that rare variable which is both meaningful (in terms of explanatory power) and is exogenous”.

(Milanovic, 2003: 35)

However, there appears to be no consensus on the mechanisms through which ethnic diversity affects the outcomes of interest. For instance, the economic growth literature has typically found that the degree of ethnic fragmentation has negative effects on growth but there is no unanimity on whether the impact of ethnic diversity is due to the consequent lack of social capital (Keefer and Knack, 1999), or the sub-optimal provision of growth-enhancing public goods due to a collective action problem (Alesina, Baqir and Easterly, 1999). In the conflict literature the channels through which ethnic diversity operates are even more controversial. While there are a few studies, both theoretical and empirical, on the relationship between collective action and economic inequality, it is not clear how the same conclusions can be generalized to ethnic diversity and further research is needed to clarify this link (Alesina and La Ferrara, 2004). Goldstone *et al.* (2004) find that ethnic composition has no direct impact on political stability, once economic development and political institutions are taken into account. Only when ethnic differences are combined with active political discrimination against particular groups does political stability decline. Finally, despite theoretical work postulating that it is the degree of ethnic polarisation rather than fragmentation that makes a country more conflict-prone, evidence has been mixed.

One of the aims of this paper is to bridge the empirical literature on the inequality-political violence nexus with the empirical literature on ethnic diversity and intrastate violent conflict. It argues that inequality between ethnic groups represents a potentially important channel through which ethnic diversity can lead to violence. This claim is tested empirically using a comprehensive dataset which merges census data with information on ethno-communal violence that took place in Indonesia between 1990 and 2003. Unlike cross-country econometric analyses of political conflict, focusing on one country has the advantage of reducing country-specific heterogeneity in the political structure and/or the historical heritage which not only typically mediate the impact of inequality on collective violence but are also often unobservable (Barron, Kaiser, and Pradhan, 2004; Deininger, 2003; Moore, Lindström and O’Regan, 1995). On the other hand, for its size, geography, ethnic diversity and assortment of internecine violence much of which very recent and still unresolved, Indonesia it is more than a case study, in the sense that the findings and implications of the present analysis could potentially be extended beyond the national boundaries.

The rest of the paper is structured as follows. Section 2 surveys alternative approaches that have been used in the empirical literature on conflict and growth to operationalise ethnicity. Section 3 briefly discusses measurement issues of group inequalities. Section 4 reviews previous empirical studies on the link between HIs and conflict. Section 5 provides some background information on Indonesia focusing particularly on its economic performance, patterns of inequality and conflict history. Section 6 illustrates the modelling strategy and discusses its limitations. Section 7 presents the data used in the analysis, while section 8 illustrates the main features of the sample. Section 9 presents and discusses the main findings. Section 10 concludes.

## 2. Operationalising ethnicity: three approaches

A review of the empirical literature on civil conflict suggests three main approaches to operationalise ethnicity: 1) ethnic diversity, 2) cultural distance, and 3) horizontal inequalities. These are discussed in turn in the rest of this section.

### 2.1 Ethnic diversity

The measurement of ethnic diversity has taken many forms: ethnic dominance (Collier, 2001), the size of the second largest group (Ellingsen, 2000), categorical indicators ranking ethnic structure from unipolar to fragmented multipolarity (Barrows, 1976; Bangura, 2001), Herfindahl-type measures of ethnic dispersion more commonly known as ethnic fractionalisation indices (Alesina *et al.*, 2003), and median-based indicators of demographic clustering around ethnic poles, commonly known as polarisation indices (Reynal-Querol, 2002).<sup>2</sup> The latter two types of indicators are the most widely used. The choice between them depends on what one seeks to explain. A number of authors have convincingly argued that to explain violent conflict polarisation is superior to fragmentation (Esteban and Ray, 1994 and 1998; Montalvo and Reynal-Querol, 2005), because collective action is needed for conflict and greater fragmentation makes collective action more difficult.<sup>3</sup> If groups are not large enough to represent viable political bases, their cultural cleavages remain unexploited (Posner, 2004a). Also, if communities are sufficiently large as to constitute viable political coalitions in the competition for national power, politicians are more likely to mobilise and use these groups as building blocks for their support by playing the ethnic card. Moguees and Carter (2004) argue that it takes a critical mass of individuals to develop group-related institutions that cement group identity. Also, the tendency to polarisation is particularly dangerous in ethnic politics since it is conducive to zero-sum outcomes that greater fluidity of alignments makes less probable (Horowitz, 2000). Perceptions of identity themselves depend on numbers. Using survey data from nine African countries, Bannon, Miguel and Posner (2004) find that ethnic fractionalisation is negatively associated with the probability that individuals identify themselves first and foremost in ethnic terms, which implies that in more ethnically fragmented societies the salience of ethnicity as a mobilizing agent may be weaker. Finally, Bodenhorn (2003) finds that antebellum light-skinned African Americans were more likely to identify as “mulatto” (as opposed to identifying as “Blacks”) when there were already a substantial number (in absolute and relative terms) of other mulattos in the community.

<sup>2</sup> Ethnic dominance is a binary dummy which equals 1 if one single ethnic group makes up 45 to 90 percent of the total population and zero otherwise.

<sup>3</sup> There is a clear inverted U-shaped relationship between polarisation and fractionalisation (Montalvo and Reynal-Querol, 2005). Arcand *et al.* (2000) model the link between polarisation and growth using the fractionalization index entered in a quadratic form to capture this non-linear relationship.

Measures of fragmentation and demographic polarisation simply record numerical composition and not the differences between groups which may give rise to conflict. The next two approaches aim to measure these differences.

## **2.2 Social (cultural) distance**

This approach goes beyond purely demographic indicators of diversity to measure the depth of cultural differences between groups. Cultural difference between groups can enhance group cohesion, identity and the salience of cleavages. Fearon (2003) proposes a new measure of cultural distance between language groups based on commonalities of language “tree branches”. He argues that the number of common classifications in the language tree can be used as a measure of cultural proximity. Barrows (1976) constructs a composite index of ethnic pluralism (or cultural diversity between the ethnic groups of a nation) based on 12 indicators encompassing aspects such as dependence on agriculture, family organisation, settlements patterns, type of authority system, descent and inheritance system. Gurr (1993) uses an indicator (0-4 category scale) of intergroup cultural differentials based on six reinforcing traits: ethnicity, language, religion, social customs, historical origins, and urban versus rural residence.

The validity of this approach has been seriously challenged by a number of qualitative and quantitative studies. Fearon and Laitin (1996) provide the striking estimate that in Africa there has only been one instance of ethnic violence for every two thousand cases that would have been predicted on the basis of cultural differences alone. Moreover, Brubaker and Cooper (2000: 24-25) observe that “in much of modern Africa some of the most bitter conflicts have taken place within collectivities that are relatively uniform culturally and linguistically (Rwanda and Somalia) and between loose economic and social networks based more on patron-client relations than ethnic affiliations (Angola, Sierra Leone)”. Gurr (1993: 57) notes that “[although] cultural differences may be invoked to explain and justify the unequal status of particular minorities, the global analysis show that there is no strong empirical evidence whatsoever between the extent of cultural differentials [...] for ethno-classes and communal contenders”. Posner (2004a) presents an interesting natural experiment involving two ethnic groups, the Chewas and the Tumbukas, whose native territory was split between Zambia and Malawi following the arbitrary drawing of the border between the two nations. The fact that both ethnic groups have mobilized politically in Malawi, where they form a large proportion of the whole population, but not in Zambia, where their relative size is small, suggests that the salience of cultural cleavages to conflict dynamics depends on the size of the groups rather than on their cultural differences.

A second, conceptually similar, way of capturing the depth of cultural differences is to consider the nature of the cleavage rather than attempting to quantify the depth of it, under the assumption that some cleavages are intrinsically less tractable than others. For instance, it has been claimed that religious cleavages are deeper because of the exclusivity of religion. As noted by Reynal-Querol (2002), one can speak more languages but believes in one God. Therefore, religiously divided societies are more prone to intense conflict than multiracial mono-religious societies. However, Alesina *et al.* (2003) have challenged this view on grounds that religion can be more easily hidden than language or race as people can conform to the state-imposed or official religion to avoid repression.

Finally, a third way of looking at cultural distance is through multiple affiliations. Fearon (2003: 31) points out that “while a variety of indicators of religious fractionalization have been constructed, [...] so far no cross-sectional data examines whether cross-cutting or overlapping cleavages between ethnicity and religion matters for the dependent

variables of interest". When more than one marker (religion, class, ethnicity, or race) defines a group, group identity is stronger and the politicization and mobilization of grievances is more likely to occur. In contrast, cross-cutting or competing social identities increase perceived intracategory differentiation and decrease perceived intercategory differences, thus reducing the salience of category distinctions (Ensari and Miller, 2001; Hewstone *et al.*, 2000). Sriskandarajah (2003: 17) notes that "the entrenchment of an underclass within both major ethnic groups could well trigger the emergence of a sustainable and effective class-based politics, thus diminishing the power of interethnic divisions". Along similar lines, Roemer (1998) argues that one potential reason why the poor did not expropriate the rich after the 20th century advent of universal suffrage is the co-existence of economic (income) and non-economic (religion/race) voters' preferences. Poor, pro-clerical voters, may shift to the "right", i.e. against their own natural economic preferences (higher tax rate), because of the non-economic policy card instrumentally played by parties to shift voters' preference away from classical issues. Alternatively, sub-ethnic affiliations can be used to dilute the overwhelming salience of ethnic affiliations (Horowitz, 2000). Varshney (2003) stresses the importance of civic engagement defined as cross-cutting affiliations in preventing Hindu-Muslim riots in India. From an empirical perspective, however, the problem with civic engagement as an effective means to defuse violence is that civic engagement itself often constitutes an outcome to be explained. Furthermore as noted by Mogues and Carter (2004: 26) "there may be critical threshold levels of group inequality, beyond which decentralized social and economic processes are likely to preserve inequality and perhaps deepen social instability. Social capital, defined as the ability of those in low-wealth categories to successfully invest in the well-endowed group, in such environments is simply unattainably missing for some individuals". This implies that from a policy perspective, promoting civic engagement may be impracticable in some contexts.

### **2.3 Horizontal inequalities**

While the last class of measures aims to gauge cultural differences between groups, the HI approach measures differences in outcomes and access to resources. Stewart (2000 and 2002) has argued on the basis of qualitative research that HIs defined as differences between culturally formed groups in political opportunities, social access, economic assets, employment and income, play an important role in determining when and where violent conflict will take place. According to Gurr (1993) relative deprivation is the necessary precondition for civil strife of any kind. The more widespread and intense is discontent among members of society, the more likely and severe is civil strife. Discontent or relative deprivation reinforces the psychological bases of group identification: "[ ] treat a group differently by denial or privilege, and its members become more self-conscious about their common bonds and interests. Minimize differences and communal identification becomes less significant as a unifying principle" (Gurr, 1993: 3).

Inequality need not always be a cause of conflict. For instance, qualitative case studies have shown that societies considered highly unequal in terms of income distribution such as Thailand, Kenya, Pakistan and Brazil are not invariably ridden by major political conflict (Stewart, 2000). However, when grievances can be politicised within an ethnic framework increased inter-ethnic conflict may be the eventual result (Sriskandarajah, 2003). Robinson (2001) uses an overlapping generation model of class and ethnic conflict with and without social mobility. Inter-group inequality is found to be a crucial factor in determining the level of conflict. The model also predicts that ethnic conflict tends to be worse in a situation where economic (vertical income) inequality in society is low. When inequalities in resources, access, and outcomes coincide with cultural differences, culture can become a powerful mobilizing agent that can lead to a range of

political disturbances. Thus, HIs are a predisposing factor to conflict which becomes particularly powerful when group boundaries are seen as impermeable and mobility is limited (Stewart, 2002; Ellemers, Wilke and Van Knippenberg, 1993). Inequality becomes a mobilising agent when it is socially-embedded: poor and rich are not only separated by their money, but also by their culture, language or appearance (Mogues and Carter, 2004).

For social stability as for individual well-being, inequality of access to inputs such as political and civil rights, education, land, housing, may be at least as important as inequality of outcomes like income, consumption or wealth (Sen, 1980), particularly as they are both visible (and hence widely perceived) and instrumental for inequality in outcomes. For example, during apartheid South African Chiefs were well-to-do but had no right to vote. Economists tend to focus widely on income or consumption inequality not only because they themselves constitute a concern but also because they are expected to serve as good proxies for other non-monetary dimensions such as education, health or political participation which involve a greater element of subjective judgment and are therefore more difficult to measure. However, Justino, Litchfield, and Niimi (2004) show that there is no reason to assume that income inequality is a good proxy for other non-income inequalities. Using 1996 household survey data from Brazil they find very little (and negative) correlation between the distribution of household health (health status is measured by the proportion of stillborn babies in the household) and the distribution of household income. Although the correlation between the distribution of income and the distribution of education (based on the number of years of schooling attained by the most educated member of the household) is higher and positive, about 20 percent of the very poor (rich) are found in the top (bottom) education quintiles. The authors conclude that in Brazil traditional inequality analysis based on household income may overestimate the level of inequalities in other non-monetary attributes. This in turn may explain why Brazil has remained politically stable despite being one of the most unequal societies in the world.

It has been argued that it is the concept of economic polarisation rather than economic inequality that holds the key to explaining communal conflict (Esteban and Ray, 1994 and 1998). Polarisation captures the extent to which society is clustered around a small number of distant and relatively (internally) homogeneous groupings. This means that a society is more polarised: a) the wider the gap between groups (alienation), b) the closer the population structure to perfect bimodality (demographic polarisation), and c) the more internally homogenous the group (within-group inequality). A society is perfectly polarised when it is evenly divided (and perfectly stratified) into those possessing a special attribute and those not possessing it. If one assumes that the level of discontent within the have-nots is proportional to the product of the number of people in the two groups, then a highly polarised society is expected to be more conflictual than a highly unequal society (Podder, 1998).<sup>4 5</sup> Polarisation is linked to inequality in a complex, nonlinear way: it increases with the level of inequality between groups and decreases with the level of inequality within groups (Zhang and Kanbur, 2003).

Whereas existing measures of group inequality and polarisation like Esteban and Ray's implicitly presume that only economic class shapes identity and polarisation, this paper

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<sup>4</sup> A similar concept is what Yitzhaki and Lerman (1991) refer to as stratification, e.g. the extent to which population subgroups occupy distinct strata of an overall distribution (income, education, land). Their index captures the degree of overlap between each group and other groups.

<sup>5</sup> There are also clear links between HI and the empirical literature on spatial inequality (Kanbur and Zhang, 1999; Noobakhsh, 2005). Clearly when cultural groups live geographically segregated, spatial inequalities also measure HIs. This may actually be the only way to measure them when data on ethnicity are hard to get.

defines groups according to some relevant "non-economic" dimensions such as language and religion rather than in terms of the same metric (e.g. income or years of education) normally used to summarize the distance between them.<sup>6</sup> This reflects the view echoed by Stewart (2000) and Figueroa (2003) that inequality is more destabilizing when it is socially embedded.<sup>7</sup>

### 3. Measuring horizontal inequalities

The concept of HI brings together the ethnic diversity literature with the (vertical) economic inequality literature. Table 1 shows a simple 2-by-2 matrix of indicators resulting from incorporating different combinations of group size and intergroup inequality in the indicators.

**Table 1: Indicators combining group size with intergroup inequality**

		Intergroup inequality	
		NO	YES
Group size	NO	-	-population unweighted HIs (Langer, 2005)
	YES	-demographic fractionalisation (Easterly and Levine, 1997) ..... -demographic polarisation (Reynal-Querol, 2002)	-population weighted HIs (Stewart, Brown and Mancini, 2005) ..... -economic polarisation (Esteban and Ray, 1994; Zhang and Kanbur, 2003)

The use of purely demographic indicators (bottom left box) as explanatory factors of violent (interethnic) conflict rests on the strong assumption that groups will mobilise just on the basis of their sense of group identity. Any estimated effect will then conflate the impact of demographic polarisation and the contribution of intergroup inequality, if the latter is not controlled for. For example, the Reynal-Querol polarisation index measures how far a particular distribution of ethnic or religious groups is from being perfectly bimodal. The distribution is only based on group population size. It ignores cultural and economic distance between groups by assuming that intergroup differences are constant between any pairs of groups.

With an unweighted measure, large deviations of very small groups would get the same weight as those of large groups. Yet from a well-being perspective, this represents a

<sup>6</sup> The polarisation index proposed by Esteban and Ray is a parametric version of the Gini coefficient of inequality between groups. Is defined as  $ER(k,\alpha) = k \sum_r^R \sum_s^S p_r^{1+\alpha} p_s |\bar{y}_r - \bar{y}_s|$ ,

where  $\bar{y}_r = \frac{1}{n_r} \sum_i^{n_r} y_{ir}$  is mean value of y for group r,  $p_r$  ( $p_s$ ) is group r (s) population share, and  $\alpha$  is an "identification" parameter which enters the Gini expression exponentially to emphasize the effect of group size on the overall polarisation index.

<sup>7</sup> Mogues and Carter (2004) derive a socio-economic polarisation index which combines two dimensions of individuals' identity: an economic one like personal income or wealth on one hand and a non-economic one like ethnicity, religion or race on the other.

different situation in that very different numbers are affected. This would also be true from an instrumental perspective: for example, Posner (2004) has found that the same groups, the Chewas and Tumbukas, have mobilised politically in Malawi, where they form a large proportion of the whole population, but not in Zambia, where their relative size is small. Hence a population weighted index is generally desirable.

The aim of measures of HI is to identify differences in economic, social and political resources between groups so as to test how far these are associated with conflict. Stewart, Brown and Mancini (2005) review different approaches to measuring HIs and conclude that an ideal measure should: a) be in so far as possible descriptive, not evaluative, b) be sensitive to group size, and c) measure inequality between groups as such, without conflating it with vertical inequality and/or demographic polarisation. In the presence of more than two relevant ethnic groups, as is often the case for Indonesian districts, an indicator that satisfies the above criteria is the group-based coefficient of variation weighted by group size.<sup>8</sup> More formally,

$$\text{GCOV} = \frac{1}{\bar{y}} \left( \sum_r^R p_r (\bar{y}_r - \bar{y})^2 \right)^{\frac{1}{2}} \quad r=1, \dots, R \quad (1)$$

where R is the number of ethnic groups,  $\bar{y}$  is the overall sample mean of variable y,

$\bar{y}_r = \frac{1}{n_r} \sum_i^{n_r} y_{ir}$  is group r mean value of y, and  $p_r$  is group r population share. For the

reasons illustrated above, this measure is to be preferred to measures of unweighted group inequality as well as to existing indicators of economic polarisation. Therefore, in the rest of the paper HIs will be measured using the GCOV indicator.

#### 4. Previous quantitative literature on HI

Despite the fact that the concept of HI is well known in theoretical and qualitative research on political conflict, few studies have attempted to test its effects on collective violence using large-N econometric analysis. This is not too surprising given the difficulties of defining groups in the first instance and, subsequently, of measuring inequality between them. An early attempt by Barrows (1976) uses partial correlation analysis between alternative indicators of political instability and group inequality for a sample of 32 sub-Saharan African countries.<sup>9</sup> HIs are defined as the degree of disproportionality between the size of groups and their respective share of certain resources or assets such as political power, wealth and education and are measured on a 1-9 point scale. Results suggest that the effect of HIs on political instability remains positive and statistically significant regardless of which definition of political instability is used and after controlling for a number of intervening variables individually, such as social mobilisation, level of government spending, proportion of civil servants, ethnic fragmentation and ethnic polarisation. Barrows (1976: 66) concludes that “intergroup disparities in access to the benefits of modernity” conspire to activate the ethnic group competition that often erupts into violence”.

<sup>8</sup> A valid alternative is to use group Gini coefficients (see Stewart, Brown and Mancini, 2005; Appendix 1, B2). However, the GCOV measure has been preferred here because it is less sensitive to variation in the number of ethnic groups across districts.

<sup>9</sup> Barrows distinguishes between elite instability, communal instability, and turmoil.

Gurr and Moore (1997) use the Minority at Risk (MAR) dataset on 202 politically-active communal groups from the 1980s.<sup>10</sup> The dataset contains four types of intergroup differences: political (access to political power, civil service, recruitment to military/police, voting rights, rights to organize political activity, effective right to equal legal protection), economic (income, land/property, education, presence in commercial activities, presence in official positions, presence in professions), cultural (social customs, history) and ecological stress or collective disadvantages (poor public health, rural to urban areas migration, dispossession from land). The various dimensions of HIs are measured using point scale indicator variables generally taking discrete values between -2 and 2.<sup>11</sup> The dataset also contains comprehensive information on group conflict behaviour (protest, rebellion, and state repression) and other group characteristics such as geographical dispersion, kin groups, and strength of cultural identity. Using simultaneous equation models which jointly model rebellion, mobilization, grievances, and state repression, the authors find that HIs, measured as an intensity weighted sum of intergroup political, economic and social differentials, have indirect positive effects on the likelihood of ethnopolitical rebellion through higher ethnopolitical mobilisation. Despite the rigor of the econometric analysis, the use of the MAR dataset makes the analysis vulnerable to criticism. Besides the common criticism of selection bias associated with the fact that only “minorities at risk” are included in the dataset, the MAR data also appears generally insensitive to changes in the magnitude of group inequalities as well as to changes in the boundaries of politically salient groups over time. Moreover, for some countries, the information provided is not always accurate like the massive underreporting of the level of state repression in Guatemala.

Østby (2003) uses Demographic and Health Survey data for 43 developing countries between 1986 and 2001. HI variables are measured as ratios between the mean values of the two major ethnic groups in each country and are based on the following (aggregated) dimensions: economic (durable goods ownership), social (women education, husband’s occupation) and health (infant mortality). Ethnic groups are defined on the basis of self-reported ethnic identity from the women’s questionnaire. The dependent variable is measured in terms of domestic armed conflict incidence and onset using country-year information from the Armed Conflict Dataset. Other control variables include GDP per capita, GDP growth, regime type, proximity of regime transition, population size, natural resource dependence, ethnic diversity (fractionalisation and/or polarisation), and vertical income inequality. The results from the logit analysis reveal sizeable positive effects on the likelihood of conflict onset associated with social HIs. The impact of economic HI is weaker both in magnitude and statistical significance, while the effect of health HI on the probability of conflict incidence is negative (the same is not significant on the likelihood of conflict onset). Other findings suggest no effect on conflict onset associated with vertical inequality, ethnic fractionalisation or polarisation once HIs are controlled for. Interestingly, the inclusion of interaction terms between vertical and horizontal inequalities suggests that the likelihood of civil conflict is highest when low within-group coexists with high between group inequalities.

The analysis suffers from a number of limitations. As for the MAR data, analyses based on DHS dataset suffer from selection bias due to the unavailability of ethnicity data for many countries, particularly those where ethnicity is politically sensitive. Secondly, the

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<sup>10</sup> To qualify as minorities at risk, groups must experience/have experienced political or economic discrimination and have consequently taken political action to protect or voice of their groups’ interests and grievance. This implies that these ethnic minorities are almost all mobilized and have a nontrivial level of cohesion.

<sup>11</sup> Negative values indicate that the group is an advantaged minority. For instance, the economically powerful Chinese minority in Malaysia scores -2 with respect to economic HIs.

measurement of horizontal inequalities is based on the two major groups only. This ignores the position of smaller groups which are often the target of violence (see for instance the Madurese in Kalimantan). Finally, the analysis assumes invariance of horizontal inequalities over time. Although group inequalities are expected to change slowly because they tend to be durable and socially embedded, to rule out a priori the possibility that they may worsen or improve over time can be a serious limitation, especially as relatively small changes may be perceived by people as being very significant, which in turn may heavily influence group mobilisation and conflict dynamics.

Barron, Kaiser and Pradhan (2004) use data on 69,000 villages and neighbourhoods from the 2002 Indonesian Village Census (PODES). They measure education HIs between ethnic groups (based on years of schooling of household heads) defined as the ratio of average education attainment of the most and least educated groups<sup>12</sup>. Conflict information on whether the community experienced conflict in the past year is collected from key-respondents (village heads) in the 2003 survey. The analysis is based on logit regression models of conflict incidence estimated separately for urban (*kelurahan*) and rural (*desa*) villages/neighbourhoods, as well as with or without villages located in the province of Aceh. Other controls include local relative poverty (defined as the ratio to the district mean), human capital inequality in the sub-district based on years of education for males aged 20-30, fraction of individuals unemployed in the village, various indicators of ethnic diversity at the sub-district level, a dummy for the presence of interethnic marriages in the village, land tenure, and community-level proxies for social capital/civic society. Among other results, they find a surprising negative association between HIs and conflict in rural areas, while HIs have no significant effect on conflict in urban areas.

The main limitation of the analysis is that conflict information is contemporaneous to most independent variables which lead to simultaneity problem, although the authors acknowledge that estimated coefficients should be viewed as measures of associations rather than causation. Also, horizontal inequalities are only based on education differences between polar groups. Reliance on education only may conceal significant group inequalities in other dimensions both social and political, while focusing on the two extreme groups only fails to capture potentially important grievances for politically salient intermediate groups.

Murshed and Gates (2005) estimate a Poisson regression model of the total number of people killed in episodes of civil violence in each of the 75 administrative districts in Nepal since 1996 (the year in which conflict started) to test the hypothesis that violent civil conflict is caused by horizontal inequalities in assets and income. The papers uses Red Cross data on the number of fatalities, while horizontal inequalities are constructed from UNDP data as the gap between the district average and Katmandu's average values in literacy rates, road density, life expectancy, landlessness, and HDI, in the year when the conflict started (1996). Controlling for geographical factors such as resource dependence and percentage of mountainous area, they find that conflict is more intense in the most disadvantaged districts in terms of human development and asset (land) holdings. In contrast, spatial differences in literacy rates, life expectancy and road density all have negative effects on conflict intensity.

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<sup>12</sup> HI indicators are calculated for sub-districts rather than villages, while the group size threshold for ethnic groups to be considered is set at 5% (10%) of the district (sub-district) population.

## 5. The Indonesian context

With a total population of over 200 millions comprising around a thousand ethnic groups Indonesia is one of the world's most populous and ethnically diverse countries. The formation of ethnic identities in Indonesia has been deeply and ambivalently influenced by its colonial past. The introduction of parallel legal systems and census classifications and, above all, the promotion of the division of labour along ethnic lines by the Dutch colonial power contributed to the demarcation of ethnic boundaries in pre-independence Indonesia. On the other hand, through fostering local ethnic and religious identities in a crude divide and rule strategy, colonial policies inadvertently laid down the basis for an Indonesian national identity founded on shared experience of colonization (Brown, 2005).

After gaining independence in 1950, Indonesia has been marred by waves of extensive internal conflict. In the late 1950s a rebellion by some of the outer islands of the 13,000 island-strong archipelago was brutally suppressed by the revolutionary hero and first Indonesian president Sukarno. A failed coup by communist sympathizers in the military in 1965 provoked a successful counter-coup which paved the way to the ascent to power of Major General Suharto in 1967 and to his three decade-long presidency known under the name of New Order. Interestingly, the impact of the New Order on identity formation in Indonesia was also characterized by ambivalence and unintended consequences, although the outcome was the obverse of the colonial experience. By privileging a discourse of national identity, which suppressed ethnicity in the public domain, New Order's social policies contributed to reinforce and antagonize local identities (Brown, 2005).

Under Suharto, the Indonesian economy grew at an average rate of 4.5% (Smith *et al.*, 2002). During this period, Indonesia saw a decline in the incidence of poverty, and improvements in child mortality and literacy rates. Among the reasons for this steady expansion is a well judged structural adjustment policy built on a mix of expansionary fiscal stance, aggressive devaluation of the rupiah while at the same time keeping inflation under control, massive investment in human capital, a major tax reform and substantial deregulation of the financial system (Booth, 2000).

However, this rapid growth was accompanied by increasing inequality, especially in urban areas. Regional decomposition analysis of inequality shows that 80% of overall inequality in Indonesia is within-provinces. Moreover, thirteen industrial and oil rich districts account for about 60-70 percent of total inequality (Cameron, 2001). The oil boom in the 1970s had the effect of increasing spatial inequalities between urban and rural areas through the adverse consequence of the real appreciation of the rupiah (Booth, 2000). Relative poverty measured as the proportion of population spending below 50% of average per capita consumption expenditure increased significantly between 1987 and 1996, while the elasticity of poverty decline with respect to economic growth fell significantly during the same period. According to Booth (2000) this sharp rise in the incidence of relative poverty at the time when average incomes and consumer expenditure were also increasing rapidly partly explains the growing social, racial and religious tensions which became obvious even before the full impact of the financial crisis hit the late 1997.

After nearly 30 years of uninterrupted growth, low inflation and stable currency, in 1998 Indonesia was violently hit by a currency crisis which rapidly spread from the financial sector to the whole economy through upward-spiralling prices. To make things worse the currency crisis compounded with natural calamities (the 1998 draught and forest fires that raged across parts of Sumatra, Sulawesi and Kalimantan) and with dramatic political change. Its timing and virulence were largely unanticipated. The poverty rate

increased from a value of 15% at the onset of the crisis in mid-1997 to a highest point of 33% at the end of 1998 (Suryahadi, Sumarto and Pritchett, 2003). In 1998, real GDP fell by nearly 14% in 1998, while inflation rose to 78%. However, this figure clouds the much higher increase of food prices. For instance rice which is the single most important commodity for Indonesians, and especially for households in the bottom expenditure where rice accounts for more than one quarter of the total budget, is believed to have increased by an average of almost 200% (Friedman and Levinsohn, 2001).

The impact of the crisis was not uniform across Indonesia. Using pre-crisis household consumption data from the 1996 SUSENAS survey and price change information between January 1997 and October 1998, Friedman and Levinsohn (2001) calculate measures of compensating variation, i.e. the amount of money sufficient to compensate households following price changes and enable a return to pre-crisis consumption levels.<sup>13</sup> The results suggest that as a result of wide geographical variation in price changes, areas located in South-East Sulawesi and in the Sumatran province of Bengkulu were hit the hardest by the crisis, while areas of East Nusa Tenggara and Irian Jaya were much less affected. The analysis also reveals significant differences between rural and urban households: self-production of agricultural products both for own consumption and net export as well as owned housing dramatically smoothed the impact of the crisis for rural households. This was particularly true for poor households, which were hit significantly harder in urban areas than in rural areas. Further evidence on employment and wage trends confirms this picture. Smith *et al.* (2002) find that the effect of the crisis manifested itself as a dramatic shift in the distribution of jobs, rather than as a massive decrease in aggregate employment, counter to the widespread rhetoric. Sectors like manufacturing, construction, retail and sales which saw significant expansions in employment before the crisis underwent a dramatic reversal of trend, while agriculture which had experienced a secular decline over the previous decade expanded by over 7% between 1997 and 1998. The formal wage sector has been hit most severely by the crisis. Hourly wages in the formal sector fell on average by around 40% across the country, but with some interesting differences across age groups and type of locality. For instance, Smith *et al.* (2002) find the wage fall was particularly large among young workers, both males and females. Moreover, the wage fall for low-skilled formal sector workers in urban areas was significantly higher than in rural areas, even though the greater relative wage deterioration in urban areas monotonically decreases as we move up the wage skill distribution. Broadly speaking, the greater incidence of self-employment and family work in rural areas made households less vulnerable to the negative shocks that affected wage labour. Interestingly, government employment remained stable through the crisis, despite the massive erosion of real wages in the public sector. Social status considerations and long-term employment stability may account for the absence of a shift out of public jobs.

Although some of internecine violence that marred Indonesia's recent past was rooted in the pre-Suharto era, his authoritarian, centralising and corrupt regime and its failure to create a pluralistic society to reflect the ethnic diversity of the archipelago definitely contributed to breed conflict across the country. The annexation and brutal occupation of West Papua, the invasion and reign of terror in East Timor, the long-term military repression in Aceh, the deleterious environmental and economic impact of the transmigration program on many indigenous people and its not-so-veiled goal of strengthening national defence and security, the pursuit of exclusionary policies targeted at specific ethno-religious groups are all examples of the direct role played by the Indonesian central government in stirring existing animosities and inter-ethnic hatred

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<sup>13</sup>

*Survei Sosial Ekonomi Nasional* (National Economic Household Survey)

(Bertrand, 2004).<sup>14</sup> It is therefore no coincidence that violence exploded in 1997 in a climate of regional instability and economic uncertainty in the wake of the financial crisis, and escalated dramatically with the power vacuum left by Suharto's fall in 1998.

Ethno-communal violence in Indonesia, which is the focus of the paper, is highly concentrated in time and space. According to Varshney, Panggabean, and Tadjoeidin, (2004), 14 provinces (out of 30) accounted for 96.4% of all non-secessionist communal conflict deaths since 1990.<sup>15</sup> More strikingly, in 2000 only a mere fifteen districts whose share of the national population did not exceed 7% accounted for 85.5% of all deaths in group violence. This is at odd with the view that sees violence in Indonesia as something endemic to its very social fabric, history and culture. The highly localised pattern of violence also challenges the view of violence as the result of ethno-religious exclusionary policies of Suharto's New Order, which bred distrust of the state and often relied on overt violence. Having identified Muslim-Christian, anti-Chinese, Dayak-Madurese as the three dominant types of communal conflict in Indonesia, Varshney *et al.* (2004: 19) concede that this theory has some merits because "the exclusion of Dayaks [...] on grounds of lack of modernity, the Chinese for lack of indigeneity [...] and Islam on ground of ideology" appear to vindicate Bertrand's claim. However the fact that the Chinese were targeted only in some parts of Indonesia and that Muslim-Christian violence mostly took place in The Malukus and parts of Central Sulawesi while much of Central Sulawesi and almost all of North Sulawesi remained quiet, poses a bit of a puzzle. In the words of Varshney *et al.* (2004: 20) this suggests that "an emphasis on institutional factors at the level of the nation or region can constitute only part of the explanation for the highly localized concentration of group violence our database has discovered".

## 6. Methodology

The paper focuses on ethno-communal violence. Following Horowitz (2000), ethnic violence is defined as violence perpetrated across ethnic lines in which at least one party is not the state and in which victims are chosen by their group membership. In the literature on civil war, rioting and warfare between rival communal groups is not coded as ethnic warfare unless it involves conflict over political power or government policy (Gurr and Harff, 1994). However, many developing countries are afflicted by high levels

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<sup>14</sup> The transmigration program has been a geopolitical cornerstone of the New Order. Its original goals were essentially of socio-economic nature: a) to resettle millions of Indonesian from the densely populated inner islands (Java, Bali, Madura) to the scarcely populated outer islands (Kalimantan, Sumatra, Sulawesi, Maluku, Irian Jaya), b) to alleviate poverty by providing land to new landless settlers, and c) to exploit more effectively the natural resources of the outer islands such as logging, mining, timber and pulpwood plantations, oil palm, and industrial shrimp farming. For more than a decade the program was heavily supported by international financial assistance from the World Bank and the Asian Development Bank and by 1990 3.5 million people had been resettled. However, when the international financial assistance withered by the early 1990s the annual volume of transmigrants declined substantially. The program was officially terminated in 2000. Over the years, the transmigration program attracted increasing criticism because of its devastating environmental impact, particularly in the form of forest fires caused by indiscriminate deforestation; its vested political goal to control the indigenous populations, who often faced gross violations of their customary land rights and forced cultural assimilation; and because it proved economically disastrous and made no significant dent in reducing population pressure in Java (Adhiati and Bobsien, 2001). Not surprisingly, transmigration has inflamed ethnic tensions in Indonesia. In Western and Central Kalimantan thousands of ethnic Madurese were killed and forced to flee by the indigenous Dayak communities. Similarly, the arrival of Muslim migrants in Ambon tipped the demographic balance between the Christian and Muslim communities precipitating the two religious communities into appalling levels of violence.

<sup>15</sup> This excludes conflicts in Irian Jaya, East Timor and particularly in Aceh where between 1998 and 2003 4,300 people, mostly civilians, were killed (Ross, 2002: 31).

of communal violence that does not take the form of civil war but it is nonetheless the source of significant destruction, displacement and suffering (Barron, Kaiser, and Pradhan, 2004). Focusing exclusively on ethnic violence implies that other types of violent conflict which do not fit into Horowitz's definition are ignored. Sambanis (2001) stresses the importance of identifying precisely the type of violence one seeks to explain and in particular to separate ethnic wars from other type of internecine violence. In particular, he finds that ethnic and non-ethnic wars have different causes. This distinction is relevant for a country like Indonesia where ethno-communal violence is just one form, though one of the deadliest, of collective violence. Among the main types of violence which are not considered in this paper as they fall outside the Horowitz's definition of ethno-communal conflict are the secessionist civil wars in Aceh, Irian Jaya, and East Timor, mass sickle battles between communities, vigilante killings, and the burning of alleged witch doctors in Java (*dukun santet*).

The econometric analysis is carried out using Indonesian districts as the unit of analysis. This choice is only partly dictated by the availability of conflict data at the district level. On the one hand, given the nature of ethno-communal violence in Indonesia, the province represents too wide a geographical unit to capture the considerable variation in violence observed across its districts.<sup>16</sup> Illuminating examples are the bordering districts of Kota Waringin Barat (KWB) and Kota Waringin Timur (KWT) in the Central Kalimantan province and the districts of Poso and Donggala in Central Sulawesi. Whereas KWB and Poso have witnessed some of the most deadly ethno-communal riots in the whole country, KWT and Donggala have remained relatively or completely quiescent. On the other hand, the interethnic riots witnessed in Indonesia between 1997 and 2001 were highly deadly clashes involving large masses of co-ethnics which spread well beyond villages and even sub-districts borders. Finally, as a result of the decentralisation programme started with the fall of Suharto, a number of central government functions have been devolved to the district government. Therefore competition for power among ethnic and religious groups at the district level is likely to become an increasingly central issue in Indonesian politics and a major challenge for social stability in the years to come.

The dependent variable is defined as a binary dummy taking value 1 if deadly ethnic violence occurred in the period 1997-2003 in district *i* and zero otherwise. The effect of HIs on the probability of deadly ethnic conflict is estimated using logit regressions. Logit models of conflict incidence and conflict outset have been widely used in the empirical literature which makes results more readily comparable with previous findings.<sup>17</sup>

HI indicators are calculated as weighted coefficients of variation (GCOV) defined in section 3, equation (1). Following the existing empirical literature reviewed in section 4, six different indicators were considered: four measures of socio-economic HIs based respectively on average years of education (GCOVEDU), the proportion of landless agricultural laborers and poor farmers (GCOVLANDP), the proportion of unemployed young males (aged 14-30) (GCOVMYUN), and average labour income (GCOVINC).<sup>18</sup> This latter dimension of socio-economic group inequality seems particularly relevant in

<sup>16</sup> Nonetheless, the model controls for the fact that observations may not necessarily independent within provinces. Corrected standard errors are calculated using the *cluster* option available in Stata 8.0

<sup>17</sup> Cross-section logit regressions were preferred to the perhaps more popular country-year approach for this type of estimation (see, for instance, Easterly and Levine, 1997; Alesina *et al.*, 2003; Østby, 2003). Given the relatively short period considered in this study, a country-year (district-year in this case) may be heavily affected by the time invariant nature of many key explanatory variables.

<sup>18</sup> Poor farmers in Indonesia are those cultivating less than 0.5 hectares of land (Booth, 2000: 82).

the case of Indonesia where youth clashes constitute the single most important trigger of group violence (Varshney, Panggabean, and Tadjoeidin, 2004).<sup>19</sup> Furthermore, the particularly harsh effect that the 1997-98 financial crisis had on young wage workers it is likely to have made this category especially vulnerable to violence. The paper also considers one measure of political HI based on the proportion of civil servants (GCOVPS), and one measure of socio-ecological or health HI based on child mortality rates (GCOVCHM).<sup>20</sup> Each of these indicators were constructed for both ethno-linguistic and ethno-religious groups (for the latter the variables take the suffix \_R). This dual definition is expected to provide clues as to which type of cleavage matters more to conflict. It also serves as a sensitivity and robustness test for the effect of HIs across alternative definitions of group membership. Not all groups are included in the analysis. Very small groups are excluded mainly because for these groups sample information cannot be taken as representative. Following previous research, a cut-off point is set to exclude ethnic groups which represent less than 5% of the district population.<sup>21</sup>

Focusing on a country like Indonesia to investigate the inequality-conflict nexus offers some important advantages vis-à-vis a cross-country analysis. As already pointed out, cross-country conflict datasets generally overlook much of the communal conflict that does not take the form of civil war but that nonetheless can be highly fatal and destructive. In Indonesia, for instance, only Aceh would fall under Collier-Hoeffler's definition of civil war, but not the ethnic violence in Ambon, Poso, and Central Kalimantan which left thousands dead and tens of thousands displaced. But even when local conflict is considered, its magnitude is significantly underreported (see for instance Restrepo, Spagat and Vargas, 2004 for Columbia). Furthermore, an intra-country analysis can, on the one hand, generally do away with otherwise key confounding (and often unobservable) factors such as regime repressiveness, proximity of electoral contexts to the timing of the survey, state strength, colonial heritage, political institutionalization, regime type, and devote more statistical and modelling resources to controlling other potential intervening effects like overall inequality, level of development, and ethnic diversity.<sup>22</sup> Olson's Collective Action theory predicts that the occurrence of conflict depends on how regimes intensify and on how dissidents overcome the collective action problem. If inequality leads to conflict only when mediated by the political opportunity structure (Schock, 1996; Goldstone *et al.*, 2003), then it is crucial to net out the effect of country-specific heterogeneity in the type of political system and other historical factors. On the other hand, Indonesia is such a vast and extraordinarily diverse country both in its ethnic composition and conflict history, that the results of this analysis are potentially interesting beyond the national borders.

Other independent variables include (for a complete list of the variables and their description refer to Appendix 1):

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<sup>19</sup> The importance of improving the income-earning opportunities for the young generally, especially for the young males, in situation of military demobilisation is strongly put by Stewart (2000).

<sup>20</sup> Data limitations have prevented the construction of additional dimensions of political HIs such as employment in local government, police and army forces. This will be an important extension for future work.

<sup>21</sup> For instance, the MAR dataset uses a minimum threshold of 100,000 members or alternatively 1% of the country population. Barron, Kaiser and Pradhan (2004) only consider groups that represent at least 10 percent of the sub-district population.

<sup>22</sup> Proximity of electoral context is particularly relevant to HIs because it may bias the salience of ethnic divisions upwards (Posner, 2004). In Indonesia local elections are held contemporaneously in all districts since 1998.

- The logarithm of the district population (LNPOP). It has been argued that population size is an additional proxy for the benefits of a rebellion since it measures potential labour income taxation (Collier and Hoeffler, 2002). A large population also implies difficulties in controlling what goes on at the local level and increases the number of potential rebels that can be recruited by the insurgents (Fearon and Laitin, 2003);
- The overall level of violence observed in the district between 1990 and 1996 (S\_PRE97). This variable is expected to capture both the proneness to violence and/or potential path dependence in violent behaviour in the years and months immediately preceding the explosion of interethnic riots;
- The district 1996 Human Development Index (HDI96). Goldstone and Marshall (2003), use this variable as a proxy for the overall level of economic development;<sup>23</sup>
- The district unemployment rate among young males (aged 14-30) (MYUN);
- The district degree of dependence on natural resources (NATRES). Greater funding opportunities for would-be rebels (Collier and Hoeffler, 2000), weaker state apparatuses (Fearon and Laitin, 2003), or grievances over resource revenues distribution (Ross, 2002) are alternative mechanisms which make countries whose economies are heavily reliant on natural resources such as oil, timber, mineral, cash crops, and drugs more vulnerable to intra-state violence. Whatever the transmission mechanism, in this paper natural resource dependence is measured as the proportion of the district population employed in the mining and timber industries. Barron, Kaiser and Pradhan (2004) use a similar definition of natural resource dependence at the village level. In their paper the variable is defined as dummy taking value 1 if revenues from mining and forestry represent the main source of household income in the village, and zero otherwise. These are sectors with typically ill-defined property rights and therefore more amenable to generate disputes and violence;
- The proportion of migrants who arrived in the district during the last 5 years (NEWMIG). This is an important factor to consider, given the ethnic tensions and the fears of Javanisation provoked by the conspicuous fluxes of transmigrants and voluntary migrants during the 1980s and 1990s;
- The proportion of the district population living in urban areas (URBAN). If self-production of agriculture goods, family employment and self-owned housing acted as a buffer against the impact of the crisis, especially for the poorest spheres of the population, this variable may partly capture the impact of the financial crisis on ethnic violence in Indonesia. Also, in the absence of more direct proxies for the presence of formal and informal networks that run across ethnic and religious lines, differences in the rural/urban composition across districts are partly expected to capture inter-district differences in the level of civic engagement (Varshney, 2003);
- The district GDP growth in 1998 (GDPGR98). This is another, perhaps more direct, proxy for the severity with which the district was hit by the financial crisis in early 1998;
- The level of income inequality in the district (INCGINI). The Gini coefficient is based on monetary as well as non-monetary (goods) labour income;
- The degree of ethno-linguistic fragmentation in the district (ELF);<sup>24</sup>

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<sup>23</sup> This variable was merged into the dataset from the 2001 Human Development Report for Indonesia.

- The degree of demographic ethno-linguistic polarisation in the district (ETHPOL);
- The degree of demographic ethno-religious polarisation in the district (RELPOL).<sup>25</sup>

The analysis suffers from a number of limitations. Firstly, group membership is assumed to be exogenously given. The notion of endogenous ethnic identity is becoming increasingly popular among social scientists. Group boundaries are not watertight as groups can grow and shrink, emerge and disappear. These are important but complex and contested issues which are clearly beyond the scope of the paper. However, in spite of these acknowledged difficulties, qualitative research suggests that when it comes to actual cases, the relevant groups and boundaries are generally fairly obvious. Moreover, switching identities is often difficult and evidence of widespread and durable inequalities between groups suggests that boundaries are generally taut (Stewart, 2002). Often the extent to which a person can choose her identity strategically depends on the perception that others have of it. If other people stereotyped her in a specific way, that is what counts. Therefore when group markers are quite obvious, ethnicity can be assumed to be somehow “primordial” or “exogenous” with respect to opportunities, access, and discrimination in the society. Moreover, the more important objective grievance is as a cause of conflict the more reasonable is to treat groups as exogenous (Collier and Sambanis, 2002).

Second, the definition of groups could be endogenous to the outcome it is used to explain. If there are multiple plausible ways of listing a country’s ethnic groups one must be careful not to choose the coding that best supports her theory (Fearon, 2003). On the other hand, as far as HIs are concerned, there is a strong case to exclude politically irrelevant groups on the ground that their grievances may confound or divert attention from where the true fault lines really are (Posner, 2004b; Brown, 2005).<sup>26</sup> There are no easy answers to these concerns or obvious empirical strategies to address them. This paper takes the view that a good compromise between the two dangers is to proxy the political salience of a group by its population share within the relevant political arena, which in the case of ethno-communal conflict in Indonesia is represented by the administrative district, as argued earlier in this section. Posner’s natural experiment results for Malawi and Zambia vindicate the choice of focusing on the bigger groups. However, to assess the sensitivity of the results to group selection, the analysis is replicated without the largest ethnic group, the Javanese, who in spite of their

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<sup>24</sup> This is measured as  $ELF = 1 - \sum_{r=1}^R p_j^2$ , where  $p_j$  is group  $j$ ’s population share. The equivalent measure for ethno-religious groups was dropped from the analysis because of its high correlation (over 95%) with the religious polarisation variable defined below. Therefore religious polarisation it is also a proxy for religious fragmentation.

<sup>25</sup> The ETHPOL and RELPOL measures are based on the Reynal-Querol index. More

formally:  $RELPOL = 1 - \sum_{r=1}^R \left( \frac{0.5 - p_r}{0.5} \right)^2 p_j$ .

<sup>26</sup> An additional concern about which groups to choose is that being very local some groups are likely to share many cultural traits. For instance, languages are often branches/dialects of a common root. However, as pointed out in section 2.2, there is no strong reason to expect that inequalities between groups be positively correlated with their cultural distance nor that cultural proximity makes HIs more acceptable or potentially less socially inflammatory (it may actually happen the opposite, as the sense of grievance may be actually higher when members of a group feel materially deprived or socially excluded vis-à-vis members of other groups with whom they share a number of common cultural traits).

overwhelming demographic dominance are seldom involved in the violence either as targets or perpetrators.

Third, inequality and identity, both real and perceived, are likely to be influenced by violent conflict:

“once constructed and used to mobilise people to war, ethnic identities become rigid and are the focal point for retaliation by members of opposing groups. Once people are targeted because of their identity, this would tend to solidify their dedication to the struggle. If people cannot escape their identity in an escalating struggle, then even if their original preferences were non-violent war would cause a preference shock that would bring them in line with their leaders’ preferences”.

Sambanis (2001: 23)

This poses serious problems to correctly assess the causal impact of HIs on violence. The strategy adopted in this paper to mitigate the endogeneity of HI with respect to violent ethno-communal conflict is to measure group inequality on the basis of individual information that predates conflict by at least two years.

Finally, the definition of the dependent variable as a binary outcome does not allow for a distinction between cases with only one fatality and cases where hundreds of people were killed. There are two main reasons for this: firstly, the number of fatalities may be misreported by the national and provincial newspapers on which the information is based and there is no guarantee that the size of under-reporting or over-reporting be the same across press sources; secondly, conflict intensity is likely to depend crucially on factors such as the type and timing of the State military intervention, the involvement of militia groups or the role of the police, which not only are difficult to measure but whose effects are also difficult to gauge because these factors could be endogenous to the violence itself. Despite these concerns, in section 9 (Table 8, equation (4)) the analysis is replicated using an ordered logit model with the dependent variable re-defined as a three-way ordinal indicator (no deadly violence, low fatality violence, high fatality violence) to gauge the sensitivity of the main findings to the chosen binary specification of the dependent variable.

## 7. Data

The dataset is constructed by averaging individual-level information from the Indonesian 1995 Intercensal Population Survey (SUPAS) up to the district-level (rural *kabupaten* and urban *kota*).<sup>27</sup> The census population is a nationally representative random sample accounting for 0.5% (nearly 1 million individuals) of the total population of Indonesia in 1995. After the averaging process, aggregated census data was merged with district-wide information on ethno-communal violence compiled by the United Nations Support Facility for Indonesian Recovery (UNSFIR) (Varshney *et al.*, 2004).

The UNSFIR Database II contains information on collective violence in 14 Indonesian provinces (12 if considering the 1995 administrative boundaries) for a total of over 3600 violent incidents (involving at least a group either as perpetrator or as target) based on news reported on both national and provincial newspapers.<sup>28</sup> The choice of these 14 provinces is justified on grounds that group violence in Indonesia is highly concentrated

<sup>27</sup> *Survei Penduduk Antar Sensus*.

<sup>28</sup> At the time of survey the provinces of Banten and North Maluku were still part of West Java and Maluku, respectively.

in space. This is in line with global trends on deadly ethnic riots, which show a highly uneven clustering across both time and space (Horowitz, 2000).

Ethnicity information was not directly available in the 1995 SUPAS due to the so-called *SARA* policy on ethnocommunal issues, where *SARA* stands for ethnic (*suku bangsa*), religious (*agama*), racial (*ras*), and inter-group (*antargolongan*) differences. The policy prohibited discussion of these differences in the public realm (Varshney *et al.*, 2004). Ethnicity statistics only became available since 2000 when an ethnicity question has been included in the census questionnaire.<sup>29</sup> For this reason, ethnic groups in this paper are either defined in terms of self-reported language information, or alternatively, in terms of religious affiliation. However, the use of language as a proxy for ethnicity in Indonesia is not a major limitation to the analysis.<sup>30</sup> A comparison between the classification of ethnic groups in this dataset and the 2002 SUSENAS dataset which includes ethnicity codes shows a close correspondence between the ranking and relative sizes of the main groups (see also Ross, 2002). This confirms that language is a good proxy for ethnicity in Indonesia.

## 8. Sample and summary statistics

From the original census population of nearly 1 million Indonesians, the number of observations included in the sample is down to 352,295 individuals living in 164 districts across 19 provinces. Individuals living in the provinces of Aceh, East Timor and Irian Jaya have been excluded due to the different nature of the conflict in these areas as explained earlier in the paper. Individuals residing in the island of Java were also excluded because with the important exception of the capital Jakarta and very few other major cities, Javanese districts are largely homogenous in both their religious and ethnic composition. Furthermore, the districts of Java have mainly witnessed incidents of collective violence of non-ethnic nature such as *dukun santet*, village brawls and episodes of “popular justice” (e.g. vigilante killings). If one excludes the bloody but very exceptional May 1998 anti-Chinese riots in Jakarta and Solo, ethno-communal incidents represent only 2% of all incidents of collective violence and account of less than 3% of all fatalities recorded in Java between 1990 and 2003 (Varshney *et al.*, 2004). Sample size was further reduced following the selection of individuals aged 10-70. About 12.5 percent of the census population provided either missing or “unhelpful” language information.<sup>31</sup> When available, father’s language has been assigned to daughters and sons with missing language information living in the household. After imputation, the sample proportion of individuals with missing language coding fell to 8%. Summary statistics (not shown) reveal that this residual sub-sample of “non-respondents” was not significantly different from “respondents” except for being slightly more educated and urbanized. Therefore, it was decided to exclude them from the computation of the ethno-linguistic HIs.

Conflict information based on the UNSFIR database is available for only 73 of the 164 districts included in the sample.<sup>32</sup> Therefore, the remaining 91 districts are treated as

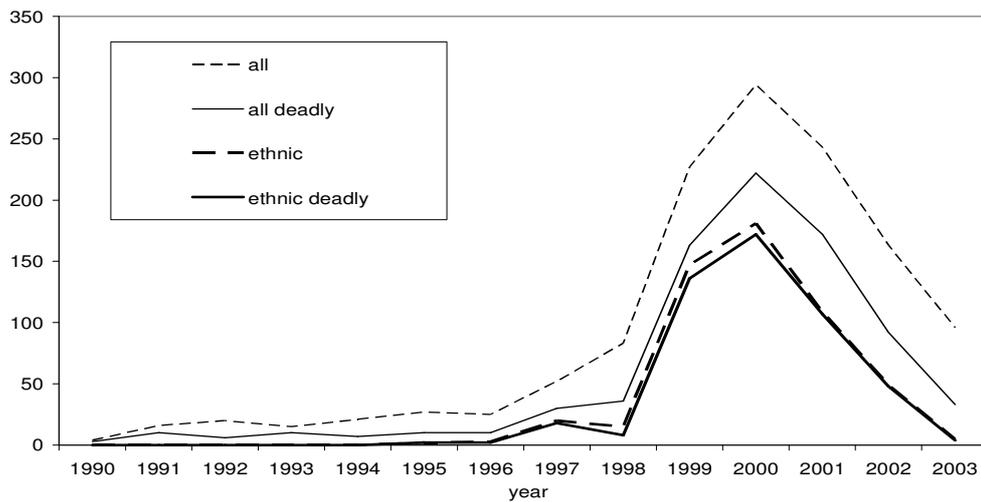
<sup>29</sup> The unavailability of information on ethnicity in survey data is not uncommon in many development countries due to its politically sensitive nature.

<sup>30</sup> Language here means mother tongue. When mother tongue information was unavailable, language spoken daily at home was used in its stead.

<sup>31</sup> Strictly speaking the non-response rate is about 1%. The remaining 11.5% is made up by individuals who indicated *Bahasa Indonesia* (the national language) as their mother tongue or daily spoken language.

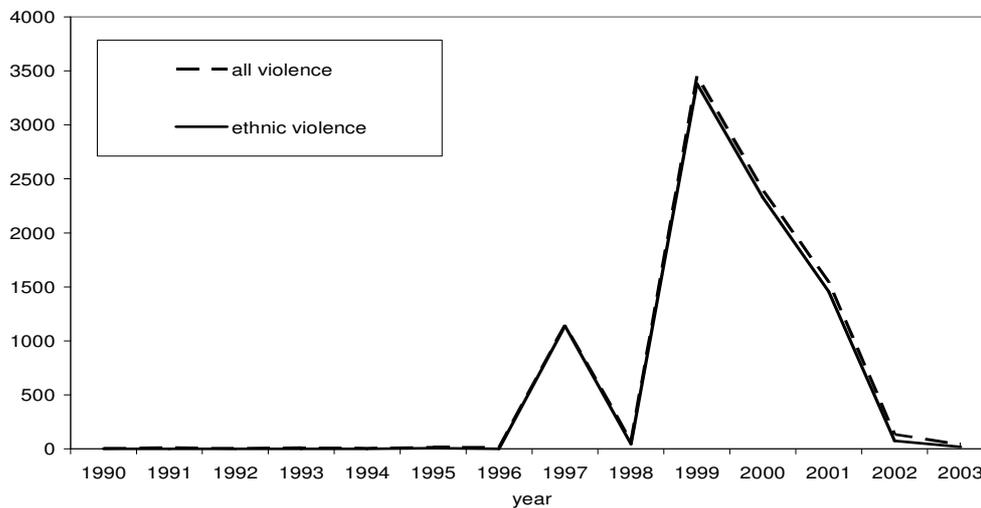
<sup>32</sup> Its earlier version, Database I, was only based on news reported in two Jakarta-based national newspapers and consequently, massively underreported the number of violent incidents. However, it included one single incident in South Kalimantan, Kota Banjarmasin district, where 130 people were killed in Dayak-Madurese clashes on May 23 1997. Being the only incident ever

“zero” conflict cases. Figure 1 shows that ethno-communal violence accounts for less than half of all incidents of collective violence recorded over the period 1990-2003 in the Indonesian districts included in the sample. However, the proportion is much higher when only deadly episodes of violence are considered. More strikingly, figure 2 shows that ethno-communal clashes account for over 95% of all fatalities.<sup>33</sup> The plots also clearly show that deadly ethno-communal violence in Indonesia dramatically exploded in 1997, immediately preceding the fall of Suharto, and has peaked in 2000 before declining steadily in the first years of the new millennium.



**Figure 1: Number of incidents of communal violence**

Source: UNSFIR Database



**Figure 2: Number of fatalities**

Source: UNSFIR Database

recorded in this province, the authors decided to exclude South Kalimantan from Database II. Given its gravity, the Kota Banjarmasin’s incident was merged into Database II and included in the analysis.

<sup>33</sup> As already pointed out, separatist and revolutionary violence in Aceh, Irian Jaya and East Timor are excluded from these calculations.

Of the nearly 250 ethno-language groups originally found in the 1995 SUPAS only the 70 major groups were included in the sample on the basis of the group size criterion discussed in section 5. Table 2 shows the ethnic and religious composition of Indonesia in 1995. For presentational purposes, only the major 15 ethnic groups are listed in the table. Many of the ethnic groups not listed are very small on the national scale but, being highly geographically concentrated, their size is significant at the district level (greater than 5 percent of the district population). Javanese represent the dominant ethnic group accounting for 12% of the sample, even after Java has been excluded from the sample. In term of religion affiliation, Islam is by far the dominant religion constituting over 73% of the sample population.

**Table 2: Sample composition of language and religious groups**

Language			Religion		
group	N	%	group	N	%
Javanese	37,538	12.01	Muslim	258,513	73.38
Melayu	29,873	9.56	Protestant	43,692	12.4
Buginese	28,709	9.19	Catholic	23,660	6.72
Minang	26,913	8.61	Hindu	19,346	5.49
Banjarese	21,391	6.85	Buddhist	5,149	1.46
Balinese	18,715	5.99	Other	1,935	0.55
Batak	13,914	4.45			
Makassarese	13,542	4.33			
Dayak	8,570	2.74			
Sasak	7,940	2.54			
Chinese	6,623	2.12			
Bima	5,210	1.67			
Toraja	5,065	1.62			
Muna-Buton	4,516	1.45			
Gorontalo	4,488	1.44			
Sumba	4,141	1.33			
Mandar	3,938	1.26			
Dawan	3,905	1.25			
Palembang	3,745	1.2			
Sundanese	3,445	1.1			
Other	60,289	19.29			
All	312,470 <sup>1</sup>			352,295	

Table 3 shows that religiously diverse districts tend to have a higher number of incidents and a higher average number of fatalities than ethnically diverse districts. A look at the HI indicators shows that group inequality in income and education is lower than other inequality in other dimensions.

Deadly ethnic conflict concentrates almost exclusively in districts which are ethnically diverse both by language and religion (Table 4). This is only partly implicit in the definition of the dependent variable, because the fact that conflict is hardly present in the 59 districts which are either religiously or linguistically diverse (but not both) needs explaining. In the light of this evidence, the 38 ethnically homogenous districts (both in terms of language and religion) will not be considered further in the analysis. In fact, by definition, in these districts the dependent variable and the HI measures are both zero. This means that if these homogenous districts are retained in the sample the significance and magnitude of the HI marginal effects on the likelihood of violent conflict that the paper seeks to estimate will be artificially inflated.

**Table 3: Variable means**

Variable	All districts	Ethnically diverse	Religiously diverse
ETHNCONF_D	0.18	0.23	0.32
KILLED	3.24	4.55	6.69
S_PRE97	0.78	0.87	1.19
LNPOP	12.47	12.55	12.51
NATRES	0.04	0.05	0.05
URBAN	0.29	0.32	0.36
NEWMIG	0.11	0.15	0.11
MYUN	0.12	0.12	0.11
HDI96	66.59	67.24	67.66
ELF	0.42	0.58	0.54
RELPOL	0.36	0.44	0.64
INCGINI	0.36	0.35	0.35
GCOVEDU	0.10	0.13	0.13
GCOVLANDP	0.34	0.47	0.46
GCOVMYUN	0.31	0.42	0.37
GCOVINC	0.13	0.17	0.16
GCOVPS	0.31	0.43	0.41
GCOVCHM	0.23	0.32	0.32
GCOVEDU_R	0.05	0.06	0.08
GCOVLANDP_R	0.15	0.19	0.30
GCOVMYUN_R	0.10	0.11	0.19
GCOVINC_R	0.06	0.08	0.10
GCOVPS_R	0.16	0.19	0.31
GCOVCHM_R	0.12	0.15	0.22
N	164	115	78

**Table 4: Distribution of violent outcomes**

	Districts		Incidents		Fatalities	
	Ethnically diverse	Religiously diverse	N	%	N	%
NO	NO	38	5	0.0	2	0.0
YES	NO	48	4	1.0	140	2.0
NO	YES	11	3	1.0	27	0.0
YES	YES	67	519	98.0	8289	98.0
Total		164	531	100	8458	100

In Table 5 (6) ethnically (religiously) diverse districts are grouped by their violent/non-violent status. The figures report mean HI values for each block of districts as well as the difference in the means (with standard errors) across the two blocks. The statistics are calculated for the whole sample as well as for the subsets of districts located in the islands of Kalimantan and Sulawesi. These two islands are of particular interest because they present situations of highly violent districts bordering relatively peaceful ones, often within the same province. The results suggest that, on average HIs are generally lower in peaceful districts (negative difference). However, the patterns observed for public sector employment and child mortality show greater consistency

both in direction of the inequality and in its statistical significance when compared with the other dimensions. Given that public sector employment and child mortality HIs tend to be highly correlated to some of socio-economic HIs (see Appendix 2) the econometric analysis presented in the next section will focus primarily on the effect of between-group inequalities in child mortality rates and public sector employment.

**Table 5: Average differences in HIs by violent status: ethnically diverse district**

		N	EDU	LANDP	MYUN	INC	PS	CHM
All districts	NV	88	0.121	0.418	0.38	0.162	0.393	0.266
	V	27	0.169	0.632	0.45	0.182	0.567	0.383
	diff		-0.048*** (0.00)	-0.213** (0.087)	-0.07 (0.06)	-0.020 (0.02)	-0.175*** (0.06)	-0.12*** (0.03)
Sulawesi	NV	15	0.117	0.511	0.347	0.145	0.275	0.289
	V	7	0.164	0.508	0.373	0.219	0.432	0.327
	diff		-0.046 (0.03)	0.02 (0.12)	-0.026 (0.09)	-0.074 (0.04)	-0.157** (0.07)	-0.038 (0.08)
Kalimantan	NV	16	0.145	0.558	0.418	0.154	0.446	0.264
	V	9	0.144	0.718	0.595	0.128	0.677	0.405
	diff		0.001 (0.02)	-0.16 (0.18)	-0.176 (0.15)	0.026 (0.02)	-0.23* (0.11)	-0.14** (0.06)

Note: Standard errors are shown in parentheses; \*\*\* indicate significance at 1% level, \*\* at 5%, \* at 10%.

**Table 6: Averages differences in HIs by violent status: religiously diverse districts**

		N	EDU	LANDP	MYUN	INC	PS	CHM
All districts	NV	53	0.074	0.294	0.257	0.104	0.285	0.201
	V	25	0.086	0.305	0.255	0.101	0.352	0.255
	diff		-0.012 (0.01)	-0.018 (0.06)	0.002 (0.06)	0.003 (0.02)	-0.067 (0.06)	-0.054 (0.03)
Sulawesi	NV	7	0.059	0.170	0.238	0.118	0.230	0.173
	V	7	0.067	0.159	0.206	0.092	0.213	0.177
	diff		-0.008 (0.01)	0.011 (0.09)	0.032 (0.06)	0.026 (0.03)	0.017 (0.05)	-0.040 (0.06)
Kalimantan	NV	12	0.100	0.299	0.264	0.130	0.330	0.225
	V	8	0.111	0.424	0.369	0.125	0.567	0.319
	diff		0.011 (0.02)	-0.124 (0.15)	-0.104 (0.14)	0.005 (0.03)	-0.237* (0.12)	-0.094 (0.06)

Note: Standard errors are shown in parentheses; \*\*\* indicate significance at 1% level, \*\* at 5%, \* at 10%.

## 9. Results

Table 7 shows the estimated coefficients (with standard errors) of the logit model run separately for ethnically and religiously diverse districts. Some regularities emerge across different sub-samples and model specifications. Deadly ethno-communal conflict is more likely to occur a) the higher the overall number of violent incidents recorded in the district between 1990 and 1996, b) the lower the district's human development index, d) the higher the proportion of the district's population made up by migrant who moved into the district since 1990, and c) the wider the gap between groups in child mortality rates. To illustrate the impact of the child mortality HI on the likelihood of violence, Figures 3 and 4 plot the change in the predicted probability of deadly communal violence to changes in the level of the horizontal inequality in child mortality rate. The likelihood of violence clearly increases with inequality and the gradient tends to be steeper at lower levels of economic development.<sup>34</sup> Results suggests that, on average, a 10 percent increase in GCOVCHM leads to a 5.3 percent increase in the probability of observing violent conflict in the district. This result is at odds with the negative effect of health-related group inequalities found by Østby (2003) in her cross-country analysis. Perhaps of all type of group inequalities considered in the paper, child mortality is the most disturbing because it puts in the spotlight the level of destitution of the poorest groups in society. It is also a very visible type of inequality which can be used instrumentally by ethnic elites to mobilize co-ethnics. Group differences in child mortality rates often reflect inequalities in other socio-economic dimensions such as levels of education, family income/wealth, and housing conditions.

This is confirmed by correlation coefficients in the region of 50% with some of these dimensions (see Appendix 2). Although differences in the magnitude of the negative growth rates in real per capita GDP observed throughout Indonesia in 1998 have no significant effect on the likelihood of ethno-communal violence, it is possible that the currency crisis has contributed to the explosion of ethnic conflict through fuelling the exasperation of the disadvantaged groups in districts where low levels of economic development coupled with greater inequalities in living standards (captured by differences in child mortality rates) across ethnic and religious groups. Table 7 also suggests that ethno-linguistic fragmentation (ELF) natural resource dependence (NATRES), unemployment rate among young males (MYUN) and income inequality (INCGINI) have no significant impact on the dependent variable.<sup>35 36</sup>

Table 8 presents some additional results intended to test the robustness of the findings commented in the previous section, particularly the HI effects. In equations (1) and (2), the HI measures of child mortality between both ethnic and religious groups were recalculated excluding the Javanese. The Javanese are the largest ethnic group in Indonesia, and they are present in significant numbers almost in every district of the archipelago. Javanese have seldom been involved in ethnic violence arguably because they constitute too sizeable and powerful a group (are seen to dominate the army and to have the backing of the central state) in the wide national political arena to become a feasible target for rival ethnic groups even in the most peripheral corners of the country. Excluding them from the computation of the HI measures is a way to check whether the

<sup>34</sup> Models with interaction terms between the HI indicators and religious polarisation, income inequality and the human development index were also estimated but results were not statistically significant at conventional levels and therefore results were not reported.

<sup>35</sup> Ethno-linguistic polarisation was even less significant than the ELF effect. For this reason it was excluded from the final specifications.

<sup>36</sup> This conclusion proved robust to result was unaffected The impact of natural resource dependence on the probability of violence remained elusive to alternative measures of the district's dependence on natural resources like the proportion of the district 1998 real per capita GDP accounted by oil and gas revenues.

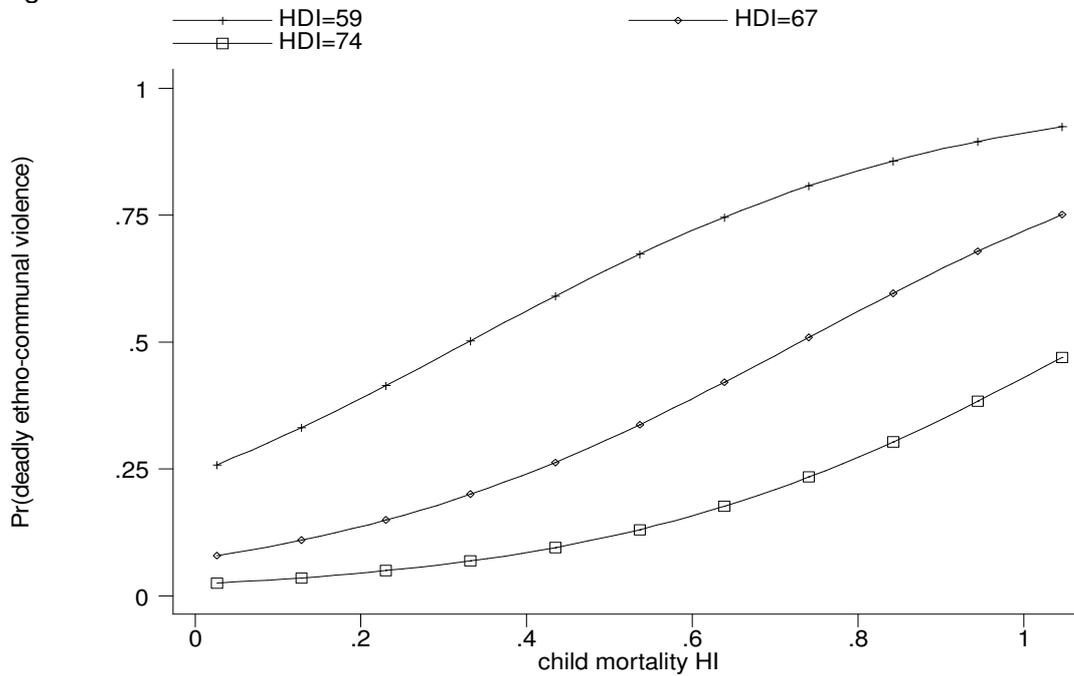
impact of GCOVCHM and GCOVCHM\_R is sensitive to the inclusion of potentially “irrelevant” groups. Table 8 shows that this is not the case and that the estimated HI coefficients remain large, positive and statistically significant after excluding the Javanese.

**Table 7: Estimation results**

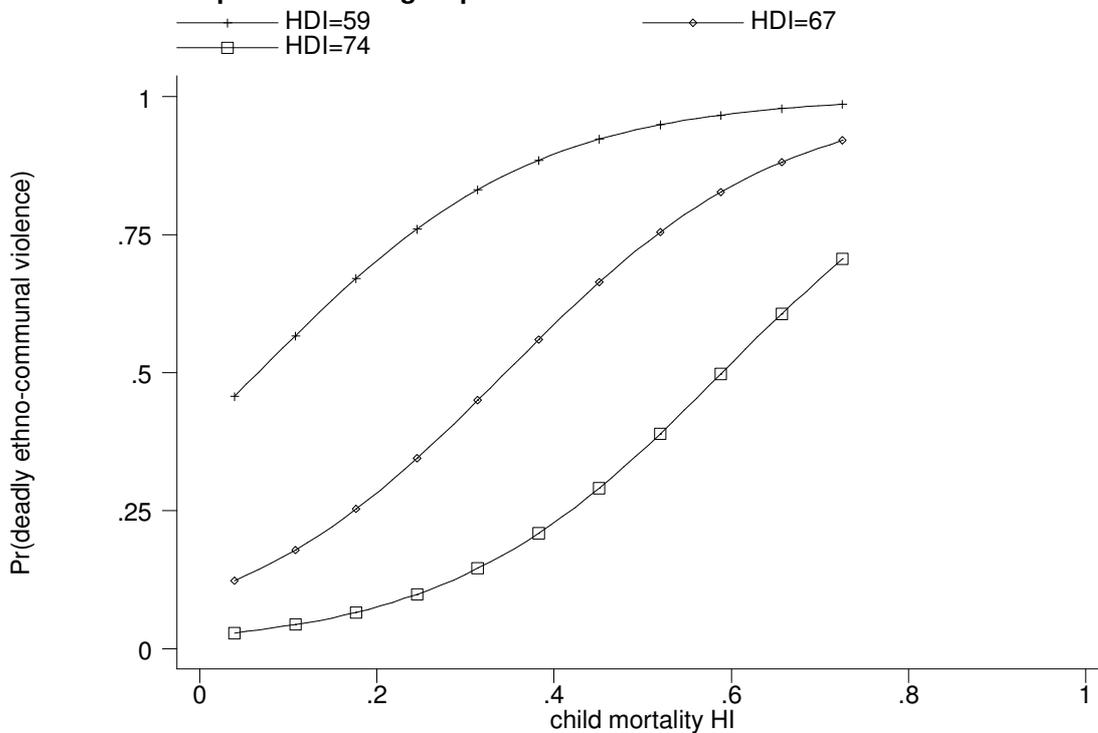
	Ethnically diverse districts		Religiously diverse districts	
	(1)	(2)	(3)	(4)
GCOVCHM	3.558 *	3.489 **		
	(1.91)	(1.59)		
GCOVPS	2.100 *	0.663		
	(1.08)	(1.02)		
GCOVCHM_R			3.304 ***	6.434 ***
			(0.98)	(2.36)
GCOVPS_R			0.983	-0.176
			(1.33)	(0.85)
LNPOP	-0.115	0.031	0.285	0.257
	(0.31)	(0.30)	(0.30)	(0.45)
S_PRE97	0.720 ***	0.781 **	0.525 *	0.697 **
	(0.27)	(0.32)	(0.29)	(0.35)
HDI96	-0.074	-0.175 *	-0.012	-0.225 **
	(0.08)	(0.09)	(0.06)	(0.10)
NATRES		-1.936		-14.657
		(8.66)		(12.48)
MYUN		0.445		1.534
		(5.31)		(5.42)
ELF		0.219		4.319
		(2.48)		(2.77)
RELPOL		3.602 ***		2.077
		(0.94)		(2.47)
NEWMIG		5.209 *		9.102 *
		(2.73)		(4.76)
INCGINI		-3.160		0.131
		(5.48)		(8.53)
GDPGR98		0.006		0.049
		(0.07)		(0.11)
constant	2.471	6.472	-4.977	4.872
	(5.22)	(6.00)	(6.76)	(10.26)
N	115	115	78	78
LL	-45.98	-40.41	-40.91	-29.19
Pred. prob. (mean)	0.22	0.18	0.36	0.30
pseudo R <sup>2</sup>	0.27	0.35	0.16	0.39

Specification (3) considers all 126 districts which are either ethnically or religiously diverse. The child mortality HI variable is redefined as the larger value between the measure based on language groups and the measure based on religious groups. This achieves two objectives: a) it prevents that the relationship between the two HI variables and the dependent variable is inflated by the inclusion of ethnically and religiously homogenous districts and b) it offers a strategy to choose the politically salient group

marker on the basis of the intensity/magnitude of intergroup inequality.<sup>37</sup> The logic behind this is that the larger the grievance the stronger is group cohesion and the sense of identity. The results confirm that child mortality HIs have a positive and statistically significant influence on the likelihood that deadly ethno-communal violence breaks out in a given district.



**Figure 3: The effect of child mortality HI on the probability of violence at different levels of economic development: ethnic groups**



**Figure 4: The effect of child mortality HI on the probability of violence at different levels of economic development: religious groups**

<sup>37</sup> A synthetic index of heterogeneity combining ethnic and religious groups based on the same logic has been used in quantitative analysis on civil war by Montalvo and Reynal-Querol (2005).

**Table 8: Additional results**

	(1)	(2)	(3)	(4)	(5)
GCOVCHM_NJ	2.245 ** (1.02)				
GCOVCHM_R_NJ		4.360 ** (1.88)			
HI_CHM			2.597 ** (1.16)	2.221 * (1.31)	
GCOVCHM_R_90					5.101 (4.38)
DGCOV95_90					4.386 * (2.37)
S_PRE97	0.710 ** (0.34)	0.644 ** (0.29)	0.770 ** (0.38)	0.101 *** (0.03)	0.595 ** (0.30)
HDI96	-0.163 ** (0.07)	-0.190 ** (0.08)	-0.146 * (0.07)	-0.195 *** (0.06)	-0.192 ** (0.08)
ELF	1.345 (1.88)	3.281 (2.55)	1.897 (1.91)	2.596 * (1.54)	4.146 * (2.52)
RELPOL	3.809 *** (0.89)	2.252 (1.99)	4.055 *** (0.86)	4.087 *** (0.90)	3.539 (2.38)
NEWMIG	4.871 (3.17)	7.080 (5.45)	4.618 (3.38)	2.637 (2.92)	7.724 (6.59)
constant	4.956 (4.37)	6.127 (4.64)	3.272 (4.03)		5.570 (4.74)
N	115	78	126	126	72
LL	-42.17	-31.98	-43.94	-67.27	-29.82
Pred. prob. (mean)	0.184	0.29	0.162		0.25
pseudo R <sup>2</sup>	0.33	0.35	0.34	0.22	0.33

The definition of the dependent variable used so far makes no distinction between cases with only one fatality and cases where hundreds of people were killed. To test the sensitivity of the main findings to the current definition of the dependent variable as a binary outcome, equation (4) presents the results from an ordered logit regression where the dependent variable takes value 0 if no deadly violence occurred in the district between 1997 and 2000, 1 if the number of fatalities from inter-ethnic violence ranged between 1 and 24 and 2 if the death toll was 25 or higher. The 25-death toll threshold is a standard value used in the literature on civil war. The evidence suggest that when the dependent variable takes into some account the severity of the violence, the sign, magnitude and statistical significance of the HI effect (as well as the other main effects such as religious polarisation and economic development) remain largely unaffected.

Finally, an interesting extension to the analysis is to explore whether ethno-communal conflict is associated not only with absolute levels of socio-economic inequalities between ethnic and religious groups, but also with their change over time. To this end, the same measure of child mortality HI is constructed from the 1990 Indonesian Census Survey which contains roughly the same number of observations as the 1995 SUPAS. The variable is calculated between ethno-religious groups only, owing to the lack of consistency in the definition of language groups between the two datasets, and to the concern that in some districts the salient groups may have changed between the two years thus making comparisons over time more difficult. These issues are less of a concern with ethno-religious groups which are much larger and stable over time. Table 9 shows that although child mortality rates on average nearly halved between 1990 and

1995 across the 114 religiously diverse districts for which data were available in both years, the level of inequality has increased on average particularly in those districts which turned violent from 1997. This suggests that it may be not only absolute levels but also differences over time in child mortality rates between groups that discriminate between violent and non-violent districts. Table 8 equation (5) shows the effect of a change in HI (constructed as the difference between the 1995 and 1990 values) on the likelihood of ethno-communal conflict is positive and statistically significant, which confirms that variation in HI over time could also play an important role in predicting ethno-communal violence.

**Table 9: Child mortality and child mortality HI by year and violent status**

	1990			1995		
	NV	V	diff	NV	V	diff
Child mortality (%)	0.11	0.11	0.0 (0.0)	0.06	0.07	-0.1 (0.1)
GCOVCHM_R	0.12	0.20	-0.08*** (0.03)	0.13	0.24	-0.11*** (0.03)
N	89	25		89	25	

## 10. Conclusions

Existing research in experimental psychology, sociology and economic theory point to the importance of intergroup bias in the access to inputs as well as in observed outcomes to explain out-group behaviour, group mobilisation and, ultimately, social unrest. However, between-group or horizontal inequalities (HIs) have received little attention in the lively empirical literature on civil conflict. To an extent, this is not surprising given the daunting task of measuring distances between groups whose boundaries are typically based on non-economic dimensions. By focusing on ethnic groups, the paper aims to bridge the concepts of ethnic diversity and economic inequality often measured and used in an unrelated fashion in the aforementioned literature to assess the impact of inter-ethnic inequality on ethno-communal violence. The paper relies on a comprehensive dataset of Indonesian districts where detailed conflict data between 1990 and 2003 was merged with a wealth of socio-economic characteristics obtained by averaging up to the district level individual and household information from the 1990 and 1995 census data. Unlike cross-country econometric analyses of political conflict, focusing on a large and diverse country like Indonesia offers the advantage to do away with country-specific heterogeneity which mediates the impact of inequality on collective violence without sacrificing the possibility to extend findings and implications beyond the national boundaries. In line with earlier studies, the results from a cross-section logistic analysis focusing on Indonesia suggest that less developed districts (lower HDI) were more likely to experience deadly ethno-communal conflict between 1997 and 2003. This suggest that the financial crisis and the ensuing economic crisis that hit Indonesia in 1998 may have fuelled simmering tensions and contributed to precipitate events in many parts of the country. Interestingly, of the traditional proxies of ethnic diversity, only the degree of religious polarisation seem to predict where violence occurred, though the impact is no longer significant when the sample is restricted to religiously diverse districts. Also, in line with previous evidence, (vertical) income inequality bears no significant role in predicting the occurrence of violence. The main result of the paper is that horizontal inequalities seem to matter to violent conflict. Districts with larger between-group differentials in child mortality rates in 1995 as well as districts where these inequalities widened between 1990 and 1995 tend to be those where deadly conflict occurred. The effect is both consistent across a number of different model specifications and robust to alternative ways of defining and

measuring group inequality. It also survives the inclusion of purely demographic measures of ethnic diversity as well as variables capturing the (economic) opportunity cost of taking up arms such as youth unemployment and level of economic development. Horizontal inequality in child mortality is a very visible type of inequality which can be used instrumentally by ethnic elites to mobilize co-ethnics. It is also a particularly disturbing type of inequality because it exposes the relative destitution of the poorest groups in society. Child mortality is also likely to reflect other dimensions of socio-economic inequality like education and income although the latter are found to have no significant direct impact on the likelihood of violent conflict. Arguably, monitoring the level of these inequalities as well as their change over time may provide some useful clues as to where and when destructive ethno-communal violence is likely to erupt.

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## Appendix 1: Variable definition

Variable	Definition
ETHNCONF_D	Dummy: 1 if district had deadly ethno-communal conflict, 0 otherwise
S_PRE97	Number of incidents of communal violence in the district between 1990 and 1996 (ethnic and non-ethnic)
LNPOP	Logarithm of district population
NATRES	Proportion of district active workforce employed in oil & gas and timber industries
RURAL	Dummy: 1 if district is classified as rural ( <i>kabupaten</i> ), 0 if district is classified as urban ( <i>kota</i> )
URBAN	Proportion of district population living in urban areas
NEWMIG	Proportion of district population born in a different province and resident in current district for less than 5 years.
MYUN	District proportion of unemployed young males (aged 14-30)
HDI96	UNDP 1996 Human Development Index
ELF	Ethno-linguistic fractionalization index
ETHPOL	Ethno-linguistic polarisation index
RELPOL	Religious polarisation index
INCGINI	Gini coefficient of vertical income inequality based on labour income (monetary and non-monetary)
GCOVEDU	Weighted coefficient of variation in average years of education between ethno-linguistic groups from district overall mean
GCOVMYUN	as above, but variation is in proportion of young male unemployed
GCOVPS	as above, but variation is in proportion of civil servants
GCOVCHM	as above, but variation is in child mortality rates
GCOVINC	as above, but variation is in labour income (monetary and non-monetary)
GCOVEDU_R	As GCOVEDU, but between religious groups
GCOVMYUN_R	As GCOVPS, but between religious groups
GCOVPS_R	As GCOVMYUN, but between religious groups
GCOVCHM_R	As GCOVCHM, but between religious groups
GCOVINC_R	As GCOVINC, but between religious groups
HI_CHM	Max (GCOVCHM, GCOVCHM_R)
GCOVCHM_NJ	As GCOVCHM, but without the Javanese
GCOVCHM_R_NJ	As GCOVCHM_NJ, but between religious groups
GCOVCHM_R_90	As GCOVCHM_R, 1990 value calculated from 1990 Indonesian Census
DGCOV95_90	(GCOVCHM_R - GCOVCHM_R_90)

**Appendix 2: Correlation matrix**

		lnpop	S_pre97	natres	urban	myun	elf	relpol	newmig	hdi96	incgini
S_pre97	coeff	0.158	1								
	se	0.078									
	N	126	126								
natres	coeff	-0.235	-0.036	1							
	se	0.008	0.689								
	N	126	126	126							
urban	coeff	-0.101	0.197	0.138	1						
	se	0.262	0.027	0.122							
	N	126	126	126	126						
myun	coeff	0.053	0.228	0.063	0.7494	1					
	se	0.553	0.010	0.484	0						
	N	126	126	126	126	126					
elf	coeff	0.170	0.069	0.180	0.293	0.417	1				
	se	0.057	0.446	0.044	0.001	0					
	N	126	126	126	126	126	126				
relpol	coeff	-0.089	0.064	0.059	0.269	0.078	0.132	1			
	se	0.324	0.480	0.511	0.002	0.388	0.140				
	N	126	126	126	126	126	126	126			
newmig	coeff	0.191	-0.041	0.156	0.204	0.198	0.523	-0.208	1		
	se	0.032	0.646	0.082	0.022	0.026	0.000	0.019			
	N	126	126	126	126	126	126	126	126		
hdi96	coeff	0.003	0.083	0.179	0.672	0.594	0.372	0.239	0.317	1	
	se	0.976	0.356	0.045	0	0	0.000	0.007	0.000		
	N	126	126	126	126	126	126	126	126	126	
incgini	coeff	0.094	0.056	-0.092	-0.067	0.013	0.024	-0.190	0.047	-0.193	1
	se	0.298	0.530	0.304	0.459	0.886	0.793	0.033	0.601	0.030	
	N	126	126	126	126	126	126	126	126	126	126

Appendix 2 (Cont.)

		lnpop	S_pre97	natres	urban	myun	elf	relpol	newmig	hdi96	incgini	gcovedu	gcovmyun	gcovps	gcovchm	gcovinc	gcovedu_r	gcovmyun_r	gcovps_r	gcovchm_r	
gcovedu	coeff	0.056	0.209	0.103	0.409	0.44	0.643	0.319	0.376	0.260	0.054	1.000									
	se	0.552	0.025	0.272	0	0	0.000	0.001	0.000	0.005	0.570										
	N	115	115	115	115	115	115	115	115	115	115	115									
gcovmyun	coeff	0.104	-0.096	0.070	-0.181	-0.193	0.365	0.105	0.176	-0.146	0.029	0.287	1.000								
	se	0.267	0.308	0.459	0.052	0.038	0.000	0.265	0.060	0.120	0.761	0.002									
	N	115	115	115	115	115	115	115	115	115	115	115	115								
gcovps	coeff	0.201	0.035	0.031	0.2	0.259	0.515	0.262	0.337	0.120	-0.039	0.528	0.372	1.000							
	se	0.032	0.708	0.745	0.032	0.005	0.000	0.005	0.000	0.203	0.683	0.000	0.000								
	N	115	115	115	115	115	115	115	115	115	115	115	115	115							
gcovchm	coeff	-0.004	-0.016	0.052	0.364	0.406	0.599	0.375	0.128	0.363	-0.006	0.489	0.273	0.477	1.000						
	se	0.969	0.868	0.579	0.000	0	0.000	0.000	0.172	0.000	0.954	0.000	0.003	0.000							
	N	115	115	115	115	115	115	115	115	115	115	115	115	115	115						
gcovinc	coeff	0.122	0.034	-0.034	0.227	0.323	0.634	0.149	0.275	0.258	0.398	0.630	0.262	0.409	0.508	1.000					
	se	0.195	0.722	0.717	0.014	0.000	0.000	0.113	0.003	0.006	0.000	0.000	0.005	0.000	0.000						
	N	115	115	115	115	115	115	115	115	115	115	115	115	115	115	115					
gcovedu_r	coeff	-0.136	0.012	0.184	0.006	-0.106	0.112	0.342	0.141	-0.183	-0.079	0.298	0.088	0.212	0.078	0.043	1.000				
	se	0.235	0.919	0.107	0.961	0.356	0.331	0.002	0.220	0.109	0.493	0.001	0.325	0.017	0.387	0.632					
	N	78	78	78	78	78	78	78	78	78	78	126	126	126	126	126	78				
gcovmyun_r	coeff	-0.066	-0.109	-0.061	-0.362	-0.460	-0.291	0.256	-0.268	-0.449	-0.055	-0.092	0.099	0.001	-0.124	-0.194	0.382	1.000			
	se	0.566	0.343	0.599	0.001	0	0.010	0.024	0.018	0.000	0.631	0.308	0.271	0.988	0.167	0.030	0.001				
	N	78	78	78	78	78	78	78	78	78	78	126	126	126	126	126	78	78			
gcovps_r	coeff	-0.037	-0.029	-0.106	-0.103	-0.159	0.046	0.308	-0.019	-0.214	-0.182	0.147	0.080	0.263	0.136	-0.021	0.577	0.487	1.000		
	se	0.751	0.802	0.354	0.370	0.163	0.689	0.006	0.867	0.060	0.112	0.100	0.371	0.003	0.129	0.818	0.000	0.000			
	N	78	78	78	78	78	78	78	78	78	78	126	126	126	126	126	78	78	78		
gcovchm_r	coeff	-0.084	0.062	0.163	0.144	0.094	0.113	0.394	-0.133	0.031	-0.359	0.192	0.081	0.220	0.294	-0.016	0.133	0.105	0.278	1.000	
	se	0.467	0.590	0.154	0.209	0.410	0.325	0.000	0.248	0.788	0.001	0.032	0.369	0.014	0.001	0.861	0.247	0.362	0.014		
	N	78	78	78	78	78	78	78	78	78	78	126	126	126	126	126	78	78	78	78	
gcovinc_r	coeff	0.004	-0.041	0.126	-0.112	-0.176	0.121	0.307	0.092	-0.129	0.103	0.221	0.151	0.195	0.049	0.121	0.666	0.363	0.445	0.084	
	se	0.973	0.724	0.271	0.328	0.123	0.293	0.006	0.426	0.261	0.371	0.013	0.092	0.029	0.583	0.177	0.000	0.001	0.000	0.464	
		78	78	78	78	78	78	78	78	78	78	126	126	126	126	126	78	78	78	78	