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Ethnic inequality and community activities in Indonesia

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Abstract: For the first time in Indonesia, we jointly analyse several economic statistics and ethnic diversity indicators at national and local levels. Nationally, we find very high levels of economic inequality, measured from household asset values or consumption expenditure. In contrast, the levels of ethnic diversity, while non-negligible, are much lower, whether they reflect fractionalization, polarization, or ethnic inequality based on individual living standards. All ethnic inequality indicators surged after the Asian economic crisis. Ethnic inequality based on education is much lower and decreasing.

In panel data models, individual participation in community activities is found to be much determined by local patterns of ethnic diversity. Different dimensions of ethnic diversity generate distinct effects. Ethnic polarization stimulates participation in strategic activities. Instead, ethnic fragmentation and ethnic inequality depress most local activities. Finally, we provide tentative explanations of local ethnic inequality in regressions that show a mixed pattern of socioeconomic influences.

Keywords: community activities, ethnic diversity, inequality, Indonesia
JEL classification: D71, H42, I32

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1 Introduction

1.1 Ethnic diversity and community activities

Ethnic diversity is at the core of the fabric of society in many countries. As a consequence, it is likely to structure various socioeconomic activities, especially at local levels. Measuring and analysing better the local dimensions of ethnic diversity is therefore of paramount importance. This is our first objective in this paper in the case of Indonesia.

In less developed countries, ethnic opposition and cooperation often take place locally through community activities and networks. This is of notable importance because in contexts in which the state and markets are deficient, community groups may provide local public goods and services, ensure mutual assistance, help mitigate adverse shocks that individuals face, assist in collective decision-making, and even contribute to local investment. For instance, in the absence of formal credit and insurance markets, networks of mutual assistance may allow for productive investments and mutualization of income shocks. Finally, information dissemination and political decisions often take place within local organizations. For all of these processes, social and political issues are likely to occur when there are local coordination issues between different ethnic groups.

Furthermore, local community activities, as most collective-action organizations, typically face free-riding issues that limit their efficiency. Despite the numerous studies of collective incentives in the literature, the inefficiencies in local collective action are still badly understood.[1]

Belonging to homogeneous groups, such as social classes or ethnic groups, may help alleviate free-riding problems and ease coordination issues. The counterpart of this is that ethnic diversity may harm local collective action. A number of authors have investigated ethnicity and social class as factors of citizen participation in local social activities. For example, for US urban areas Alesina et al. (1999) connect individual preferences about the ethnic groups in their neighbourhood to public good investment. Baland and Platteau (1997) show the theoretically ambiguous effect of wealth inequality on the outcome efficiency of social activities. In the United States, Alesina and La Ferrara (2000) analyse the influence of ethnicity and income concentrations on individual participation in community activities. They find that participation is lower in more unequal or ethnically fragmented communities. In Tanzania, La Ferrara (2002) reports an ambiguous effect of growing inequality on group participation.

However, there is also growing evidence that ethnic diversity may be noxious to social organization in general. For example, Fearon and Laitin (2003) find that post-Cold War civil wars are not more likely in more ethnically diverse countries. Comparing a Tanzanian district to a Kenyan district, Miguel (2004) shows that local ethnic diversity leads to fewer public goods in Kenya but not in Tanzania. More specifically, Miguel and Gugerty (2005) find in rural western Kenya that ethnic diversity is associated with lower and worse school and water facilities. Banerjee and Somanathan (2007) report that in India in the 1970s and 1980s an equalization trend in favour of disadvantaged social groups had a moderate negative influence on social fragmentation. In an experiment in a slum in Kampala, Habyarimana et al. (2007) show that public goods provision is helped by co-ethnic people using cooperative strategies, while non-co-ethnic people do not. In Senegal and Burkina-Faso, Arcand and Fafchamps (2012) find that people who are closer geographically, have similar wealth and household size are more often associated in community groups. Finally, in

[1] Lin and Nugent (1995) and Banerjee et al. (2008) discuss this issue in detail.

Colombia, Attanasio et al. (2012) show that close friends and relatives often participate in the same risk-pooling group. Ethnic favouritism (De Luca et al. 2015; Hodler and Raschky 2014) seems to be another feature of the divisions across ethnic groups. Finally, Desmet et al. (2012) exhibit the impact of linguistic cleavages on political economy outcomes.

A dimension of diversity that is crucial is the opposition between ethnic groups. Following the seminal article by Esteban and Ray (1994), ethnic polarization has often been found to be a decisive factor in conflicts and poor coordination among ethnicities. For example, Montalvo and Reynal-Querol (2005b) find that ethnic polarization reduces investment and increases government consumption and civil conflict.

In the cases in which characteristics of individuals can be observed, ethnic inequalities have been found to matter a lot, as pointed out by Esteban et al. (2012).

1.2 Measuring ethnic diversity

The right measure of ethnic diversity to include in empirical studies is somewhat unclear. Fractionalization, originally introduced by Herfindhal (Hirschman 1964), is a popular measure. Besides, several variants have been proposed in the literature (e.g. Bossert et al. 2008). Using country-level data, Sturm and De Haan (2015) find that the impact of ethnic fractionalization on income distribution is conditional on the level of economic freedom. Chadha and Nandwani (2016) find a strong connection between overall inequality and low ethnic fragmentation at the district level in India for the years 1987–2012.

Diverse definitions of fractionalization indices have been used, although it seems that the variants do not yield fundamentally different correlations with socioeconomic phenomena. Beyond seminal papers, Alesina et al. (2003) consider new measures of ethnic fractionalization for most countries. On the whole, they rather confirm previous results in the literature about the impact of fractionalization on growth and government quality, although with a few differences. In his turn, Fearon (2003) proposes a new nomenclature of ethnic groups for 160 countries. He reports how the resulting fractionalization variable differs from using the typical ethno-linguistic definition. Posner (2004) defines ethnographic groups by accounting for whether they engage in political competition. Wimmer (2008, 2013) goes as far as attempting to identify the process of boundary-making for ethnic groups. Finally, from a more general point of view, Kranton (2016) reflects on how to define individual identities, including ethnic identities, and their relationship with behaviour norms. In this paper, after a few tries, we choose to stick with the classic definition of fractionalization, while completing it with polarization and ethnic inequality indicators.

Indeed, as we discuss later, other measures such as ethnic Gini or polarization indices have been employed to investigate the impact of ethnic diversity on socioeconomic country-level variables (e.g., Alesina et al. 2016; Esteban et al. 2012). Looking at different periods may also be useful. Anderson et al. (2012) examine the extent of decreasing or growing polarization in lifetime gross domestic product (GDP) per capita over time. Neumann and Graeff (2013) extended polarization indices to multivariate distributions, albeit warning against sensitivity of social science results to the chosen method.

1.3 Mechanisms

Measurement is not enough. If we want to be able to interpret the correlations of ethnic diversity indicators with socioeconomic variables, we need some notions about what the mechanisms of action of ethnic diversity are. Some recent research on this suggests some lines of approach. Using country-level data, Wimmer et al. (2009) claim that violent conflict is not necessarily the

consequence of ethnic diversity as such, but rather stems from specific ethnic configurations, including the way ethnic elites share power. von Hau and Singh (2014) further review the literature on public good provision, which is depleted by ethnic fractionalization, by eliciting three kinds of mechanisms: collective action by ethnic groups; actions and perceptions of other collective actors; and institutional change. Gisselquist et al. (2016), using district-level data from Zambia, investigate the mechanisms behind the negative relationship between ethnic diversity and public good provision and welfare outcomes, and the conditions in which it can be reversed. They find an occurrence of a positive instead of negative relationship with some welfare outcomes.

In these conditions, more emphasis on analyses incorporating local competition across ethnic groups, and local ethnic inequality, which can be a consequence, may yield more profound understanding of the social and economic mechanisms at work. Rivalry between competing ethnic groups is a salient feature of social and economic life in most countries. It may result in high levels of ethnic inequality that may interact with purely economic inequalities, as well as with various decisions of economic agents. In developing contexts, community activities constitute a vibrant competing ground for these ethnic groups, and this is why we study them in this paper.

As mentioned before, to understand the functioning of community activities, one would like to understand how the free-riding issue, which plagues collective action, can be overcome at the local level. This unsolved theoretical problem remains untested empirically. However, collective action may suffer not only from free riding and coordination issues, but also from external shocks that put local institutions out of balance. Ethnic solidarities and rivalries may be a mechanism that could potentially ease the collective-action problems in stressed contexts. Given that stable groups have probably lower costs for redistributing gains and losses internally, for example by using norms, one may think that these operations are facilitated by members belonging to the same ethnic group. It is often believed, for example, that ethnic nationalism appears as the main source of group cohesion, but also of intergroup conflicts.

More specifically, ethnic inequality may interact in many ways with social and economic environments, with positive and negative consequences. On the one hand, ethnic inequality is connected to ethnic diversity, which may imply greater variety of skills and endowments, and thereby may contribute to increasing productivity through complementarity and specialization of human factors and higher innovation. On the other hand, ethnic inequality and ethnic fragmentation may lead to badly targeted policies, suboptimal investment in public goods, and even ethnic violence and segregation. In general, government quality and social harmony have also been found to be harmed by ethnic inequality.

In turn, mechanisms have been suggested also for the other measures of ethnic diversity. For example, ethnic polarization may contaminate economic and social policies through rent-seeking, and may generate corruption and inefficient policies. It has been found in the literature that ethnic fragmentation is negatively correlated with depletion of development outcomes, from production to education and public goods. It is also empirically associated with ethnic conflicts and segregation.

Of course, economic inequality itself, without ethnic dimensions, has also positive and negative effects on diverse social and economic dimensions of societies, and this has been well studied. Typically, greater inequality generates more crime, investment-deterring taxes, and educational glass ceilings. On the bright side, greater inequality may foster incentives for innovation and entrepreneurship.

1.4 Pooling diversity measures

Faced with the complexity of the presumed interactions of socioeconomic phenomena with ethnic dimensions, it would make sense to distinguish among them by using varied measures of ethnic diversity together. For example, polarization may better capture potential for conflict while fractionalization may better explain free-riding issues.

Accordingly, Montalvo and Reynal-Querol (2005a) find that polarization is a significant and positive determinant of civil wars. They also report that polarization and fractionalization, at country level, are little related. As a matter of fact, for high levels of diversity the correlation of polarization and fractionalization can be quite low. Using data from 46 countries, Baldwin and Huber (2010) show that economic inequality, ethnic fractionalization, cultural fractionalization, and between-group inequality differ greatly in practice, with only between-group inequality being significantly and negatively associated with public goods provision.

With three indicators, using a sample of 138 countries over the years 1960–2008, Esteban et al. (2012) show that ethnic polarization, ethnic fractionalization, and ethnic Gini index are all significant correlates of conflict. These results are consistent with the theoretical model in Esteban and Ray (2011), in which when group cohesion is high, polarization (respectively fractionalization) affects conflict if the prize is public (respectively private), while ethnic Gini affects conflict under low group cohesion.

Alesina et al. (2016) also examine between-ethnicity inequality across countries. They find ethnic inequality to be negatively correlated with development as measured by light intensity measured from space. They also find that the well-established negative association of ethnic fragmentation and polarization with development outcomes in the literature fades away when accounting for ethnic inequality that remains solely significant in their data. This suggests that this is the distribution of income and assets among ethnic groups that may matter for growth, instead of just the respective size of these groups.

One feature of most studies in the literature is that they are based on data at relatively aggregated levels (countries, homelands, regions). In contrast, we work at the village level in a large country, which should provide a finer measure of ethnic inequality issues.

1.5 In Indonesia

Let us now turn to previous work about group-based inequality in Indonesia. Mancini (2005), using district-level data, finds that local horizontal inequality in child mortality is positively associated with ethnic violence. Violence among ethnic groups is more frequent under low economic development and high religious polarization. In contrast, Mancini finds that economic inequality and ethnic fractionalization have no impact on violence.

Using cross-section analyses of the Indonesian Family Life Survey (IFLS) 1997 and 2000 data, Beard (2005, 2007) discusses citizen engagement in local groups with a different list of activities. Although, she focuses more on time and money spent to the benefit of these groups, rather than on mere participation, she finds that a few main socioeconomic characteristics are correlated with participation. However, she does not consider ethnic diversity issues, and we fill this gap.

Stewart et al. (2010) examine the definition of horizontal inequity based on social, economic, political, and cultural status. They propose to use measures of group inequality with population weighting such as GGini, GCov, and GTheil, which we discuss below. Using data from Indonesia,

they find a high correlation across these three measures, albeit a low correlation with the economic Gini coefficient.

Chen (2010) finds that after the 1997–98 economic crisis in Indonesia, religious intensity, a form of group identity, is associated with insurance after the occurrence of harmful economic shocks. Muller and Vothknecht (2013), for the years 1997 and 2000, exhibit the interactions of violent environments with ethnic characteristics. They find that one consequence of violence is general depression of participation in community activities, except in ethnically polarized villages, where a violent context stimulates participation. Beyond contexts of violence, the results raise the question of the role of ethnic diversity in community activity development in Indonesia. Muller and Vothknecht (2016) provide benchmark estimations for the correlation of many socioeconomic variables with activity participation, although not for ethnic inequality variables. Even though they do not deal with ethnicities, Alatas et al. (2016) show the importance of local network relationships for implementing policies in Indonesian villages, in their case pro-poor targeting programmes. It seems likely that some of these network interactions follows ethnic lines.

In this paper, using household and community panel data from Indonesia, we study ethnic inequality, ethnic fractionalization, polarization, and economic inequality, both for themselves and as factors correlated with individual participation in community groups. Our approach to the issues is three-pronged. First, we estimate and analyse ethnic diversity and economic inequality statistics at the village level. Second, we investigate how local inequality and diversity across groups and social classes influence the involvement of individuals in community activities. Third, we examine the correlates of ethnic inequality at the village level.

Section 2 presents the Indonesian data. In Section 3 we explain our statistical strategy. In Section 4 we discuss our estimation results. Section 5 concludes.

2 The context and the data

2.1 Indonesia

Indonesia is a large lower-middle income country with a GDP per capita of US$3,630 in 2014 (most recent available safe statistics). Its huge population of 254 million inhabitants, among whom about 11 per cent are poor, enjoys an average life expectancy at birth of 64 years.

Most Indonesian islands are made of an imbroglio of groups, castes, villages, tribes, religious groups, clans, and production associations that connect inhabitants together through implicit social contracts. These contracts ensure solidarity, but also bring many constraints. Individuals who neglect their social duties may be excluded from the community. For example, people who do not give expected presents or do not carry their share of collective work may lose access to diverse social and economic, formal or informal, institutions; or, as in Bali, they may be deprived of cremation at their death. Social rights and social duties typically depend on hierarchical parental positions.

As a matter of fact, family and religious values remain the moral basis of the Indonesian society, with special deference to ancestors, elders, and family heads. The village is the fundamental social unit that embodies the traditional and modern solidarities, which are often regulated by customs. This is where many collective decisions are made, often after long deliberations aimed at reaching some social consensus, at least apparently.

In particular, Indonesians stay faithful to traditions of mutual help (Bowen 1986). Over Indonesia's history, the underlying ethic of mutual help (*gotong royong*) has frequently been invoked by the state to bring to the fore development plans supported by collective solidarity. More recently, local community initiatives have been a response to rising inequality (Cameron 2000) and to the 1998 financial crisis (Ravallion and Lokshin 2007).

Accordingly, the 2001 Decentralization Laws transferred most public and social decision-making to local institutions.[2] The 1999 Regional Autonomy Law had already split up the decision-making power of the provinces (33 provinsi) and the districts (kabupaten) into smaller administrative units, spurring the autonomy of communes and villages (62,000 kota). Some objectives pursued through these laws were higher efficiency and more equitable distribution of resources. As a result, village communities emerge as the relatively autonomous foundation of the whole administrative edifice.

Substantial financial effort accompanied this decentralization process. More than one-third of government expenses were transferred to lower levels in 2001. Simultaneously, fuel subsidies were drastically reduced, which delivered substantial funding for local development projects (about US$10 billion). In 2006, US$5 billion was added from spurring growth and dropping debt service payments. Nowadays, about two-thirds of public funds are spent at provincial and district levels. This situation is also seen as a potential opportunity for overhauling public services (3.9 per cent of GDP for education, 1.0 per cent for health) and local infrastructure investment (2.4 per cent of GDP) using a bottom-up approach.

2.2 Survey data

We use data taken from the IFLS, a longitudinal household and community survey (Strauss et al. 2004), which represents 83 per cent of the Indonesian population.[3] For reasons of information availability, we use the second (IFLS2 in 1997), the third (ILFS3 in 2000), and the fourth waves (ILFS4 in 2007) of the IFLS.

The sample includes 13,303 respondents for 1997, 15,770 respondents for 2000, and 20,929 respondents for 2007. Many individuals can be observed in several rounds, which allows for panel data analyses. The community survey offers data on the characteristics of the 311 communities. An IFLS community/village is a randomly drawn enumeration area.[4] The nationally representative sampling frame was the one also used for the 1993 SUSENAS National Household Survey. A community includes 200–300 households.

From the 1997 IFLS wave, data on individual participation was collected for nine community activities. These activities are gathered into four mutually non-exclusive categories that are described by Muller and Vothknecht (2016): (1) local governance, (2) social services, (3) infrastructure development, and (4) mutual insurance.

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[2] Kartasasmita and Stern (2016) analyse Indonesia's political economy during the unfolding of the 1997 crisis and up to the present.

[3] The IFLS covers Java, the provinces of North, West, and South Sumatra, and Lampung on Sumatra, the islands of Bali and Nusa Tenggara Barat, and finally South Sulawesi and South Kalimantan. The least densely populated regions and the provinces in violent conflict, Aceh, Malukku, and East Timor, were not surveyed because of cost efficiency and security motives.

[4] As a simplifying shortcut, we often call it a 'community' or a 'village' in this paper, although some of these areas are urban or peri-urban.

Local governance organizations include community meetings and women associations (*Pendidikan Kesejahteraan Keluarga*, PKK). Community meetings are headed by a locally elected resident. During these meetings, discussions, and strategic decisions take place collectively about all kinds of issues. Since the wife of the community meeting leader is traditionally the head of the PKK, we group PKK activities with community meetings in a unique category. Among other issues, the PKK manages public services delivered locally by neighbourhood members. Among the main ones are informal education and health monitoring.

As a consequence, the PKK is also included in the category of social services, which further incorporates mother and child health posts (*Posyandu*) and voluntary labour groups. *Posyandu* groups provide primary healthcare to young children. They also train mothers in healthcare and parenting. Beneficiary mothers can reciprocate with some work or cash. Voluntary labour groups take care of environmental development and social services. We only use female responses for the PKK and *Posyandu* because these activities only allow female membership.

The third category encompasses public infrastructure maintenance and development. The *Kampung Improvement Programme* is aimed at building and maintaining physical infrastructure, such as public facilities, roads, drains, and water supplies. The *Kecamatan Development Programme* delivers similar services in poor rural communities. Community groups dealing with provision of drinking water and garbage disposal are also included in this category. We use only men's responses for this category because these are considered by Indonesians to be exclusively male activities.

A final category regroups mutual insurance and mutual protection activities. *Ronda* is an informal security system organized in neighbourhoods. Members of these groups patrol at night to contribute to local safety. 'Cooperatives' include all the other risk-sharing activities for which participation information has been collected in the 1997 survey. Although two kinds of activities can be seen as some kind of mutual insurance, we choose to separate them because safety risks have generally different features from other typical socioeconomic risks. Equipped with these variables, we can now discuss the statistical strategy.

3 The statistical strategy

Our statistical strategy is in three stages. First, we need to specify ethnic diversity measures, one of our main interests. We perform a descriptive analysis of these variables in Indonesia, notably in terms of economic ethnic inequality and educational ethnic inequality. Second, we include these measures as covariates in models of activity participation over time. Finally, we estimate regressions that exhibit the correlates of ethnic inequality at the village level.

3.1 Ethnic diversity measures

Our investigation is based on estimating diverse indicators of ethnic diversity that have been proposed in the literature. We now state their definition. The estimation of these national-level and village-level ethnic diversity indicators is based on the survey sub-samples in each village. Although these sub-samples were drawn randomly, and are therefore representative, they may involve some small sampling variations that are not accounted for in the estimation. However, since we have more than 300 observations of villages at each survey round, and about 60 interviewed individuals in most villages, we expect these random variations to be smoothed out and not to substantially affect the analysis.

The Herfindahl index of *ethnic fragmentation* (*EH*) (Hirschman 1964) is one of the first formulae proposed for capturing ethnic diversity:

$$EH = 1 - \sum_{i=1}^{n} s_i^2 \quad (1)$$

where s_i is the size of the ith largest ethnic group in the community. EH corresponds to the probability that two randomly drawn individuals belong to different groups.

The index of *ethnic polarization* (*PQ*) proposed by Reynal-Querol (2002), is:

$$PQ = 4\sum_{i=1}^{n} s_i^2 (1 - s_i) = 1 - 4\sum_{r=1}^{R}((0.5 - \text{sr})/0.5)^2 \quad (2)$$

where s_i is the relative size of the ith largest ethnic group and n is the number of ethnic groups in the community. Ranging between 0 and 1, a higher value of the *PQ* index indicates a more ethnically polarized community, with *PQ* equal to 0 for an ethnically homogeneous community and *PQ* equal to 1 for a community with two ethnic groups of the same size.

Several group-inequality indicators are also estimated. They are typical inequality measures that are computed (nationally or in each village) by using the mean consumption per-adult-equivalent for each group. Alternatively, we also consider the mean education level (among individuals over 14 or over 24) for each group.

Let m_r be the mean of the variable y in group r, m its global mean, and s_r the population share of group r. Let sqrt() be the square root operator. The sums $\sum_r$ and $\sum_s$ run over all the R ethnic groups. Then, the *group-weighted coefficient of variation* (GCOV) is:

$$\text{GCOV} = (1/R)\ \text{sqrt}(\sum_r S_r\ (m_r - m)^2 \quad (3)$$

The *group-weighted Theil index* (GTheil) is:

$$\text{GTheil} = \sum_r s_r\,(m_r/m)\ \ln(m_r/m) \quad (4)$$

The *group-weighted Gini coefficient* (GGini) is:

$$\text{GGini} = (\sum_r \sum_s s_r\, s_s\, |m_r - m_s|)/(2m) \quad (5)$$

3.2 Econometric models

Once we are equipped with indicators of ethnic diversity at village level, we can mobilize them in attempting to explain civic participation. For this, we specify models of individual participation separately for each community activity category. We first define the latent unobserved propensity, B^*_{ijtk}, of individual i to participate in a certain community activity k, in community j and at year t. This propensity to participate is assumed to be a linear function of determinant variables:

$$B^*_{ijtk} = X_{it}\beta + V_{jt}\gamma + R_j\delta + T_t\varphi + a_i + \varepsilon_{it} \quad (6)$$

where X_{it} is a vector of individual and household characteristics, V_{jt} a vector of village characteristics that includes the economic inequality and the ethnic diversity variables, R_j and T_t are province and time dummies, a_i denotes an unobserved individual effect, ε_{it} is a centred idiosyncratic error term, and β, γ, δ, and φ are parameter vectors to estimate. We observe the individual participation choice, P_{itk} (1 = participation if the propensity variable B^*_{ijtk} is positive, 0 otherwise).

In some cases, B^*_{ijtk} may be seen as representing the expected benefit of participation for an individual unconstrained in her choice. However, an alternative interpretation is that of internal/external selection rules by insider members and/or other authorities, which could possibly be based on observable and unobservable individual and local characteristics. Therefore, it is safe to interpret the estimation results as stemming from mixed decision processes by both applicants and insiders.

A random-effects logit model is our preferred empirical specification of the participation observations for each activity separately. This approach controls for unobserved individual heterogeneity that might affect individual participation. This matters because of the presence of unobserved stable individual characteristics, such as personality, family background, or past personal events. An alternative fixed-effect model is not possible here because too many observed individuals remain with the same participation status over all survey rounds. We do not include fixed effects for districts or villages because we want to examine the effects of local variables of interest, especially the local ethnic diversity measures that do not vary much over time in most communities. Finally, even though efficiency could be enhanced by simultaneously estimating all categories' equations, this is not needed because the large sample size already generates accurate estimates.

We deal with potential endogeneity issues by first including province, time, and individual effects that substantially control for the unobserved heterogeneity of individuals and of situations that may cause endogeneity bias. Second, we incorporate a very large set of correlates in the regressions, which assists us further in controlling for endogeneity channels.

Finally, we also attempt to investigate potential explanations of local ethnic inequality by estimating fixed-effect and random-effect regressions of village-level ethnic inequality on a variety of regressors describing the demographic and economic local contexts. We now turn to our empirical results.

4 Empirical results

4.1 Descriptive statistics

Levinson and Christensen (2003) propose a nomenclature including more than 300 ethnic groups in Indonesia. The village and local communities are the social basis of all these groups, even though the groups have different languages, cultures, and histories. The largest ethnic group are the Javanese (41 per cent of the total), who live mostly in Java but also on other islands. The Malay, Sundanese, and Madurese are other important groups. Other ethnic groups are small, such as the Chinese who account for less than 1 per cent of the population. Although ethnic group definition may be debatable, we are constrained to using the information available in the IFLS questionnaire, which is basically related to languages. Therefore, our definition of ethnic group is that proposed by the Indonesian administrators of the survey.

Individual ethnicity information is obtained from IFLS4 (collected in 2007–08). Since no information on ethnicity is available from IFLS3, we assume stable ethnic composition of villages between years for our analyses. This implies that the changes in ethnic composition caused by migration and other demographic changes are neglected.

Economic inequality is a major issue in Indonesia, with our national estimated Gini coefficient of assets from 0.64 to 0.68 across the survey rounds, and all the more so with the concentration of

wealth in Jakarta in contrast to destitute peripheral regions. The economic Gini coefficient of the household equivalent consumption is also high, between 0.42 and 0.60, depending on the years. In contrast, the Gini coefficient of number of education years is relatively low at around 0.19. Local inequality may also be a problem, but it has been less studied. In general, the within-village asset inequality, as measured by the Gini coefficient, is substantial.

Table 1 (a–d) shows the distribution of individuals by ethnic groups and diverse ethnic inequality statistics. The Javanese and Sundanese groups account for nearly half the surveyed sample of individuals. The large number of ethnic groups recorded illustrates the diversity of the ethnic situation in Indonesia.

Table 1a: Ethnic groups in the 2007 sample

Ethnicity	Number of observations	Percentage
Jawa	8,737	41.87
Sunda	2,556	12.25
Bali	988	4.73
Batak	690	3.31
Bugis	841	4.03
Tionghoa	151	0.72
Madura	699	3.35
Sasak	933	4.47
Minang	1,058	5.07
Banjar	669	3.21
Bima-Dompur	434	2.08
Makassar	289	1.39
Nias	71	0.34
Palembang	58	0.28
Sumbawa	107	0.51
Toraja	118	0.57
Betawi	749	3.59
Dayak	7	0.03
Melayu	236	1.13
Komering	20	0.10
Ambon	11	0.05
Manado	2	0.01
Aceh	22	0.11
South Sumatera	609	2.92
Banten	64	0.31
Cirebon	501	2.40
Other	246	1.18
Total	*20,866*	*100*

Source: author's calculations, based on data from the IFLS.

Table 1b: Measures of horizontal inequality based on living standards

	Year	Ethnicity	Religion	Region	Gender	Rural/urban	Capital/others
GCOV	1997	0.170	0.118	0.240	0.0283	0.317	0.238
	2000	0.152	0.0867	0.187	0.0156	0.271	0.208
	2007	0.419	0.358	0.443	0.0427	0.331	0.302
GGini	1997	0.0774	0.0181	0.116	0.00997	0.108	0.0355
	2000	0.0595	0.0120	0.0820	0.00551	0.0946	0.0301
	2007	0.150	0.0659	0.205	0.0151	0.116	0.0438
GTheil	1997	0.0135	0.00457	0.0250	0.000200	0.0245	0.0117
	2000	0.00992	0.00247	0.0145	0.000061	0.0181	0.00904
	2007	0.0609	0.0341	0.0781	0.000457	0.0272	0.0179

The living standard variable = per-adult-equivalent consumption expenditure; total adult population.

The considered religions are: Muslim, Catholic, Protestant, Hindu, other. The regions are: Bali, Jakarta, Jawa Barat, Jawa Tengah, Jawa Timur, Lampung, North Sumatera, Nusatenggara Barat, South Kalimantan, South Sumatera, Sulawesi Selatan, West Sumatera, Yogyakarta.

Source: author's calculations, based on data from the IFLS.

Table 1c: Measures of horizontal inequality based on years of education, population 15 years and older

	Year	Ethnicity	Religion	Region	Gender	Rural/urban	Capital/others
GCOV	1997	0.120	0.0516	0.112	0.113	0.244	0.0818
	2000	0.0482	0.0546	0.100	0.101	0.231	0.0761
	2007	0.0964	0.0416	0.0880	0.0846	0.189	0.0645
GGini	1997	0.0535	0.0106	0.0564	0.0399	0.0837	0.0121
	2000	0.0482	0.0112	0.0478	0.0359	0.0806	0.0110
	2007	0.0403	0.00843	0.0425	0.0299	0.0666	0.00935
GTheil	1997	0.00749	0.00100	0.00561	0.00320	0.0145	0.00155
	2000	0.00586	0.00112	0.00445	0.00259	0.0177	0.00134
	2007	0.00467	0.000660	0.00347	0.00178	0.00893	0.000976

Source: author's calculations, based on data from the IFLS.

Table 1d: Measures of horizontal inequality based on years of education, population 25 years and older

	Year	Ethnicity	Religion	Region	Gender	Rural/urban	Capital/others
GCOV	1997	0.141	0.0653	0.120	0.154	0.270	0.0729
	2000	0.127	0.0673	0.112	0.146	0.257	0.0757
	2007	0.108	0.0500	0.103	0.117	0.224	0.0768
GGini	1997	0.0639	0.0136	0.0557	0.0543	0.0920	0.0104
	2000	0.0571	0.0142	0.0493	0.0515	0.0892	0.0106
	2007	0.0474	0.0104	0.0510	0.0413	0.0788	0.0109
GTheil	1997	0.0102	0.00159	0.00650	0.00591	0.0177	0.00123
	2000	0.00823	0.00168	0.00564	0.00531	0.0162	0.00132
	2007	0.00598	0.000963	0.00475	0.00342	0.0124	0.00136

Source: author's calculations, based on data from the IFLS.

Ethnic inequality calculated from individual consumption levels (per-adult-equivalent consumption expenditure) is far from extreme, but not non-negligible. For ethnic Gini coefficients of living standards, it reaches about 8 per cent in 1995, 6 per cent in 2000, and 15 per cent in 2007. The huge surge in 2007, after the economic crisis, is found for all ethnic inequality indicators. In general, the trends of ethnic inequality are the same for all ethnic inequality indicators (GCOV,

GGini, and GTheil), but also for other group-inequality indicators based on the following groups: religion, region, gender, rural/urban, and capital/others. We do not comment on them further.

Interestingly, a different picture emerges when examining instead group-inequality statistics based on the number of education years. In that case, the group-inequality levels are low, whether the considered populations are the individuals of 15 years and older, or of 25 years and older. This result may reflect the impact of mandatory education laws over time in Indonesia, which act as levellers of education levels across ethnic groups, as well as across other groups. Even more, a slight trend in equalization can be observed between 1997 and 2007. For example, for the Gini coefficient of education inequality, we obtain for 15 years and older: 5.3 per cent in 1997, 4.8 per cent in 2000, and 4.0 per cent in 2007. For 25 years and older this is: 6.4 per cent, 5.7 per cent, and 4.7 per cent, respectively.

Using aggregate data from the 1995 census at district level, while excluding Java and some conflict areas, Mancini (2005) computes ethnic inequality indicators in Indonesia. He finds a Gini coefficient of income of 0.36, an ethnic GCOV for income of 0.13, and an ethnic GCOV for education of 0.10. Although the data and the variables are different, it is comforting to find a similar gap in our results between the Gini coefficient of economic inequality and the ethnic inequality estimates.

As Stewart et al. (2010) point out, the chosen ethnic inequality indicators are very correlated in Indonesia. They report that the linear correlation coefficients of GGini and GTheil, across districts for different religion groups in 1995 and 1990, each about 91 per cent for education and 80 per cent for per capita income; the respective linear correlation coefficients of GGini and GCov corresponds to 0.99 per cent and 86 per cent. We recover the same pattern of high correlation at village level, which justifies using only the GGini index in the following.

Ethnic fragmentation is about 0.25, while ethnic polarization reaches 0.40. These latter two variables, which portray the stable ethnic demographic composition of villages, vary little across years.

Let us now consider the correlation between all these economic and ethnic variables at the village level. First, the correlations fluctuate slightly over time, and are generally lower in 2007. When considering together, across villages, all the correlation coefficients of all ethnic diversity and economic inequality or economic mean indices, a certain dichotomy emerges between economic statistics and ethnic diversity variables. Mean living standards have a clear link with mean asset levels, with a correlation coefficient that varies between 0.32 in 2007 up to 0.50 in 2000. The correlations of the mean levels of living standards or assets with the Gini coefficient of inequality of assets are much lower, except in 2000 when it reaches 0.30 with the mean level of assets. On the other hand, the linear correlation coefficient of fragmentation and polarization indices is very high, at 0.90. Ethnic inequality is also relatively highly correlated with polarization (0.40 in 1997, 0.43 in 2000, 0.44 in 2007) and with fractionalization (0.35 in 1997, 0.45 in 2000, 0.48 in 2007).

Note, however, that there are still some notable correlations between some economic statistics and some ethnic diversity variables. If we choose a minimum threshold of 0.3 for the coefficient of correlations, we find no notable relationship between these types of variables in 1997, while in 2007 the ethnic inequality indicator appears to be related to the mean per-adult-equivalent consumption (0.47) and to the economic Gini coefficient based on assets (0.36). In 2000, this is the mean per-adult-equivalent consumption that is related to the three ethnic diversity indices with respective correlation coefficients equal to 0.41 with ethnic inequality, 0.39 with fractionalization, and 0.33 with polarization. The other correlation coefficients amid all these variables are smaller.

Because of these high levels of correlation between these indicators, one may think that part of the findings in the literature dealing with the determinants of socioeconomic outcomes may attribute exaggerated weight to the influence of some included diversity indicators, while they may in fact reflect the effect of some excluded diversity indicators.

Tables 2 and 3 report descriptive statistics for the variables used in the estimation, respectively at individual and village levels. The analysis is restricted to individuals aged 14 years old or more. The studied population is young and have heterogeneous education levels, with more than half having no or only primary education, while two-fifths obtained some amount of secondary education. The figures largely reflect the complex Indonesian educational history. Nowadays, nine years of education are compulsory, and children therefore enjoy six years of primary education and three years of secondary education. In total, secondary education lasts for six years (three years in junior high school and three years in senior high school). Higher education varies with the chosen specialty and lasts about four additional years; this affects only 6 per cent of individuals. In practice, this pattern is only approximate since some students may follow accelerated learning programmes while others take some classes twice. We do not observe the actual number of years of education in this survey. Instead, we impute this variable in using the number of years of the completed education level for each individual.

Table 2: Descriptive statistics for individuals

Variable	Obs.	Mean	Std dev.	Min.	Max.
Sex	49,997	0.460	0.498	0	1
No education	49,740	0.105	0.307	0	1
Junior high school	49,740	0.171	0.377	0	1
Senior high school	49,740	0.231	0.421	0	1
Higher education	49,740	0.0634	0.243	0	1
Private worker	49,995	0.210	0.407	0	1
Self-employed	49,995	0.291	0.454	0	1
Unpaid family	49,995	0.112	0.315	0	1
Government job	49,995	0.0450	0.207	0	1
Work hours	49,997	3.03	2.74	0	11.2
Ln monthly income (in 1,000 Rp.[a] 2000 Prices)	49,989	6.54	6.24	0	19.8
Married	49,997	0.682	0.465	0	1
Head's spouse	49,997	0.646	0.478	0	1
Age head	49,997	0.597	0.490	0	1
Low expenditure	48,604	0.276	0.447	0	1
High expenditure	48,604	0.210	0.407	0	1
Rel. rank asset	49,997	0.550	0.283	0.0166	1
Farm household	49,997	0.426	0.494	0	1
Business household	49,997	0.446	0.497	0	1
Female head	49,997	0.126	0.332	0	1
Household size	49,997	6.35	2.84	1	38
Suffer shock	49,997	0.210	0.407	0	1
Moved	49,997	0.0924	0.289	0	1
Rural	49,997	0.530	0.499	0	1
Total population	49,642	0.920	1.36	0.0207	23.6
Village ln asset	49,997	17.3	0.778	15.1	21.3
Gini asset	49,881	0.529	0.117	0	0.885
Gini × rank	49,881	0.291	0.167	0	0.885
Jakarta	49,997	0.0759	0.264	0	1
Jawabarat	49,997	0.150	0.357	0	1
Jawatimur	49,997	0.153	0.360	0	1
Nusatbarat	49,997	0.0668	0.249	0	1
Sulawesisel	49,997	0.0522	0.222	0	1

[a] Exchange rate in 2000: US$ = ~3,000 IDR.

[b] As assessed by the interviewer.

Source: author's calculations, based on data from the IFLS.

Table 3: Village means

	1997	2000	2007
Age	35.7	36.2	38.7
	(3.31)	(3.63)	(3.52)
Gender	0.438	0.452	0.472
	(0.087)	(0.078)	(0.055)
Age of head	0.607	0.614	0.592
	(0.160)	(0.147)	(0.124)
Farm households	0.321	0.377	0.346
	(0.324)	(0.349)	(0.348)
Business households	0.388	0.507	0.471
	(0.208)	(0.211)	(0.195)
Female heads	0.124	0.128	0.145
	(0.104)	(0.102)	(0.092)
Household size	6.03	6.37	6.75
	(1.13)	(1.25)	(1.37)
Household shocks	0.340	0.274	0.0788
	(0.190)	(0.174)	(0.197)
Migrants	0.011	0.0234	0.197
	(0.0829)	(0.077)	(0.363)
Equivalent consumption (1000 rupiah)	99.48	73.5	143.0
	(92.49)	(37.0)	(212.0)
Rural	0.421	0.417	0.389
	(0.494)	(0.492)	(0.485)
Population (thousands)	1.13	.989	1.13
	(2.06)	(1.09)	(1.65)
Village average asset	8.09e+07	4.63e+07	5.41e+07
	(1.59e+08)	(4.42e+07)	(5.79e+07)
Village Gini of assets	0.520	0.535	0.558
	(0.136)	(0.124)	(0.112)
Ethnic Gini	0.0963	0.105	0.160
	(0.113)	(0.111)	(0.169)
Ethnic fragmentation	0.248	0.247	0.247
	(0.244)	(0.243)	(0.244)
Ethnic polarization	0.399	0.396	0.396
	(0.361)	(0.361)	(0.360)
Jakarta	0.115	0.112	0.112
	(0.320)	(0.316)	(0.316)
Jawabarat	0.163	0.164	0.145
	(0.370)	(0.371)	(0.352)
Jawatimur	0.144	0.145	0.145
	(0.352)	(0.352)	(0.352)
Nusatbarat	0.0514	0.0516	0.0516
	(0.221)	(0.221)	(0.221)
Sulawesi	0.0514	0.0516	0.0516
	(0.221)	(0.221)	(0.221)
Governance group	0.483	0.315	0.313
	(0.186)	(0.176)	(0.160)
Social services group	0.732	0.550	0.602
	(0.267)	(0.270)	(0.217)
Infrastructure group	0.510	0.340	0.353
	(0.188)	(0.181)	(0.175)
Mutual insurance group	0.572	0.274	0.281
	(0.237)	(0.187)	(0.203)
Security group	0.698	0.555	0.479

	(0.247)	(0.302)	(0.282)
Cooperatives	0.206	0.117	0.101
	(0.248)	(0.157)	(0.139)
No. observations	311	311	311

Standard deviations in parentheses.

Source: author's calculations, based on data from the IFLS.

About two-thirds (68 per cent) of the studied individuals are married. Although relatively poor, more than half of these individuals are employed, mostly in the informal private sector and formal private sector. One-third of the surveyed individuals are self-employed, while one-fifth are employed in the private sector. Few of them enjoy a job in the public sector (4.5 per cent), while a non-negligible number work in the informal sector as unpaid family workers (11 per cent). Slightly more than half of the individuals live in rural areas, and they are spread across all surveyed provinces.

We measure the prevalence of each community activity by combining two information sources: first, interviews with village heads; and second, individual responses about the existence of activities in the village and about their participation in these activities. As a result, we define an activity as present if either the village head states its existence, or if at least one surveyed village member reports participation. As a matter of fact, all activities are almost always present everywhere during the surveyed years.

The descriptive statistics at the village level and village means, for the sample of 311 villages, are consistent with the individual descriptive statistics. The mean Gini coefficient of village inequality of assets is very high (0.52 to 0.56, depending on years) and little concentrated among villages. Conversely, the mean of village-level Gini coefficient of ethnic inequality, based in per-adult-equivalent consumption, is much lower (0.096 to 0.161) and much more dispersed, with a coefficient of variation above 1 in every survey year. The means of village-level polarization (0.396 to 0.399) and village-level fractionalization (0.247 to 0.248) are substantial and agree with the aggregate national estimates. However, substantial differences between villages occur in that respect also, as shown by a coefficient of variation of about 1.

In general, most of the variables used are characterized by relative stability across years and substantial dispersion across villages, which augurs well for their use in econometric estimation. We now turn to such estimations.

4.2 Involvement in community activities

A quick examination of descriptive statistics (not shown) reveals that the participants within each activity category appear to be relatively homogeneous in terms of age, consumption level, and education. For example, the participants in cooperatives and community meetings are relatively old, well-educated, and wealthy, while the opposite is true for participants in the social service activities.

Table 4 shows our estimation results for random-effects logit regressions of individual participation, separately for each activity category, further distinguishing between cooperatives and security groups. Clearly, simultaneous estimation is not needed since results are very efficient already. We discuss our results by successfully introducing ethnic polarization, ethnic fragmentation, and ethnic inequality as specific or joint covariates.

Table 4: Random-effect logit—ethnic diversity and inequality variables; diverse partial specifications

Variables	Governance	Social services	Infrastructure	Insurance	Security	Cooperatives
Population share of own Ethnic group	0.477** (0.189)	0.361* (0.195)	0.394* (0.237)	0.547** (0.241)	0.422 (0.302)	0.411 (0.531)
Lowest quantile of equivalent consumption	−0.254*** (0.0735)	−0.0446 (0.0757)	0.00101 (0.115)	−0.0259 (0.104)	−0.121 (0.135)	−0.280 (0.233)
Highest quantile of equivalent consumption	0.398*** (0.0828)	0.0348 (0.0905)	−0.237** (0.120)	0.0926 (0.113)	0.0998 (0.156)	0.0198 (0.220)
In village: rel. HH rank assets (0 > 1)	0.513 (0.455)	−0.0655 (0.479)	−0.796 (0.729)	0.982 (0.669)	1.822** (0.908)	0.971 (1.404)
Village: average HH asset value (in log)	0.22*** (0.03)	0.16*** (0.03)	−0.09* (0.04)	0.04 (0.04)	−0.09 (0.05)	0.04 (0.07)
Within-village Gini HH assets	−0.19 (0.33)	0.43 (0.35)	−0.56 (0.47)	−1.29** (0.33)	−0.31 (0.63)	−2.47** (0.83)
Asset inequality × rel. wealth	−0.26 (0.50)	−0.39 (0.55)	0.01 (0.72)	0.34 (0.71)	−0.78 (0.96)	1.38 (1.21)
Ethnic polarization	0.15 (0.08)	−0.09 (0.08)	0.06 (0.10)	0.77*** (0.10)	0.27* (0.13)	0.73*** (0.19)
Ethnic fragmentation	−0.26* (0.12)	−0.50*** (0.13)	0.08 (0.15)	0.86*** (0.16)	0.45* (0.21)	0.38 (0.29)
Ethnic inequality	−0.76*** (0.15)	−0.73*** (0.16)	−0.87*** (0.20)	0.01 (0.21)	−0.00 (0.28)	−0.31 (0.36)
Village: average HH asset value (in log)	0.24*** (0.03)	0.17*** (0.03)	−0.07 (0.04)	0.04 (0.04)	−0.10 (0.05)	0.04 (0.07)
Within-village Gini index HH asset value	−0.07 (0.33)	0.58 (0.36)	−0.44 (0.47)	−1.33** (0.47)	−0.31 (0.64)	−2.49** (0.84)
Asset inequality × rel. wealth	−0.36 (0.51)	−0.50 (0.55)	−0.06 (0.73)	0.47 (0.72)	−0.71 (0.98)	1.52 (1.23)
Ethnic inequality	−0.83*** (0.16)	−0.74*** (0.17)	−1.02*** (0.21)	−0.07 (0.22)	−0.07 (0.29)	−0.24 (0.38)
Ethnic fragmentation	−0.94*** (0.21)	−0.82*** (0.21)	0.05 (0.24)	−0.31 (0.27)	0.29 (0.35)	−2.54*** (0.59)
Ethnic polarization	0.65*** (0.13)	0.33* (0.13)	0.09 (0.15)	0.95*** (0.17)	0.15 (0.22)	2.03*** (0.35)

Many controls are included that are shown in Muller and Vothkneckt (2016). Standard errors in parentheses.
*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: author's calculations, based on data from the IFLS.

The estimated marginal effects for other controls are in line with findings by Muller and Vothknecht (2016), who provide detailed results with typical determinants of participation, although with a specification much more complete than usual. In particular, many effects of economic and social crises are captured through village fixed effects, year fixed effects, and individual random effects. Age, gender, and the individual's position within the household are found to largely affect participation. These effects are consistent with traditional roles of family members in village life. Moreover, involvement in most activities requires skills, which may explain why it increases with educational level, except for security groups.

Some specific individual needs are also associated with occupation and family problems, and shocks suffered by households. Economic capacity and power positions also play their parts. For example, the economically wealthier individuals are more involved in local decision-making, on the one hand, and less engaged in hard physical work such as in infrastructure or security groups, on the other.

Finally, recent migrants and members of ethnic minorities are found to be less likely to participate, notably in governance and risk-sharing activities, perhaps because of different needs or weaker network access. This brings us to our main interest: the role of ethnic diversity variables. Note first that, apart from ethnic and inequality variables, few village-level variables have significant effects. This may be because they are mostly absorbed into the highly significant province dummies and individual random effects. Rural and urban areas appear to differ less than expected in terms of aggregate patterns of participation. Nonetheless, individuals living in rural areas are found to be more involved in infrastructure groups, and less frequently in security groups. We now turn to the correlations of ethnic diversity and inequality variables with activity participation.

4.3 Effects of ethnic and inequality variables

We find that it is indeed possible to identify separately the effects of the included different components of ethnic diversity, which are functionally independent of one another. We discuss these estimated effects of interest only for the significant coefficients at the 5 per cent level or lower. First, we note that the dispersions of living standards and of household assets play their part in the engagement of citizens in community activities. Individuals belonging to the lower quartile of the living standard distribution are less often present at governance meetings. In contrast, individuals whose household lies in the upper quartile of the distribution of living standards are more frequently involved not only in village governance meetings, but also less often associated with infrastructure groups. Even more, participation in security groups increases with the relative rank of the household in the village asset distribution. The average wealth in the village has a slightly significantly negative impact on infrastructure groups, which are less frequented in wealthy locations, but it has more powerful positive consequences on governance and social services. Wealthier villages are thus also more developed in these dimensions of collective decisions and public services. Interestingly, wealth inequality, as measured by the Gini coefficient of assets in the village, has significant effects on the participation pattern, although not when it is interacted with the individual relative wealth in the village. Namely, villages with high asset inequality exhibit relatively fewer participants in cooperatives, which also shows up in the insurance columns. This is consistent with cooperatives being less useful in contexts of high wealth concentration. Village means and inequality indices based on per-adult-equivalent consumption expenditure are not shown as they do not affect participation in groups. This is at odds with the emphasis on the role of income inequality in many theoretical models of coalition formation.

In contrast, the ethnic diversity variables correspond to salient interactions with community activities. First and foremost, when included exclusive of other ethnic diversity variables, ethnic polarization has a definite positive impact on participation in insurance activities, whether security groups or cooperatives. This is consistent with competing groups attempting to control these economically crucial activities.

If instead of polarization the ethnic fragmentation index is included in the model, only infrastructure activities and cooperatives appear not to be affected. Moreover, there is a clear contrast between activities seemingly favoured by ethnic fragmentation, mostly insurance and security groups, and the activities handicapped by it: social services and, marginally, governance activities.

In turn, when we replace again the fractionalization index by the Gini coefficient of ethnic inequality, we find another distinct effect, with ethnic inequality being negatively and clearly associated with participation in governance meetings, social services, and infrastructure groups.

To summarize so far: the effects of the ethnic diversity variables in the tables are all significant when entered separately, while they vary with the considered activity. Moreover, the inclusion of such composite indices of ethnic diversity seems to be necessary in order to elicit useful results. Indeed, dummy variables for specific ethnic groups, and for the ethnic minority in the village, are found to have no significant effects on participation.

Our last specification is based on entering all of the above ethnic diversity and economic inequality regressors. Such a specification has often been resisted by researchers who generally only include a few of these variables in their model, lest they would be too collinear to yield significant results. However, this kind of precaution may make sense for a small sample of countries, although much less so for a large sample of individuals, as in our case. It is also fair to say that a few authors have already included more ethnic statistics than usual in their models, as mentioned before in the introduction, although not for civic involvement equations.

Even when all economic inequality and ethnic diversity variables are included together, their effects appear to be partially robust, while slightly less significant than when they are entered one by one. We find that it is possible to identify separately the respective roles of fragmentation, polarization, and ethnic inequality. However, some effects are altered by this specification strategy. First, the positive effect of fragmentation on insurance and security groups vanishes. Further, its negative effects on involvement in governance and social services are much amplified. Finally, a strong negative impact on cooperatives emerges.

For polarization, not only its positive impacts on insurance and cooperatives rise greatly, but also new significant positive effects on governance (and social services at the 10 per cent level) appear. Thus, ethnic polarization, calculated within each community, is positively associated with individual participation for all categories of local groups, except for infrastructure and security. In particular, participation in cooperatives is much in highly polarized communities. This suggests the presence of strategies of ethnic group capture of some activities in contexts of fierce ethnic competition. Ethnic or social groups may find it advantageous to specialize in specific activities linked to their economic or political backgrounds. Alternatively, some groups may be better positioned to access some of these social benefits, perhaps because of better network access, localization, or information. The results also suggest that risk sharing may be somehow favoured by ethnic polarization. Theoretically, this is consistent with competing ethnic groups having different aversions with respect to certain risks, perhaps because they specialize in distinct economic activities. This result is rather at odds with risk-sharing arrangements, often believed to be within ethnic group boundaries exclusively.

Note finally that ethnic inequality keeps the same kind of significant effects as when it was included alone. This is reassuring for the robustness of these effects. Ethnic inequality is found to have generally depressing effects on all participation except for mutual insurance groups, including against security risks. This is reminiscent of some results found for economic inequality for the United States and other countries, where ethnic fractionalization negatively affects civic engagement, investment in public goods, and delivery of public services, except that here it is the ethnic inequality that fulfils this function of hampering local development.

The changes generated by including all diversity variables together reflect the substantial correlations between ethnic diversity variables, and also economic inequality variables. This shows the importance of using complete specifications when analysing these phenomena. This is the

introduction of a relatively complete description of ethnic diversity variables, jointly with living standard and asset statistics, which allowed us to better show the roles of the fractionalization and polarization variables that had remained partly hidden by the missing variable bias. In the next sub-section we examine the correlates of ethnic inequality at the village level.

4.4 Correlates of ethnic inequality

Few authors have attempted to explain ethnic diversity as such. However, Michalopoulos (2012) explains the determinants of ethnic linguistic diversity within and across countries, with an emphasis on its geographical origin, measured by land quality and elevation.

Table 5 shows the results of panel regressions of the ethnic Gini coefficient of inequality over a broad set of village-level regressors. There are two specifications: fixed-effect and random-effect estimators. The result of the Hausman test for the common set of coefficients, with a *p*-value of 0.70, implies that the random-effect specification for panel regressions is preferred to the fixed-effect estimator. As a consequence, we mostly comment on the more efficient random-effect results.

Table 5: Panel fixed-effect and random-effect regressions of ethnic inequality at community level

Variables	FE	RE
Proportion female	−0.0802 (0.081)	−0.104* (0.058)
Proportion farm households	−0.0431 (0.036)	−0.0744*** (0.016)
Proportion business households	−0.00333 (0.028)	−0.0127 (0.020)
Proportion female heads	−0.127** (0.056)	−0.150*** (0.043)
Mean household size	0.0244*** (0.0057)	0.0242*** (0.0037)
Proportion shocked	−0.0337* (0.018)	−0.0309* (0.016)
Proportion migrants	0.0263 (0.016)	0.0348** (0.015)
Mean per-adult-equivalent consumption	0.000323*** (0.000028)	0.000334*** (0.000026)
Mean asset value	−7.12e−11 (6.81e−11)	−1.12e−10*** (4.15e−11)
Total population	−0.00156 (0.0036)	0.0010756 (0.002703)
Constant	0.0124 (0.052)	0.0400 (0.039)
Number of communities	311	311

Standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Source: author's calculations, based on data from the IFLS.

Interestingly, when included, the village-mean participation variables (lagged in 1997 so as to attempt to explain ethnic variables in 2000 with limited endogeneity) have no significant effects on ethnic inequality, or on other ethnic diversity variables, except perhaps sometimes for security groups. Accordingly, we did not include these variables and we discuss the results for the other covariates. Explaining ethnic inequality is hard. Many attempted covariates, which are village-level variables, have non-significant coefficients in both specifications. This is the case for the

percentage of business households, proportion of migrant households, rural dummy variable, or total population of the village, for example. We now comment on the significant coefficients only.

The proportion of females in the surveyed persons within the village is negatively related to ethnic inequality, as is the proportion of female household heads. Although mechanisms are elusive at this stage of data analysis, it seems that female presence, including in power positions, may be more conducive to equity among ethnicities. Another demographic characteristic seems to be important: household size. The bigger the households in the village, the higher the ethnic inequality.

There seems to be some connections between ethnic inequality and the prosperity of the village, although it is unclear which precise mechanisms they may correspond to. An agricultural orientation of the village, measured by the proportion of farming households, appears to be negatively associated with ethnic inequality. The mean per-adult-equivalent consumption and the mean level of assets are significantly correlated with ethnic inequality, respectively positively and negatively. At the 10 per cent level, the percentage of households having suffered a severe shock seems to have a positively effect on ethnic inequality.

5 Conclusion

In this paper we examine ethnic diversity in Indonesia and how it interferes with community activities at the turn of the millennium. Looking at these interactions informs us about hidden mechanisms and determinants of local collective action in the Indonesian context, notably the roles of ethnic solidarity and opposition.

At the national level, we find high levels of economic inequality, measured from household asset values or consumption expenditure. In contrast, the levels of ethnic diversity, while non-negligible, are much lower, whether they reflect fractionalization, polarization, or ethnic inequality based on individual living standards. We observe a surge of all ethnic inequality indicators after 2007, following the economic crisis. Ethnic inequality indicators based on education levels are much lower and decreasing, suggesting that education laws in Indonesia act as levellers across ethnicities as well as across other groups.

At the village level, ethnic diversity variables are rather strongly correlated, as are the economic variables of mean wealth or economic inequality. Weaker, but still salient, links remain between those economic and ethnic variables. These relationships raise the question of whether all these variables should not be included in equations determining socioeconomic outcomes, in case of omitted variable bias.

Accordingly, we incorporate simultaneously all relevant economic and ethnic distribution variables in panel data models of individual participation in community activities. Participation is found to be greatly determined by local patterns of ethnic diversity. Different dimensions of ethnic diversity that generate distinct effects can be identified. Ethnic polarization stimulates participation in strategic activities, supporting the occurrence of group capture of these activities. Instead, ethnic fragmentation and ethnic inequality tend to depress most local activities.

Average village wealth greatly increases participation in governance and social services, while asset inequality decreases participation in cooperatives. Ethnic fragmentation strongly and negatively affects governance, social services, and cooperatives, as does ethnic inequality, except for mutual insurance. Ethnic polarization stimulates governance, social services, insurance groups, and

cooperatives. This suggests possible attempts of group capture of these activities, or ethnic specialization.

Finally, we provide tentative explanations of local ethnic inequality in regressions that show a mixed pattern of socioeconomic influences. Among intriguing correlates related to lower ethnic inequality are the local presence of female individuals and female heads, or the proportion of farm households. Conversely, areas with higher mean living standards are generally associated with higher levels of ethnic inequality.

Better understanding of ethnic inequality and its link with socioeconomic activities at the village level in Indonesia is important for policy. As a consequence of the 1997 financial crisis and the global slowdown in economic activity, the living standards of the poor and vulnerable households in Indonesia slumped in the studied period. In an attempt to alleviate these shocks, the Indonesian government implemented reforms, including stabilization plans, which severely impacted poverty, inequality, and other social dimensions. Equity of policies across ethnic groups is a crucial issue in this context.

Dhalber et al. (2012) have shown that generating these policies may be a challenge even for purely income-distributive policies. This is because preferences for redistribution may follow ethnic divisions, as also noted by DasGupta and Kanbur (2007). As a matter of fact, extreme ethnic divisions may even generate violent conflict, as analysed by Esteban and Ray (2011).

What we found is that equalizing and unequalizing policies may also have unexpected consequences for local community activities, including public goods, public services, and local insurance systems. Clearly, more research is needed to disentangle these complex interactions and to free the analyses of simplifying prejudiced policy conclusions.

For example, diverse policies should be investigated for transfer systems, eliciting the gains in reducing tensions across ethnic groups. Added to a growing sensitivity in Indonesia to corruption issues, this situation increases the political demands of populations for fairer and more efficient policy dealing with community and ethnic issues. However, within the framework of communal activity participation, such policies in ethnically polarized contexts may imply lower participation in most community activities. Thus, a tentative conclusion for analysts is to systematically separate 'ethnically polarized' situations from 'ethnically unequal' settings, which may correspond to opposite effects on civic participation.

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