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Inequality, ethnicity, and social cohesion

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WIDER Working Paper 2017/204

Inequality, ethnicity, and social cohesion

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Abstract: How do changes in socio-economic inequality between ethnic groups affect interethnic ties in a divided society? I analyse the evolution of cross-ethnic marriages in a society affected by violence along ethnic boundaries and make three principal findings. First, as inequality between ethnic groups increases, the prospects of interethnic marriages decline. Status equalization between ethnic groups promotes cross-ethnic ties. Insofar as intermarriage indicates social cohesion, reducing ethnic inequality in multiethnic societies may facilitate ethnic integration. Second, the effect of ethnic inequality is not uniform across ethnic groups. Endogamy remains high among certain groups even when socio-economic disparities diminish. I suggest this is because the ethnic norms and sanctions proscribing outmarriage are particularly powerful within these groups. Third, the social and political salience of ethnic boundaries may be distinct. Intermarriages can increase even as civil war violence intensifies. Ethnic divisions risk being overstated by assuming political attitudes also drive choices in the social sphere. I establish these findings in the deeply-divided society of Mindanao in the southern Philippines by analysing over 6.2 million marriages and comparing individual-level census data for the years 2000 and 2010. Mindanao is home to a longstanding insurgency, waged by rebels drawn from the native Muslim Moro population resentful of their minoritization and dispossession by Christian settlers.

Keywords: Inequality, ethnicity, violent conflict, intermarriage, social cohesion, Philippines
JEL classification: D63, I24, D74, Z13

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1 Introduction

In an ethnically-divided society, do interethnic ties improve when socio-economic inequalities between ethnic groups decline? The relationship between ethnicity and socio-economic status constitutes a cardinal question in the social sciences. As fundamental forms of social stratification, each has the potential to create powerful boundaries constraining social interaction and the formation of cross-group ties. An expanding corpus of empirical work has examined the impact of the coincidence of socio-economic and ethnic boundaries on a variety of aggregated outcomes: civil wars (Cederman, Weidmann, & Gleditsch, 2011; Østby, 2008), public good provision (Baldwin & Huber, 2010), and democratic breakdown (Huber & Suryanarayan, 2015). In this paper I extend this work to consider the effect of socio-economic inequality between ethnic groups at the micro-social level. What impact does one ethnic group's socio-economic ascendancy over another have on interpersonal ties across ethnic boundaries? Conversely, what happens to the formation of cross-ethnic ties when ethnicity and socio-economic status cross-cut, that is when upper and lower classes exist in each ethnic group?

I examine how the relationship between ethnicity and socio-economic status affects interethnic ties by analysing the impact of changes in ethnic inequality on *marriages* across ethnic boundaries. When ethnicity and socio-economic status reinforce each other in society, ethnic inequality is high. When they intersect, it is low. I examine ethnic inequality's impact on intermarriage in the context of a deeply-divided society where ethnic boundaries have been deeply inscribed by violence. Intermarriage is a powerful indicator of the quality of interethnic relations. At the individual-level, it is a readily-observable behavior and is indicative of a clear and stable social preference. At the societal level, intermarriage between two ethnic groups reflect the social distance between them. The extent to which groups are willing to accept marriages outside of the group is indicative of the strength of the social norms and sanctions within the group. Changes in intermarriage levels then are a useful barometer of the state of intergroup relations.

In this paper I consider how changes in socio-economic differences between ethnic groups affect intermarriages in a conflict-affected society. I make three principal claims. First, as socio-economic disparities between ethnic groups decline, I find intermarriages increase across localities. Insofar as intermarriage is indicative of social cohesion, reducing ethnic inequality has the potential to foster good ethnic relations. The coincidence of socio-economic and ethnic boundaries, by implication, is an obstacle to ethnic integration. Second, ethnic groups differ in their sensitivity to changes in their relative socio-economic status. Although some groups become more likely to intermarry as ethnic inequality declines, others remain impervious to the equalization of status and continue to inmarry. The social norms and sanctions proscribing outmarriage are stronger in some groups than in others. Third, I suggest the social salience of ethnic boundaries is distinct to their political salience. Even in a society affected by war, intermarriages can increase in the face of an intensification of violence. We should not overstate ethnic divisions by assuming political attitudes also drive choices in the social sphere.

I establish these findings in the context of Mindanao, an ethnically diverse and deeply-divided society in the southern Philippines that has been the location of a long-running insurgency. The war has been waged by rebel groups drawn from the indigenous Muslim Moro group resentful of their minoritization and dispossession by the influx of Christian settlers from outside of the region. I examine intermarriages between these two groups and also with a third group, the Lumad, Mindanao's other indigenous minority group, using census micro-data from 2000 and 2010. The paper proceeds as follows. Section 1 presents the theoretical framework; section 2 describes the research design, data, and methods; section 3 presents the results; and section 4 discusses and concludes.

2 Theoretical framework

As forms of social stratification, both ethnicity and socio-economic status represent potential boundaries to interaction and tie-formation across group lines. Consistent with the well-established homophily principle (McPherson, Smith-Lovin, & Cook, 2001), individuals from the same socio-economic status and individuals of the same ethnicity generally prefer to associate with each other. Educational homogamy and ethnic endogamy, for instance, are both well-established empirical regularities (Blossfeld, 2009; Rosenfeld, 2008). However, intra-group ties based on ascriptive characteristics such as ethnicity, race, caste, and religion tend to be stronger than those based on non-ascriptive markers such as class and ideology (Neckerman & Torche, 2007). As social forces that promote within-group over between-group solidarity then, ethnicity and socio-economic status are potentially sources of social divisions. Cross-group ties consequently hold the potential to moderate these divisions. Such bonds are among the fundamental sources of bridging social capital (Robert D Putnam, 2000) and in the case of cross-ethnic ties, theories of ethnic cooperation and conflict emphasize their importance to social stability and peaceful coexistence (Laitin & Fearon, 1996; Varshney, 2001).

Unlike socio-economic status, ethnicity is a nominal rather than ordinal social category. Ethnic differences then represent simply diversity or heterogeneity in society. As such, the macrosociological theory suggests that greater heterogeneity should—as a matter of structural opportunity—lead to greater social interaction (Blau, 1977). Empirically, however, a significant body of research suggests the converse is true. Ethnic diversity or fragmentation is linked to lower trust both within and across groups and generally to lower social capital in societies (A Alesina & La Ferrara, 2000; Robert D. Putnam, 2007). It is also associated with an ever-expanding list of other undesirable political and economic outcomes, outside of this paper's scope, including the under-provision of public goods, weak economic growth, and civil war.

In contrast, socio-economic status is an ordinal or graduated social category. The existence of a lower, middle, and upper class, for instance, represents a ranked stratification of society. Differences in socio-economic status—indicated by education, occupation, or income—create inequalities in societies (Blau, 1977). A small upper class and large lower class implies high socio-economic inequality within society. Empirical research suggests an association between rising income inequality and declining social capital, specifically lower trust and lower civic participation (Alberto Alesina & La Ferrara, 2002; Costa & Kahn, 2003). As with ethnic diversity, socio-economic inequality is also associated with a large host of societal ills and negative political and economic outcomes.

Given the distinct effects of ethnic and socio-economic differences on social relations, an evident question arises as to their effect when these differences coincide and when they cross-cut. Macro-sociology suggests that reinforcing cleavages—such as when ethnic and socio-economic boundaries coincide—increase the social distance between groups. The effect is to discourage interaction across group lines. This consolidation or reinforcement effect arises when two nominal parameters or dimensions of difference coincide such as ethnicity and religion. However, the effect should, in theory, be stronger when it involves a nominal and ordinal parameter such as ethnicity and socio-economic status. The overall distance would comprise both the cultural distance and the socio-economic distance between the two groups. It is worth noting that, again in theory, the effect would also be greater as the number of coinciding dimensions or differences increase. Multi-dimensional differences are possible. Thus if one group shared one ethnicity, religion, and language – three dimensions - and a second group shared a distinct ethnicity, religion, and language, the boundary between the two groups would be strong and the distance great (Selway, 2011). Conversely, when ethnic and socio-economic differences intersect to create a cross-cutting

cleavage in society, the distance between groups theoretically should decrease and social interaction become more likely.

When two dimensions of difference involve a nominal and ordinal parameter such as ethnicity and socio-economic status, the extent to which they reinforce or cross-cut each other is conceptually equivalent to measuring ethnic inequality. The more the two parameters reinforce each other, the greater the ethnic inequality; the more they cross-cut, the lower the inequality. The concept in fact exists, under different names, across a disparate set of literatures: horizontal inequality in the literature on civil wars and under-development (Cederman et al., 2011; Stewart, 2010), between-group inequality in relation to public good provision (Baldwin & Huber, 2010), and ranked/unranked ethnic groups in one theory of ethnic conflict (Horowitz, 1985). The breadth of research reflects the mounting recognition of the potential explanatory power of inequality between groups.

Empirical research on the effect on interethnic relations of ethnic inequality (and its conceptual equivalents) is, however, surprisingly limited. Some evidence suggests *racial* income inequality is associated with lower levels of trust (Tesei, 2017). Other scholars, however, have debated whether the lower trust is attributable to racial diversity rather than racial inequality in society (Portes & Vickstrom, 2011; Robert D. Putnam, 2007). I examine the effect of ethnic inequality on another important indicator of the quality of cross-ethnic relations: intermarriage. Intermarriages create durable ties at the interpersonal level, often across socially-proscribed boundaries. They bring together not only two individuals, but also potentially two social networks. Furthermore, the children of intermarriages help blur the sharpness of the boundaries between groups. As such they are a useful and potentially more reliable marker of the state of intergroup relations than attitudinal measures. In addition, intermarriage, through the assimilation of one partner to the other's culture, is believed to facilitate social integration under certain conditions (Song, 2009). As such, it is also a useful marker of social cohesion in diverse societies.

Sociological theory conceptualizes intermarriage as a function of individual preferences, social norms and sanctions, and structural opportunities in the marriage market (Kalmijn, 1998). Once structural opportunities are taken into account (for instance the size and geography of groups), the strength of individual preferences and social norms and sanctions will reflect the overall social distance between groups. In the context of interethnic relations, I distinguish between social norms and social sanctions. Social norms refer to group expectations for attitudes and behaviours that individuals have internalized. They *willingly* accept them. In contrast, social sanctions refer to the enforcement of these expectations by one's co-ethnics. Enforcement occurs irrespective of individual wishes. Since preferences, when aggregated, may reflect social norms individuals have internalized, social sanctions may be a better gauge of the overall social distance between groups. Individuals who defy group expectations and cross-ethnic boundaries risk stigmatization, ostracization, and even threats to their physical well-being. As these sanctions vary in their severity, they will also affect the ethnic distance between groups.

3 Research design

3.1 Case selection: Mindanao, the Philippines

I examine the relationship between ethnicity and socio-economic status in the context of Mindanao, the southernmost of the three major island groups that make up the Philippines. The region is home to nearly 22 million persons who together form a society that is deeply-divided into three dominant ethno-religious groupings: the Moro, the Lumad, and the Christian settler

community. Moro refers to the collective identity of the several Muslim tribes native to Mindanao, Lumad is the overarching identity of those indigenous minority groups who do not identify as Moro, and the grouping Christian settlers describes the migrants to the region from the two more northern island groups who now form the numerical majority in Mindanao.

Spanish colonial conquest in the 16th century had impressed Catholicism upon the Philippines' two northern island groups, Luzon and Visayas. Mindanao in the south, by contrast, was deeplyinfluenced by Islam brought by Arab traders starting in the 14th century (Majul, 1973). Islamic influence manifested itself not only in the religious conversion of much of the native population, but also in the establishment of several autonomous Islamic political authorities, Sultanates, in the region. Spain's attempts to incorporate Mindanao into the Spanish Philippines encountered resistance in a series of wars with the Moro lasting nearly three centuries. It was only following Spain's military defeat and cession of the Philippines to the United States in 1898 that a period of comparative order prevailed in Mindanao. This was largely due to American accommodation of local Muslim political elites (Abinales, 2010). However, the new colonial administration also made the historically consequential decision to launch an ambitious resettlement initiative that would sow the seeds of Mindanao's post-independence wars.

After independence in 1945, the new Philippines' government expanded the resettlement program and encouraged even more inhabitants from the over-populated northern island groups to migrate to Mindanao. The effect was to minoritize Mindanao's native population. It also exacerbated the native sense of dispossession as the government continued the mandatory land registration policy introduced during American colonial rule (McKenna, 1998). The Moro and Lumad found themselves increasingly marginalized in their own lands.

It was resentment of their diminished status that would inspire the Moro to launch several armed separatist movements in the post-colonial era. The Moro National Liberation Front (MNLF) waged an insurgency, peaking between 1972-76, that claimed between 50-100,000 lives (Ahmad, 2000). The war resulted in an agreement to establish the Autonomous Region of Muslim Mindanao (ARMM) in 1991. However, a breakaway rival, the Moro Islamic Liberation Front (MILF), rejected this agreement and continued its armed rebellion against the Filipino state. The MILF separately achieved their own peace deal in 2014 to replace ARMM and to establish the 'Bangsamoro Political Entity.' However, at the time of writing, the future status of the agreement remains uncertain. What is more certain, however, is that the differences between the Christian settler population and minority Moro and Lumad remain unreconciled. Mindanao's ethnic divisions remain deep and persistent.

3.2 Data

The data are drawn primarily from the Philippines national censuses of 2000 and 2010. Unusually for a population census, the data were released for all households in the country providing extraordinarily rich micro-data and eliminating the risk of under-sampling rare events such as marriages across deeply-inscribed social boundaries. For Mindanao this meant data were available on 18.3 million individuals in 2000 and 21.9 million individuals in 2010. Altogether the two censuses recorded 6.2 million marriages. As the data were released at the individual level, variables could be constructed down to the lowest administrative level. In the year 2000, Mindanao administratively comprised 6 regions, 25 provinces, 430 municipalities, and 10,019 *barangays*. As administrative boundaries changed in the intervening decade, I aligned the 2010 data to correspond with the 2000 boundaries.

3.3 Empirical approach

In addition to reporting simple statistics on absolute and relative frequencies, I draw on two other techniques to examine the change in intermarriages between 2000 and 2010. First, I calculate endogamous odds ratios for both years. Odds ratios indicate the odds of marrying within one's group relative to the odds of marrying outside the group. A higher odds ratio indicates a higher level of endogamy. Odds ratios offer the advantage over simple proportions of taking into account the relative sizes of groups which affect the structural opportunity to intermarry. Odds ratios are given by the following formula:

$$\text{Odds ratio} = \left[\left(\frac{p_1}{1-p_1}\right) / \left(\frac{p_2}{1-p_2}\right) \right] \quad (1)$$

Second, I conduct a time series analysis to identify the determinants of changes in the proportion of intermarriages between 2000 and 2010 within localities in Mindanao. Changes in intermarriages are examined within the smallest administrative locality possible: the *barangay*. I employ a fixed effects model which minimizes bias arising from potentially omitted variables by examining the changes *within* a given locality over time (rather than *across* localities), thereby holding constant any locality-specific effects that do not change over time. While such models take care of unobserved heterogeneity attributable to locality characteristics that are time-invariant, two cardinal assumptions are that the model includes all other time-varying determinants and that these determinants do in fact vary over time. Appropriate model specification then is essential to ensure unbiased estimates of the determinants.

3.4 Variable construction

I employ as the dependent variable the number of intermarriages as a proportion of all marriages, both endogamous and exogamous, in a given locality. Strictly, as this is an analysis of longitudinal data, I am examining the *change* in the proportion of intermarriages between 2000 and 2010. The explanatory variable of principal interest is ethnic inequality. To measure inequality between ethnic groups (INEQUAL), I employ the Coefficient of Variation, weighted for the size of each ethnic group, given its simple and intuitive interpretation (Mancini, Stewart, & Brown, 2008). It compares the difference between each ethnic group's mean with the population mean on the quantity of interest (socio-economic status here) and takes into account the size of each group. It is given by the following formula.

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

where y is the quantity of the variable of interest; $\bar{y}_r$ is the mean value of y for ethnic group r; $\bar{y}$ is the mean value of y for the population, R is the number of ethnic groups; and p_r is ethnic group r's proportion. The variable is scaled from 0 to 1 where 0 represents perfect equality between groups. I construct both an aggregate measure capturing inequality between all ethnic groups as well as individual measures for each ethnic group separately. Thus, in addition to the aggregate measure, there would be separate variables capturing inequality between Christian settlers and all who are not Christian settlers; between Muslim Moro and all who are not Muslim Moro; and Lumad and non-Lumad.

Consistent with the classic theoretical model of intermarriage in sociology (Kalmijn, 1998), I control for the structural opportunities to intermarry provided in the marriage market. Becker first proposed the idea of a market for marriage in which individuals compete to win partners in

accordance with their individual preferences. I include variables to capture two dimensions of the marriage market: first, the pool of available marriage partners from different ethnic groups (POOL) and second, the spatial segregation of ethnic groups (SEGREG). POOL is measured first for all ethnic groups using a well-known heterogeneity measure based on the Herfindahl index and second for each ethnic group separately using simply their proportion of the population. The heterogeneity measure captures the likelihood that two individuals chosen at random would be from different ethnic groups and is given by the following formula where *p* represents the proportion of ethnic group, *i*:

$$\text{Ethnic diversity} = 1 - \sum_{i=1}^{n} p_i^2 \qquad (3)$$

The spatial segregation of ethnic groups is measured using the well-known index of dissimilarity (Massey & Denton, 1988). Conceptually, the index measures the percentage of one group who would have to change their geographic sub-division (Filipino *barangay*) in order to create an even distribution throughout the larger geographical unit (Filipino *municipality*). It is given by the formula:

$$\text{Segregation (dissimilarity index)} = \sum_{i=1}^{n} [t_i |p_i - P| / 2TP(1-P)] \qquad (4)$$

where t_i and p_i are the total population and group proportion of the geographic sub-division (barangay), *i,* and T and P are the population size and group proportion of the larger geographical unit (municipality) under comparison. The index is scaled from 0 to 1 where a higher score indicates a higher level of segregation. Given the possibility that individuals move to localities where intermarriages are high (or low), thereby confounding preference and opportunity, I control for such movements by including the proportion of migrants, defined as those who moved into a locality within the last 5 years, in the model (MIGRANT). Lastly, I include as control variables the population density (POPDEN) and two indicators of the locality's socio-economic status: the mean education (EDUC) and poverty (POOR) level. A locality's poverty level is measured by the proportion of households defined as poor using the criteria established in the Philippines National Household Poverty Survey.

4 Results

4.1 Descriptive analysis

Insofar as intermarriage is indicative of social integration, Mindanao is a deeply-segregated society. The proportion of intermarriages is small. Only 2.7 per cent of the 2.7 million marriages in existence in 2000 were across ethno-religious boundaries. However, this aggregate statistic obscures important variation between ethnic groups, and also differences between men and women. In ethnic terms, the Muslim Moro are the most socially closed of the three groups. They have the smallest percentage of exogamous marriages (about 1.5 per cent in 2000) and, more tellingly, they have the highest endogamous odds ratios (19,543 in 2000). The odds ratios are the more informative statistic because they take into account the relative size of groups and thus control for some of the group's opportunity to outmarry. In contrast, the Lumad are the socially most open group. Some 13 per cent of all Lumad were married to non-Lumad individuals in 2000 and the endogamous odds ratio was very low (562 in 2000). Christian settlers occupy a position on a scale of social openness in-between the Muslim Moro and the Lumad with an endogamous odds ratio of 1095 in 2000. Table 1 summarizes these simple statistics.

Table 1. Marriages in Mindanao by ethnicity and gender in 2000 and 2010

	Year	Christian Settler Male	Christian Settler Female	Muslim Moro Male	Muslim Moro Female	Lumad Male	Lumad Female
All marriages	2000	1,941,128	1,941,065	529,987	526,234	225,519	229,388
	2010	2,269,002	2,258,145	756,940	749,343	442,741	461,392
All endogamous marriages	2000	1,905,738	1,905,738	520,394	520,394	198,150	198,150
	2010	2,178,432	2,178,432	734,643	734,643	379,234	379,234
All exogamous marriages	2000	35,390	35,327	9,593	5,840	27,369	31,238
	2010	90,570	79,713	22,297	14,700	63,507	82,158
Endogamous marriages as % of all marriages within grp.	2000	98.18	98.18	98.19	98.89	87.86	86.38
	2010	96.01	96.47	97.05	98.04	85.66	82.19
Exogamous marriages as % of all marriages within grp.	2000	1.82	1.82	1.81	1.11	12.14	13.62
	2010	3.99	3.53	2.95	1.96	14.34	17.81
Endogamous odds ratio for all marriages	2000	1,095	1,095	19,543	19,543	562	562
	2010	336	336	5733	5733	212	212

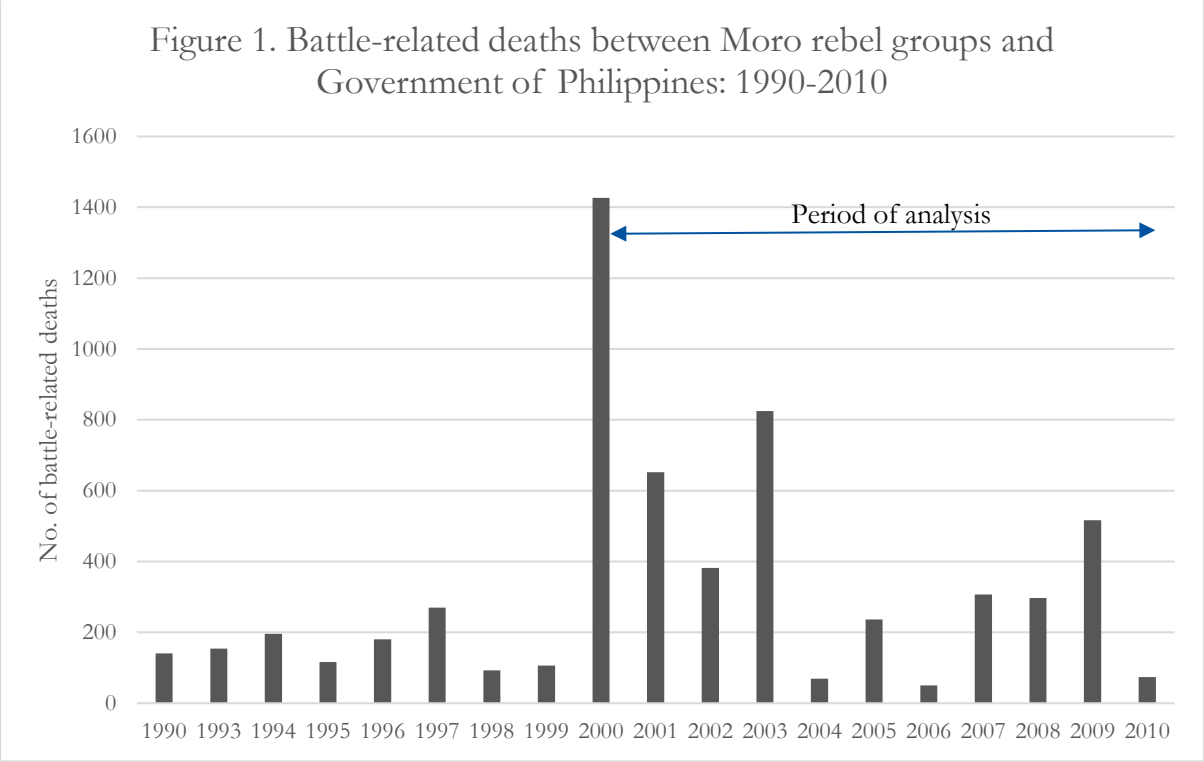
Source: Author-compiled data based on Philippines census data.

This variation between groups likely reflects the strength of social forces—ethnic norms and sanctions—operating within each group. For the Moro, powerful religious institutions enforce boundaries and socialize members. The religious leadership (*ulamaa*), religious establishments (mosques), and religious schools (*madrassahs*) all work to protect the distinct identity of the group. In contrast, the Lumad are a more religiously diverse group comprising primarily Christians, but also Muslims and adherents of tribal religions. Among Lumad Christians there is further diversity as this sub-group includes Roman Catholics and followers of numerous Protestant denominations. As such the Lumad lack the unified set of formal institutions enjoyed by the Moro and the group's social borders are, by comparison, weakly protected.

In terms of gender, among Christian settlers and Muslim Moro women are less likely to marry outside of the group than men. One explanation for this difference is that these groups are more protective of women and strongly sanction outmarriage for them because ethnicity is conventionally patrilineal in Mindanao. The children of exogamous unions would assume the identity of the father. It is noteworthy that this sexual policing is much weaker among the Lumad where women are, contrarily, more likely than Lumad men to outmarry. This is consistent with the earlier suggestion that the Lumad have much weaker social institutions and sanctions in force within the group. Lumad women consequently may enjoy more freedom in their choice of life-partner.

Although intermarriage is rare in Mindanao, there is cause for cautious optimism. The trend in intermarriage is positive. Between 2000 and 2010, both in aggregate and across all groups individually, intermarriage has been increasing. In 2000, intermarriages represented 2.7 per cent of some 2.7 million marriages. In contrast in 2010 it had reached 5.1 per cent of some 3.5 million marriages. This amelioration in cross-group ties is confirmed in the improved endogamous odds ratios across all three groups. Again, as with the cross-sectional perspective above, there is variation between ethnic groups. The largest improvement observed is among the Muslim Moro. The odds ratio for the Moro declined from nearly 20,000 to just under 6,000 in the intervening decade. Christian settlers had the next greatest gain. Lastly, the Lumad exhibited the smallest change in absolute and relative terms. These differences partly reflect the very different starting points of each group. The Moro were already very socially conservative; the Lumad in contrast were already highly open as a group. The Lumad consequently had comparatively less gain to make in their intermarriage levels.

Surprisingly, this uptick in intermarriages coincided with an uptick in violence in Mindanao's civil war. In 2000, then President of the Philippines, Joseph Estrada, ended a ceasefire to engage in a what he termed 'all-out war' against the Moro Islamic Liberation Front, one of the principal insurgent groups operating in Mindanao. As Figure 1 illustrates, the result was a dramatic spike in the violence in 2000 followed by a period of violence at a higher intensity level than in the previous decade. Despite this, during this same period Moro, Lumad, and Christian settlers intermarried in greater numbers than before. As noted earlier, the increase was greatest among the Moro and smallest among the Lumad in terms of changes in odds ratios. There was also, however, variation between men and women. The relative percentage change in outmarriage was greater for women than men for both the Moro and Lumad. However, conversely, it was smaller for Christian settlers. One interpretation is an increase in the independence of Moro and Lumad women. Across all three groups, however, the differences between men and women are small in absolute terms. It would be imprudent to infer that a closing of the gap between men and women in their outmarriage levels necessarily implies an increase in female empowerment.



Source: Author-compiled graph using Uppsala Battle-Related Deaths dataset, 2016

What then accounts for the improvement in intermarriage levels between 2000 and 2010? Descriptively, the observed overall increase in intermarriages coincides with improvements made in aggregate education, poverty, diversity, and segregation levels in Mindanao in that decade. Table 2 summarizes the change over time in these variables. As described previously, theory predicts all four factors should have an effect on intermarriage levels. There are, however, again important differences between the Moro, Lumad, and Christian settlers in several of these areas that reliance on aggregate measures obscures.

Table 2. Descriptive statistics on dependent and independent variables for 2000 and 2010

	YEAR	Settler male	Settler female	Moro male	Moro female	Lumad male	Lumad female
INTERMARRIAGE	2000	1.82	1.82	1.81	1.11	12.14	13.62
Intermarriages as % of all marriages	2010	3.99	3.53	2.95	1.96	14.34	17.81
INEQUAL AGG	2000			0.13			
Inequality between all groups	2010			0.13			
INEQUAL	2000	0.12	0.12	0.06	0.06	0.11	0.11
Inequality for groups individually	2010	0.13	0.13	0.07	0.07	0.09	0.09
EDUC AGG	2000			2.18			
Mean education for all groups	2010			2.58			
EDUC	2000	2.34	2.34	1.91	1.91	1.43	1.43
Mean education of each group	2010	2.80	2.80	2.20	2.20	1.98	1.98
POVERTY	2000	12.11	12.11	12.11	12.11	12.11	12.11
% of households in poverty	2010	9.62	9.62	9.62	9.62	9.62	9.62
POOL AGG	2000			0.46			
Ethnic diversity	2010			0.53			
POOL	2000	29.62	29.62	79.21	79.21	89.84	89.84
Size of other groups combined (%)	2010	36.55	36.55	77.70	77.70	85.70	85.70
SEGREG AGG	2000			0.61			
Segregation of all groups	2010			0.56			
SEGREG	2000	0.78	0.78	0.88	0.88	0.77	0.77
Segregation for groups individually	2010	0.72	0.72	0.86	0.86	0.71	0.71
MIGRANT	2000			0.28			
% of migrants within last 5 years	2010			0.94			
POPDEN	2000			179.04			
Persons/sq.km.	2010			218.01			

Source: Author-compiled data based on Philippines census data

In terms of socio-economic status, indicated by educational and poverty levels, Christian settlers enjoy the highest rank of the three groups, the Moro occupy an intermediate status, and the Lumad are at the bottom as the most marginalized group in Mindanao. For instance, on a 5-point educational scale, Christian settlers on average had 2.34 units of education in 2000 whereas the Moro and Lumad had only 1.91 and 1.43 units respectively. The EDUC variable was constructed to reflect substantial and meaningful differences in educational attainment levels where (1) signified no education; (2) some or completed primary education; (3) some or completed secondary education; (4) some or completed post-secondary or vocational education; and (5) some or completed college education or higher academic degree. The differences then in the educational scores for each ethnic group is suggestive of high between-group inequality in Mindanao. In terms of change *over time* all three groups exhibited improvements in educational levels between 2000 and 2010. However, it is the Lumad who make the largest gains in relative terms. The Lumad educational attainment level increases by 38.5 per cent to an average of 1.98 compared to 19.7 per cent and 15.2 per cent increases for Christian settlers and Muslim Moro respectively. This change goes some way to equalizing educational status in Mindanao and thus reducing between-group inequality. However, in absolute terms the socio-economic hierarchy of Christian settlers, Muslim Moro, and the Lumad remains unchanged.

The opportunity for outmarriage in Mindanao, indicated by ethnic diversity and spatial segregation levels, also improved between 2000 and 2010. Ethnic diversity, defined here as the probability that two individuals chosen at random would be from different ethnic groups, increased from 0.46 to 0.53. Aggregate segregation levels, taking into account all three groups, conversely decreased from 0.78 to 0.72. Both changes made it more likely that individuals would have contact with persons from a different ethnic background to themselves. Again, there were differences between individual ethnic groups worth noting beyond the aggregate statistic. When segregation is measured in terms of individual ethnic groups—Moro segregation from non-Moro, Lumad from non-Lumad, and Christian settlers from natives—spatial integration indeed improves across each group individually. However, the improvement is smallest for the Moro. In contrast, the advance is substantively larger and of similar magnitude for the Lumad and Christian settlers. We would expect then the Moro to have the smallest increase in outmarriage levels attributable to improvements in their spatial integration levels.

Ethnic inequality, the explanatory variable of principal interest, is unequivocally high in Mindanao. INEQUAL, which is based on the Coefficient of Variation and which measures the difference between each group's mean education level and the population's mean educational level, shows an aggregate score of 0.13 in 2000. A score of 1.00 indicates perfect equality. However, reliance on an aggregate measure of inequality again conceals important variation between individual ethnic groups. When inequality between the Moro and non-Moro, Lumad and non-Lumad, and Christian settlers and natives is examined separately, it is apparent that ethnic inequality is highest for the Moro, followed by the Lumad, and lowest for Christian settlers. The aggregate measure also obscures important changes in inequality levels *over time* between groups. In both 2000 and 2010 INEQUAL was 0.13. This statistic, however, captures none of the important changes in the relative educational levels of each group that occurred in the intervening decade. When inequality is examined for each group individually, there is a deterioration for Christian settlers and Muslim Moro, but an improvement for the Lumad. This improvement for the Lumad is consistent with the descriptive data that showed a 38.5 per cent increase in the Lumad's average educational attainment level between 2000 and 2010. We would expect then the Lumad to have the largest improvement in outmarriage attributable to an improvement in ethnic inequality.

Table 3. Panel data analysis (fixed effects) of intermarriages in Mindanao, the Philippines, 2000-2010

	All groups Aggregated	Settler Males	Settler Females	Moro Males	Moro Females	Lumad Males	Lumad Females
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
INEQUAL	-0.10***	-0.30***	-0.20**	0.27	-0.06	-0.62***	-0.52***
	(0.03)	(0.06)	(0.06)	(0.20)	(0.20)	(0.17)	(0.16)
POOL	0.27***	0.42***	0.33***	0.49***	0.14	0.51***	0.42***
	(0.01)	(0.02)	(0.02)	(0.12)	(0.11)	(0.06)	(0.05)
EDUC	0.00	-0.02	-0.04**	0.02	-0.01	0.01	0.03
	(0.01)	(0.01)	(0.01)	(0.04)	(0.04)	(0.04)	(0.04)
POOR	-0.16***	-0.38***	-0.30***	-0.25	-0.59***	-0.35*	-0.58***
	(0.02)	(0.05)	(0.05)	(0.17)	(0.17)	(0.14)	(0.14)
POPDEN	-0.00	-0.00	-0.00**	-0.00	-0.00	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
SEGREG	-0.04**	0.03	0.04	-0.05	-0.05	-0.11	-0.12
	(0.01)	(0.03)	(0.03)	(0.10)	(0.10)	(0.06)	(0.06)
MIGRANT	0.53***	-0.12	0.04	1.26	2.52***	2.56***	2.42***
	(0.09)	(0.22)	(0.23)	(0.68)	(0.68)	(0.63)	(0.60)
Year 2010	0.01*	0.02**	0.03***	-0.00	-0.02	0.00	0.01
	(0.00)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)
F-test (model)	171.89***	102.94***	64.89***	3.79***	4.28***	19.28***	22.77***
DF	2,633	2,606	2,608	2,041	1,846	2,285	2,303
SSM	2.306	6.442	4.405	2.150	2.138	8.053***	8.773
SSE	4.416	20.385	22.130	144.798	115.340	119.312	110.924
SEE	0.041	0.088	0.092	0.266	0.250	0.229	0.219
F-test (FE)	2.30***	3.29***	2.96***	2.05***	2.40***	1.83***	1.94***
R^2	0.90	0.93	0.93	0.88	0.89	0.87	0.88
Adjusted R^2	0.67	0.79	0.77	0.59	0.63	0.57	0.60
N	8362	8162	8179	6907	6449	7458	7519

Notes: Statistical significance * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; standard errors reported in parentheses

Source: Author-compiled data based on Philippines census data.

4.2 Multivariate analysis

The panel data analysis corroborates some but not all the descriptive analysis above. I examine the simultaneous effect on intermarriage of changes over time in education, poverty, diversity, segregation, and ethnic inequality levels using fixed effects models to control for other, unobserved factors specific to individual localities that may also drive the outcome.

Improvements in the overall socio-economic status of Mindanaons between 2000 and 2010 had some positive effect on intermarriage levels. As the proportion of those in poverty declined, the proportion of all intermarriages increased, holding everything else constant (Model 1). Specifically, a 1 per cent increase in the proportion of poor households in a community decreased the proportion of intermarriages in that locality by 16 per cent. The substantive effect and statistical significance of declining poverty levels persisted when intermarriages for men and women of each ethnic group were examined individually (Models 2-7). Poverty hinders intermarriage. Moro men were the one exception for whom improvements in poverty levels had no statistically significant effect on their outmarrying (Model 4). In contrast with poverty, improvements in education had a more ambiguous effect on intermarriage. In the aggregate, that is for all intermarriages, EDUC had no statistically significant effect (Model 1). However, when disaggregated by gender and ethnicity, EDUC mattered for Moro and Lumad men and women but not for Christians settler women and only weakly for Christian settler men. This finding is consistent with the fact that Christian settlers were, by far, the best-educated ethnic group in Mindanao. A further increase in their average educational level would imply the social distance between them and the Moro and Lumad had become even greater, making outmarriage even more improbable. As Christian settlers were also by far the largest group in numerical terms in Mindanao, it is likely they are also driving the null finding in the aggregate model (Model 1) that examines all intermarriages.

Improvements between 2000 and 2010 in the opportunity for intermarriage in Mindanao also had some positive effect on outmarriage. As ethnic diversity (POOL) increased across individual localities, the proportion of all intermarriages in those localities also increased (Model 1). Specifically, a one unit increase in ethnic fractionalization increases the proportion of intermarriages by 27 per cent. Similarly, when men and women of each individual ethnic group are examined separately (Models 2-7), increases in the proportion of individuals from a different ethnicity resulted in increases in the proportions of outmarriages of individuals from each ethnicity, *ceteris paribus*. The one exception again were the Moro, this time Moro women, for whom increases in diversity had no statistically significant effect on their outmarrying. In contrast with diversity (POOL), spatial segregation (SEGREG) had no statistically significant effect on the outmarriage levels of men and women of individual ethnic groups. This is very likely due to the control for internal migration (MIGRANT) included in the model to account for individuals who move to localities where intermarriage is either already low or high in accordance with their preferences. The implication then is that ethnic settlement patterns may impact intermarriage more through preferences than through opportunities.

Ethnic inequality (INEQUAL), the variable of primary interest, also affects intermarriage. When measured in the aggregate, that is inequality between all three groups, there is a clear and substantial negative effect. As the overall level of ethnic inequality increases across localities in Mindanao, the proportion of all intermarriages in these localities declines. Specifically, a one unit increase in ethnic inequality reduces the proportion of intermarriages by 10 per cent. Consistent with the theoretical prediction then, as the social distance between ethnic groups grows smaller, the likelihood of marriage between these groups increases. If we disaggregate the aggregate measure by gender and ethnicity (Models 2-7), its effect continues to hold, *ceteris paribus*. Rising between-group inequality hurts the prospects of intermarriage. The Muslim Moro, however, are once again the exception.

There is no statistically significant effect for the Moro. They remain unaffected by the equalization of socio-economic status between ethnic groups. This is true of both Moro men and women. Ethnic inequality matters then, but more so for some ethnic groups than for others.

4.3 Robustness checks

I tested the sensitivity of these findings to variable construction and model selection. First, I defined socio-economic status using two alternate indicators: education and wealth levels. Education was originally constructed as a 5-point ordinal variable where each point reflects a distinct and meaningful level of educational attainment. However, I additionally test a 10-point educational variable distinguishing partially from fully attained educational levels. Wealth is constructed using the same criteria employed in the Philippines National Household Poverty survey. It uses the type and condition of an individual's housing to predict poverty status.

Second, regarding model selection, I conducted an F-test to determine whether there is a significant improvement in the goodness of fit when using a fixed effect instead of a pooled OLS model. The test failed to reject the null hypothesis that the group intercepts are zero. I infer then the existence of a significant fixed effect. I then conducted a Breusch-Pagan Lagrange multiplier test to compare a random effects model against a pooled OLS model. Again, the test fails to reject the null hypothesis that individual-specific error variance components are zero. I infer then there is also a significant random effect. As these tests point to the existence of both fixed and random effects, I finally conduct a Hausman test to determine which model is superior. The test is, however, inconclusive as the data fail to meet asymptotic assumptions. As a consequence, I report both fixed and random effects models. The latter appear in the Appendix (Models 8-14).

5 Discussion and conclusion

This paper provides empirical support for the power of inequality between groups to affect marriages between them. As socio-economic disparities between groups increase, the prospects of intermarriage decline. Between-group inequality represents a new and potentially important variable in the theorization of intermarriage. In an ethnically diverse society, insofar as cross-ethnic marriages may also promote social integration and stability, it implies that policies to reduce ethnic inequality have the potential to improve interethnic relations. From an integrationist perspective, the coincidence of ethnicity and socio-economic status in society then is an undesirable occurrence. The paper also points to opportunities in the marriage market whose importance for intermarriage is already recognized in sociological theory. The paper shows, however, that the effect of between-group inequality is distinct from the effect of such macro-structural opportunities. These findings suggest four concluding observations.

First, although the paper provides evidence that ethnic inequality affects interethnic relations, it does not investigate why this is the case. The causal mechanism remains unidentified. Conflict theory suggests one possible explanation. It points to the powerful negative emotions that socio-economic disparities between groups can inspire. In societies marked by high ethnic inequality, a marginalized ethnic group may feel aggrieved by their inferior socio-economic status and resentful of the more ascendant group. The dominant group may in turn feel pride in their superior status and disdain for the more lowly-ranked group (Horowitz, 1985). Together, these emotions operate to create social distance and to deter social interaction between groups. This causal logic has been expanded to explain individual-level motivation to marry in terms of an aspiration to optimize status (McDoom, 2016). An individual's overall socio-economic status is determined by both their

own personal status as well as their group's status. Both contribute to an individual's 'value' on the marriage market. Consequently, the motivation to optimize status may, for instance, explain why a highly-educated individual from a low status group would marry a lesser-educated individual from a high status group. They are exchanging personal for group status (Merton, 1941). If status optimization is the mechanism linking ethnic inequality and intermarriage, it would lend support to the importance of individual preferences rather than structural opportunities in the theorization of intermarriage.

Second, the findings suggest that ethnic groups differ in their sensitivity to the factors theorized to encourage or constrain intermarriage. It should not be presumed, for example, that an increase in the opportunity to outmarry will necessarily generate a uniform increase–or indeed an increase at all–in exogamous marriages across all groups. Similarly, reductions in ethnic inequality will not automatically result in more intermarriages for each and every group. Certain ethnic groups will be more indifferent to the equalization of socio-economic status than others. One explanation for why ethnic groups respond differently in such instances may lie in the variation in the strength of the social forces within each group. Social norms and sanctions operate to socialize and control group members. However, these forces are not equal across groups. In Mindanao, for instance, the findings suggest the existence of powerful norms and sanctions among the Muslim Moro in particular. The Moro were the only group for whom changes in ethnic inequality did not produce an effect. I suggested the strength of their religious institutions may, in part, account for Moro exceptionalism. However, the strength of their religious beliefs may also have a role to play; individual religiosity may affect perceptions of compatibility with a life-partner of a different faith. Both suggestions merit further empirical investigation.

Third, an important methodological implication of the previous point is that reliance solely on aggregate measures of societal characteristics risks obscuring meaningful differences between social groups and potentially misdirecting theory and policy. In this case, an aggregate measure capturing overall inequality between all ethnic groups in Mindanao suggested that reducing ethnic inequality would promote cross-ethnic marriage. However, when disaggregated measures were deployed, it was apparent this was not true of all ethnic groups. As noted previously, the Moro were unresponsive to changes in ethnic inequality, possibly due to the strength of their religious institutions and beliefs. This would imply the need for a different set of policy prescriptions to promote the integration of this particular group. The use of aggregate measures of between-group inequality is increasingly commonplace (Mancini et al., 2008). While such measures may usefully *describe* inequality within a society, their role in *explaining* outcomes within a society requires greater prudence. The same methodological caution may be warranted when using other measures that aggregate group characteristics such as those capturing segregation and diversity within societies.

Fourth, the counter-intuitive finding that intermarriages increased when violence in Mindanao's insurgency also increased suggests there is merit in distinguishing between the political and social salience of group boundaries. Mindanao's internal conflict is frequently framed in ethnic terms, typically through the use of the descriptor 'Moro.' This ethnic framing, however, potentially overstates the extent of the division by conflating the political and social spheres. It misleadingly assumes armed conflict will affect an individual's political and social attitudes in the same manner. Yet individuals may view the war primarily as a political dispute in which they are disinterested. Or they may view it as an 'ethnic conflict' but distinguish ethnic groups in the abstract from individual ethnic group members they personally or concretely know. In Mindanao the data suggest that the ongoing insurgency did not enter into the decisions of ordinary Mindanaons regarding their life-partners. Rather it appears that the social forces within the group–the social norms and sanctionsdrove these choices. Mindanao's ongoing insurgency is also a potentially important scope condition for the paper's findings in respect of ethnic inequality. It is rare to find empirical studies

of intermarriage outside of politically stable and economically-developed contexts. However, as divisions are typically deeper in conflict-affected societies, it would be reasonable to infer that inequality reduction would have a similar if not more powerful effect in promoting intermarriage in peace-time contexts as well.

Lastly, although this paper has confined itself to intermarriage, the question of socio-economic status and ethnicity's relationship underlies and links a diverse set of research fields that share a broad concern with improving societal relations. Sociologists have debated the role of racial inequality in the decline of social capital in the United States (Hero, 2003; Portes & Vickstrom, 2011). Normative theorists (Kymlicka, 1995) have argued that eliminating the disadvantages of ethnic minorities may promote social integration. Social psychologists (Allport, 1958; Hewstone & Swart, 2011) have hypothesized that prejudice declines when groups have contact under conditions of equal status. Political scientists have theorized that shifts in the relative socio-economic status of ethnic groups create anxieties that motivate ethnic conflict (Horowitz, 1985). Although not exhaustive, this enumeration is indicative of the growing recognition of between-group inequality's power to shape intergroup relations and underscores the importance of further research into its effects and its mechanisms.

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Appendix

Table A1. Panel data analysis (random effects) of intermarriages in Mindanao, the Philippines, 2000-2010

	All groups Aggregated	Settler Males	Settler Females	Moro Males	Moro Females	Lumad Males	Lumad Females
	(8)	(9)	(10)	(11)	(12)	(13)	(14)
INEQUAL	-0.23***	-0.63***	-0.69***	-0.70***	-0.62***	-1.24***	-1.06***
	(0.01)	(0.03)	(0.03)	(0.08)	(0.08)	(0.07)	(0.06)
POOL	0.25***	0.43***	0.43***	0.69***	0.58***	0.50***	0.52***
	(0.00)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
EDUC	-0.01***	-0.03***	-0.02***	-0.13***	-0.16***	0.01	0.01
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
POOR	-0.07***	-0.17***	-0.20***	-0.49***	-0.56***	-0.26***	-0.30***
	(0.01)	(0.02)	(0.02)	(0.06)	(0.07)	(0.05)	(0.05)
POPDEN	-0.00***	-0.00***	-0.00**	-0.00**	-0.00**	0.00	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
SEGREG	-0.08***	-0.04**	-0.00	-0.11***	-0.16***	-0.01	-0.04
	(0.01)	(0.01)	(0.01)	(0.03)	(0.04)	(0.03)	(0.03)
MIGRANT	0.61***	0.11	0.38**	1.46***	2.34***	1.39***	1.71***
	(0.06)	(0.15)	(0.15)	(0.40)	(0.40)	(0.32)	(0.33)
Year 2010	0.01***	0.02***	0.01***	0.07***	0.07***	0.04***	0.05***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)
N	8362	8162	8179	6907	6449	7458	7519

Notes: Statistical significance * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$; standard errors reported in parentheses

Source: Author-compiled data based on Philippines census data