

Development, social change and assortative mating: ethnic marriage pairing in Indonesia

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Summary

This paper stems from our ongoing work on marriage pairing patterns in terms of age, education, ethnicity, and religion in Indonesia. In this paper, we focus on the regional patterns of ethnic intra/intermarriage patterns among currently married co-resident couples.

We used the full enumeration data from the Indonesian Population Census 2010 and applied the most detailed classification of ethnicity (1340 single ethnicity codes). We found that endogamy (marriage between individuals of the same ethnic group) remains the norm across all provinces in Indonesia. The rate of endogamy was lowest in the nation's capital of Jakarta (63.7%) and highest in Central Java (98.9%). There is some evidence to support negative associations between endogamy rates and provincial development indicators. Across provinces, there was a negative and significant association between endogamy rates and ethnic fractionalisation index.

Upon examining the regional variation in endogamy, we turned to analyse couple-level correlates of endogamy. We selected two provinces with relatively high degree of ethnic mix in their population but significantly different level of development: North Sumatra (n=2,419,369 couples), and the Capital Region of Jakarta (n=1,769,147 couples). We applied logistic regressions to summarize relationships between the likelihood of endogamy and migration status, ethnic group size, age group, and education. Among couples in North Sumatra, the likelihood of endogamy was lower for couples in urban areas, and when either one of the spouses was a lifetime migrant (born outside of North Sumatra), had a higher level of education, and was in the younger age group (20-29). In Jakarta, these relationships also hold, except that lifetime migrants had higher likelihood of endogamy than non-migrants. Controlling for other factors, we found a positive relationship between ethnic size and endogamy in both provinces.

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1 Introduction

Within the literature on demography in Southeast Asia, changing marriage patterns are typically expressed in the form of women's increasing age at first marriage, an important factor behind global fertility transitions. In the broader context, however, changing patterns in the timing, meaning, and pairing of men and women in marriage reflect fundamental shifts in the institution of family, and underpin a grander narrative of social change (Jones, Hull, & Mohamad, 2011).

Similarly, much of the scholarship on changing marriage patterns in Indonesia had also focused on trends surrounding the postponement of entry into marriage (Hull, 2003; Jones, 2007). Women's advancement in education and their increasing participation in paid employment have been cited as the main drivers of the rise in the female singulate mean age at marriage from 18.7 in 1964 to 23 in 2000 (Hull, 2011). However, following the recent release of the results of the Population Census 2010, there is growing speculation concerning the return of early marriage. By 2010, the singulate mean age at marriage for women was estimated to have slightly fallen to 22.3 (BPS - Statistics Indonesia., 2011a). This reversal has been attributed to a religion-motivated ideational shift that encourages and romanticises early marriage in Indonesia (Hull, in Faizal, 2012).

This story of contested values and conflicting trends surrounding gender roles, marriage, and the family is an emerging feature of the post-Suharto era in Indonesia. At the end of Suharto's 32 years of autocratic rule in 1998, democratic euphoria brought an air of optimism for more egalitarian gender relations and generally a more open and tolerant society in Indonesia (Rinaldo, 2002). Yet at the same time, the Reform (Ind: *reformasi*) has also provided a platform for the re-emergence of customary and religious laws and stereotypes tinged with heavy patriarchal undertones and ethno-religious sentiments in both national and local politics (Creese, 2004; Utomo, 2008). It is this unique landscape of development and democratic reforms that make the study of marriage pairing a timely contribution to the literature on marriage and the family.

In contrast to the extensive literature on the timing aspect of first marriages in Indonesia, there is currently little knowledge on how processes of democratisation and social change are reflected in other equally important dimensions of marriage. To date, not much is known about the prevailing patterns in the pairing of husbands and wives in Indonesia. Yet, debates surrounding legal issues of interfaith, and international marriage, and minimum age at marriage for men and women continue to take centre stage in the post-Reform environment. These developments signal increasing attempts to address and regulate the changing norms of marriage pairing. Understanding patterns in 'who marries whom' would provide new and much-needed insight on the interrelationship between development, social change, and the institution of marriage in contemporary Indonesia.

This paper stems from our ongoing work on marriage pairing patterns in Indonesia. In this paper, we focus on the regional patterns of ethnic intra/intermarriage patterns among currently married co-resident couples, using the full enumeration data from the Indonesian Population Census 2010.

2 Current study

There is a dearth of nationally or regionally representative studies on endogamy (marriage between spouses of the same ethnic group) and exogamy (interethnic marriage) in Indonesia. Indonesia, an archipelagic nation of more than 240 million people, is known as one of the most ethnically diverse countries in the world.² However, national collection of data on ethnicity was suspended in the pre-Reform period to promote national unity (Hugo, 2003). Since first collected in the 1930 Census, ethnic identification was not collected again until the 2000 and 2010 Censuses. This hiatus in data collection explains why, despite the sustained importance of ethnicity in the life of everyday Indonesians, census-based studies on ethnicity in Indonesia are relatively limited in number (see Ananta, 2006; Ananta, Arifin, & Bakhtiar, 2005; Ananta, Arifin, Hasbullah, Handayani, & Pramono, 2013, 2014; Bruner, 1974; Castles, 1967; Suryadinata, Arifin, & Ananta, 2003; Van Klinken, 2003).³

Mapping the regional dynamic in marriage pairing is important given the diversity in the rate of development, ethnocultural specificities, and social structure across the 33 provinces in the Indonesian archipelago. The latest Indonesian Census in 2010 records over 1300 ethnic and 1204 daily language codes. Examining ethnic marriage pairing patterns not only provides insights into ethnic relations, ethnic distance, and social stratification in the country, it may also identify significant differences in marriage norms over different population groups.

Our analyses on ethnic pairing patterns are centred on the following research questions:

- i) What the regional variations of endogamy (and conversely, exogamy) rates in Indonesia?
- ii) Do rates of endogamy vary with development indicators across the 33 provinces?
- iii) What are the individual-level correlates of endogamy?

² See ethno-linguistic maps in Appendix Figure 1.

³ In contrast to the lack of numbers-based study on ethnicity, there are much livelier scenes concerning the study of ethnicity in anthropology and political science. For recent works on ethnic conflicts and ethnic relations in post-Reforms Indonesia, see for example Bertrand (2004) and Davidson (2009).

The paper is structured as follows. To place ethnicity in the wider context of marriage pairing and social change, we begin our paper with a brief literature review covering multiple aspects of assortative mating.⁴ We then outline what we know to date about marriage pairing patterns in Indonesia, including a brief discussion of our previous findings on the patterns of married couples' relative characteristics in age and education. Here, we highlight that very little is known about patterns of ethnic assortative mating. To follow, we provide a brief background on ethnicity in Indonesia. We then describe the data and methods, followed by results, and our concluding remarks.

3 Assortative mating in the context of development and social change

In theory, large scale surveys and census data in Indonesia allows us to study the marriage pairing patterns in terms of four socio-demographic variables: age, education, religion, education, and ethnicity. Thus, the questions addressed in our broader project of marriage pairing in Indonesia are centred on two streams of narrative in social change. The first of these is the scholarship on modernisation and changing gender roles (Inglehart & Norris, 2003); and the second is the scholarship on modernisation, assortative mating, and social stratification (Blossfeld & Timm, 2003; Haller, 1981; Mare, 1991; Rosenfeld, 2008).

Under the broad banner of development and globalisation, attitudes to and practices of gender roles in the Southeast Asian family have undergone fundamental changes over the last thirty years (Gubhaju & Eng, 2011; Sen, 1999; Stivens, 1998). Broadly speaking, with the expansion of women's education, their increased participation in the workforce, delayed marriage, and falling fertility, the male breadwinner family model is fast becoming a site of tension and negotiation (see McDonald, 2000). In contrast to the recent past, in which women typically married someone who was older, better educated, and with better employment prospects than themselves, it is important to examine whether any substantial shifts in the trend of women 'marrying up' and conversely, of men 'marrying down' have taken place in Indonesia. Focusing on these trends of demographic hypergamy is of interest, because convergence in the demographic characteristics of married couples in age, education, and employment is bound to facilitate a normative revolution in gender relations within marriage, and consequently triggers a range of socio-demographic changes (Casterline, Williams, & McDonald, 1986; Polachek, Zhang, & Zhou, 2010).

Second, alongside theories of changing gender relations and demographic hypergamy are narratives pertaining to assortative mating and social stratification. Assortative mating, in terms of education, religion, and ethnicity, shapes the formation of

⁴ The standard definition of assortative mating is marriage pairing pattern in which individuals with similar characteristics marry with one another more frequently than expected under a random mating pattern.

families. Trends in assortative mating across these social dimensions may serve as useful proxies for the variance in degree of societal openness across different parts of the Indonesian archipelago.

A number of studies on educational assortative mating have shown that processes of development may fuel stronger convergence in couples' relative levels of education. The status exchange hypothesis predicts that education serves as a means to attain social status in the marriage market. As men and women find it difficult to marry someone outside their educational background, an increasing tendency for educational assortative mating is theorised to accentuate social stratification (Mare, 1991). But, recent studies on education assortative mating have proposed alternative theories to explain an inverted-U relationship between homogamy (where husband and wife have the same educational attainment) and development (Smits & Park, 2009). At later stages of development, the general openness hypothesis predicts that homogamy will decline with modernisation and the processes associated with it. These processes include urbanisation, greater social mobility, and lesser parental control over children such as the shift from arranged to self-choice/romantic marriages (see Smits & Park, 2005 for a seminal review).

In studying the trends and correlates of marriage pairing, our project sets these modernisation hypotheses on assortative mating against the revival of religious and ethnocentric conservatism in post-Reform Indonesia. With a narrower focus on ethnicity, this paper examines the prevailing levels and correlates of endogamy. In general, divergence in the relative ethnic origin of husbands and wives is associated with openness (Schwartz, 2013). As development and processes of modernisation take hold, one would expect that an increase in interethnic marriage. Thus, through mechanisms similar to those described in the literature on educational assortative mating outlined above, at the regional level, we expect rates of endogamy to be lower in provinces with higher level of development. However, we anticipated that studying the association between regional development and the prevalence of ethnic intermarriage to be far from straightforward. For one, we expect significant interactions between factors such as province-specific ethnic composition/fractionalisation, historical migration-flow patterns, and ethno-religious specific marriage pairing preferences across the 33 provinces. In line with the modernisation and general openness theory, within a specific province, we expect to see that individuals with higher levels of education, and from younger cohorts, to have higher likelihood of being in an exogamous marriage.

4 What do we know about assortative mating in Indonesia?

A review of the literature suggests that we know relatively little about marriage pairing patterns in Indonesia. Smits and Park (2009) included Indonesia as one of the countries in their analysis of changing patterns in educational assortative mating in 10 East Asian

countries. They found that, controlling for other factors, South Korea and Indonesia had the highest rate of educational homogamy in their sample. However, using 5 marriage cohorts derived from three cross-sectional surveys (1976-1997), they found that the odds of educational homogamy in Indonesia had declined over time.

Our preliminary analysis of educational homogamy in Indonesia also supports the results of Smits and Park. Using more recent data from a series of the National Socio-economic Surveys (Susenas), we found that there had been a decline in the percentage of homogamous couples among all prevailing marriages: from 64.5% in 1982, to 53.4% in 2010.⁵ This decline in homogamy holds after we control for the changes in the marginal distributions of husband's and wife's education over the three decades, whereby significant educational expansion took place for both men and women.⁶

Also using a matched-sample of husbands and wives from the same Susenas years, our earlier work found that the spousal age gap has declined from 6.4 to 4.7 years in the same 30-years period (Utomo, 2014). This particular study also examined couple-level correlates of spousal age gap using data from the 2010 Susenas. The multivariate analysis found a robust negative association between women's age at first marriage and the spousal age gap. Higher levels of wife's education were associated with lower spousal age gap and higher likelihood of age homogamy. Regional factors in age homogamy were also noted in the analyses. Couples living in rural areas were estimated to have lower levels of spousal age gap and were more likely to be in age homogamous marriage than urban couples. Couples living in the capital, Jakarta, are estimated to have lower spousal age gap than those living in other parts of Java and Sumatra. However, those in Jakarta have higher age gap than couples living in the Eastern Indonesia - the lesser developed parts of Indonesia. Controlling for age at first marriage, current age, and spousal education levels, it may be the case that marriage in rural areas and in Eastern parts of the Indonesia are relatively more age-stratified or more age homogamous than in other parts of the country.

Having reviewed what we know so far about assortative mating in age and education, we shift our discussion to ethnic assortative mating.⁷

⁵ See Appendix Figure 2.

⁶ See results from our log linear analysis of educational assortative mating in Appendix Table 1 and 2.

⁷ Looking at religious intermarriage in Indonesia through large and nationally representative sample surveys is rather difficult. This is due to the fact that interreligious marriage is not encouraged, and couples are often required to change their denominations prior to becoming officially married. We aim to collect qualitative data on interreligious marriage, and conduct fieldwork to gather case studies that include administrative data from marriage registry offices in 2015-2016.

5 Ethnicity and marriage pairing in Indonesia

In an ethnically diverse setting, measuring ethnicity through large and nationally representative datasets is a difficult task. Official reports and studies using the ethnicity variable from the Census may use different groupings of ethnicity. The 2010 Census official publications aggregated over 1300 ethnic codes into 31 broad categories (BPS - Statistics Indonesia., 2011b).⁸ Javanese made up 40.2 per cent of the out of the total population of 236.7 million (p. 9). There is a large disparity between the proportion of the Javanese with the second largest ethnic group in the population, the Sundanese (15.5%), and the third largest group the Bataks (3.6%).

Using a different coding of 634 ethnic categories, Ananta et al (2013, p. 16) estimated that the 15 largest ethnic groups make up 84.9 per cent of the total population in Indonesia in 2010, with the remaining 15 per cent made up by the other 619 very small ethnic groups. In addition to vast categories, the data on ethnicity was gathered through self-identification, where each individual could only nominate a single ethnicity (Ananta et al., 2014). This is a problem when identifying intermarriage rates, given that we cannot identify whether a head of household, or a spouse, is of mixed ethnicity to begin with.

We are not aware of demographic studies on ethnic intermarriage using the census data to date. However, a number of recent studies have utilised the Indonesian Family Life Surveys (IFLS) to examine the relationship between ethnicity and certain marital outcomes. Only one of these studies provided statistics on the rate of exogamy. Bутtenheim and Nobles (2009) looked at how ethnic diversity, through the role of cultural norms (Ind: adat), influenced age at marriage and post-marriage residence. However, their analytical framework focused on the effects of women's ethnicity and did not account for interethnic marriage. Ethnicity is also considered in an earlier study on married couples' bargaining power and decision making relating to household expenditure (Frankenberg & Thomas, 2001). Here, ethnicity was included as an explanatory variable in separate models for men and women. Interethnic marriage was not discussed in their analysis. Rammohan and Robertson (2012) focused on how kinship norms influence female education. Among other findings, they found that having parents with different ethnicities is associated with better education outcomes for women. Their summary statistics reported that only 1.4% of respondents in their analytical sample from the fourth wave of the IFLS (2007) were of mixed ethnicity (p.291). Clearly, ethnicity and ethnic intermarriage plays a role in influencing certain marital outcomes. The small proportion of interethnic marriage in the

⁸ Of these 31 categories, 18 are actual names for ethnic groups, and 13 are aggregated grouping of ethnicities originating from an Island or a province (Ananta et al., 2014). Sub-divisions of major ethnic groups have no clear patterns. The dominant Javanese for example have 5 sub-groups, of which four are very small in numbers. In contrast, the Dayak people of Kalimantan have 260 sub-groups.

IFLS samples has probably discouraged further study of interethnic marriage patterns using these surveys.

6 Data and methods

Using full enumeration data from the 2010 the Population Census, the paper employs husband–wife pairs as the primary unit of analysis. We defined that a married couple is endogamous when the husband and wife have the same ethnic code. First, we used the most detailed classification of ethnicity in the census (1340 single ethnicity codes).⁹ For comparative purposes, we also applied an alternative definition of endogamy using the 44 aggregate ethnic categories in each province.¹⁰

We focus on prevailing marriages of co-resident primary heterosexual couples in monogamous marriage ($n=47,822,404$ couples). We acknowledge several limitations arising from the way we defined our analytical sample. First, we are effectively excluding second or later-ranked couples in multifamily households. Among those excluded would be young married couples who are still living in their parental homes; a practice which is quite common in Indonesia. Second, although rates of endogamy may vary between first marriages and higher order unions, unfortunately our data does not let us define couples in first marriages, or to identify couples by marriage cohorts. Third, while assortative mating studies in the West have further examined variations across union types (Hamplova, 2009; Hamplova & Le Bourdais, 2008), such data is not available in the Indonesian census. Cohabitation exists in practice, but marriage remains the universal norm of unions in the majority of regions in Indonesia. Fourth, since individuals can only have one self-identified ethnicity, we are likely to overestimate endogamy, and conversely, underestimate exogamy. The accuracy of the ethnicity data in the census can also be questioned given that often the one person in the household would answer on behalf of other household members (Ananta et al., 2014). In our future work, we intend to further examine the temporal aspect of endogamy through stratifying our existing cross-sectional analytical sample by birth cohorts.

To begin our analysis, we calculated provincial endogamy rates, defined as the percentage of prevailing marriages where both couples are from the same ethnic/sub-ethnic groups in each province. Applying the most detailed ethnic codes means that our estimate

⁹ The 2010 Census used provided 1331 unique ethnic codes, each with province of origin identifier. These 1331 ethnic codes include: 1315 codes for ethnic groups whose origins are from within Indonesia and 16 codes for groups whose origins are from outside of Indonesia (e.g. Arabs, Chinese, Dutch, etc). In addition to these 1331 ethnic groups, we have added 9 additional codes for ungrouped ethnicity with small numbers according to their island of origin.

¹⁰ While the official reports on ethnicity provide tabulation of 31 major ethnic groups, we were provided with codes for 44 major ethnic groups in the Census by Statistics Indonesia.

of endogamy rates would be smaller relative to estimates derived from aggregated categories of ethnic groups.

To further explore province level variations, we tested whether endogamy rates are significantly associated with multiple indicators of regional development through pairwise correlations. The indicators include the 2010 provincial Human Development Index (World Bank., 2014), and the 2009 Regional Development Index (BPS - Statistics Indonesia., 2010). The IRP index was compiled by Statistics Indonesia and included sub-indices that measures regional development across multiple dimensions (economic development, social development, infrastructure development, and the environment).

We also looked at the pairwise correlation between rates of endogamy and an index of ethnolinguistic fractionalisation in the province. We follow the literature on fractionalisation and development to calculate a Herfindahl-based index of fractionalisation (Alesina, Devleeschauwer, Easterly, Kurlat, & Wacziarg, 2003; Taylor & Hudson, 1972). The index is calculated as follows:

$$Frac = 1 - \sum_{i=1}^N \pi_i^2,$$

where π is the proportion of an ethnic group in the total provincial population. This index measures the likelihood that 2 randomly drawn individuals from the total population will be from two separate ethnic groups. For each province, the index was calculated using the 1350 ethnicity codes and ranged from 0 to 1, with 0 denoting zero ethnic fractionalisation.¹¹

To look at couple-level correlates of endogamy, we limit our analysis to two provincial-level files from Census: North Sumatra and the Capital Region of Jakarta. These two provinces were selected because of the relatively high degree of ethnic mix in their populations.¹² Medan, North Sumatra's capital, is the largest city outside the island of Java. Jakarta is the largest city in Java (and in Indonesia).

We identified over 1000 ethnic groups in both provinces. The top 10 ethnic groups represent over 92 per cent of the total population in North Sumatra, and 93 per cent in Jakarta.¹³ In both provinces, Javanese made up the highest proportion of the population (33% in North Sumatra and 36% in Jakarta). As before, our analytical sample consisted of co-resident married (heterosexual) couple households (2,419,369 couples in North Sumatra, and 1,769,147 couples in Jakarta). We applied the detailed categories of ethnic group (1340) to classify whether a couple is endogamous or otherwise. We used descriptive

¹¹ See Appendix Table 4 for total couples included in the analyses and province level indicators including the fractionalisation index, HDI 2010 and IRP 2009.

¹² Statistics Indonesia reported that for 2010, the Gross Regional Domestic Product was Rp 275,056.51 for North Sumatra, and Rp 861,992.09 for Jakarta. (http://www.bps.go.id/eng/tab_sub/view.php?kat=2&tabel=1&daftar=1&id_subyek=52¬ab=1). For the same year, per capita GRP (without oil and gas at 2000 prices) were Rp 9,055.34 thousand and Rp 40,939.43 thousand for North Sumatra and Jakarta respectively.

http://www.bps.go.id/eng/tab_sub/view.php?kat=2&tabel=1&daftar=1&id_subyek=52¬ab=8

¹³ See Appendix Table 6

statistics and logistic regression to summarise relationships between the likelihood of endogamy/exogamy and migration status, ethnic size, age group, and education.

7 Results

Provincial variation in ethnic endogamy

Appendix Table 5 presents the rates of endogamy by province. The table outlined both endogamy rates calculated from the 1340 ethnic categories (*endog_total*) and the 44 aggregate ethnic categories (*endog_44*). As anticipated, using the detailed categories would yield lower endogamy rates compared to rates of endogamy were calculated when using the aggregate ethnic categories.

On average, there is a 2.2 percentage points difference (s.d. 2.9) when we calculated the provincial rates of endogamy using the two different classifications. Two provinces with notably high gap between the two endogamy rates are Maluku (11 percentage points) and East Nusa Tenggara (7.4). The two rates also yield different ranking of provinces. Using either categories, the nation's capital and the centre of economic growth, Jakarta remains the province with the lowest rate of endogamy (67%), and Central Java, the homeland of the Javanese people, remains the province with the highest rate of endogamy (99%).

The pairwise correlation in Table 4 below show a generally negative but insignificant association between the first endogamy variable (*endog_total*) and provincial development indices. Using the second endogamy variable (*endog_44*), we observed significant negative associations between endogamy and the human development index, as well as between endogamy and the regional development index on economic development.

Table 1 Pairwise correlation of endogamy rates and provincial development indicators

	irp_econ	irp_soc	irp_infra	hdi_2010	irp_general	frac	endogamy	endogamy (44)
irp_econ	1							
irp_soc	0.5837*	1						
irp_infra	0.7081*	0.6641*	1					
hdi_2010	0.6115*	0.7057*	0.6376*	1				
irp_general	0.8261*	0.7620*	0.9070*	0.7209*	1			
frac	-0.2012	-0.5428*	-0.3949*	-0.1255	-0.3371	1		
endog_total	-0.2245	0.1825	-0.029	-0.2668	-0.1407	-0.7724*	1	
endogamy (44)	-0.4136*	0.0073	-0.1366	-0.4234*	-0.2819	-0.6435*	0.9448*	1

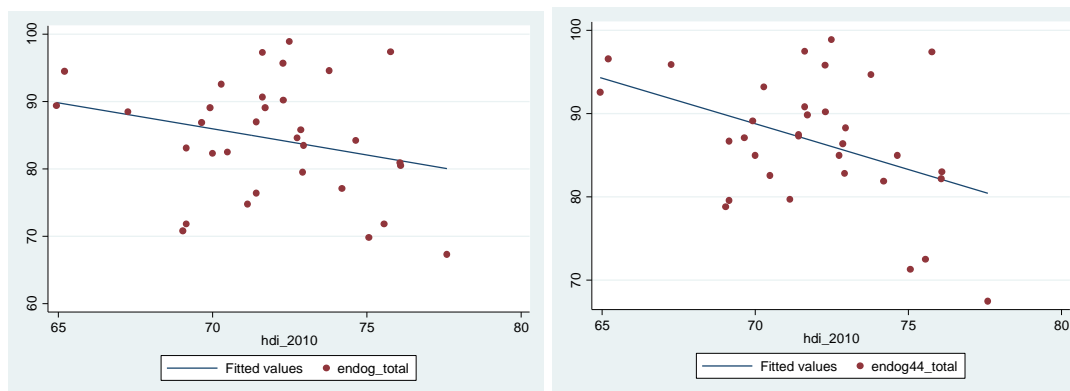
*Significant at the 5% level

Figure 1 plots each province's human development score against its endogamy rates. Using the second endogamy variable (*endog_44*), the three provinces that stand out as having lower rates of endogamy are those with relatively good performance as measured by their HDI scores (Jakarta, East Kalimantan, and Riau Islands – figure not labelled). The

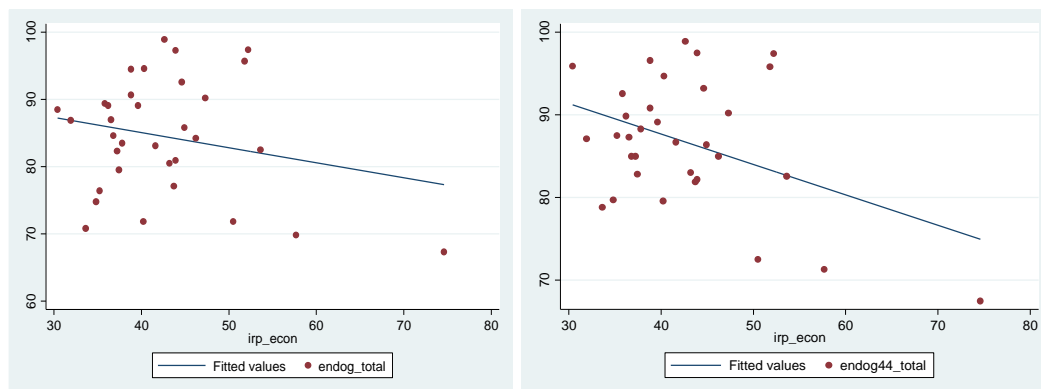
Special Region of Yogyakarta, in Java, is noted for its high HDI score and high rates of endogamy.

As with Figure 1, the association between endogamy and the regional index of economic development is not clear cut (Figure 2). On one hand, it is true that provinces in the higher end of the IRP score such as Jakarta, Riau and East Kalimantan has lower rates of endogamy. On the other hand, provinces on the other extreme of regional economic development, like Papua and North Maluku, also displayed relative low rates of endogamy.

Appendix Figure 1 HDI and endogamy rates



Appendix Figure 2 IRP (Economy) and endogamy

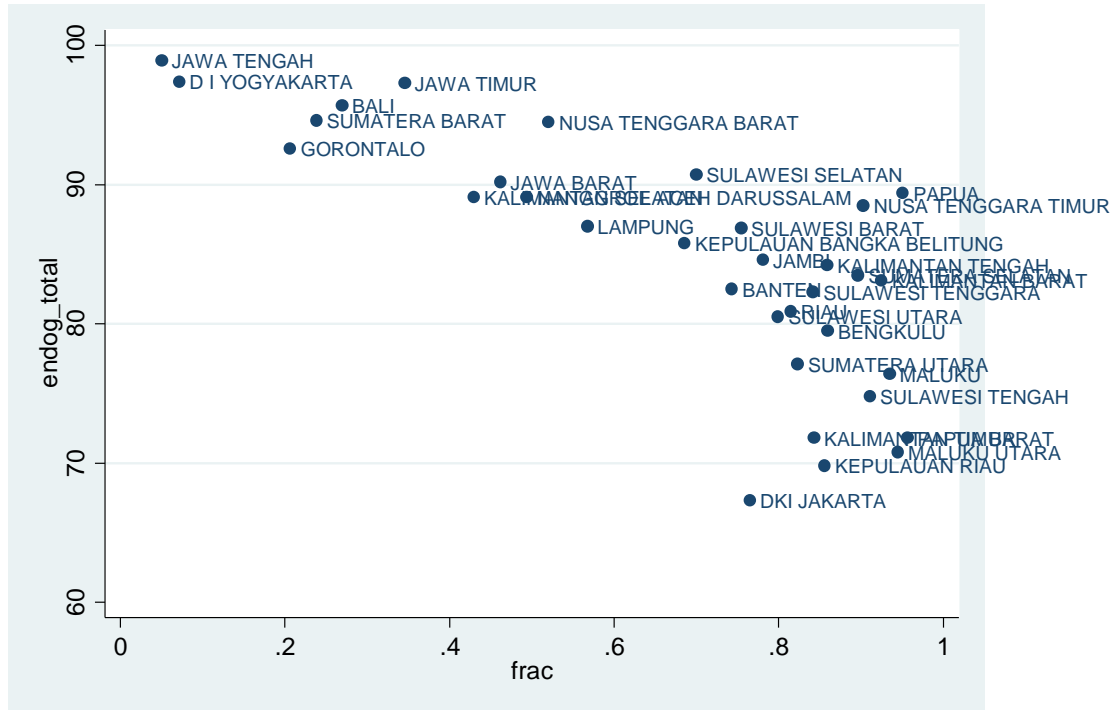


The absence of clear relationships between ethnic intermarriage and macro development indicators suggests that there are other factors at play that drives ethnic pairing patterns. Table 1 also shows that there is a strong negative correlation between the provincial ethnic fractionalisation index and endogamy rates.¹⁴ Figure 3 plots this association. The degree of ethnic fractionalisation in each province is influenced by a plethora of factors, including: geo-cultural specificities, economic push and pull factors that

¹⁴ Because the fractionalisation index was calculated using the detailed ethnic categories, we can see a weaker correlation between fractionalisation and endog_44 in Table1.

drive internal migration, and other historical trends in internal migration flows (such as the large scale government-initiated transmigration programs out of Java). In general, provinces with higher score of ethnic fractionalisation have lower rates of endogamy.

Appendix Figure 3 Ethnic fractionalisation and endogamy rates



Couple-level correlates of endogamy

Appendix Table 7 provides the summary statistics for the logistic regression in this section.¹⁵ Our multivariate analysis suggest that among couples in North Sumatra, the likelihood of endogamy was lower for couples in urban areas, and when either one of the spouses was a lifetime migrant (born outside of North Sumatra), had a higher level of education, and was in the younger age group (20-29). In Jakarta, lifetime migrants had higher likelihood of endogamy than non-migrants. These findings reflect the historical differences in internal migration flows. Jakarta has been the centre of development in Indonesia that attracts migrants from all over the archipelago. While North Sumatra has also been a migrant destination, the proportion of lifetime migrants in its total population, at 4 per cent, is much smaller than the corresponding proportion in Jakarta (42%).

The multivariate analysis suggests a positive relationship between ethnic size and endogamy in both provinces. We note however that there are many ethnic-specific

¹⁵ Because our unit of analysis is couples, the rate of exogamy is the same for all men and women in both provinces. However, looking at the exogamy rates for men and women in specific ethnic groups reveal interesting patterns (Appendix Table 8.). In most cases, men are more likely to be exogamous than women of the same ethnic groups across the two provinces. Among the ethnic Chinese, we observed a lower rate of exogamy among females relative to males.

exceptions to this rule. For example, the Chinese, relatively small in number in both provinces, have high rates of endogamy (over 90%). Irrespective of their size in the province in question, the Batak Tobas, a large ethnic group in North Sumatra, but is relatively smaller in Jakarta, also have high rates of endogamy (over 80%).¹⁶

Table 2 Odds Ratios of endogamous marriage: co-resident couples in North Sumatra and Jakarta

	North Sumatra		By Husband's Characteristics		Jakarta		By Husband's Characteristics	
	By Wife's Characteristics		By Husband's Characteristics		By Wife's Characteristics	P-value	By Husband's Characteristics	
	OR	P-value	OR	P-value	OR	P-value	OR	P-value
Urban/Rural								
Urban (ref)								
Rural	2.037	0.000	2.059	0.000	Omitted		Omitted	
Lifetime migration status								
Non-migrant (ref)	-	-	-	-	-	-	-	-
Migrant	0.854	0.000	0.948	0.000	1.116	0.000	1.139	0.000
Log of ethnic size	2.134	0.000	2.588	0.000	1.267	0.000	1.572	0.000
Age group								
10-19	0.983	0.329	1.350	0.000	0.984	0.369	0.820	0.003
20-29 (ref)	-	-	-	-	-	-	-	-
30-39	1.043	0.000	1.033	0.000	1.016	0.000	1.039	0.000
40-49	1.170	0.000	1.126	0.000	1.144	0.000	1.095	0.000
50-59	1.484	0.000	1.357	0.000	1.440	0.000	1.326	0.000
60-69	2.083	0.000	1.797	0.000	1.767	0.000	1.579	0.000
70-79	2.676	0.000	2.153	0.000	2.168	0.000	1.787	0.000
80+	2.621	0.000	2.156	0.000	2.526	0.000	1.834	0.000
Highest education								
Never attended school	4.395	0.000	3.660	0.000	1.469	0.000	1.683	0.000
None	1.435	0.000	1.432	0.000	1.174	0.000	1.271	0.000
PS	1.197	0.000	1.209	0.000	1.155	0.000	1.234	0.000
JHS (ref)	-	-	-	-	-	-	-	-
SHS	0.861	0.000	0.833	0.000	0.923	0.000	0.860	0.000
DI/DII	0.867	0.000	0.928	0.000	0.851	0.000	0.814	0.000
DIII	0.804	0.000	0.776	0.000	0.820	0.000	0.747	0.000
DIV/Bachelor	0.765	0.000	0.756	0.000	0.928	0.000	0.884	0.000
Master/PhD	0.661	0.000	0.689	0.000	0.787	0.000	0.805	0.000
Constant	0.020	0.000	0.006	0.000	0.406	0.000	0.112	0.000
N	2,419,369		2,419,369		1,769,147		1,769,147	
Prob>chi2	0.000		0.000		0.000		0.000	

Source: 2010 Population Census Data files, Statistics Indonesia

¹⁶ See Appendix Figure 6 and 7.

8 Concluding remarks

Our analysis suggests that endogamy remains the norm in prevailing marriages across all provinces in Indonesia. As opposed to marrying someone from other ethnic groups, the Census data suggests that Indonesians are more likely to marry someone from the same ethnic group. The rate of endogamy was lowest in the nation's capital of Jakarta (63.7%) and highest in Central Java (98.9%), the homeland of the Javanese people; the dominant ethnic group in Indonesia. Our preliminary analysis on the regional variation in endogamy provides some preliminary evidence supporting the premise of the modernisation and the general openness theory on ethnic assortative mating. Clearly, such results are preliminary given the cross-sectional nature of our data, and the province-specific factors not accounted in our discussion. Ideally, future work on this topic would benefit from having a longitudinal data approach. This is a challenging task since, as we said, the collection of data on ethnicity only resumed in 2000 and 2010 after it was last collected in the colonial period in 1930. The multivariate analysis also provided some support for the general openness theory: younger and more educated individuals have a lower likelihood of being in an endogamous marriage.

A closer look into our dataset indicates the following salient findings. First, there is a notable variation in endogamy among sub-ethnic groups which are often classified into one ethnicity in demographic studies. It is often the case that ethnic sub-groups in Indonesia have different spoken languages altogether, with each practicing different religions and practicing different social customs. A case in point is the variation in endogamy rates among the Bataks of North Sumatra. The endogamy rate for the mostly-Christian Batak Toba in North Sumatra is 84%, while the rate for the Muslim-majority Batak Mandailing is 64%.¹⁷ This highlights the advantage of using the most detailed classification of ethnicity when studying ethnic intermarriage patterns.

Second, there is a sex-specific pattern of exogamy within each ethnicity. In 7 of the 8 Batak sub-ethnic groups in North Sumatra (Toba, Karo, Tapanuli, Mandailing, Angkola, Pakpak Dairi, Ulu Muara Simongi, and Simalungun), men are more likely to marry someone from a different ethnic group. Future work on ethnic marriage patterns in Indonesia should look into whether certain stereotypes of gender-specific ethnic attributes that make oneself attractive or otherwise in the marriage market, are reflected in the data of endogamy/exogamy by sex and ethnic groups.

Third is the issue of single ethnicity in the Census. We note only a small proportion of exogamous co-resident couples have children who were enumerated under different ethnicities (e.g. child 1 has mother's ethnicity, child 2 has father's ethnicity; 1.7% in North Sumatra and 2.7% in Jakarta). Among exogamous couples whose children all had the same

¹⁷ See Appendix Figure 8 and Appendix Table 9

ethnicity, most were recorded as having the same ethnicity as their father (97% in North Sumatra and 83% in Jakarta). On one hand, the dominant patrilineal systems in kinship may offer some explanations to this. However, the matrilineal tradition in certain ethnic group does not seem to make a big difference either. In families of Minang exogamous women in Jakarta, only 11.3 per cent of the families had children numerated as having the same ethnicity as their mother. This is lower than what we had expected. The fact that each individual can only nominate one ethnicity in the Census suggests that the actual rates of interethnic marriage in Indonesia are likely to be higher than what we have estimated from the Census data. This example supports the calls to revise the collection of data on ethnicity in future population Censuses (e.g. Ananta et al., 2014).

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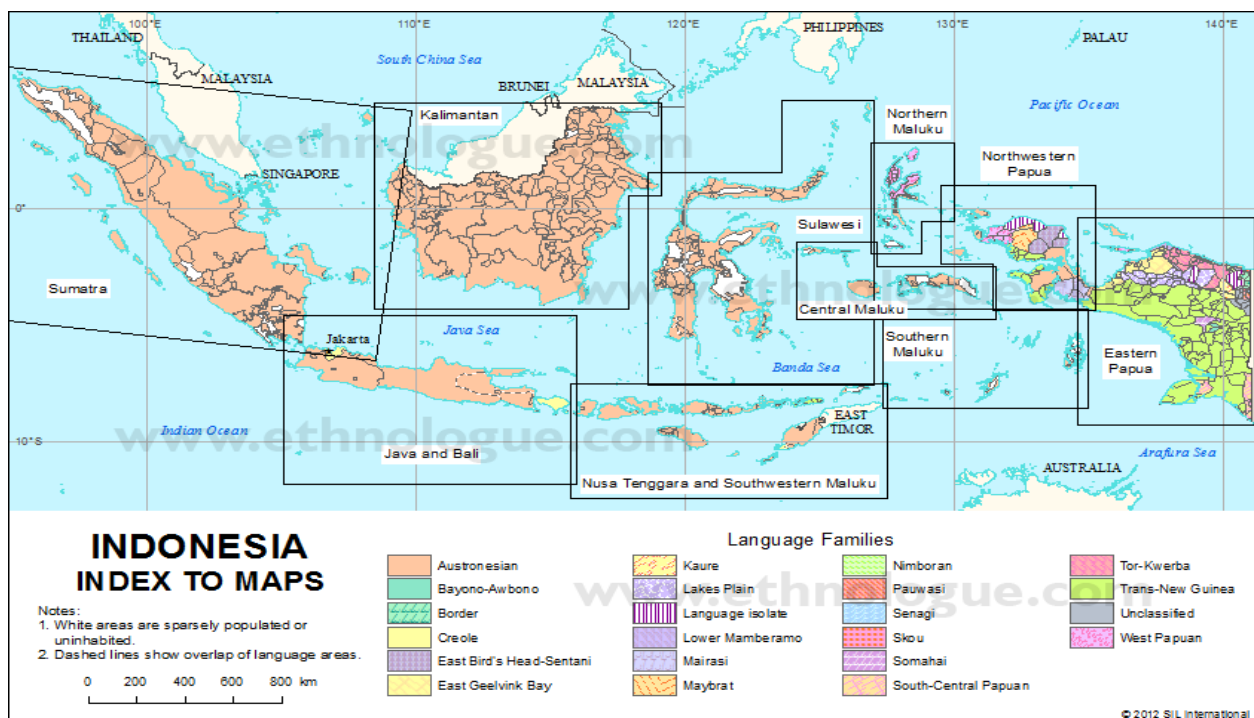
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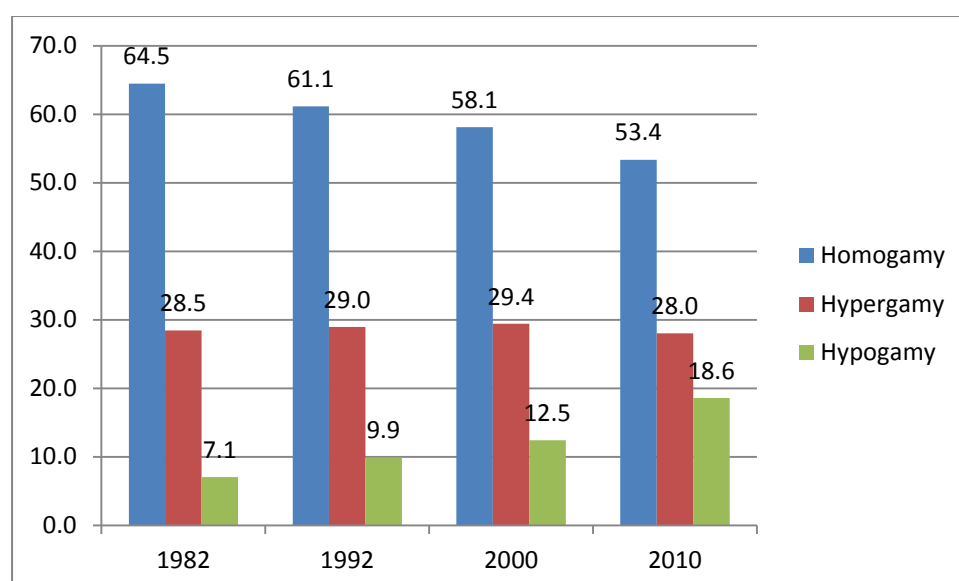
Year	Wife's education	Husband's education					Total
		Less than	PS	JHS	SHS	Tertiary	
1982	Less than PS	46.3	14.2	2.1	1.1	0.1	63.6
	PS	4.4	13.2	4.2	2.7	0.1	24.6
	JHS	0.4	1.1	2.0	2.7	0.4	6.6
	SHS	0.1	0.3	0.6	2.7	1.0	4.8
	Tertiary	0.0	0.0	0.0	0.1	0.3	0.5
Total		51.2	28.7	8.9	9.3	1.9	100.0
Total couples							47,373
1992	Less than PS	37.5	11.7	2.0	1.1	0.1	52.3
	PS	5.3	14.5	4.4	3.3	0.3	27.8
	JHS	0.6	1.5	2.6	3.9	0.5	9.0
	SHS	0.2	0.7	1.0	5.5	1.9	9.4
	Tertiary	0.0	0.0	0.1	0.5	1.0	1.6
Total		43.6	28.4	10.1	14.2	3.8	100.0
Total couples							52,940
2000	Less than PS	24.8	9.5	1.7	0.9	0.1	36.9
	PS	5.2	19.2	5.9	3.6	0.3	34.1
	JHS	0.7	2.5	4.2	4.7	0.5	12.6
	SHS	0.2	1.0	1.6	8.2	2.4	13.5
	Tertiary	0.0	0.1	0.1	1.0	1.7	2.8
Total		31.0	32.2	13.5	18.4	4.9	100.0
Total couples							307,170
2010	Less than PS	13.9	6.7	1.6	0.8	0.1	23.1
	PS	5.0	18.6	5.7	3.7	0.4	33.4
	JHS	1.2	4.2	5.8	5.5	0.6	17.2
	SHS	0.5	1.8	2.9	11.0	3.0	19.1
	Tertiary	0.0	0.2	0.4	2.5	4.1	7.2
Total		20.6	31.4	16.4	23.5	8.2	100.0
Total couples							233,838

Appendix Figure 4 Ethno-linguistic maps of Indonesia



Source: Image taken from http://www.ethnologue.com/map/ID_x, retrieved, 9 September 2014. The site reported that the number of individual languages listed for Indonesia is 719 (706 are living and 13 are extinct).

Appendix Figure 5 Relative education of couples: 1982-2010



Source: Susenas 1982, 1992, 2000, and 2010. Based on a standardised classification of 5 educational groups across the 4 surveys (individual's highest completed education: less than primary school, primary school, junior high school, senior high school, and tertiary).¹⁸

¹⁸ It should be noted that there is a difference in results from a previous publication (Utomo 2014) which noted less of a decline in homogamy (50.6 in 1982 and 48.6 in 2010), and a slightly larger decline in hypergamy between 1982 (39.4%) and 2010 (31.4) , when more detailed education categories were used (e.g. detailed sub-categories of tertiary education were considered: diploma, diploma 3, bachelor, and postgraduates).

Appendix Table 2 Log linear models of educational assortative marriages 1982, 1992, 2000, 2010

Model		G2	df	BIC
Model 1	hed*year, wed*year, hed*wed	1522.4	51	1443.8
Model 2	hed*year, wed*year, hed*wed, homog*year	1203.8	54	1099.0
Model 3	hed*year, wed*year, hed*wed, varyhom*year	1010.7	66	905.9
Model 4	hed*year, wed*year, hed*wed, crossing*year	1344.5	63	1161.2
Model 5	hed*year, wed*year, hed*wed, hyper*year	1459.0	54	1354.2
Model 6	M3+crossing*year	208.5	75	-1.0
Model 7	M5+hyper*year	32.9	81	-202.8

Note: hed: husband's education, wed: wife's education, homog: uniform homogamy parameter, varyhom: homogamy varies by education level, crossing: parameter, hyper: a parameter for hypergamy (wife's education < husband's education)/

Appendix Table 3 Estimated odds ratios of homogamy

Year	Estimate of homogamy parameter in (1982)	Interaction parameter	Significance	Odds ratios
1982	2.137			8.474
1992	2.137	-0.044	**	8.109
2000	2.137	-0.001		8.466
2010	2.137	-0.122	**	7.501

The odds of being married to someone with the same education level as opposed to marrying someone outside one's educational group in 2010 is 7.5. The odds of being married to someone with the same education level in 1982 is 8.47

Appendix Table 4 Province level population size and development indicators

Province	Total Population	Frac	2009 IRP				HDI 2010
			Economy	Social	Infrastructure	General	
NANGGROE ACEH DARUSSALAM	4,494,410	0.494	36.2	76.7	62.8	56	71.7
SUMATERA UTARA	12,982,204	0.823	43.7	77.4	64.9	55.9	74.19
SUMATERA BARAT	4,846,909	0.239	40.3	78	70.3	57.5	73.78
RIAU	5,538,367	0.815	43.9	76.9	61.2	58.2	76.07
JAMBI	3,092,265	0.781	36.8	77.9	59.9	52.5	72.74
SUMATERA SELATAN	7,450,394	0.896	37.8	78.5	58.1	54.9	72.95
BENGKULU	1,715,518	0.860	37.4	78.5	63.5	56.6	72.92
LAMPUNG	7,608,405	0.567	36.5	80.7	56.1	53.8	71.42
KEPULAUAN BANGKA BELITUNG	1,223,296	0.686	44.9	78.8	68.8	60.1	72.86
KEPULAUAN RIAU	1,679,163	0.856	57.7	75	73.8	61	75.07
DKI JAKARTA	9,607,787	0.765	74.6	87.7	80.1	71.9	77.6
JAWA BARAT	43,053,732	0.462	47.3	79.8	60.8	54.9	72.29
JAWA TENGAH	32,382,657	0.050	42.6	83.2	68.2	60.2	72.49
D I YOGYAKARTA	3,457,491	0.072	52.2	87	79.8	67.6	75.77
JAWA TIMUR	37,476,757	0.345	43.9	84	68.3	58.8	71.62
BANTEN	10,632,166	0.743	53.6	76.3	62.6	56.9	70.48
BALI	3,890,757	0.269	51.8	86.5	75.4	64.3	72.28
NUSA TENGGARA BARAT	4,500,212	0.520	38.8	74	61.1	55.8	65.2
NUSA TENGGARA TIMUR	4,683,827	0.903	30.4	69.6	55.1	49.2	67.26
KALIMANTAN BARAT	4,395,983	0.925	41.6	75.4	54.7	52.5	69.15
KALIMANTAN TENGAH	2,212,089	0.859	46.2	81.5	56.6	57.1	74.64
KALIMANTAN SELATAN	3,626,616	0.429	39.6	79.9	61.2	54	69.92
KALIMANTAN TIMUR	3,553,143	0.843	50.5	80.6	68.7	64	75.56
SULAWESI UTARA	2,270,596	0.799	43.2	86	77.3	64.2	76.09
SULAWESI TENGAH	2,635,009	0.911	34.8	76.8	61.9	55.3	71.14
SULAWESI SELATAN	8,034,776	0.700	38.8	78.7	64.8	53.6	71.62
SULAWESI TENGGARA	2,232,586	0.842	37.2	73.3	62	56.1	70
GORONTALO	1,040,164	0.206	44.6	78.6	62	57.2	70.28
SULAWESI BARAT	1,158,651	0.754	31.9	75.9	49.8	49.4	69.64
MALUKU	1,533,506	0.935	35.2	74.6	63.7	55.2	71.42
MALUKU UTARA	1,038,087	0.945	33.6	75.6	56.9	53.8	69.03
PAPUA BARAT	760,422	0.956	40.2	73	63.7	56.7	69.15
PAPUA	2,833,381	0.951	35.8	67.9	57.2	50.1	64.94

Appendix Table 5 Endogamy rates by province, 2010

Province	% Endogamy (detailed categories)			% Endogamy (44 ethnic categories)			Total couples in analytical sample
	Urban	Rural	Total	Urban	Rural	Total	
NANGGROE ACEH							
DARUSSALAM	80.75	92.31	89.12	81.35	93.10	89.87	801,403
SUMATERA UTARA	69.59	84.05	77.10	74.63	88.57	81.87	2,419,369
SUMATERA BARAT	92.13	96.00	94.57	92.22	96.16	94.70	897,998
RIAU	74.14	84.96	80.91	75.52	86.12	82.16	1,110,000
JAMBI	72.51	89.51	84.62	73.11	89.81	85.01	642,664
SUMATERA SELATAN	66.99	91.51	83.46	78.05	93.33	88.32	1,522,117
BENGKULU	59.20	87.71	79.50	66.32	89.42	82.77	357,895
LAMPUNG	74.51	90.76	86.95	75.10	90.99	87.27	1,625,478
KEPULAUAN BANGKA							
BELITUNG	79.73	90.13	85.81	80.74	90.45	86.41	218,046
KEPULAUAN RIAU	66.90	83.34	69.83	68.51	84.00	71.27	327,474
DKI JAKARTA			67.29			67.50	1,769,147
JAWA BARAT	85.67	97.84	90.18	85.76	97.84	90.24	8,880,699
JAWA TENGAH	98.26	99.37	98.89	98.27	99.38	98.90	6,854,785
D I YOGYAKARTA	96.28	99.35	97.41	96.30	99.35	97.43	716,875
JAWA TIMUR	95.78	98.62	97.33	95.95	98.75	97.48	8,027,263
BANTEN	76.16	96.17	82.54	76.28	96.19	82.63	2,078,810
BALI	93.77	98.43	95.70	93.85	98.51	95.79	832,706
NUSA TENGGARA BARAT	91.89	96.30	94.54	94.12	98.21	96.57	908,212
NUSA TENGGARA TIMUR	66.59	93.23	88.53	86.76	97.87	95.91	767,288
KALIMANTAN BARAT	72.99	86.99	83.07	75.37	91.12	86.71	838,333
KALIMANTAN TENGAH	75.06	88.58	84.21	75.86	89.32	84.97	466,672
KALIMANTAN SELATAN	83.74	92.75	89.05	83.82	92.81	89.12	763,692
KALIMANTAN TIMUR	67.38	78.86	71.82	67.84	79.96	72.52	708,330
SULAWESI UTARA	71.95	86.93	80.52	74.45	89.40	83.00	475,263
SULAWESI TENGAH	60.86	78.70	74.80	65.26	83.70	79.66	507,648
SULAWESI SELATAN	81.26	95.60	90.67	81.40	95.77	90.83	1,393,233
SULAWESI TENGGARA	68.71	86.91	82.27	73.47	88.96	85.01	391,966
GORONTALO	89.96	93.90	92.64	90.15	94.60	93.17	205,338
SULAWESI BARAT	79.32	88.85	86.88	79.46	89.08	87.09	203,783
MALUKU	61.88	84.58	76.45	80.01	91.63	87.47	246,681
MALUKU UTARA	56.81	75.47	70.84	67.65	82.49	78.81	177,070
PAPUA BARAT	60.15	76.56	71.83	69.89	83.50	79.58	132,965
PAPUA	68.55	95.57	89.39	76.35	97.40	92.59	553,201

Appendix Table 6 Ethnic composition in North Sumatra and Jakarta. 2010

Top 10 Ethnic Groups in North Sumatra			Top 10 Ethnic Groups in Jakarta		
	n	%		n	%
Jawa	4,318,720	33.3	Jawa	3,452,062	35.9
Batak Toba	2,708,704	20.9	Betawi	2,700,722	28.1
Batak Mandailing	1,223,869	9.4	Sunda	1,395,025	14.5
Nias	911,820	7.0	Cina	628,431	6.5
Batak Karo	716,205	5.5	Minangkabau	272,018	2.8
Melayu	568,601	4.4	Batak Toba	118,948	1.2
Batak Angkola	532,185	4.1	Batak Karo	91,590	1.0
Minangkabau	333,241	2.6	Melayu	81,548	0.8
Cina	333,067	2.6	Madura	79,925	0.8
Batak Simalungun	314,688	2.4	Bugis	68,227	0.7
<i>Others</i>	<i>1,021,104</i>	<i>7.9</i>	<i>Others</i>	<i>719,291</i>	<i>7.5</i>
Total Population	12,982,204	100.0	Total Population	9,607,787	100.0

Source: 2010 Population Census Data files, Statistics Indonesia

Appendix Table 7 Endogamy rate of co-resident married couples by urban/rural, wife's current age and highest education attainment: North Sumatra and Jakarta, 2010.

	% Endogamous	
	North Sumatra (n=2,419,369)	DKI Jakarta (n=1,769,147)
Urban/Rural		
Urban	69.6	67.3
Rural	84.1	
Total	77.1	67.3
Wife's current age		
10 to 19	77.3	65.7
20 to 29	74.6	64.7
30 to 39	74.5	64.8
40 to 49	77.2	68.1
50 to 59	82.0	72.9
60 to 69	86.8	76.5
70 to 79	90.6	80.1
80+	92.1	83.1
Wife's highest education		
Never attended school	94.9	78.4
<PS	85.7	73.5
PS	82.1	72.1
JHS	76.6	67.6
SHS	70.7	64.8
DI/DII	71.6	62.6
DIII	67.1	61.8
DIV/Bachelor	65.0	64.4
Master/PhD	59.8	61.7
Husband's highest education		
Never attended school	93.9	81.4
<PS	85.6	76.2
PS	82.8	75.0
JHS	77.6	69.3
SHS	71.2	64.5
DI/DII	74.2	62.6
DIII	67.4	60.6
DIV/Bachelor	65.4	63.5
Master/PhD	61.2	62.0

Source: 2010 Population Census Data files, Statistics Indonesia

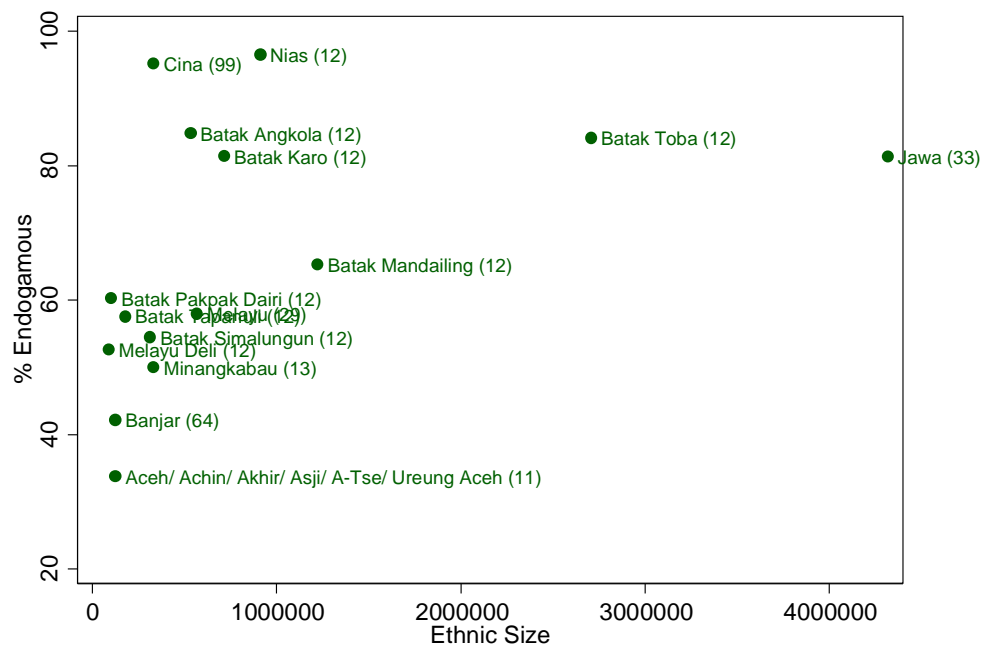
Appendix Table 8 Exogamy rates of males and females in the 21 largest ethnicity groups by province, 2010

North Sumatra			Jakarta		
Ethnicity	% Exogamous		Ethnicity	% Exogamous	
	Male	Female		Male	Female
Jawa	15.2	18.9	Jawa	27.2	27.4
<i>Batak Toba</i>	16.6	16.4	Betawi	30.4	33.5
<i>Batak Mandailing</i>	38.4	34.9	Sunda	48.3	52.6
<i>Nias</i>	8.3	3.4	Cina	8.2	4.8
<i>Batak Karo</i>	23.2	19.7	Minangkabau	43.2	34.2
Melayu	38.9	42.1	Batak Toba	25.5	18.5
<i>Batak Angkola</i>	14.8	15.4	Batak Karo	36.6	25.4
Cina	10.7	4.9	Madura	28.6	17.6
Minangkabau	53.8	49.9	Melayu	61.6	56.8
<i>Batak Simalungun</i>	50.6	46.9	Bugis	53.6	36.1
<i>Batak Tapanuli</i>	43.6	42.7	Palembang	70.4	67.7
Banjar	60.5	58.5	Batak Tapanuli	35.7	24.1
Aceh/ Achin/ Akhir/ Asji/ A-Tse/ Ureung Aceh	70.3	66.7	Ambon	68.8	44.5
<i>Melayu Deli</i>	43.3	47.2	Lampung	69.5	76.4
<i>Batak Pakpak Dairi</i>	44.0	40.3	Minahasa	55.9	52.3
<i>Langkat/ Melayu Langk</i>	34.7	35.6	Makassar	67.2	51.8
<i>Melayu Asahan</i>	36.4	42.8	Batak Mandailing	53.0	41.4
Banten	79.4	75.0	Aceh/ Achin/ Akhir/ Asji/ A-Tse/ Ureung Aceh	69.2	53.2
Sunda	72.7	74.7	Medan/ Modang	52.8	42.4
India	30.8	22.7	Banten	51.6	53.3
<i>Pesisir</i>	7.0	7.5	Bima	51.5	29.9
All in sample	23.3	23.3	All in sample	33.1	66.9

Note: Sorted by ethnic size in each province. Ethnicity in Italics are natives of the province. The total exogamy rates account for other ethnic groups who were present in the province but not included in the above tabulation.

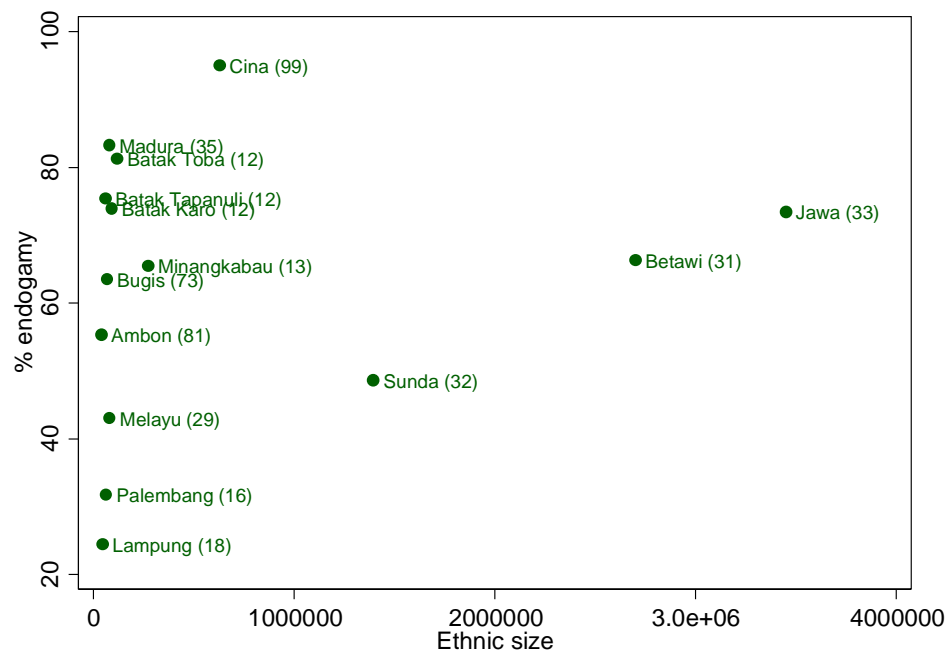
Source: 2010 Population Census Data files, Statistics Indonesia

Appendix Figure 6 Ethnic size and endogamy rate: Top 15 ethnic groups in North Sumatra



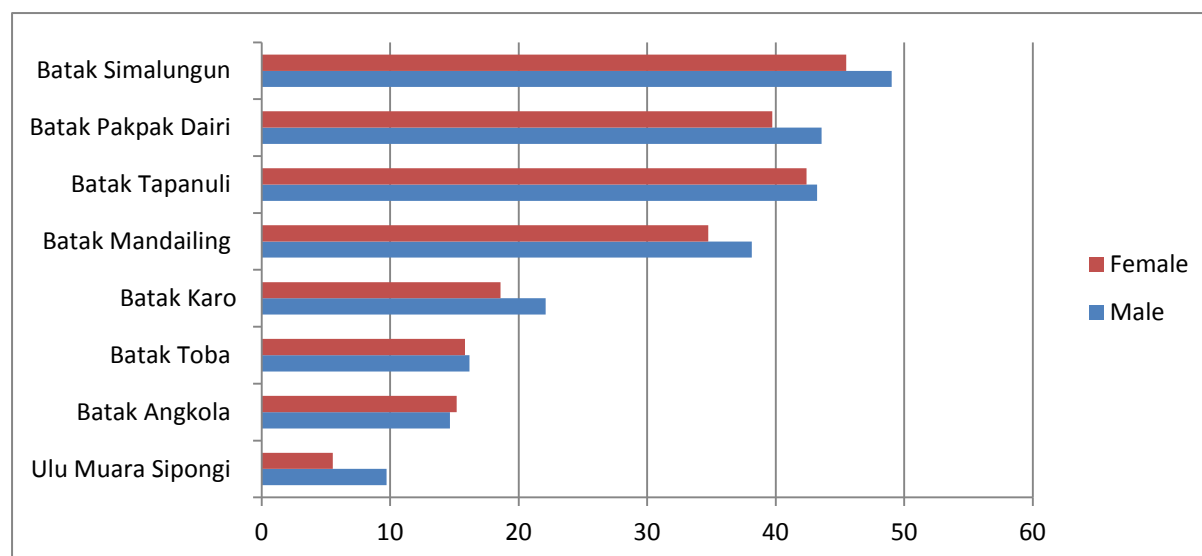
Source: 2010 Population Census Data files, Statistics Indonesia

Appendix Figure 7 Ethnic size and endogamy rate: Top 15 ethnic groups in Jakarta



Source: 2010 Population Census Data files, Statistics Indonesia

Appendix Figure 8 Which Batak is more likely to intermarry? Exogamy rates by ethnic groups and sex: the Batak of North Sumatra



Source: 2010 Population Census Data files, Statistics Indonesia

Appendix Table 9 Selected Batak sub-groups: Spousal preference by ethnicity

Spouse's ethnicity (%)	Exogamous Respondent's Sex and Ethnicity					
	Batak Toba		Batak Simalungun		Batak Mandailing	
	Men	Women	Men	Women	Men	Women
Other Batak	49.8	54.3	54.22	58.1	25.3	30.2
Jawa	30.3	23.0	35.33	29.5	47.5	40.8
Malay	8.3	5.7	4.72	4.0	12.9	10.7
Minang	3.4	3.7	1.66	2.3	6.2	8.0
Other ethnicities from Sumatra	3.3	7.9	0.43	1.76	0.9	1.6
Aceh	1.2	1.0	0.61	0.8	2.2	2.7
Chinese	1.1	0.6	0.32	0.6	0.4	0.7
Banjar	0.7	0.7	0.95	1.1	1.6	1.7
Others	1.9	3.2	1.8	1.9	3.1	3.7
Total	100	100	100	100	100	100
n	75,825	73,945	30,658	26,582	84,578	73,072