Poverty and Ethnicity in Asian Countries

Carlos Gradín

(Universidade de Vigo and EQUALITAS)

Abstract

This paper compares the extent and the nature of higher prevalence of poverty among disadvantaged ethnic groups in a selection of Asian countries using demographic surveys. We first estimate a composite wealth index as a proxy for economic status, and analyze the magnitude of the ethnic gap in absolute and relative poverty levels across countries and ethnicities. Then, we use regression-based counterfactual analysis for explaining these ethnic differentials in poverty. For that, we compare the actual differential in poverty with the gap that remains after disadvantaged ethnic groups are given the distribution of characteristics of the advantaged ones (by reweighting its density using propensity score). Our results show that there is a substantial cross-country variability in the extension, evolution, and nature of the ethnic poverty gap, which can be as high as 50 percentage points or more in some specific cases in Nepal, Pakistan, as well as in India. The gap in the latter country increased over the analyzed period, while it was reduced in the Philippines. Ethnic disadvantaged groups are poorer because of the persisting strongly high inequalities in education (e.g. India, Nepal, and Pakistan), regional development (e.g. the Philippines), or due to the persistent large urban-rural gap (e.g. Pakistan).

Keywords: Asia, poverty, ethnicity, gap, decomposition.

JEL Classification: D63, I31, I32, J15.

Address: Facultade de CC. Económicas e Empresariais, Universidade de Vigo, Campus Lagoas-Marcosende, 36310 Vigo, Galicia, Spain. E-mail: cgradin@uvigo.es; Phone: +34 986813527.

1. Introduction

During the last decades, a growing number of Asian countries have experienced a significant economic growth that has led to an unprecedented reduction in poverty levels and to generally improved living conditions. In this context, however, it is crucial to investigate whether or not the benefits of this higher wellbeing have reached the entire population. One of the relevant issues in this context is to know whether economic opportunities do not depend on given characteristics such as race or ethnicity due to the large history of economic and social disadvantage that many ethnic or indigenous groups faced in many societies. Asian countries have remarkable examples of this, given its extraordinary ethnic diversity. Disadvantaged groups are more likely to be overrepresented in those segments of the population that might not be reached by economic growth if, for example, they lack the most demanded skills or live in inaccessible remote areas. This could be the consequence of them being historically denied the access to the proper education and basic infrastructure that would allow them to take advantage of the greater economic opportunities. Or it could be the consequence of segregation and wage discrimination in the labor market. Identifying the extent of the ethnic differential in poverty is of extraordinary importance to assess the opportunity of implementing policies aimed at reducing such a gap. Understanding its nature helps to evaluate what type of policies are expected to be more effective in closing the gap in each country.

The existence of ethnic and racial inequalities in wellbeing have long been an issue of concern all over the world that has attracted more extensive attention recently. This is the result of the combination of a greater public concern about the situation of disadvantaged ethnic groups, and the growing availability of data, that makes persistent ethnic inequalities more visible, and of adequate methodologies for its research. Outstanding examples of this growing interest, in the case of the Asian and Pacific Region, are the series of reports from the Asian Development Bank (ADB, 2002), including analysis of the situation of ethnic minorities in Cambodia, Indonesia, the Philippines, Vietnam, and the Pacific region, or the books recently edited by Hall and Patrinos (2012) –including analysis for China, India, Laos and Vietnam– and Bhalla and Luo (2013) about India and China. A number of papers have also been published analyzing the situation of particular groups, areas and countries or focusing on specific dimensions such as labor market performance or educational gaps. The introduction in recent years of regression-based decomposition analysis previously developed in labor economics have allowed a more in-depth investigation of the nature of those inequalities. Ethnic inequalities have already been documented in some Asian countries using any of these regression-based techniques.[1] However, there has been very little comparative research so far on both the extent and the nature of ethnic inequalities in Asia in order to identify common and country-specific patterns.[2] Very often, the analysis has been focused on the mean gap

[1] For example, in China (Hannum and Wang, 2012; Gradín, 2013b), India (Borooah, 2005; Das et al., 2012; Gang et al., 2008), Laos (King and van de Walle, 2012) and, especially, Vietnam (Baulch, 2008; Baulch et al., 2004, 2007, 2008, 2010; Dang, 2012; Hoang et al., 2007; Imai et al., 2011; Pham et al., 2010; Swinkels and Turk, 2006; van de Walle and Gunewardena, 2001).

[2] For a comparison of ethnic inequalities among non-Asian countries (blacks and whites in US, Brazil and South Africa), see Gradín (2014).

only, ignoring the existence of possible distributional patterns that make the disadvantage of the poor differ from that of the most affluent people.

For this reason, the aim of this paper is to investigate the extent and the nature of the gap in poverty across ethnic groups in a selection of Asian countries. The emphasis on the comparative perspective and its focus on the poor are the main contributions of this paper. Data come from a highly comparable demographic dataset that uses similar surveys across many developing countries. Individual economic status will be approximated with a synthetic index of wealth defined as the weighted sum of a series of indicators of assets, utilities and housing conditions and equipment. For the sake of greater comparability, we use the same indicators and estimate a common set of weights across the selected countries using Multiple Correspondence Analysis. We will undertake the analysis in two steps.

In a first stage, we will make cross-country comparisons of ethnic gaps in absolute and relative poverty rates. For that, we compute the ethnic poverty gap as the difference in poverty rates between two ethnic groups (comparison and reference) in each country along all possible poverty lines. When the cross-country comparison uses the same levels of wealth as poverty lines, we call this the *absolute ethnic poverty gap curve*. When the comparisons are based instead on the wealth quantiles of the corresponding reference group in each country, in line with the interdistributional inequality approach (Butler and McDonald, 1987; Le Breton et al., 2012), we call that the *relative ethnic poverty gap curve*.

In a second stage, we will investigate the main factors determining the ethnic poverty gap in four countries among the possible competing explanations, using regression-based counterfactual analyses. By comparing the actual differential in poverty with that remaining when the comparison group is given the same distribution of characteristics as the reference one, we estimate the characteristics and coefficients effects of the ethnic poverty gap. The characteristics effect provides an idea of how much of a given poverty differential is explained by the disadvantaged group having more prevalence of those attributes associated with lower wealth, what might be the result of discrimination, historical and cultural factors, etc. For example, because their members have lower attained education, their households have more children, or they live in the least developed rural areas. The coefficients effect quantifies to what extent these factors have a stronger association with wealth in some groups. That is, one ethnicity might be obtaining lower returns to education due to prevailing wage discrimination in the labor market or because of the lower quality of the schools they attend. Similarly, one ethnic group might be more harmed by living in rural areas because of their poorer access to productive assets. This analysis will be undertaken using Gradin's (2013a, 2014) approach, who adapted the reweighting technique, based on propensity score, proposed by DiNardo et al. (1994) in the context of wage differentials.[3]

[3] These approaches have been recently followed to analyze differences in wellbeing between blacks and whites in Brazil and South Africa, or among Chinese Han and minorities, among many other examples (e.g. Gradín, 2009, 2013a,b).

The rest of the paper is organized as follows. The next two sections describe the data and the methodology, after which we report the empirical results. The final section summarizes the main findings.

2. Data

For the empirical analysis, we will use the *Demographic and Health Survey* (DHS). This is a standardized nationally representative household-based survey collecting a wide range of data on population, health and nutrition in a variety of developing countries in the world. The DHS is implemented under the *Monitoring and Evaluation to Assess and Use Results Demographic and Health Surv*eys (MEASURE DHS) project, funded by the U.S. Agency for International Development (USAID) and other international agencies. Since 1984, it is implemented in overlapping five-year phases (e.g. DHS VI during 2008-13).[4] We will use the most recent data for those Asian countries with information on ethnicity. These include Azerbaijan (2006, DHS V), India (1998/99 DHS IV and 2005/06 DHS V), Nepal (2011 DHS VI), Pakistan (2006/07 DHS V), the Philippines (2003 DHS IV and 2008 DHS V), and Vietnam (2005 DHS V).[5]

DHS surveys are generally representative of the whole population for which it provides basic demographic and socioeconomic information.[6] However, detailed information on other aspects, including ethnicity and labor market performance, is usually only provided for eligible subsamples. The common eligible subsample in all datasets used in the analysis is ever-married women between 15 and 49 years old. Thus, this will be the target group for the study, but using also information reported about their partners and other members of their households.

The study uses the ethnic groups defined according to the information available in DHS surveys for each country. The reference group is the wealthiest among the outstanding groups in each country and the comparison group is the rest of the population, except some affluent minorities. Given that sample sizes for individual groups are generally not large, for most of the analysis we pooled disadvantaged ethnicities into one group in each country, but in some cases, whenever the sample sizes allow that, we will analyze the situation of outstanding groups.[7]

In Azerbaijan and Vietnam the reference group is the majoritarian ethnicity (respectively, Azerbaijani and Vietnamese), while the comparison group is made up of ethnic minorities (except Russian in Azerbaijan and Chinese in Vietnam). In India and Nepal, ethnicity refers to caste or tribe. In India, the comparison groups are people belonging to the traditionally disadvantaged groups recognized as such by the Indian Constitution and protected by affirmative action policies: Scheduled Castes (SC), Schedule Tribes (ST), and Other Backward Class (OBC). Those not classifying as belonging to any of these three groups (reporting the category "none of them"), make up the reference group. In Nepal, the reference group is Hill Brahmin, a traditional elite caste in Hinduism,

[4] See the information provided in its web page (http://www.measuredhs.com) for details about available datasets, design, questionnaires and variables.
[5] In all cases, we use the standard DHS survey, except in the case of Vietnam, for which we use the standard AIDS Indicator (AIS) survey because it is the only one with data on ethnicity. Previous releases of the DHS survey for Nepal were not used given the difficulty to match ethnic groups in different years.
[6] The main exception is Azerbaijan, which excludes two regions in the border with Armenia (Kalbajar-Lachin and Nakhchivan). The survey for India 1998/99 indicates that its coverage is more than 99%.
[7] Sample sizes of the eligible subsample are reported in Table A3 in the Appendix.

while the comparison groups are the rest of castes: Hill Chhetri, Hill Dalit, Hill Janajati and other. In Pakistan, ethnicity refers to the mother tongue, and the Urdu speakers are taken as the reference, with Punjabi, Sindhi, Pushto, Siraiki and other languages being the comparison groups. In the Philippines the reference is the major ethnic group, Tagalog, while the comparison groups include the other major ethnic groups such as Cebuano, Ilocano, Ilonggo, and other ethnic minorities.

Ethnicities in each country are listed in Table 1 reporting their shares of the eligible population. The share of disadvantaged ethnic groups over the eligible population varies greatly across countries. They altogether are a minority of the population only in Azerbaijan (6%) and Vietnam (16%), but make up the majority in the other countries, ranging between about 70% in India or the Philippines, and 92% in Pakistan.

Table 1. Ethnic groups by country

Country	Reference group	% eligible	Comparison groups	% eligible
Azerbaijan, 2006	Azerbaijani	93.9	Other (except Russian): Tallish, Lesgin, Other	5.6
India, 2005/06	None of Them	30.8	Scheduled Caste (SC)	19.6
			Scheduled Tribe (ST)	8.6
			Other Backward Class (OBC)	41.1
			All comparison groups	69.2
Nepal, 2011	Hill Brahmin	14.1	Hill Chhetri	19.5
			Hill Dalit	10.0
			Hill Janajati	24.0
			Other (Terai Brahmin/Chhetri, Terai Dalit, Terai Janajati, Other Terai Caste, Newar, Muslim, Other)	32.5
			All comparison groups	85.9
Pakistan, 2006/07	Urdu	8.0	Punjabi	41.3
			Sindhi	10.5
			Pushto	13.7
			Siraiki	15.6
			Other (Hindko, Kashmiri, Pahari, Potowari, Farsi, Balochi, Barauhi, Marwari, Other)	10.9
			All comparison groups	92.0
Philippines, 2008	Tagalog	28.8	Cebuano	22.4
			Ilocano	8.4
			Ilonggo	9.7
			Other (Bicolano, Waray, Kapampangan, Aklanon, Chavakano, Kankanaey, Panggasinense, Zamboangueno, Antiqueno, Boholano, Ifugao, Iraya, Maguindanawon, Mandaya, Maranao, Masbateno, Tausog, Other)	30.7
			All comparison groups	71.2
Vietnam, 2005	Vietnamese	85.3	Other (except Chinese): Tay, Thai, Khmer, Muong, Nung, Phu La, E De, Dao, Cham, Hmong, Gia Rai, Ba Na, Xo Dang, san chay (cao lan - san chi), San Diu, Mnong, Ma, Ta Oi.	14.0

Note: Eligible population: Ever-married women, 15-49 years old.

In the literature on poverty, there are different ways to approximate individual wellbeing. The most common approach is to use income or expenditure, although more multidimensional approaches have been gaining popularity in recent years. The DHS surveys do not include information on income or expenditure, or on the market value of assets. The primary variable usually taken to capture people's economic status is the DHS Wealth index. This index is estimated using Principal Components Analysis (PCA) based on all variables available in each sample describing household assets and utility services, plus whether there is a domestic servant and whether the household owns agricultural land. That is, wealth is computed as a weighted average of a number of categories,

with weights obtained using the first dimension from PCA. This approach has several advantages (Rutstein and Johnson, 2004, page 4): "It represents a more permanent status than does either income or consumption. In the form that it is used, wealth is more easily measured (with only a single respondent needed in most cases) and requires far fewer questions than either consumption expenditures or income." The authors also point out to some evidence showing that the wealth index actually performed better than the traditional consumption expenditure index in explaining differences in educational attainment and attendance or in health outcomes (e.g. Filmer and Pritchett, 2001; Rutstein and Johnson, 2004).

In the presence of categorical variables, Multiple Correspondence Analysis (MCA) is more appropriate to estimate economic status because PCA is designed for continuous variables. Furthermore, the set of variables used to estimate DHS wealth are sample-specific, and so are the weights estimated separately for each sample. For the sake of cross-country comparability, we prefer an index estimated using a common set of variables. This necessarily means to restrict the information used to construct the index to only those variables available in all datasets although the loss of information is small. Furthermore, we believe that using the same weights for all countries has the advantage of making cross-country comparisons of wealth and poverty easier to interpret. The use of country-specific weights, although raising comparability issues, is an appealing alternative but this choice turned out to be of little empirical relevance because the overall correlation is about 94%, with also high correlation within countries.[8] Thus, by using common weights we gain comparability and pay only a small price in terms of loss of information and how meaningful the weights are in each country.

For all these reasons, we will estimate a new wealth index using MCA based on a common set of variables reflecting economic status in all countries (most recent sample) using common weights. Despite all these differences, the new index is highly correlated within countries with the DHS index: 80% in Azerbaijan, 88% in India, around 96-97% in the other countries. However, in our view the values of the new index reflect better cross-country absolute differences in wealth. Instead of normalizing the index to have a mean of zero and standard deviation of 1 in each sample (as in the DHS index), we normalize it to have a value between 0 and 1, reflecting respectively, the lowest and highest possible wealth profiles. The next section explains in more detail how we constructed this new index.

3. Methodology

3.1 The composite index of wealth

In this subsection we explain how we constructed the wealth index using a set of categorical variables that associate with the economic status of a household. Note that we do not aim to construct an index of multidimensional poverty, what would call for using additional dimensions of

[8] The use of common weights for all countries might be criticized on the basis that the implication of a household falling in a given category might differ across countries. For that reason, we also computed a country-specific index of wealth estimating separately the MCA scores for each country. The linear correlation between the indices constructed using common weights and country-specific weights is above 94% in Azerbaijan, and above 97% in the other countries. So we would not expect this choice to have a significant impact on the results.

wellbeing, but to estimate a proxy for the unobserved wealth (or economic status). Thus, the weights have no normative value, they just reflect the extent to which each category is associated with the latent economic status. For that, we use 17 variables that account for the conditions of dwellings (materials used in roof, floor, and walls; and the number of people per room used for sleeping), basic assets owned by the household (such as vehicles and domestic appliances), cooking fuel, and type of access to water and sanitation. All the variables are categorical. The only originally continuous variable (the number of household members per sleeping room) has been discretized in different intervals. Given that this information refers to basic items, we expect the index to discriminate better among the poor than among the rich, which is consistent with our focus on poverty. These categorical variables are listed in Table 2, while Table A1 in the Appendix reports the distribution by country and comparison/reference groups across the different categories.

Table 2. Variables used to construct the wealth index

Source of drinking water	Has television	Main floor material
Type of toilet facility	Has refrigerator	Main wall material
Share toilet with other households	Has bicycle	Main roof material
Has electricity	Has motorcycle/scooter	Household members / Rooms used for sleeping
Has telephone	Has car/truck	Type of cooking fuel
Has radio	Has an animal-drawn cart	

Note: See Table A1 in the appendix for more details.

We will estimate the index using a pool of the most recent sample of all six countries, in which each country has the same weight (1/6). This allows us to interpret differences in wealth values across countries as reflecting differences in their economic status using a common framework (an average of the selected countries).[9]

Let $c_1, \dots, c_Q$ be the set of categorical variables associated with the economic status of a population of size *N*, where c_q is coded with consecutive integers $1, \dots, n_q$. Let Z^q be the $N\ x\ n_q$ binary indicator matrix associated with c_q, with $Z_{ij}^q = 1$ if and only if the *q*th categorical variable for the *i*th individual $c_{iq} = j$. Let $Z = (Z^1, \dots, Z^Q)$ be the $N\ x\ J$ indicator matrix of the set of variables, where $J = n_1 + \dots + n_Q$ is the total number of categories.

For each variable c_q we estimate scores (coordinates) $s_1^q, \dots, s_{n_q}^q$ using the first extracted dimension with Multiple Correspondence Analysis (MCA). Let $\overline{s} = \overline{s}^1, \dots, \overline{s}^Q$ and $\underline{s} = \underline{s}^1, \dots, \underline{s}^Q$ be, respectively, the vectors with the highest and lowest scores associated with the Q categorical variables. Given that higher scores are associated with higher wealth, $\underline{s}$ and $\overline{s}$ represent the worst and best possible wealth profiles.

We define y_i to be a wealth composite index that summarizes the economic status profile for the *i*th person as a weighted sum of the categories for this individual. The index is normalized to range between 0, the value corresponding to the worst possible profile, and 1, that for the best possible

[9] We do not aim here at producing results representative of Asia as a whole or of a specific region. We want a comparable wealth index to be meaningful in each country. In the case that each country were weighted according to its population, the index would be strongly influenced by the Indian survey.

profile[10]. Thus, the weights represent the relative marginal contribution to the individual wealth of being in each category, compared with being in the worst category, expressed as a proportion of the maximum possible contribution:

$$y_i = \sum_{q=1}^{Q} \sum_{j=1}^{n_q} Z_{ij}^q w_j^q, i = 1, .., N; \text{ with } w_j^q = \frac{s_j^q - \underline{s}^q}{\sum_{q=1}^{Q} (\overline{s}^q - \underline{s}^q)}.$$

In particular, this means that the weights attached to the worst categories of each variable will all be zero, while the weights attached to the best categories will sum up to 1. Table A1 in the Appendix reports the estimated scores and the corresponding normalized weights.[11] Given that all categorical variables refer to the household, all individuals within a household will share the same wealth.

In order to analyze the evolution of poverty among ethnicities in the Philippines and India we also construct two new wealth indices based on the two-year pool for each of these countries. We do so because the information of earlier samples is more restrictive, so we cannot reproduce the same set of variables used for the latest samples. Thus, given that we are only interested in the time trend we estimate country-specific indices using the common information in both years (see Table A2 in the Appendix for the list of variables used).[12]

3.2 The ethnic poverty gap curves

In order to measure the extent to which disadvantaged ethnic groups tend to have more poverty than advantaged groups across countries, we will first estimate (non-parametrically) their corresponding cumulative distribution functions.

Let us call $F_0(y)$ and $F_1(y)$ the cumulative distribution functions of wealth $y \in [0,1]$ for the reference (advantaged) and comparison (disadvantaged) groups.[13] We define the *absolute ethnic poverty gap curve* $\gamma(y) = F_1(y) - F_0(y)$ as the difference in the cumulative distribution (head-count ratio) between the comparison and the reference group for each possible wealth level used as poverty line. For example, $\gamma(.25)$ indicates the differential in poverty rates between both groups when the wealth poverty level is fixed at $y = .25$. We can interpret $\gamma(y)$ as the ethnic differential in absolute poverty levels because the poverty threshold used in the comparison is the same wealth level (proxied economic status) for all samples (across countries or over time). This curve is not invariant to changes in the scale of wealth. Then comparisons across samples will be influenced by

[10] This index is just a linear transformation of the predicted value. This prediction is usually standardized to have zero mean and standard deviation equal to 1.

[11] The index, estimated using the first dimension, explains 58% of total variability (inertia). Given the high correlation of this index with a similar country-specific index (which explains a much higher proportion of each country's inertia), we expect most of the unexplained inertia being variability between countries. As expected, the index assigns a zero weight (poorest profile) to households using unprotected well as their main source of drinkable water, using natural materials for their floor and roof and having no walls in the dwelling. They are overcrowded (more than 10 people per sleeping room), use animal dung for cooking fuel and lack any facility for toilet as well as most assets (all but a bicycle and a cart).

[12] The variability (inertia) explained by the first dimension used to construct the wealth index was 86% in India and 90% in the Philippines. The within-country correlation with the main index (with common weights across all six countries) was 93% in India (2005/06) and 94% in Philippines (2008).

[13] The corresponding densities will be estimated using Gaussian kernels with adaptive optimal bandwidth, computed with the *akdensity* STATA routine written by P. Van Kerm.

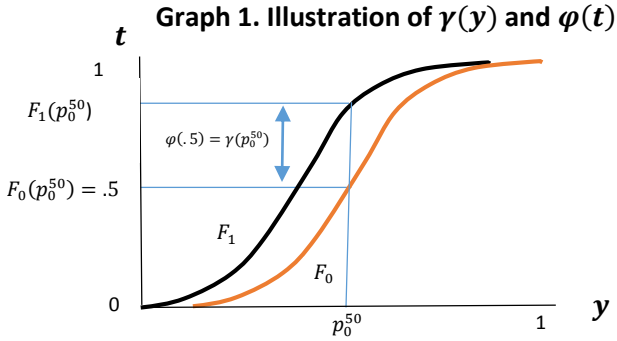
differences in average wealth, e.g. the differential in poverty at lower wealth levels will tend to be higher in the poorest countries.

Similarly, we can define the *relative ethnic poverty gap curve* $\varphi(t) = F_1(F_0^{-1}(t)) - t$, where $F_0^{-1}(t)$ is the t^{th} quantile of the reference distribution, $t \in [0,1]$ with F^{-1} denoting the quantile (right inverse) function attached to the distribution F. In other words, $\varphi(t)$ is the differential between the observed proportion of poor people in the comparison group for each quantile of the reference group taken as the poverty line, and the value one would expect if both groups had a similar distribution (i.e the proportion corresponding to the quantile). For example, $\varphi(.5)$ is the difference between the proportion of people in the comparison group below the median of the reference group and 50% (the value expected if both distributions were identical). This provides an idea of the differential in relative poverty because the wealth threshold used as poverty line is country-specific. It is indexed to the quantiles of the reference group in each country. Similarly, it is year-specific in comparisons over time.[14] This makes the curve, and thus the comparison across samples, invariant to changes in the scale of wealth for all individuals in each sample.

The construction of $\varphi(t)$ is in the spirit of the interdistributional Lorenz curve of the first type proposed by Butler and McDonald (1987), also called first order discrimination curve in the extended approach of Le Breton *et al.* (2012). This curve is a representation of the cumulative distribution functions of the reference and comparison groups $\phi^1(t) = F_0(F_1^{-1}(t))$, where the vertical distance between the 45^0 line and the interdistributional Lorenz curve, $t - \phi^1(t)$, is a measure of the economic disadvantaged of members of the comparison group.[15] In our context we prefer the poverty line to be indexed to the reference group because then the wealth threshold used as poverty line is the same for the various ethnicities in the country.

Note that, by construction, $\varphi(t) = \gamma(F_0^{-1}(t))$. For example, $\varphi(.5) = \gamma(p_0^{50})$ if p_0^{50} is the corresponding median of the reference group (see Graph 1). The difference between both curves is that in the cross-sample comparisons the differential is associated either with a common wealth threshold (absolute comparison) or with a sample-specific wealth threshold (a percentile of the corresponding reference group, relative comparison). Both curves will be constructed by joining the points estimated non-parametrically at several values of respectively y and t.

Graph 1. Illustration of $\gamma(y)$ and $\varphi(t)$



[14] This relative threshold deviates from the most commonly used in the literature (e.g. the 60% of country's median income used in the European Union) in that it is indexed to the entire distribution (no only one specific quantile). Furthermore, the reference here is a specific ethnic group, the most advantaged one. Obviously, one could alternatively define the reference to be the rest of groups or the society as a whole, having different implications.

[15] As Butler and McDonald (1987) pointed out, this approach was implicit in Vinod's (1985) notion of economic advantage of one group over another.

Whenever the ethnic poverty gap is always non-negative, this means that F_0 dominates F_1 at the first-order of stochastic dominance. This have strong implication because it implies dominance in higher orders, meaning that for whatever poverty line and for all indices of the FGT family, the reference group shows more poverty than the comparison group (cf. Foster and Shorrocks, 1988a,b).

3.3 Decomposing the ethnic poverty gap

After having estimated the poverty rates by ethnic group for different thresholds, we aim at providing an aggregate decomposition of these gaps into the explained (characteristics effect) and unexplained (coefficients effect) parts. For that, we estimated a counterfactual distribution in which we give members of the comparison group the same distribution of the relevant characteristics of the reference group using the adaptation of a propensity-score technique (DiNardo *et al.,* 1996) in Gradín (2014). This procedure also allows to produce a *detailed* decomposition of the characteristics effect by quantifying the contribution to the gap by the different potential explicative factors (such as region, area, demographic structure, labor market performance, and education, described below).

We assume that each individual observation was drawn from some joint density function *f* over (*y, x, g*), where *y* indicates the vector of wealth, *x* is a vector of observed characteristics, and *g* identifies whether the individual is in the reference ($g = 0$) or comparison ($g = 1$) group.

The marginal distribution of wealth for each group *g* is given by the density

$$f_g(y) \equiv f(y \mid g) = \int_x f(y, x \mid g)dx = \int_x f(y \mid x, g) \cdot f_x(x \mid g)dx ,$$

This can be obtained as the product of two conditional distributions, where

$$f_x(x \mid g) \equiv \int_y f(y, x \mid g) .$$

In other words, each wealth density is determined by the marginal wealth density of members of the group having each combination of characteristics (a high level of education, living in the poorest regions, and so on) times the proportion of group members having this set of characteristics.

Then, we defined the counterfactual wealth distribution $f_c(y)$ as the distribution of *y* that would prevail if the comparison group kept their own conditional wealth distribution (the probability of having a certain wealth given their characteristics) but had the same characteristics (marginal distribution of *x*) of the reference group. We produced this counterfactual distribution by properly reweighting the actual wealth distribution of the comparison group:

$$f_c(y) = \int_x f(y \mid x, g = 1) \cdot f_x(x \mid g = 0)dx =$$

$$= \int_x f(y \mid x, g = 1) \cdot \psi_x \cdot f_x(x \mid g = 1)dz = \int_x \psi_x f(y, x \mid g = 1)dx$$

F_c is the corresponding cumulative counterfactual distribution function. Based on Bayes' theorem, the reweighting scheme ψ_x can be expressed as the product of two ratios:

$$\psi_x = \frac{f_x(x \mid g=0)}{f_x(x \mid g=1)} = \frac{\text{Prob}(g=1)}{\text{Prob}(g=0)} \frac{\text{Prob}(g=0 \mid x)}{\text{Prob}(g=1 \mid x)}.$$

where the ratio $\frac{\text{Prob}(g=1)}{\text{Prob}(g=0)}$ is constant that indicates the share of people that belongs to each group in the pooled sample, and we estimate the ratio $\frac{\text{Prob}(g=0 \mid x)}{\text{Prob}(g=1 \mid x)}$ using the predictions from a logit model of the probability of belonging to the reference group conditional on *x* in the pooled sample including individuals from both the reference and the comparison group.

In parallel with the conventional Oaxaca (1973)-Blinder (1973) procedure, widely used in labor economics to estimate wage discrimination, we add and subtract the counterfactual distribution to produce the following decomposition of the relative ethnic poverty gap:

$$\varphi(t) = F_1\left(F_0^{-1}(t)\right) - t = \left[F_1\left(F_0^{-1}(t)\right) - F_c\left(F_0^{-1}(t)\right)\right] + \left[F_c\left(F_0^{-1}(t)\right) - t\right].$$

The first term in the last expression represents the part of the poverty differential by ethnicity explained by characteristics (or characteristics effect) because it measures the change in poverty due to shifting the distribution of characteristics (after re-weighting the comparison group). The second part is the unexplained part (or coefficients effect) because is the gap that remains when both the comparison and the reference group had the same distribution of characteristics but differ in their conditional wealth distributions. Given the correspondence between $\varphi(t)$ and $= \gamma(y)$ discussed above, the same decomposition applies to the latter.

In the detailed decomposition, we want to quantify the impact on the poverty differential of changes in a single covariate (or set of covariates) x_j instead of the whole vector. For that, we used the Shapley decomposition that results from averaging over all possible sequences of factors (Chantreuil and Trannoy, 2012; Shorrocks, 2012).

For example, in order to compute the contribution of education, we have to estimate first the impact of education when it is the only factor equalized between both groups. That is, we estimate the gap between the comparison group and the counterfactual when the latter is estimated using only the coefficients of education-related variables in the logit regression (while the rest of coefficients are replaced by zeroes). In order to estimate the contribution of education when it is the second equalized factor, we need to measure the gap between the counterfactual in which we only use the coefficients of education jointly with another factor (e.g. region), and the counterfactual using only the coefficients of this other factor. Then we repeat the same exercise replacing region by each of the other three factors (area, demographics, and labor variables). Similarly, we estimate the contribution of education when it is the third, fourth and fifth factor equalized between both groups. The overall contribution of education is the average of all these estimated contributions. Using this same procedure, we compute the contributions of each of the five factors. The resulting individual effects would be path independent and add up to the overall effect.[16]

[16] See Sastre and Trannoy (2002) for a general formalization of the procedure to compute the Shapley decomposition.

4. The extent of the ethnic poverty gap

4.1 Ethnic differences in mean wealth

First of all, Table 3 reports the mean and median values of the wealth index in each country for the entire population. The table also shows the values for the eligible subpopulation (15-49 years old ever married women), which turned out to be very similar. Clearly, there is a large difference between the wealth in Azerbaijan, where the population is on average at 0.76, and the rest of countries. Among them, India and Nepal report the poorest mean values, below 0.4, while Vietnam and the Philippines report higher values, 0.56, with Pakistan in the middle, 0.49.

Table 3 also reports average and median wealth values for the comparison and the reference group within the eligible subpopulation. In all countries the wealth of disadvantaged groups falls, on average, behind that of corresponding reference group, although the magnitude of the ethnic wealth gap differs across countries. The gap is only 0.044 in Azerbaijan, but rises to 0.262 in Pakistan or 0.205 in Vietnam. With intermediate levels for this gap we find the Philippines, India and Nepal, respectively 0.121, 0.154 and 0.170. It is interesting to note that Pakistani Urdu report a median wealth similar to that of Azerbaijani, despite the large differential in wealth between their two countries.

The lower panel of Table 3 reports the average and median values using country-specific wealth indices for India and the Philippines to analyze the trend over time. It shows that there was a large improvement in the average and median wealth of people living in both countries compared with the level in the previous survey. The increase in the average wealth was larger for the reference group in India and for the comparison group in the Philippines. As a consequence, the ethnic gap in average wealth increased in the former (from 0.129 to 0.152) while decreased in the latter (from 0.178 to 0.150).

Table 3. Mean and median wealth by country and group

	Mean wealth				Median wealth			
Country	**All**	**Eligible population**	**Comparison group**	**Reference group**	**All**	**Eligible population**	**Comparison Group**	**Reference group**
Azerbaijan, 2006	0.762	0.765	0.722	0.767	0.772	0.774	0.721	0.777
India, 2005/06	0.389	0.394	0.346	0.501	0.342	0.350	0.296	0.517
Nepal, 2011	0.388	0.396	0.372	0.542	0.366	0.376	0.347	0.535
Pakistan, 2006/07	0.494	0.497	0.476	0.738	0.506	0.511	0.480	0.772
Philippines, 2008	0.565	0.568	0.533	0.654	0.588	0.591	0.550	0.673
Vietnam, 2005	0.561	0.565	0.388	0.593	0.553	0.556	0.377	0.583
Indian-specific wealth index								
1998/99	0.299	0.301	0.250	0.379	0.244	0.246	0.195	0.353
2005/06	0.338	0.344	0.297	0.450	0.288	0.288	0.245	0.453
Philippine-specific wealth index								
2003	0.440	0.443	0.390	0.568	0.438	0.443	0.366	0.580
2008	0.493	0.496	0.453	0.602	0.507	0.511	0.463	0.613

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

4.2 The distribution of wealth by groups

The inter-ethnic difference in average wealth is a summary measure of the economic disadvantage of one group over another. But the information it provides is limited because it does not take into consideration how wealth is concentrated among the comparison and reference populations. In this

context it is much more informative to consider the entire distribution of these two groups. This is what we do in this subsection.

Figure 1 displays the non-parametric densities of wealth estimated separately for the reference and comparison groups in each country. It becomes clear that in every country there is an unequal distribution of wealth along ethnic lines, with the reference group being generally overrepresented at the upper end of the wealth index. In some cases, the distributions are so different as if they were obtained from two different countries. Disadvantaged ethnic groups tend to be overrepresented at the lowest levels of wealth. The exception to this is Azerbaijan, where both groups are concentrated at the upper end of the wealth index. The distribution of the reference groups are generally to the left of the comparison groups, although In India, there is a high within-group heterogeneity, with a large proportion of the reference group (those not ST/SC/OBC) having low wealth levels as well.

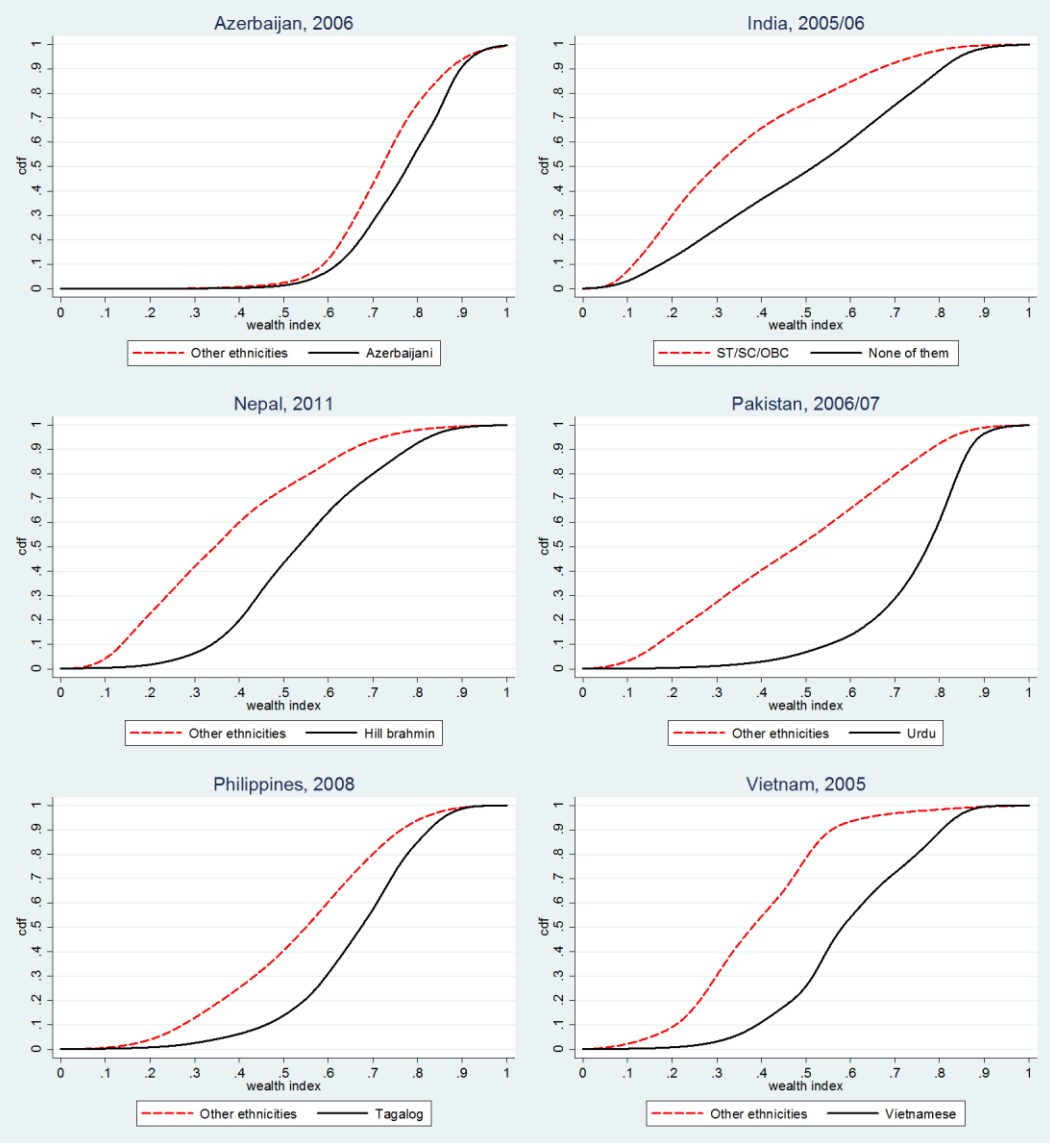
Figure 2 displays the corresponding cumulative distribution functions, that is, the head-count ratio (the share of each group's poor population) for every possible poverty line. In every country, the cumulative distribution of the comparison ethnic groups tends to be above that of the reference group.[17] This means that there generally is first-order stochastic dominance that, as we know, also implies higher-order stochastic dominance. As a result, for a large range of poverty lines and all members of the FGT family of indices, poverty will be systematically higher among disadvantaged groups, although the intensity at which this happens varies across countries. We analyze this in more detail in the next subsection.

[17] For very low levels of wealth, the point estimate of the proportion of poor is slightly higher for the reference group in India (wealth below 0.036, where we find about 0.5% of the population of each group) and Nepal (0.025, a level not reached by about 0.2% of the population of each group).

Figure 1. Wealth densities by ethnic groups and country

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Non-parametric densities with adaptive optimal bandwidth and Gaussian kernels.

Figure 2. Wealth cumulative distribution functions by ethnic groups and countries



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Non-parametric densities with adaptive optimal bandwidth and Gaussian kernels.

4.3 The absolute ethnic poverty gap curves across countries

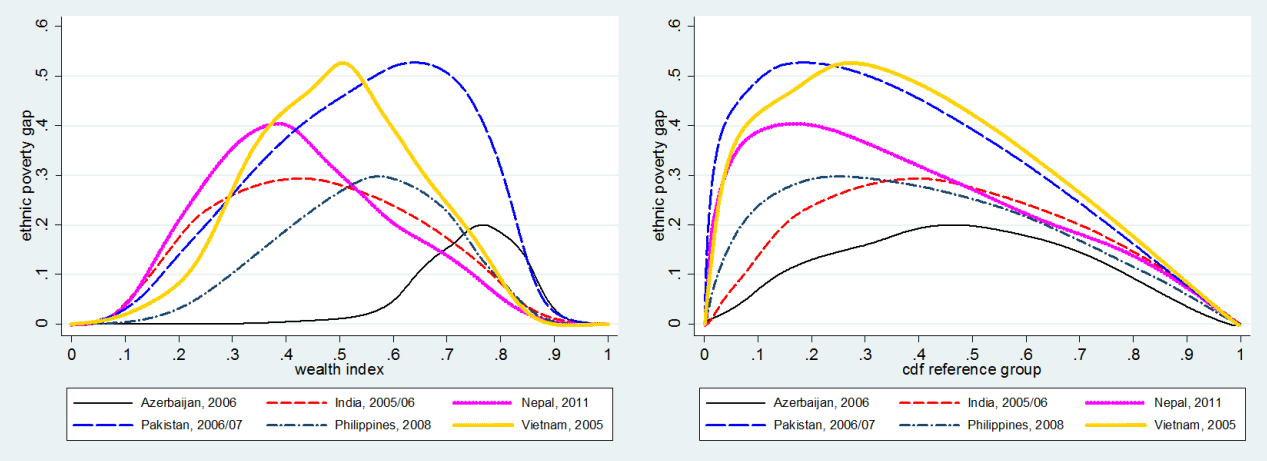
The comparison of inter-ethnic poverty across countries is better summarized in Figure 3 that displays each country's absolute and relative poverty gap curves, $\gamma(y)$ and $\varphi(t)$ as defined previously in section 3.2.

On the left graph, the absolute ethnic poverty gap curve $\gamma(y)$ projects the differential between the poverty rates of the comparison and reference groups for each possible wealth cut-off. Which country shows the largest ethnic poverty gap depends on the specific threshold used. Nepal shows the largest ethnic gap in severe poverty, up to a level of wealth of about 0.370. Then, the differential becomes largest in Vietnam (until wealth is about 0.545), and after that level in Pakistan (up to 0.849). Azerbaijan joins Pakistan with the largest poverty differential only when the threshold is

fixed at the very top of the wealth distribution, which does not seem very reasonable for a poverty line.

The largest differential in poverty rates is as much as 50 percentage points in Vietnam and Pakistan, about 40 in Nepal and 30 in the Philippines and India. The lowest, 20 percentage points is the maximum achieved in Azerbaijan.

Figure 3. Ethnic poverty gap curves $\gamma(y)$ and $\varphi(t)$ across countries



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Non-parametric densities with adaptive optimal bandwidth and Gaussian kernels.

4.4 The relative ethnic poverty gap curves across countries

The previous comparison of absolute poverty differentials across countries is obviously influenced by their differences in average wealth. For that reason, the graph on the right in Figure 3 displays the relative ethnic poverty gap curve, $\varphi(t)$, the same ethnic poverty gap as before but expressed as a function of each quantile of the reference group (thus, the specific wealth threshold is different in each country). This is a better measure of relative poverty or how well the comparison group in each country performs relative to its corresponding reference group. We can distinguish basically three clubs of countries in terms of the level of the relative ethnic poverty gap. Clearly, Azerbaijan outstands for having the smallest differential among all countries all over the distribution of the corresponding reference group. Thus, this country shows the smallest ethnic differential in both absolute and relative poverty. Below the median of the reference group, the relative ethnic gap in poverty is the largest in Pakistan, Vietnam and Nepal. India and the Philippines show intermediate levels. Above the median Nepal tends to converge with the latter countries.

Poverty indices of the FGT family (for α=0, 1, and 2) computed for 10^{th}, 25^{th} and 50^{th} percentiles of the reference group are reported for all groups in Table 4. By definition, the FGT(0) or head count ratio is 10%, 25% and 50% respectively for the reference group in each country. Thus, the gap depends on by how much the comparison groups deviate from those figures. FGT(1), the poverty gap ratio, additionally takes into account the gap in wealth between the poor and non-poor in each case. The FGT(2) also incorporates inequality among the poor. But both indices provide a significantly similar picture of the gap (in some cases exacerbating the inter-ethnic differentials). For simplicity, we will concentrate on the gap in the head-count ratio from now on.

Table 4. Poverty measures by country and ethnic group for different quantiles of the reference group

	FGT(0) Head count ratio			FGT(1) Poverty gap ratio			FGT(2) Severity of poverty		
Country	**10th**	**25th**	**50th**	**10th**	**25th**	**50th**	**10th**	**25th**	**50th**
Azerbaijan 2006									
Azerbaijani	10.0	25.0	50.0	1.0	2.6	6.4	0.2	0.5	1.3
	0.5	0.8	1.0	0.1	0.1	0.2	0.0	0.0	0.0
Minorities	16.4	38.7	69.9	1.6	4.3	9.9	0.3	0.8	2.1
	2.0	3.0	2.9	0.3	0.4	0.6	0.1	0.1	0.2
India 2005/06									
None of Them	10.0	25.0	50.0	3.2	9.1	20.9	1.4	4.6	11.7
	0.3	0.4	0.5	0.1	0.2	0.3	0.1	0.1	0.2
Comparison	23.6	51.2	77.4	7.5	20.6	39.4	3.3	10.9	24.3
	0.3	0.3	0.3	0.1	0.2	0.2	0.1	0.1	0.2
SC	25.8	53.4	80.4	8.8	22.3	41.5	4.0	12.1	26.0
	0.6	0.6	0.4	0.2	0.3	0.3	0.1	0.2	0.3
ST	39.3	74.9	90.6	11.3	32.1	53.9	4.7	16.9	35.5
	0.8	0.6	0.4	0.3	0.4	0.4	0.2	0.3	0.3
OBC	19.3	45.2	73.1	6.0	17.4	35.4	2.6	9.0	21.1
	0.3	0.4	0.3	0.1	0.2	0.3	0.1	0.1	0.2
Nepal 2011									
Hill Brahmin	10.0	25.0	50.0	2.1	5.0	12.0	0.7	1.7	4.2
	1.0	1.6	1.7	0.3	0.4	0.6	0.1	0.2	0.3
Comparison	48.6	63.9	77.5	18.7	26.2	35.6	9.5	14.2	20.6
	0.7	0.7	0.6	0.4	0.4	0.4	0.3	0.3	0.3
Hill Chhetri	37.4	55.1	71.8	12.6	19.3	28.7	5.8	9.4	15.0
	1.3	1.4	1.4	0.5	0.6	0.7	0.3	0.4	0.5
Hill Dalit	55.5	74.7	87.3	20.0	29.0	40.1	9.8	15.1	22.6
	1.9	1.8	1.3	0.9	1.0	1.0	0.6	0.7	0.8
Hill Janajati	42.6	59.4	74.8	15.1	22.2	31.8	7.3	11.4	17.4
	1.4	1.4	1.3	0.6	0.7	0.8	0.4	0.5	0.6
Other	57.7	69.3	79.9	24.6	32.4	41.2	13.2	18.8	25.7
	1.4	1.2	1.0	0.8	0.8	0.8	0.6	0.6	0.7
Pakistan 2006									
Urdu	10.0	25.0	50.0	1.9	4.4	8.4	0.6	1.5	2.6
	1.3	2.1	2.7	0.3	0.5	0.6	0.1	0.2	0.3
Comparison	58.5	75.7	88.9	24.8	32.7	39.1	14.0	19.1	23.2
	0.7	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.3
Punjabi	47.6	69.2	85.9	16.0	23.9	30.8	7.9	12.0	15.7
	1.1	1.1	1.0	0.5	0.5	0.5	0.3	0.4	0.4
Sindhi	68.8	83.1	92.7	34.4	42.3	48.2	21.3	27.1	31.5
	1.8	1.5	1.2	1.2	1.2	1.1	0.9	1.0	1.0
Pushto	59.9	75.5	88.8	24.7	32.6	39.1	13.0	18.3	22.6
	1.8	1.5	1.2	1.0	1.0	1.0	0.6	0.7	0.8
Siraiki	75.4	87.5	95.3	35.7	44.4	50.5	21.2	27.7	32.5
	1.7	1.3	0.8	1.0	1.0	1.0	0.8	0.9	0.9
Other	63.6	76.2	87.8	33.5	40.3	45.7	21.5	26.8	30.7
	1.8	1.7	1.4	1.2	1.2	1.2	0.9	1.0	1.0
Philippines 2008									
Tagalog	10.0	25.0	50.0	2.4	5.2	9.8	0.9	1.9	3.3
	0.7	1.0	1.2	0.2	0.3	0.4	0.1	0.1	0.2
Comparison	34.4	55.0	75.1	10.2	16.8	23.9	4.4	7.6	11.1
	0.6	0.6	0.6	0.2	0.2	0.3	0.1	0.2	0.2
Cebuano	34.1	54.3	75.5	9.6	16.2	23.4	3.9	7.1	10.5
	1.0	1.1	1.0	0.4	0.4	0.5	0.2	0.3	0.3
Ilocano	23.0	49.4	70.1	5.7	11.4	18.5	2.2	4.3	7.2
	1.3	1.9	1.7	0.4	0.6	0.7	0.2	0.3	0.4
Ilonggo	32.2	53.3	73.7	9.0	15.6	22.6	3.8	6.8	10.1
	1.7	1.9	1.7	0.6	0.7	0.8	0.3	0.4	0.5
Other	38.5	57.6	76.5	12.3	19.2	26.2	5.6	9.1	12.8
	0.9	1.0	0.9	0.4	0.4	0.5	0.2	0.3	0.3
Vietnam 2005									
Vietnamese	10.0	24.9	50.0	1.9	5.1	9.9	0.6	1.7	3.2
	0.6	0.9	1.0	0.2	0.3	0.3	0.1	0.1	0.2
Minorities	53.9	77.4	92.1	15.8	26.1	34.9	6.7	12.2	17.2
	2.3	2.0	1.1	1.0	1.1	1.0	0.6	0.7	0.8

Notes: Eligible population: ever-married women, 15-49 years old. Values multiplied by 100. Bootstraps standard errors below each estimate (300 replications).

4.5 The ethnic poverty gap curves for outstanding groups

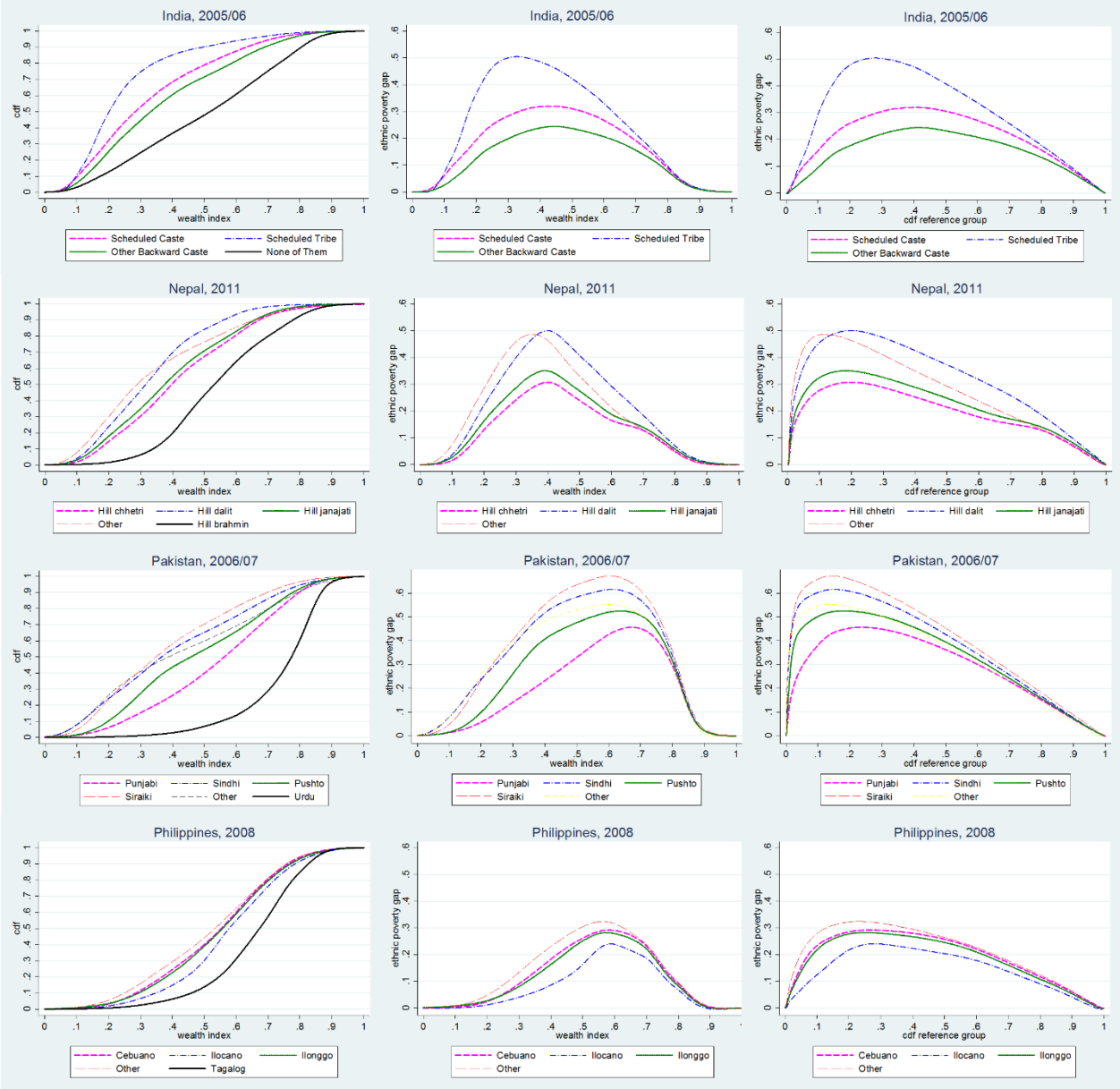
The situation described above in the selection of countries conceals a high degree of heterogeneity within disadvantaged ethnicities in each country that is explored in Figure 4, displaying the

cumulative distribution functions and the corresponding ethnic poverty gaps for outstanding groups in India, Nepal, Pakistan and the Philippines. In all countries, the ethnic poverty gap tends to be systematically higher for some groups. India is probably the country with the largest diversity among disadvantaged ethnic groups. In India, poverty tends to be substantially larger for Scheduled Tribes, achieving a differential with the reference group of 50 percentage points, followed by Scheduled Castes (30 percentage-point differential at its maximum), with Other Backward Class showing the smallest gap with respect to the population classifying as not being in any of these groups.

In Nepal, the gap tends to be largest for most poverty lines for Hill Dalit and Other groups (also reaching 50 percentage points) than for Hilt Chhetri or Hill Janajati. In Pakistan, Punjabi generally show smaller poverty rates than Sindhi, Siraiki, and other groups (whose maximum ethnic poverty gap is about 60 percentage points), with Pushto having intermediate gaps. In the Philippines, the diversity is the smallest among these selected countries. Ilocano outstand for having the smallest poverty gap, especially compared with those included in the “Other” category.

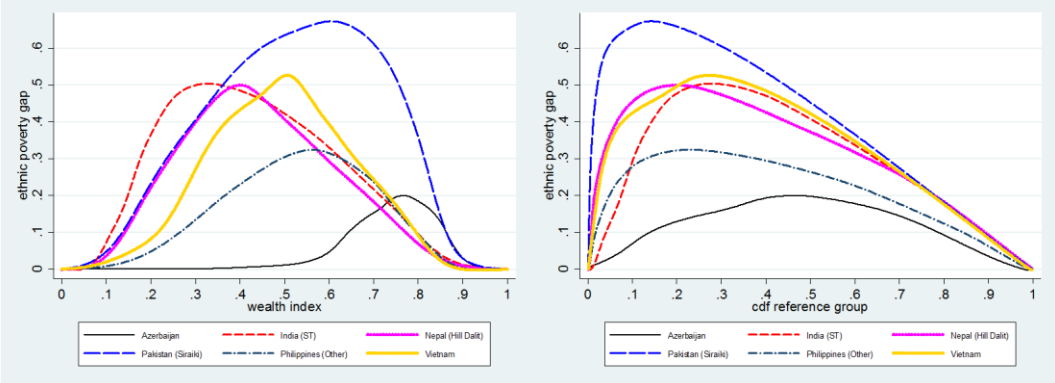
The situation of these particular ethnic groups across countries is summarized in Figure 5, displaying the ethnic poverty gap curves for the most outstanding disadvantaged group in each country. It reveals that Indian Schedule Tribes face the largest absolute poverty gap among all considered ethnic groups in this study for a large range of low poverty thresholds, although its relative gap is smaller for lower quantiles as a result of the large proportion of poor people in the reference group. Pakistani Siraiki report the largest ethnic gap at higher levels of wealth (also at extremely low levels), and when it comes to the relative ethnic gap in poverty. Vietnamese minorities and Nepalese Hill Dalit also show ethnic poverty gaps substantially larger than most disadvantaged minorities in the Philippines and Azerbaijan.

Figure 4. CDFs and Ethnic poverty gap curves $\gamma(y)$ and $\varphi(t)$ by country, detailed groups



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Non-parametric densities with adaptive optimal bandwidth and Gaussian kernels.

Figure 5. Ethnic poverty gap curves $\gamma(y)$ and $\varphi(t)$ across countries, specific groups



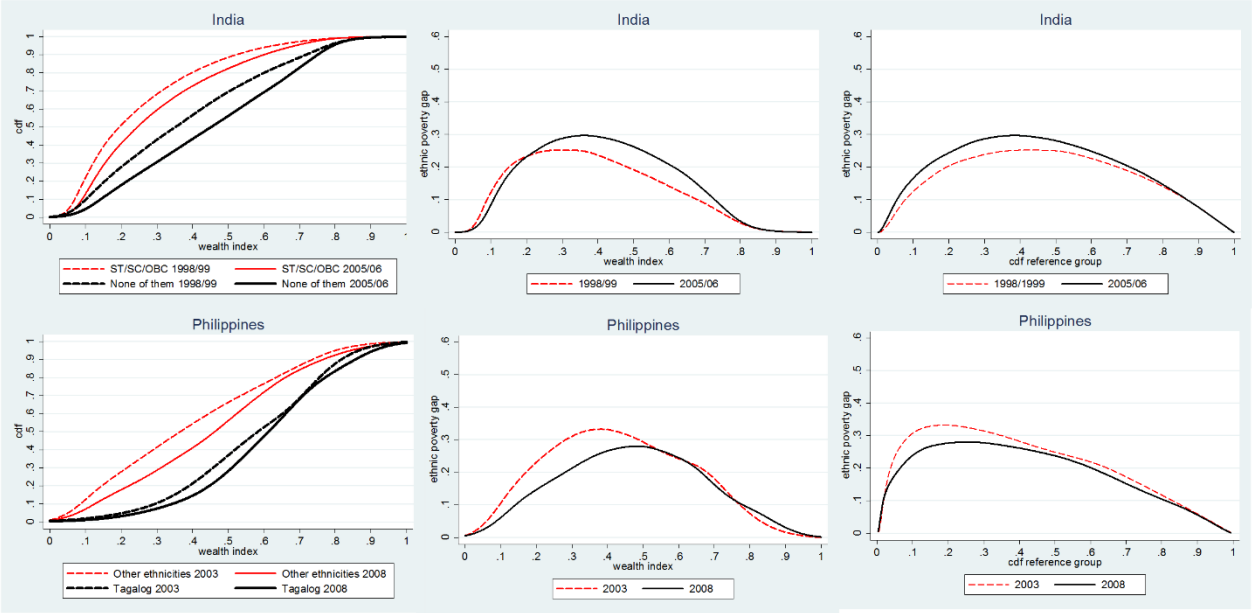
Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Non-parametric densities with adaptive optimal bandwidth and Gaussian kernels.

4.6 Trends in the ethnic poverty gap

In order to grasp the evolution of the ethnic poverty gap over time, Figure 6 reproduces the previous analysis for India and the Philippines in two different years (respectively, 1998/99-2005/06 and 2003-2008). In these periods of strong growth in average wealth levels both countries followed divergent trends. Both the absolute and the relative ethnic poverty gaps were generally reduced in the Philippines. Especially relevant was the reduction of the ethnic gap in severe poverty. However, although there was also a reduction in the ethnic gap in severe poverty in India, this was much smaller and contrasts with an increase when we use higher poverty lines (above 0.2) and a relative approach, indicating that the improvement in wealth was larger for the reference group than for the comparison group along the entire distribution of wealth.

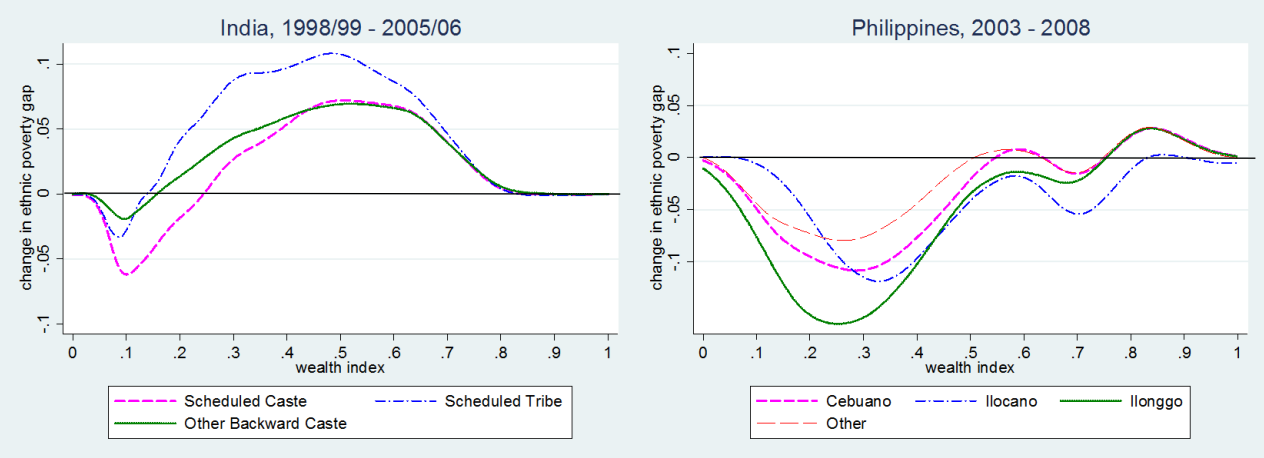
Figure 7 shows the change in the ethnic poverty gap for the most outstanding groups in both countries, and reveals that the reduction in the ethnic poverty gap benefited all Filipino disadvantaged groups but especially Ilonggo. In India, the increase in the ethnic poverty gap was largest for the Schedule Tribes, thus aggravating the relative situation of the most disadvantaged group. Similarly, the reduction in the ethnic gap in extreme poverty was largest for the Schedule Castes.

Figure 6. Ethnic poverty gap trend, India and the Philippines



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Non-parametric densities with adaptive optimal bandwidth and Gaussian kernels.

Figure 7. Change in the ethnic poverty gap curve $\gamma(y)$ by group: India and the Philippines



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Non-parametric densities with adaptive optimal bandwidth and Gaussian kernels.

5. Explaining the ethnic poverty gap

5.1 Competing explanations

The previous section has shown that there is a substantial poverty gap by ethnicity in the selected Asian countries. In this section, we look at what might be the determinants of those gaps in four of those countries. There are a few possible explanations.

The first possible explanation is geographical. Some ethnic groups live in the least developed regions of their countries or in rural or mountainous areas, in which people's wealth is generally lower

regardless their ethnicity. A second possible explanation comes from disadvantaged groups having different demographic structures, for example with more children or elder people in their households as the consequence of higher fertility rates or migration flows. By increasing their needs this reduces their ability to accumulate wealth. A third possible explanation is socioeconomic, it comes from the different levels of education and performance in the labor market. Disadvantaged groups might have lower attained education or a weaker attachment to the labor market, significantly reducing their ability to earn income. All these explanations have in common that disadvantaged groups have "worst" attributes, that is, a higher prevalence of those observed characteristics which are typically associated with higher poverty, either because they imply lower income (and thus wealth) or higher needs. Note that in some cases the causality might go in both directions, giving that higher poverty of one group, for example, might also help to explain its higher fertility rates or its lower school enrollment.

Alternatively, higher poverty of some ethnic groups might also be the direct consequence of unobserved factors such as prevailing earnings discrimination in the labor market against them, or the lower quality of some of their attributes, especially their education, producing lower returns in the labor market, or their location (e.g. living in more inaccessible rural areas).

In the conventional analysis of wage differentials, wage discrimination is usually identified as being part of the unobserved gap (or coefficients effect), once wage gaps coming from inter-group differences in productivity have been already considered. However, in our context, it is important to note that discrimination against one particular ethnic group might more generally affect higher poverty either directly by reducing the returns to their characteristics (captured by the unexplained or coefficients effect), or indirectly, through the accumulation of lower education, exclusion from the labor market, lack of geographical mobility, etc. (the characteristics effect). That is, discrimination might be at the root of the lower endowments that ultimately explain the ethnic gap in poverty. For example, some ethnic groups might live in remote areas as the consequence of their traditional communities being historically denied basic infrastructure by the government, or them being excluded from the most profitable lands. They might have higher fertility rates not as the consequence of having different cultural views about family, but different access to family planning. And they might have lower education and labor force participation as the result of their lower opportunities for schooling or them anticipating segregation and lower returns in the labor market due to discrimination.

In this section we aim at disentangling what explanation (geographical, demographic, socioeconomic, or unobserved factors) seems to be having a higher relevance in four selected Asian countries. A more accurate research of the extent to which these are the result of discrimination or not, and what precise mechanism is producing it are far beyond the present paper and needs a much more detailed country-specific analysis.

5.2 Characteristics included in the logit model

In our case, we consider a number of characteristics that might be associated with the higher risk of poverty of some ethnicities and are available in the demographic surveys. As previously explained, the counterfactual methodology used in the analysis requires these characteristics to be considered as explanatory variables in the logit regression of the probability of belonging to the reference group.

We measure location by a dummy indicating whether the area is urban or rural, and by the region of residence. In Nepal, region refers to each of the 13 subregions. In India and the Philippines, States and Provinces respectively were grouped by deciles according to their average wealth. Similarly, districts in Pakistan were grouped into wealth quartiles.

We also considered some demographic factors such as marital status (currently versus formerly married), teenage marriage (if age of first marriage was below 18), household type (two related adults, three or more related adults, rest of households), the number of household members, the number of children below 5 years old in the household, and the total number of living children. Age (and age squared) is collected for each individual and the householder. Immigration status reflects whether the individual was immigrant or not, and in affirmative case, whether she arrived less or more than five years ago, and from the countryside or urban areas.

Education is captured by the completed level of education (incomplete primary, primary, incomplete secondary, secondary, higher) for the householder, for each eligible individual, and for her partner in the case of currently married women. Individual literacy was also considered.

Regarding labor-related variables, we used information about occupation (at 1 digit) for each eligible individual (and her partner), as well as whether or not she worked during the last 12 months, or has a non-paid job.[18]

All other factors, including direct wage discrimination or differences in the quality of education or location, would be captured by the unobserved component that remains unexplained.

Summary statistics of the explanatory variables, and regression coefficients and standard errors of the logit probability estimated for reweighting the comparison's distribution are reported in Tables A4-7 in the Appendix.

5.3 Decomposition of the ethnic poverty gap

We now present the results of the decomposition in four countries of the relative ethnic poverty gap at different quantiles (10^{th}, 25^{th}, and 50^{th}) of the corresponding reference group applying the methodology described in section 3.3. These results are reported in Tables 5 and 6 and the share explained by each factor is summarized in Figures 8 to 10. Tables 7 to 9 report the distribution of some relevant characteristics.

In all countries a large part of the observed ethnic poverty gap is associated with the divergence in the distribution of observable characteristics by ethnic group (characteristics effect). Regarding the underlying factors, we can distinguish three different patterns. India and Nepal outstand for socioeconomic factors being at the root of the higher poverty of disadvantaged ethnic groups. The Philippines, on the opposite side, outstand for the higher poverty of disadvantaged ethnic groups being associated with their location. In the middle, both location and socioeconomic factors play a substantial role in shaping ethnic inequalities in poverty levels in Pakistan. Let us see this in more detail.

[18] Although questionnaires are very similar across countries, they still are country-specific and come from different phases and survey types and, thus, some variables were not available in specific samples.

India

The characteristics effect in India is able to account for about 80% of the ethnic poverty gap. The extent of the gap varies with the quantiles of the reference group used as poverty line, as seen before, but the determinant factors are rather stable. Socioeconomic factors jointly account for 56-57% of the ethnic gap in poverty rates. The lower education of disadvantaged ethnicities alone accounts for more than 40% of the gap. This means about 11 percentage points of higher poverty (at 25 and 50th quantiles) among disadvantaged groups and does not come as a surprise. For example, about two thirds (65%) of the eligible population in the disadvantaged groups (SC/ST/OBC) are illiterate, and only the household head of 46% has completed primary education (see Table 7). These figures sharply contrast with 39% and 65% respectively for the reference group.

The majority of the population from disadvantaged groups living in rural areas (74% compared with 49% of the reference group, see Table 8) and in the poorest states respectively explain about 7% and between 2-7% (depending on the threshold) of the gap. Demographic factors are at least as important as geographical variables to explain the ethnic gap in poverty rates, about 12% (for example, there is a higher prevalence of immigration from the countryside, 9% higher, and of teen marriage, 16% higher).

These features of the ethnic (caste) gap in poverty levels in India apply to all three disadvantaged groups: Scheduled Castes, Scheduled Tribes and Other Backward Class (see Table 5 and Figure 9). Let us consider the case when the poverty line is fixed at 25th percentile of the reference group. The ethnic gap in poverty rates, as mentioned in the previous section, is larger for Scheduled Tribes (51 percentage points), and much smaller for Scheduled Castes (28 percentage points) and Other Backward Class (20 percentage points). The proportion of the poverty gap explained by characteristics is also largest among Scheduled Tribes (86%) and smallest among Scheduled Castes (77%), and after controlling for characteristics the remaining gap is similar for Scheduled Castes and Scheduled Tribes (6-7 percentage points) and still smaller for Other Backward Class (4).

In all three groups the socioeconomic explanation accounts for more than half the observed gap. In absolute terms, the gaps explained by education, labor and location are larger for Scheduled Tribes (associated with respectively 17, 11 and 13 percentage points of higher poverty). Only the demographic gap is a bit higher for Scheduled Castes.

The distribution of the importance by factor shown in the overall results basically reflects what happens with Other Backward Class. The largest contribution to the characteristics effect, 39% of the gap, comes from education, followed by 15% from labor variables, 13% from demographics, and 9% from living in rural areas. In the case of the most disadvantaged group, Scheduled Tribes, education is relatively less relevant (33%) but labor variables (21%) and their overrepresentation in rural areas (18%) are much more important than in any other group. For Scheduled Castes, education (44%) and the region where they live (10%) are more relevant than in the other two groups.

Regarding the change over time in the contribution of each factor in India, Table 6 and Figure 10, we observe that the increase in the gap between 1998/99 and 2005/06 discussed above (4 percentage points at the 10th and 25th quantiles) was driven by an increasing contribution from all factors.

Nepal

The proportion of the ethnic poverty gap that is explained by characteristics in Nepal is smaller at the bottom of the distribution, about 68%, but sharply increases for higher poverty lines. The proportion explained by education is even larger than in India, 60% at the 10th quantile, and goes up to 90% at the median. This implies that education is associated with between 23 and 26 percentage points of higher poverty among disadvantaged ethnicities in this country. This, again, does not come as a surprise considering that inequality in education turns out to be even stronger than in India because of the higher education, in average, of the reference group. In the disadvantaged groups, 54% of eligible women are illiterate, while only for 37% of them the household head has completed primary studies, compared with 22% and 64% in the case of the reference group. Demographic factors are also of some relevance (3 percentage-point differential) especially for explaining moderate poverty (about 12% of the gap). Location and labor variables here turn out to be of little relevance in general.

Pakistan

The characteristics effect also explains the largest part (near 90%) of the observed gap in poverty rates by ethnicity in Pakistan. A large part of this gap is associated with location. In this case, it is the over-representation in rural areas (71% of the eligible population of disadvantaged ethnic groups compared with only 15% of Urdu) the main factor behind the ethnic poverty gap. This explains 35-39% of the differential, that is, about 19 percentage points of higher poverty at the 10th and 25th quantiles. The district of residence also matters. The fact that about 60% of Urdu reside in the richest quartile of districts, compared with only 19% of the other ethnicities, explains about 13-16% of the poverty differential (about 6-7 additional percentage points). However, the educational gap is also responsible for about one third of the overall gap in poverty (14-17 percentage points). Again this is due to a huge gap in attained education. Similar to what was shown for Nepal, 74% of eligible women in disadvantaged ethnicities are illiterate, while only for 45% of them the household head has completed primary studies, compared with 31% and 73% in the case of Urdu.

The Philippines

In contrast with the socioeconomic explanation dominant in India and Nepal, the Philippines is a remarkable case in which location turns out to be of extraordinary importance. Due to historical reasons the different ethnic groups are strongly linked to specific regions and islands, and there is a large inequality in wealth across regions that goes along ethnic lines (see Table 9). The wealth decile of the region of residence explains more than 80% of the gap at the 10th and 25th quantiles (respectively 20 and 25 percentage points of differential). For these two quantiles, the characteristics effect globally accounts for more than 90% of the gap. The proportion explained by region goes down to still 65% at the median, where a larger proportion of the gap (29%) remains unexplained. Education is also important, about 20% of the differential (5 percentage points) but much less than in India and Nepal as the educational gap is also smaller (Table 7).

A look at the trend over time reveals that the reduction of the ethnic poverty gap in the Philippines between 2003 and 2008 was driven by a lower contribution from location (region and area) due to the larger increase in wealth in rural areas and in regions with proportionally more population from disadvantaged ethnic groups (e.g. regions IX, VI, or VIII, see Table 9) and lower in urban areas and

in regions where Tagalog are disproportionally represented (e.g. IV-a, III, and the National Capital Region).

Table 5. Decomposition of the ethnic poverty gap for different quantiles of the reference group

Country	Ethnic poverty gap	Explained gap						Unexplained Gap
		Total	Region	Area	Demographic	Education	Labor	
India 2005/06								
10th	13.6	10.8	0.4	0.8	1.6	5.9	2.1	2.8
	0.4	0.3	0.2	0.1	0.2	0.2	0.2	0.3
25th	26.2	21.2	1.8	1.5	2.8	10.8	4.3	5.0
	0.5	0.4	0.3	0.3	0.3	0.4	0.3	0.4
Scheduled Caste	28.4	22.0	2.9	0.5	4.0	12.5	2.1	6.4
	0.7	0.6	0.4	0.4	0.4	0.5	0.4	0.6
Scheduled Tribe	50.0	42.7	3.7	9.1	3.7	16.6	10.5	7.3
	0.8	1.3	0.9	0.7	0.7	0.9	0.8	1.3
Other Backward Class	20.2	18.5	3.9	1.2	2.2	7.4	3.6	3.7
	0.6	0.8	0.7	0.3	0.3	0.4	0.3	0.5
50th	27.4	22.4	1.5	1.8	3.2	11.6	4.4	4.9
	0.5	0.5	0.3	0.3	0.3	0.4	0.3	0.5
Nepal 2011								
10th	38.6	26.5	1.3	-1.2	3.2	23.0	0.1	12.2
	1.3	1.1	0.6	0.5	0.7	1.3	1.0	1.3
25th	39.0	28.0	0.3	-1.7	3.6	26.3	-0.6	10.9
	1.7	1.4	0.8	0.6	0.8	1.5	1.3	1.6
50th	27.5	24.3	-0.8	-2.0	3.4	24.6	-1.0	3.2
	1.8	1.7	0.9	0.8	0.8	1.7	1.2	1.9
Pakistan 2006								
10th	48.6	43.0	6.2	18.9	0.0	15.3	2.6	5.7
	1.5	1.3	0.9	1.5	0.6	1.7	1.1	1.2
25th	50.7	45.8	7.3	19.3	-0.2	17.3	2.2	4.9
	2.1	1.6	1.0	1.6	0.7	1.8	1.1	1.7
50th	39.0	34.2	6.4	13.5	-0.6	13.6	1.4	4.8
	2.6	1.9	0.9	1.2	0.7	1.6	0.9	2.7
Philippines 2008								
10th	24.4	23.3	20.0	-2.0	-1.6	5.1	1.8	1.2
	0.9	0.8	0.9	0.6	0.6	0.8	0.7	0.8
25th	30.1	27.9	25.4	-2.6	-2.5	5.6	1.9	2.1
	1.2	1.1	1.2	0.7	0.8	1.0	0.8	1.4
50th	25.1	17.7	16.3	-2.1	-2.4	4.5	1.3	7.4
	1.4	1.3	1.3	0.6	0.7	1.0	0.8	1.7

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Reweighting decomposition described in Section 3.3. Bootstraps standard errors below each estimate (300 replications).

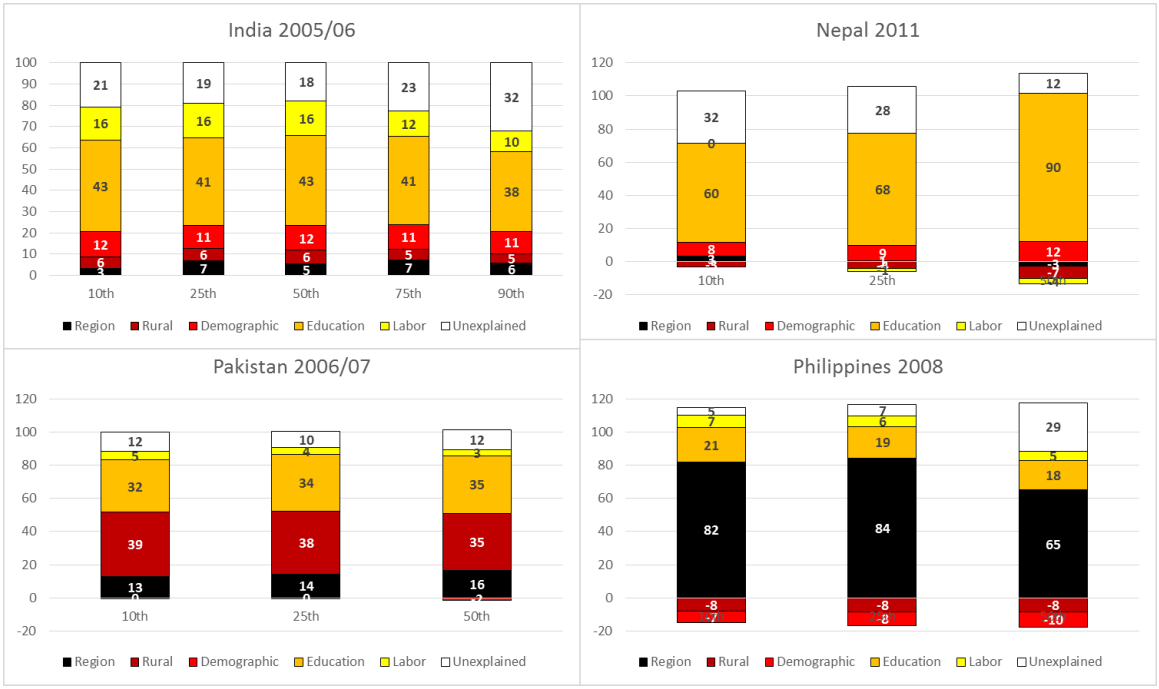
Table 6. Decomposition of the change in the ethnic poverty gap for different quantiles of the reference group

Country	Change in EPG	Explained gap						Unexplained Gap
		Total	Region	Area	Demographic	Education	Labor	
India 1998/1999-2005/06 (Indian-specific wealth index)								
10th	4.5	4.3	1.1	0.3	0.7	1.3	1.0	0.1
	0.6	0.4	0.3	0.2	0.2	0.3	0.2	0.5
25th	4.5	5.7	1.8	0.4	1.3	0.8	1.3	-1.1
	0.7	0.5	0.4	0.4	0.3	0.6	0.4	0.6
50th	3.0	3.3	0.7	0.2	1.5	0.1	0.8	-0.3
	0.6	0.6	0.4	0.4	0.3	0.6	0.4	0.7
Philippines 2003–2008 (Philippine-specific wealth index)								
10th	-7.1	-4.4	-3.8	-2.7	0.1	0.4	1.6	-2.7
	1.3	1.2	1.3	0.8	0.9	1.1	1.0	1.3
25th	-5.0	-5.1	-3.5	-3.0	-0.4	0.3	1.3	0.1
	1.8	1.6	1.6	0.8	1.1	1.5	1.1	2.0
50th	-0.4	-4.0	-2.1	-2.4	0.0	-0.1	0.7	3.6
	1.9	1.8	1.6	0.7	1.1	1.4	1.1	2.3

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1. Reweighting decomposition described in Section 3.3. Bootstraps standard errors below each estimate (300 replications).

Figure 8. Decomposing the ethnic poverty gap

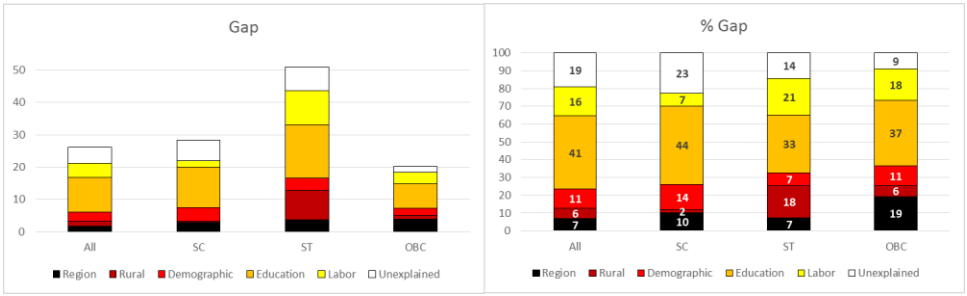
Proportion (%) of the relative ethnic poverty gap explained by each characteristic



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Figure 9. Decomposing the ethnic poverty gap in India

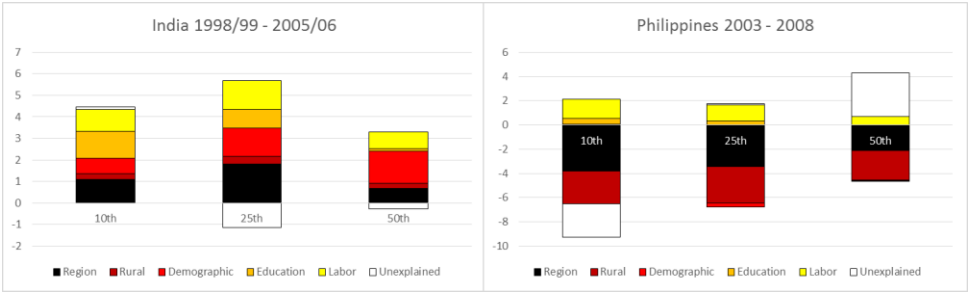
Percentage points and proportion (%) of the relative ethnic poverty gap explained by each characteristic



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Figure 10. Trends in ethnic poverty gap

Change in absolute values between both surveys



Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Table 7. Education and ethnicity

Country	Individual		Household head	Country	Individual		Household Head
	Illiterate	Primary completed	Primary completed		Illiterate	Primary completed	Primary completed
India 2005/06				**India 1998/99**			
None of them	38.6	62.1	65.1	None of them	41.7	50.6	59.6
SC	69.5	31.9	41.7	SC	70.9	23.0	37.7
ST	78.4	22.1	32.7	ST	76.9	16.5	30.6
OBC	60.9	41.0	51.4	OBC	58.8	35.4	49.5
SC/ST/OBC	65.5	36.1	46.4	SC/ST/OBC	65.1	28.9	43.1
Nepal 2011				**Pakistan 2006**			
Hill Brahmin	22.2	67.0	64.4	Urdu		31.5	44.9
Rest of groups	54.0	34.9	36.8	Rest of groups		74.3	21.8
Philippines 2008				**Philippines 2003**			
Tagalog	2.8	95.6	88.7	Tagalog	2.8	93.9	87.8
Rest of groups	11.1	85.4	76.2	Rest of groups	11.2	82.5	74.3

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Table 8. Area of residence and ethnicity

Country	Rural	Country	Rural
India 2005/06		**India 1998/99**	
None of them	57.9	None of them	65.8
SC	72.6	SC	78.9
ST	89.9	ST	89.3
OBC	71.1	OBC	76.0
SC/ST/OBC	73.9	SC/ST/OBC	78.8
Nepal 2011		**Pakistan 2006**	
Hill Brahmin	82.7	Urdu	15.4
Other	87.5	Other	71.1
Philippines 2008		**Philippines 2003**	
Tagalog	27.9	Tagalog	22.9
Other	55.9	Other	55.3

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Table 9. Location and ethnicity: The Philippines

Region	2008			2003		
	Wealth	Tagalog	Other	Wealth	Tagalog	Other
I - Ilocos Region	0.543	1.3	6.2	0.472	1.3	6.3
II - Cagayan Valley	0.487	1.0	4.1	0.418	1.3	4.7
III - Central Luzon	0.568	20.9	6.8	0.527	18.7	7.6
IV-a – Calabarzon	0.594	36.3	3.6	0.567	36.4	3.7
IV-b – Mimaropa	0.369	5.2	1.9	0.291	4.1	2.4
V - Bicol Region	0.424	1.3	7.3	0.366	1.8	6.7
VI - Western Visayas	0.423	0.3	10.1	0.320	0.5	9.2
VII - Central Visayas	0.467	0.2	9.9	0.406	0.3	10.7
VIII - Eastern Visayas	0.388	0.1	5.5	0.303	0.2	5.8
IX - Zamboanga Peninsula	0.393	0.2	5.3	0.279	0.2	5.4
X - Northern Mindanao	0.410	0.1	6.1	0.388	0.1	5.9
XI - Davao Peninsula	0.414	0.1	6.7	0.417	0.3	6.8
XII – Soccsksargen	0.377	0.3	5.4	0.323	0.4	5.7
XIII – Caraga	0.406	0.2	3.4	0.346	0.1	3.5
National Capital Region	0.643	32.2	10.1	0.599	34.2	8.4
Cordillera Administrative Region	0.493	0.4	2.2	0.461	0.3	2.1
Arm	0.269	0.1	5.5	0.199	0.0	5.3
Urban	0.592	72.0	44.1	0.550	77.1	44.7
Rural	0.391	27.9	55.9	0.316	22.9	55.3

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

6. Conclusions and some policy recommendations

The results of this study showed that in the six analyzed countries there are some ethnic groups facing higher poverty risk than others when an index of wealth is used to measure economic status. There is, however, an important level of cross-country heterogeneity in both the extent of the ethnic poverty gap and the main explanatory factors, as well as in the evolution over time.

The poverty gap between some ethnic groups and their country's reference can be astonishingly large. In some cases the differential in poverty rates is above 50 or even 60 percentage points for some wealth cut-offs. This is especially the case of Siraiki and other linguistic groups in Pakistan, Scheduled Tribes in India, Hill Dallit in Nepal, or ethnic minorities in Vietnam. Clearly, ethnic minorities surveyed in Azerbaijan enjoy not only higher levels of wealth, but also a smaller poverty gap with respect to Azerbaijani (about 20 percentage points at its maximum). To a lower extent the ethnic poverty gap in the Philippines also tend to be smaller, around 30 percentage points in its peak, similar to Scheduled Cates in India or Hill Chhetri and Hill Jananti in Nepal.

Regarding the reasons of this ethnic inequality in poverty rates, we know that some ethnic groups usually accumulate a number of disadvantages across different dimensions such as having lower education, higher unemployment, larger families, or lower development of their communities that help to explain their higher poverty. Among the studied cases, this is probably a good description of the higher poverty gap of Scheduled Tribes in India, the group showing the largest absolute poverty rates among all those included in our analysis.

We have, however, found significant cross-country differences in what factors are more strongly associated with the ethnic poverty gap in the four countries we have analyzed in more detail. We showed that the higher poverty of disadvantaged groups in India and Nepal is mostly driven by the extraordinarily high inequality in attained education by ethnicity prevailing in these two countries. As mentioned before, in the specific case of the Scheduled Tribes in India, their higher concentration in rural areas and their poorer performance in the labor market are also remarkable determinant factors. On the contrary, the Philippines outstands for having regional wealth inequalities as the main factor associated with most of the ethnic poverty gap of their disadvantaged ethnicities. Pakistan resembles India and Nepal in the remarkable importance of the poorer education of the disadvantaged groups, but it also outstands for their concentration in rural areas being associated with their higher poverty.

We also showed that in a period of generally strong economic growth in the region, the wealth of all ethnic groups in India and the Philippines have increased. This implied a reduction of the ethnic poverty gap only in the Philippines (driven by diminishing interregional inequality), while disadvantaged groups in India, especially Scheduled Tribes, took less advantage of growth than the reference group and the relative ethnic poverty gap increased (driven by the contribution of all factors).

The nature of this study does not allow us to make very specific policy recommendations because there is no causal analysis and because that would need a more in-depth research of the mechanisms that work to keep each particular ethnic group with higher poverty in each country. However, we can draw a few lessons that might be of help in orienting policy when it comes to reduce the ethnic poverty gap.

The large extent of the inter-ethnic poverty gap for many groups in Asian countries described in this paper suggests that the situation of several disadvantaged ethnic groups in Asian countries should be taken very seriously. Ethnicity should definitely be a matter of concern in Asian countries and be part of any agenda of poverty reduction in the region for the next years. This calls for a higher visibility of ethnicity in statistics across Asian countries so to be able to monitor the progress made during these years of intense economic growth in the region, establishing specific goals of poverty reduction, and designing appropriate strategies to achieve them.

We have found that that most of the ethnic poverty gap seems to be associated with a set of basic observed characteristics. This suggests that it is not difficult to identify what policies are generally expected to have a larger impact on reducing the poverty gap in each case. The indicated factors associated with the ethnic poverty gap point out to the direction of policies aimed at closing the gap. And these are policies addressed at improving the basic endowments of the poorest ethnic groups.

In Nepal and India, where education was identified as the main factor associated with the ethnic poverty gap, we can expect little improvement in the relative situation of ethnic disadvantaged groups (castes and tribes) without addressing this extraordinarily high inequality in the attained levels of education. It is worth noting that the inter-ethnic difference in education is observed at the elementary level, with a large gap in literacy rates and in the proportion of the population that have completed primary school. Thus, it is at these basic levels that most efforts should be addressed improving and enhancing the existing infrastructure as well as promoting the enrollment among the poorest ethnic groups. For example, there exists wide empirical evidence of the success of conditional cash transfers in promoting schooling jointly with improvements in incomes among the poor in many countries (e.g. the meta-analysis in Saavedra and García, 2012) that suggests enhancing this type of transfers might have a formidable impact on reducing the ethnic gap too. The fact that India has a long tradition of affirmative action quotas in politics, public employment and education has probably prevented the gap to be even higher, but was unable so far to substantially close it or even, as shown here, to prevent an increase over time.

A similar lesson applies to Pakistan, a country that shares with India and Nepal a high ethnic inequality in the access to basic education, what is one determinant factor of the large poverty rates of some linguistic groups. In this country, we might also expect a significant reduction in the ethnic gap by reducing the urban-rural gap through development of rural communities where disadvantaged ethnic groups overwhelmingly live, something that would also be extremely important in India, especially for Scheduled Tribes.

In the Philippines, every policy that aims at reducing the large geographical inequality increasing the economic opportunities in the least developed provinces is expected to have an extraordinary impact on closing the ethnic gap too. In fact, we have shown that a reduction in geographical inequalities between 2003 and 2008 accounted for the reduction in the ethnic poverty gap, both absolute and relative, that occurred during that period in this country.

References

ADB (2002), *Indigenous Peoples/Ethnic Minorities and Poverty Reduction*. Regional report, Viet Nam, Philippines, Pacific Region, Indonesia, and Cambodia, Environment and Social Safeguard Division, Regional and Sustainable Development Department, Asian Development Bank, Manila, Philippines.

Bhalla, A.S. and D. Luo (2013), *Poverty and Exclusion of Minorities in China and India*, The Palgrave Macmillan, New York.

Baulch, B. (2008), "Ethnic Minority Underdevelopment in Vietnam: Full Research Report", ESRC End of Award Report, RES-167-25-0157. Swindon: ESRC.

Baulch, B., H.T.M. Nguyen, P.T.T. Phuong, H.T. Pham (2010), "Ethnic minority poverty in Vietnam", Working Paper 169, Chronic Poverty Research Centre, Manchester.

Baulch, B., Truong, C., Haughton, D. and Haughton, J. (2004), "Ethnic minority development in Vietnam: A socio-economic perspective", Chapter 8 in Glewwe P., Agrawal, N., and Dollar, D. (eds), Economic Growth, Poverty and Household Welfare in Vietnam, World Bank Regional and Sectoral Studies, Washington DC: World Bank.

Baulch, B., Truong, C., Haughton, D. and Haughton, J. (2007), "Ethnic minority development in Vietnam", Journal of Development Studies, 43(7): 1151-1176.

Baulch, B., H.T Pham, and B. Reilly (2008), "Decomposing the Ethnic Gap in Living Standards in Rural Vietnam: 1993 to 2004", mimeo, Institute of Development Studies, mimeo, University of Sussex.

Blinder, A.S. (1973), ''Wage discrimination: reduced form and structural estimates'', Journal of Human Resources, 8 (4): 436–55.

Borooah, V.K. (2005), "Caste, Inequality, and Poverty in India", Review of Development Economics, 9(3): 399-414.

Butler, R.J. and J.B. McDonald (1987), "Interdistributional Income Inequality", Journal of Business and Economic Statistics, 5(1): 13-18.

Dang, H-A. (2012), "Vietnam: A Widening Poverty Gap for Ethnic Minorities", in Hall and Patrinos (2012), Chapter 8: 304-343.

Das, M.B. G.H. Hall, S. Kapoor and D. Nikitin (2012), "India: The Scheduled Tribes", in Hall and Patrinos (2012), Chapter 6: 205-248.

DiNardo, J., Fortin, N. and Lemieux, T. (1996), "Labor market institutions and the distribution of wages, 1973-1992: a semiparametric approach", Econometrica, 64: 1001-1044.

Even, W. E. and D.A. Macpherson (1990), "Plant size and the decline of unionism", Economics Letters, 32 (4): 393-398.

Filmer, D. and L. Pritchett (2001), "Estimating wealth effects without expenditure data—or tears: An application to educational enrollments in states of India", Demography, 38(1): 115-132.

Foster, J. and A.F. Shorrocks (1988a), "Poverty Orderings", Econometrica, 56(1): 173-77.

Foster, J. and A.F. Shorrocks (1988b), "Poverty Ordering and Welfare Dominance", Social Choice and Welfare, 5(2-3): 179-198.

Gang, I.N., K. Sen and M-S.Yun (2008), "Poverty in Rural India: Caste and Tribe", Review of Income and Wealth, 54(1): 50-70.

Gradín, C. (2009), "Why is poverty so high among Afro-Brazilians? A decomposition analysis of the racial poverty gap", Journal of Development Studies, 45(9): 1-38.

Gradín, C. (2013a), "Race, poverty, and deprivation in South Africa", Journal of African Economies, 22(2): 187-238.

Gradín, C. (2013b), "Rural Poverty and Ethnicity in China", Paper presented at the Workshop 'Poverty Reduction in Asia', Asian Development Bank and Sogang University, Seoul.

Gradín, C. (2014), "Race and income distribution: Evidence from the US, Brazil and South Africa", Review of Development Economics, 18(1): 73-92.

Hall, G. and H. Patrinos (Eds.) (2012), *Indigenous Peoples, Poverty and Development*, Cambridge University Press: New York.

Hannum, E.C. and M. Wang (2012), "China: A Case Study in Rapid Poverty Reduction", in Hall and Patrinos (2012), Chapter 5: 149-204.

Hoang, H., Pham, G., Tran, M., and Hansen, H., (2007), "Ethnicity and poverty reduction", in Nguyen, T. and Hansen, H. (eds) Markets, Policy and Poverty Reduction in Vietnam, Hanoi: Vietnam Academy of Social Sciences/National Political Publishing House.

Imai, K.S., R. Gaiha and W. Kanga (2011), "Poverty, inequality and ethnic minorities in Vietnam", International Review of Applied Economics, 2(3): 249-282.

King, E.M. and D. van de Walle (2012), “Laos: Ethno-linguistic Diversity and Disadvantage” in Hall and Patrinos (2012), Chapter 7: 249-303.

Le Breton, M., A. Michelangeli, and E. Peluso (2012), “A stochastic dominance approach to the measurement of discrimination”, Journal of Economic Theory, 147: 1342-1350.

Oaxaca, R. L. (1973), ‘‘Male-female wage differentials in urban labor markets’’, International Economic Review, 14 (3): 693–709.

Pham, T.H., Le Dang, T. Nguyen, V.C. (2010), “Poverty of the Ethnic Minorities in Vietnam: Situation and Challenges from the Poorest Communes”, MPRA Paper 50372, Munich Personal RePEc Archive, Munich.

Rutstein, S.O. and K. Johnson, (2004), “The DHS Wealth Index”, DHS Comparative Reports No. 6, ORC Macro, Calverton, Maryland, US.

Saavedra, J.E. and Sandra García (2012), “Impacts of Conditional Cash Transfer Programs on Educational Outcomes in Developing Countries: A Meta-analysis”, RAND Labor and Population Working Paper Series, WR-921-1.

Swinkels, R., and Turk, C. (2006), “Explaining ethnic minority poverty in Vietnam: a summary of recent trends and current challenges”, Background paper for CEM/MPI meeting on Ethnic Minority Report, 28 September 2006. Hanoi: World Bank.

van de Walle, D. and D. Gunewardena (2001), “Sources of ethnic inequality in Viet Nam”, Journal of Development Economics, 65: 177–207.

Vinod, H. (1985), “Measurement of Economic Distance between Blacks and Whites”, Journal of Business and Economic Statistics, 3(1): 78-88.

APPENDIX

Table A1. Components of the wealth index and distribution by country and group

Variables and Categories	MCA Score s_j^q	Normalized Weight w_j^q	Eligible population: Distribution by country and group (%) (C=comparison R=Reference)											
			Azerbaijan		India		Nepal		Pakistan		Philippines		Vietnam	
			C	R	C	R	C	R	C	R	C	R	C	R
Source of drinking water														
Piped into dwelling	1.514	0.08	17.5	32.2	8.4	21.7	4.1	9.5	26.4	63.5	19.5	33.4	4.1	21.8
Piped to yard/plot	0.513	0.05	16.8	19.8	10.3	13.4	14.7	24.7	6.1	5.3	6.4	5.1	0.0	0.0
Public tap/standpipe	-0.942	0.02	5.9	3.8	18.1	12.1	23.6	24.6	2.2	3.3	6.1	2.9	2.0	1.1
Tube well/borehole	-0.932	0.02	9.5	9.9	46.1	40.9	43.8	29.0	15.0	11.0	21.8	19.2	0.0	0.0
Protected well	-0.317	0.03	22.5	5.4	2.0	3.0	1.7	2.8	41.9	8.7	6.1	1.4	34.2	54.0
Unprotected well	-1.770	0.00	0.0	0.2	11.2	6.6	2.4	0.7	1.3	0.0	5.1	1.1	5.2	1.9
Surface water	-0.623	0.03	26.1	15.9	2.7	1.2	8.6	6.9	4.2	0.7	11.6	3.4	53.9	7.5
Rainwater	0.215	0.05	0.0	0.0	0.2	0.1	0.1	0.0	0.3	0.0	0.8	0.0	0.5	12.8
Tanker truck	1.687	0.08	1.7	10.3	0.4	0.4	0.7	0.7	0.9	3.0	1.0	0.6	0.0	0.8
Cart with small tank	0.541	0.05	0.0	1.0	0.1	0.2	0.0	0.0	0.5	0.2	0.6	0.5	0.0	0.0
Bottled water	1.558	0.08	0.0	0.1	0.3	0.3	0.5	1.1	0.2	3.7	19.4	31.5	0.0	0.1
Other	-0.003	0.04	0.0	1.4	0.2	0.1	0.0	0.0	1.1	0.7	1.6	0.7	0.2	0.1
Type of toilet facility														
Flush to piped sewer system	1.760	0.09	16.6	42.7	5.6	17.3	5.2	9.3	27.7	80.6	1.3	8.4	4.2	35.3
Flush to septic tank	0.571	0.06	0.0	1.1	17.1	32.2	32.3	59.1	18.9	8.4	62.4	85.0	0.0	0.0
Flush to pit latrine	-0.543	0.04	0.0	0.0	5.0	8.3	4.0	6.6	0.0	0.0	14.1	1.7	0.0	0.0
Flush to somewhere else	0.145	0.05	0.5	0.7	1.5	1.1	0.3	0.1	9.3	5.4	0.8	1.0	0.0	0.0
Ventilated improved pit latrine	0.146	0.05	0.0	0.0	0.3	0.4	1.0	1.1	0.9	0.1	1.4	0.2	3.5	9.8
Pit latrine with slab	0.437	0.06	59.4	40.2	2.0	3.8	8.4	11.7	1.1	1.6	2.6	0.3	47.5	42.2
Pit latrine without slab/open pit	0.073	0.05	22.9	14.6	1.0	1.9	7.1	5.4	3.1	0.3	3.1	0.2	0.0	0.0
No facility/bush/field	-2.165	0.00	0.6	0.3	66.7	33.9	41.6	6.2	30.5	1.0	12.1	3.1	44.9	12.7
Composting toilet	-1.285	0.02	0.0	0.0	0.1	0.1	0.2	0.4	0.0	0.0	0.7	0.0	0.0	0.0
Bucket/dry toilet	-1.328	0.02	0.0	0.0	0.4	0.9	0.0	0.0	1.7	0.1	0.2	0.0	0.0	0.0
Hanging toilet/latrine	-0.480	0.04	0.0	0.0	0.0	0.0	0.0	0.0	6.7	2.6	1.4	0.2	0.0	0.0
Other	0.017	0.05	0.0	0.4	0.3	0.2	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
Share toilet with other households														
No	0.849	0.07	96.4	91.2	23.8	49.9	40.7	74.9	59.4	88.5	65.1	78.4	49.6	79.2
Yes	0.094	0.05	2.8	8.3	9.5	15.8	17.6	18.8	9.6	10.1	21.3	17.2	5.1	7.7
No facility/unknown	-2.129	0.00	0.8	0.5	66.7	34.3	41.8	6.3	31.1	1.5	13.7	4.5	45.3	13.2
Has electricity														
No	-2.413	0.00	0.4	0.6	36.4	21.0	26.2	4.8	11.0	0.5	19.9	5.5	15.4	2.5
Yes	0.421	0.07	99.6	99.5	63.6	79.0	73.8	95.3	89.0	99.6	80.1	94.5	84.7	97.5
Has telephone														
No	-0.659	0.00	43.7	42.1	90.2	74.2	92.4	78.3	52.9	26.6	91.4	80.6	94.7	63.9
Yes	1.593	0.05	56.3	57.9	9.8	25.8	7.6	21.7	47.1	73.4	8.6	19.4	5.3	36.1
Has radio														
No	-0.374	0.00	54.1	53.9	71.2	58.7	51.3	30.7	65.8	73.5	36.4	27.4	66.4	57.3
Yes	0.449	0.02	45.9	46.1	28.8	41.3	48.7	69.3	34.2	26.5	63.6	72.6	33.7	42.7
Has television														
No	-1.750	0.00	4.2	4.1	59.1	38.0	53.3	27.0	44.6	10.3	32.4	11.4	42.3	9.8
Yes	0.845	0.06	95.8	95.9	40.9	62.0	46.7	73.0	55.4	89.7	67.6	88.6	57.7	90.3
Has refrigerator														
No	-0.866	0.00	30.1	23.8	90.2	69.9	90.7	79.8	64.4	26.4	65.3	47.2	95.2	75.9
Yes	1.711	0.06	69.9	76.2	9.8	30.1	9.3	20.2	35.6	73.6	34.7	52.8	4.8	24.1
Has bicycle														
No	0.097	0.01	89.8	91.4	43.6	42.3	55.1	55.7	56.9	64.1	75.4	74.5	41.9	16.4
Yes	-0.129	0.00	10.2	8.6	56.4	57.7	44.9	44.4	43.1	35.9	24.6	25.5	58.1	83.6
Has motorcycle/scooter														
No	-0.270	0.00	94.2	99.1	85.0	70.2	89.8	77.5	80.2	61.0	76.1	75.3	56.3	35.6
Yes	0.929	0.03	5.9	0.9	15.0	29.8	10.2	22.6	19.8	39.0	23.9	24.7	43.7	64.4
Has car/truck														
No	-0.168	0.00	82.0	77.0	98.5	94.5	98.4	97.0	92.9	87.7	92.0	84.0	99.7	98.8
Yes	2.013	0.05	18.0	23.0	1.5	5.5	1.6	3.0	7.1	12.3	8.0	16.0	0.3	1.2
Has an animal-drawn cart														
No	0.049	0.02	96.3	96.6	93.2	93.3	95.3	99.1	88.3	97.0	95.4	99.1	95.8	95.7
Yes	-0.802	0.00	3.7	3.4	6.8	6.7	4.7	0.9	11.7	3.0	4.6	0.9	4.2	4.3
Main floor material														
Natural	-1.812	0.00	1.1	2.8	53.2	33.0	71.4	44.2	52.6	6.3	9.2	6.9	35.3	11.9
Rudimentary (wood planks, palm ...)	0.906	0.06	87.0	78.6	6.5	7.1	1.5	1.3	0.0	0.0	29.3	6.5	29.5	3.4
Parquet, polished wood	2.433	0.10	6.5	10.0	0.1	0.1	0.3	1.1	0.0	0.0	0.5	0.3	0.3	0.5
Vinyl, asphalt strips	1.095	0.07	0.0	0.0	0.2	1.1	1.3	2.3	0.0	0.0	3.1	6.3	0.0	0.0
Ceramic tiles	1.203	0.07	0.0	0.0	3.5	7.6	0.2	1.3	0.9	1.7	8.1	16.2	9.6	54.9
Cement	0.454	0.05	0.7	1.5	31.1	39.0	19.5	36.0	28.0	54.3	48.6	60.9	25.3	29.3
Carpet/mats	1.325	0.07	0.0	0.4	0.2	0.4	5.7	13.9	1.0	3.5	0.2	0.2	0.0	0.1
Other finished (polished stone, marble)	1.391	0.07	2.7	3.9	5.2	11.7	0.0	0.0	17.6	34.0	0.9	2.7	0.0	0.0
Other	1.446	0.08	2.1	2.8	0.0	0.1	0.1	0.0	0.0	0.2	0.0	0.1	0.0	0.0

Main wall material														
No walls	-2.134	0.00	0.0	0.1	0.1	0.1	0.0	0.0	8.5	0.8	0.0	0.0	0.2	0.0
Cane/palm/trunks/grass	-1.570	0.01	0.2	0.1	3.8	2.5	2.5	0.8	0.0	0.0	2.0	1.3	17.9	10.0
Dirt/mud/sand	-2.077	0.00	0.9	2.5	27.2	14.3	6.6	2.2	23.1	3.6	0.0	0.0	3.1	0.4
Bamboo with mud	-1.800	0.01	0.0	0.0	2.6	2.9	23.8	5.7	0.0	0.0	20.3	4.5	13.2	1.3
Stone with mud	-1.297	0.02	10.7	5.5	3.2	2.1	26.9	27.8	0.0	0.0	0.0	0.1	0.9	0.1
Plywood/reused wood	-0.433	0.04	0.5	0.3	0.3	0.2	1.0	2.0	0.1	0.0	12.9	9.6	19.6	3.5
Cardboard	-1.380	0.02	0.0	0.0	0.0	0.0	0.0	0.0	6.1	0.5	1.1	0.7	0.2	0.1
Uncovered adobe/unburnt	-0.529	0.04	5.4	1.0	1.7	1.1	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.1
Cement	0.676	0.07	0.7	0.6	32.8	50.4	24.5	48.2	0.0	0.0	21.2	38.5	0.1	0.2
Stone with lime/cement	0.317	0.06	11.7	4.3	5.8	5.9	0.9	1.6	0.6	0.9	0.4	0.6	1.4	1.2
Baked bricks	0.200	0.05	5.3	3.7	19.2	16.1	7.8	6.1	21.6	14.4	0.1	0.1	15.7	76.9
Cement blocks	0.980	0.07	1.7	0.3	2.7	3.8	0.8	1.9	39.5	79.1	29.0	39.8	0.1	0.4
Covered adobe	1.008	0.07	8.5	3.7	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	2.6	0.7
Wood planks/shingles	-0.725	0.03	1.7	0.5	0.1	0.1	4.6	3.3	0.0	0.0	11.6	3.6	20.9	3.2
Other finished	1.955	0.09	52.6	76.8	0.3	0.4	0.0	0.0	0.0	0.3	1.0	0.9	0.0	0.0
Other	-0.680	0.03	0.0	0.6	0.2	0.2	0.5	0.3	0.6	0.3	0.1	0.3	3.9	1.9
Main roof material														
No roof	-0.881	0.03	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0
Natural	-2.015	0.00	0.0	0.1	17.7	8.9	19.2	4.7	35.5	6.1	16.6	2.8	15.3	6.2
Rudimentary	-1.872	0.00	0.4	0.3	7.2	4.2	1.2	0.2	0.2	0.2	1.0	0.4	3.1	0.3
Metal	0.290	0.05	3.0	4.3	9.2	11.5	28.0	38.3	2.8	6.4	80.4	94.4	13.1	29.2
Wood	-0.150	0.04	0.0	0.1	0.8	1.1	0.2	0.2	39.3	24.9	0.1	0.2	0.0	0.0
Calamine/cement	-0.122	0.04	0.0	0.0	0.8	1.1	2.2	1.1	0.0	0.0	0.1	0.1	15.8	10.8
Cement	0.913	0.07	2.5	6.3	29.7	45.4	18.9	33.8	22.1	62.2	0.9	1.5	4.0	16.9
Ceramic tiles	-0.766	0.03	4.7	3.4	13.8	13.1	29.4	21.7	0.0	0.0	0.2	0.2	48.8	36.2
Other finished	1.224	0.08	87.7	84.0	20.5	14.5	0.0	0.0	0.0	0.0	0.8	0.2	0.0	0.4
Other	-0.104	0.04	1.7	1.4	0.3	0.2	0.9	0.1	0.1	0.3	0.0	0.1	0.0	0.0
Household members/ Rooms used for sleeping														
<1	0.720	0.05	2.5	1.3	0.7	0.9	2.5	6.6	0.9	2.3	1.1	0.9	0.4	1.6
1-2	0.667	0.05	20.9	15.6	9.0	14.6	24.6	42.6	5.6	8.9	14.6	14.7	14.9	23.2
2-2.5	0.515	0.05	28.3	27.0	14.3	18.5	21.6	22.5	9.1	11.4	16.9	19.0	16.1	26.1
2.5-3	0.370	0.04	16.7	14.8	9.1	11.2	10.6	8.7	8.3	8.0	11.1	12.5	8.7	13.1
3-4	-0.052	0.03	15.9	20.3	21.0	20.0	18.7	11.6	23.2	23.1	22.2	22.2	18.1	17.5
4-5	-0.331	0.03	9.3	13.3	18.0	15.8	10.3	5.1	18.1	16.1	13.9	11.6	14.5	11.3
5-10	-0.998	0.01	6.5	7.5	27.0	18.2	11.4	2.8	32.0	28.1	19.3	18.9	25.2	7.0
>=10	-1.432	0.00	0.0	0.2	1.0	0.8	0.4	0.2	2.8	2.3	1.0	0.3	2.3	0.2
Type of cooking fuel														
Electricity	1.437	0.07	20.0	22.6	0.3	0.5	0.1	0.0	0.2	0.2	1.0	1.1	0.2	0.5
Gas	1.665	0.08	54.9	68.4	17.4	38.1	15.5	32.1	25.9	82.8	24.3	53.7	3.3	35.4
Biogas	-0.077	0.04	0.0	0.0	0.4	0.7	2.3	13.0	2.0	0.4	0.0	0.0	0.0	1.7
Kerosene	0.302	0.05	0.0	0.4	2.1	2.9	0.3	0.0	0.0	0.0	1.1	3.9	0.0	0.0
Coal/lignite	0.508	0.05	0.3	0.1	1.7	2.8	0.0	0.0	0.0	0.0	0.1	0.2	0.9	11.1
Charcoal	0.278	0.05	2.0	0.5	0.3	0.5	0.1	0.7	0.5	0.0	16.1	16.4	0.0	0.0
Wood	-1.039	0.02	22.8	7.5	55.7	34.2	70.7	53.5	55.3	14.0	56.4	23.8	94.7	38.7
Straw/shrubs/grass	-1.217	0.01	0.0	0.0	4.7	6.3	3.5	0.1	4.4	0.7	0.0	0.0	1.0	12.5
Agricultural crop	-1.505	0.01	0.0	0.0	4.0	4.2	1.1	0.2	4.1	0.4	0.9	0.8	0.0	0.0
Animal dung	-1.789	0.00	0.2	0.3	13.5	9.7	6.2	0.2	7.5	1.5	0.0	0.0	0.0	0.0
No food cooked in house	-0.069	0.04	0.0	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.1	0.0	0.0	0.0
Other	-0.571	0.03	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0	0.1

Note: Eligible population: Ever-married women, 15-49 years old.

Table A2. Variables used for country-specific wealth indices in India and the Philippines

India 1998/99-2005/06				
Source of drinking water	House	Motorcycle	Water pump	Cot or bed
Type of toilet facility	Acres of land under cultivation	Car	Thresher	Chair
People/sleeping rooms	Electricity	Telephone	Tractor	Mattress
Main cooking fuel	Radio	Clock or watch	Fan	Pressure cooker
Purify water	Refrigerator	Bullock cart	Television (b/w)	Table
Separate room used as a kitchen	Bicycle	Household owns livestock	Television (color)	Sewing machine
Philippines 2003-2008				
Source of drinking water	Main wall material	Refrigerator	Has landline telephone	Cd/vcd/dvd player
Time to get to water source	Electricity	Bicycle/trisikad	Cellphone	Component/karaoke
Type of toilet facility	Radio	Motorcycle/scooter/tricycle	Personal computer	Owns a tractor
Main floor material	Television	Car/truck	Washing machine	Tenure status of lot

Table A3. Sample sizes

Sample	Reference	Comparison					Comparison (All)	Total
	Azerbaijani	Other						
Azerbaijan 2006	5,318	458					458	5,776
	None of Them	SC	ST	OBC				
India 2005/06	31,763	15,814	11,789	30,318			57,921	89,684
India 1998/99	37,467	15,256	10,906	26,028			52,190	89,657
	HB	HC	HD	HJ	Other			
Nepal 2011	1,359	2,528	1,154	2,241	2,555		8,478	9,837
	Urdu	Punjabi	Sindhi	Pushto	Siraiki	Other		
Pakistan 2006/07	735	3,098	1,318	2,057	1,372	1,437	9,282	10,017
	Tagalog	Cebuano	Ilocano	Ilonggo	Other			
Philippines 2008	2,131	2,186	897	841	3,139		7,063	9,194
Philippines 2003	2,342	2,410	1,014	834	2,724		6,982	9,324
	Vietnamese	Other						
Vietnam 2005	4,220	785					785	5,005
All								**221,753**

Table A4. Summary variables and Logit regression:
Probability of belonging to the reference group, India 2005/06

	Reference		Comparison		Coef.	Std. Err.
	Mean	sd	Mean	sd		
State Dec 1	9.5	29.3	13.3	34.0	Ref.	
State Dec 2	6.2	24.2	13.5	34.1	-0.336	0.055
State Dec 3	12.7	33.3	16.6	37.2	0.006	0.053
State Dec 4	15.3	36.0	4.6	21.0	1.491	0.059
State Dec 5	6.6	24.9	8.2	27.4	0.189	0.056
State Dec 6	7.5	26.4	9.4	29.1	0.203	0.059
State Dec 7	3.8	19.1	15.5	36.2	-1.412	0.058
State Dec 8	19.9	39.9	9.9	29.8	0.918	0.052
State Dec 9	7.2	25.8	5.0	21.8	0.560	0.058
State Dec 10	11.3	31.7	4.1	19.8	0.823	0.051
Rural	57.9	49.4	73.9	43.9	-0.144	0.028
2 related adults	28.9	45.3	32.9	47.0	Ref.	
3+ related adults	67.4	46.9	62.8	48.3	0.015	0.031
Other household type	3.6	18.7	4.3	20.4	0.177	0.071
Female	12.6	33.2	12.6	33.2	0.190	0.047
HH age	46.5	13.5	44.1	12.9	-0.019	0.006
HH age square					0.000	0.000
Age	32.4	8.3	31.3	8.4	0.085	0.012
Age squared					-0.001	0.000
N Members	5.6	2.9	5.8	3.0	0.004	0.007
N children (5yo)	0.7	1.0	0.9	1.1	-0.063	0.017
N Living Children	2.3	1.6	2.6	1.7	-0.019	0.009
Primary (incomplete)	37.9	48.5	63.9	48.0		
Primary (complete)	7.9	27.0	6.9	25.3	0.346	0.046
Secondary (incomplete)	36.6	48.2	23.3	42.3	0.225	0.050
Secondary (complete)	6.1	24.0	2.7	16.2	0.381	0.070
Higher education	11.5	31.9	3.2	17.5	0.721	0.071
Illiterate	38.6	48.7	65.5	47.5	-0.338	0.045
Head's Primary (incomplete)	34.9	47.7	53.6	49.9	Ref.	
Head's Primary (complete)	6.8	25.2	8.0	27.1	0.099	0.049
Head's Secondary (incomplete)	37.3	48.4	29.5	45.6	0.273	0.040
Head's Secondary (complete)	6.7	25.0	3.6	18.6	0.501	0.062
Head's Higher education	14.3	35.0	5.4	22.5	0.439	0.068
No immigrant	15.7	36.4	17.8	38.2	Ref.	
Immigrant (<=5 years / visitor)	27.1	44.5	23.9	42.7	0.153	0.039
Immigrant (6+ years)	57.2	49.5	58.3	49.3	0.198	0.037
Immigrant from countryside	53.5	49.9	62.6	48.4	-0.073	0.028
Currently married	94.7	22.4	93.9	23.9	Ref.	
Formerly married	5.3	22.4	6.1	23.9	-0.041	0.051
Teen marriage	49.2	50.0	65.1	47.7	-0.189	0.024
No working/other	74.1	43.8	57.1	49.5	Ref.	
Professional, clerical	4.3	20.2	2.1	14.5	0.347	0.078
Services, Skilled	10.8	31.1	13.3	33.9	0.386	0.058
Agriculture	10.8	31.0	27.4	44.6	-0.248	0.064
Worked last 12 moths	70.9	45.4	48.5	50.0	0.892	0.052
Not paid work	6.9	25.3	13.8	34.5	0.217	0.051
Partner: did not work / No partner	2.3	14.8	1.7	13.0	Ref.	
Partner: professional/technical/managerial	11.1	31.4	5.0	21.9	-0.111	0.083
Partner: clerical	6.0	23.7	3.5	18.3	-0.188	0.087
Partner: sales	17.1	37.7	10.3	30.4	0.027	0.078
Partner: agricultural	25.7	43.7	35.2	47.8	0.059	0.076
Partner: services	5.9	23.5	5.4	22.6	-0.372	0.084
Partner: skilled and unskilled manual	31.7	46.5	38.7	48.7	-0.255	0.075
Partner: unknown occupation	0.2	4.9	0.2	4.8	0.177	0.222
Partner: no education/ don't know	17.4	38.0	32.7	46.9	Ref.	
Partner: primary	13.2	33.9	17.1	37.7	0.090	0.038
Partner: secondary	49.9	50.0	42.4	49.4	0.015	0.039
Partner: higher	19.4	39.5	7.8	26.8	0.158	0.062
Intercept					-2.986	0.247
N observations					89,684	
Wald chi2					8,010	
Pseudo R2					0.177	

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Table A5. Summary variables and Logit regression:
Probability of belonging to the reference group, Nepal 2011

	Reference		Comparison		Coef.	Std. Err.
	Mean	sd	Mean	Sd		
Eastern Mountain	1.1	10.3	1.8	13.5	Ref.	
Central Mountain	2.1	14.4	1.9	13.8	1.075	0.237
Western Mountain	0.5	7.1	3.2	17.7	-0.762	0.350
Eastern Hill	2.5	15.6	8.1	27.3	-0.548	0.262
Central Hill	11.6	32.0	11.4	31.8	0.335	0.225
Western Hill	25.9	43.8	10.0	30.0	1.528	0.207
Mid-Western Hill	4.0	19.7	5.5	22.8	0.575	0.241
Far-Western Hill	2.9	16.8	3.3	17.9	1.071	0.242
Eastern Terai	14.9	35.7	14.6	35.4	0.550	0.219
Central Terai	13.0	33.6	21.0	40.7	0.517	0.229
Western Terai	13.2	33.8	8.3	27.6	1.192	0.216
Mid-Western Terai	3.4	18.1	5.5	22.9	0.501	0.239
Far-Western Terai	4.9	21.6	5.2	22.2	0.947	0.246
Rural	82.7	37.9	87.5	33.1	0.286	0.106
2 related adults	29.1	45.4	29.4	45.5	Ref.	
3+ related adults	58.9	49.2	57.4	49.4	0.170	0.119
Other	12.1	32.6	13.2	33.9	-0.203	0.172
Female	28.8	45.3	28.1	45.0	0.167	0.135
Head's age					-0.001	0.020
Head's age squared					0.000	0.000
Age	33.2	8.6	31.1	8.7	0.052	0.041
Age squared					0.000	0.001
N members	4.5	1.9	5.3	2.6	-0.151	0.033
N children (5yo)	0.5	0.7	0.8	0.9	-0.104	0.069
N living children	2.2	1.4	2.5	1.7	0.067	0.040
Primary (incomplete)	33.0	47.0	65.1	47.7	Ref.	
Primary (complete)	5.7	23.2	6.5	24.7	-0.042	0.206
Secondary (incomplete)	23.7	42.5	18.1	38.5	0.299	0.147
Secondary (complete)	18.5	38.8	6.5	24.7	0.906	0.175
Higher education	19.1	39.3	3.8	19.1	1.336	0.205
Illiterate	22.2	41.6	54.0	49.8	-0.691	0.137
Head's Primary (incomplete)	35.6	47.9	63.2	48.2	Ref.	
Head's Primary (complete)	5.6	23.0	7.4	26.1	0.371	0.199
Head's Secondary (incomplete)	23.3	42.3	18.2	38.6	0.525	0.149
Head's Secondary (complete)	16.6	37.2	6.5	24.6	0.760	0.181
Head's Higher education	18.9	39.1	4.8	21.4	0.668	0.212
Currently married	96.0	19.6	96.5	18.4	Ref.	
Formerly married	4.0	19.6	3.5	18.4	-0.033	0.201
Teen marriage	41.1	49.2	61.4	48.7	-0.173	0.090
No working/other	35.8	48.0	38.7	48.7	Ref.	
Professional, clerical	8.8	28.3	2.2	14.5	-0.184	0.211
Services, skilled	13.4	34.1	11.2	31.5	-0.389	0.163
Agriculture	41.8	49.3	46.0	49.8	0.024	0.188
Unskilled manual	0.3	5.1	1.9	13.8	-1.322	0.521
Worked last 12 moths	23.2	42.2	22.6	41.9	-0.274	0.145
Not paid work	41.4	49.3	42.5	49.4	0.065	0.156
Partner: professional/technical/managerial	18.2	38.6	5.0	21.8	Ref.	
Partner: clerical	9.7	29.6	11.5	31.9	-0.457	0.169
Partner: agricultural	22.0	41.4	28.1	44.9	-0.303	0.158
Partner: services	36.1	48.1	23.7	42.5	-0.127	0.136
Partner: skilled manual	6.5	24.6	16.2	36.8	-0.836	0.191
Partner: unskilled manual	7.4	26.2	15.5	36.2	-0.637	0.192
Partner: no education/ don't know	7.2	25.9	24.0	42.7	Ref.	
Partner: primary	11.5	31.9	25.4	43.5	0.179	0.171
Partner: secondary	49.1	50.0	42.0	49.4	0.562	0.172
Partner: higher	32.2	46.8	8.7	28.2	0.899	0.214
Intercept					-4.524	0.871
N observations						9,837
Wald chi2						1,000
Pseudo R2						0.228

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Table A6. Summary variables and Logit regression:
Probability of belonging to the reference group, Pakistan 2006/07

	Reference		Comparison		Coef.	Std. Err.
	Mean	sd	Mean	sd		
District Quartile 1	8.2	27.4	27.1	44.4	Ref.	
District Quartile 2	15.3	36.0	27.1	44.4	0.488	0.191
District Quartile 3	16.6	37.2	26.4	44.1	0.209	0.193
District Quartile 4	59.9	49.0	19.5	39.6	1.116	0.170
Rural	15.4	36.1	71.1	45.3	-1.621	0.141
2 related adults	25.1	43.4	21.5	41.1	Ref.	
3+ related adults	72.4	44.7	75.5	43.0	-0.237	0.163
Other	2.5	15.7	3.0	17.2	-0.026	0.391
Female	8.3	27.6	9.7	29.5	-0.279	0.262
Head's age	46.0	12.3	47.4	14.7	0.036	0.029
Head's age squared					0.000	0.000
Age	33.3	7.9	32.2	8.7	0.058	0.054
Age squared					-0.001	0.001
N members	7.9	4.2	8.6	4.8	0.026	0.027
N children (5yo)	1.2	1.3	1.5	1.5	-0.098	0.067
N living children	3.3	2.4	3.5	2.5	0.050	0.036
Primary (incomplete)	28.7	45.3	73.5	44.1	Ref.	
Primary (complete)	10.7	30.9	9.2	28.9	0.700	0.216
Secondary (incomplete)	12.6	33.2	6.6	24.8	0.716	0.245
Secondary (complete)	21.6	41.2	6.1	23.8	1.254	0.259
Higher education	26.4	44.1	4.7	21.2	1.768	0.285
Illiterate	31.5	46.5	74.3	43.7	-0.188	0.209
Head's Primary (incomplete)	26.8	44.3	54.8	49.8	Ref.	
Head's Primary (complete)	10.2	30.3	11.5	31.8	0.176	0.218
Head's Secondary (incomplete)	16.3	37.0	11.1	31.4	0.324	0.245
Head's Secondary (complete)	18.8	39.1	13.0	33.6	0.022	0.229
Head's Higher education	27.8	44.8	9.7	29.6	0.105	0.265
Currently married	95.6	20.5	95.3	21.1	Ref.	
Formerly married	4.4	20.5	4.7	21.1	0.243	0.259
Teen marriage	32.8	47.0	47.9	50.0	-0.078	0.125
No working/other	83.9	36.8	74.3	43.7	Ref.	
Professional, clerical	4.8	21.4	2.0	14.0	-0.408	0.337
Services, skilled	9.0	28.6	9.8	29.8	0.156	0.272
Agriculture	0.6	7.6	12.3	32.8	-1.367	0.509
Unskilled manual	1.8	13.3	1.5	12.3	0.638	0.456
Worked last 12 moths	79.8	40.2	68.8	46.3	0.199	0.222
Not paid work	1.1	10.7	3.6	18.6	0.368	0.411
Partner: did not work	2.9	16.8	4.0	19.5	Ref.	
Partner: professional/technical/managerial	16.3	36.9	8.4	27.7	0.118	0.314
Partner: clerical	3.7	18.8	3.8	19.0	-0.586	0.363
Partner: sales	23.4	42.4	12.4	33.0	0.271	0.301
Partner: agricultural	4.5	20.7	22.9	42.0	-0.223	0.343
Partner: services	11.7	32.1	10.2	30.2	0.038	0.314
Partner: skilled manual	20.1	40.1	15.4	36.1	0.119	0.296
Partner: unskilled manual	17.5	38.0	23.0	42.1	0.222	0.294
Partner: no education/ don't know	18.2	38.6	36.9	48.3	Ref.	
Partner: primary	11.1	31.4	16.5	37.2	0.043	0.202
Partner: secondary	38.3	48.7	33.3	47.1	0.012	0.201
Partner: higher	32.4	46.8	13.2	33.9	-0.098	0.263
Intercept					-4.834	1.171
N observations						10,017
Wald chi2						666
Pseudo R2						0.276

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.

Table A7. Summary variables and Logit regression:
Probability of belonging to the reference group, Philippines 2008

	Reference		Comparison		Coef.	Std. Err.
	Mean	sd	Mean	Sd		
Province Dec 1	2.7	16.4	14.8	35.6	Ref.	
Province Dec 2	2.6	16.0	14.0	34.7	-0.021	0.164
Province Dec 3	1.8	13.2	14.2	34.9	-0.512	0.179
Province Dec 4	6.6	24.8	13.7	34.4	0.781	0.157
Province Dec 5	3.0	17.2	13.5	34.2	-0.020	0.176
Province Dec 6	6.6	24.9	9.4	29.2	1.230	0.166
Province Dec 7	21.5	41.1	6.1	23.9	2.877	0.154
Province Dec 8	23.3	42.3	4.3	20.2	3.479	0.167
Province Dec 9	16.6	37.2	4.7	21.2	2.997	0.169
Province Dec 10	15.2	36.0	5.3	22.3	2.802	0.174
Rural	27.9	44.9	55.9	49.7	0.326	0.090
2 related adults	33.9	47.3	40.4	49.1	Ref.	
3+ related adults	55.4	49.7	50.5	50.0	0.096	0.094
Other	10.7	30.9	9.1	28.7	-0.187	0.131
Female	15.0	35.7	11.0	31.3	0.114	0.110
Head's age	43.5	12.5	42.8	12.1	0.013	0.018
Head's age squared					0.000	0.000
Age	33.7	8.5	34.3	8.5	-0.056	0.034
Age squared					0.001	0.000
N members	5.7	2.3	5.7	2.4	0.002	0.022
N children (5yo)	0.9	0.9	1.0	1.0	-0.022	0.047
N living children	2.5	1.8	3.0	2.2	0.013	0.025
Primary (incomplete)	4.4	20.6	14.6	35.3	Ref.	
Primary (complete)	10.8	31.1	15.6	36.3	0.227	0.167
Secondary (incomplete)	12.3	32.8	16.4	37.0	0.116	0.178
Secondary (complete)	35.3	47.8	26.6	44.2	0.376	0.171
Higher education	37.2	48.3	26.8	44.3	0.432	0.181
Illiterate	2.8	16.4	11.1	31.4	-0.594	0.190
Head's Primary (incomplete)	11.3	31.7	23.8	42.6	Ref.	
Head's Primary (complete)	15.4	36.1	16.8	37.4	0.306	0.127
Head's Secondary (incomplete)	11.4	31.8	13.0	33.6	0.056	0.158
Head's Secondary (complete)	26.4	44.1	22.0	41.4	-0.014	0.148
Head's Higher education	35.4	47.8	24.4	42.9	0.027	0.150
No immigrant	29.1	45.4	31.3	46.4	Ref.	
Immigrant (<=5 years / visitor)	32.4	46.8	29.6	45.6	-0.456	0.093
Immigrant (6+ years)	38.5	48.7	39.2	48.8	-0.279	0.088
Immigrant from countryside	25.8	43.8	33.8	47.3	-0.090	0.087
Currently married	91.2	28.3	93.5	24.6	Ref.	
Formerly married	8.8	28.3	6.5	24.6	0.038	0.122
Teen marriage	18.8	39.0	22.6	41.8	0.282	0.094
No working/other	53.5	49.9	52.7	49.9	Ref.	
Professional, clerical	20.4	40.3	17.7	38.1	0.017	0.118
Sales, services, skilled	21.6	41.2	16.4	37.0	0.318	0.115
Agriculture	2.3	14.9	11.6	32.0	-0.196	0.192
Unskilled manual	2.3	14.8	1.7	12.9	0.193	0.248
Worked last 12 moths	38.9	48.8	38.4	48.6	0.061	0.103
Not paid work	0.6	8.0	5.6	22.9	-1.857	0.302
Partner: did not work / No partner	4.7	21.1	2.9	16.8	Ref.	
Partner: : professional/technical/managerial	16.9	37.5	10.6	30.8	0.189	0.175
Partner: clerical	2.6	15.9	1.4	11.7	0.296	0.256
Partner: sales	7.6	26.6	5.2	22.2	0.314	0.197
Partner: agricultural	10.5	30.6	29.9	45.8	-0.030	0.182
Partner: domestic	2.1	14.3	1.0	10.0	0.380	0.269
Partner: services	8.0	27.2	6.6	24.8	-0.142	0.189
Partner: skilled manual	34.4	47.5	27.9	44.8	-0.008	0.162
Partner: unskilled manual	13.1	33.8	14.6	35.3	0.125	0.174
Partner: no education/don't know	0.3	5.6	2.6	16.0	Ref.	
Partner: primary	17.8	38.2	32.3	46.8	0.897	0.433
Partner: secondary	43.2	49.5	38.3	48.6	1.079	0.435
Partner: higher	38.8	48.7	26.8	44.3	1.217	0.437
Intercept					-3.189	0.853
N observations						9,194
Wald chi2						1,823
Pseudo R2						0.287

Notes: Eligible population: ever-married women, 15-49 years old. Ethnic groups as listed in Table 1.