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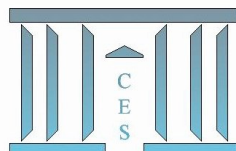
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# Human Capital, Labour Market Outcomes, and Horizontal Inequality in Guatemala

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## Abstract

With the second largest indigenous population by percentage in Latin America, Guatemala is an important case for understanding horizontal inequality and indigenous politics. This paper presents new analysis of survey data, allowing for consideration both of indigenous and ladino populations, as well as of ethno-linguistic diversity within the indigenous population. Overall, our analysis illustrates both the depth and persistence of horizontal inequalities in educational and labour market outcomes, and a broad trend towards greater equality. Earnings gaps have been reduced by, among other factors, improved educational outcomes. Ethnic groups also show distinct patterns of wages and wage gaps, and there is evidence of a ‘sticky floor’ effect at the lower ends of the income spectrum affecting some groups more than others. Our findings suggest that the focus on the indigenous/non-indigenous divide found in much of the economic literature on Latin America obscures meaningful diversity within the indigenous population. We posit that further consideration of such within-group diversity has implications for broader theories of ethnic politics, and in particular for understanding the comparative weakness of indigenous political mobilisation in Guatemala at the national level.<sup>1</sup>

**Keywords:** Inequality; ethnicity; schooling; earnings; Guatemala

**JEL Classification:** J22; J31; J71

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# 1 Introduction

Guatemala has the second largest indigenous population by percentage in Latin America and a clear history of horizontal inequality and violent state-sponsored oppression. Despite a wealth of literature on Guatemala's indigenous population, however, there are a number of gaps in our knowledge about horizontal inequality. This paper draws on new analysis of individual-level data from the 2000 and 2011 rounds of the Guatemalan National Living Standards Survey (Encuesta Nacional de Condiciones de Vida - ENCOVI) to speak to these gaps. ENCOVI has helped to address major gaps in poverty data more generally for Guatemala, which historically has had a weak tradition of compiling such data ([World Bank \(2004\)](#)).

Our analysis documents a number of empirical patterns in the decades following the end of the civil war in 1996, including consideration of inequalities both between ladino and indigenous populations and between the ladino population and diverse indigenous ethnic groups defined by language, culture, and region (e.g., Quiché, Kekchí, Kakchiquel). It shows overall both the depth and persistence of horizontal inequalities in educational and labour market outcomes, and a general trend towards greater equality. Reductions in earnings gaps have been supported by, among other factors, improved educational outcomes. Ethnic groups also show distinct patterns of wages and wage gaps, and there is evidence of a 'sticky floor' effect at the lower ends of the income spectrum affecting some groups more than others.

Quantitative work on these topics to-date has focused heavily on the dichotomy between indigenous and non-indigenous populations. In considering 'within-group' ethnic divisions in the indigenous population, our empirical analysis is informed by the more qualitative literature on identity and ethnicity in Guatemala, which documents the strength and salience of diverse indigenous identities.

As we explore at the end of this article, our findings lend support to the persistent relevance of both between- and within-ethnic group inequalities in Guatemala. More broadly, we posit that our findings may have implications for broader theories of ethnic politics, and in particular may help to explain the puzzling weakness of indigenous mobilisation in Guatemala at the national level as compared to other countries in the region with sizable indigenous populations ([Madrid \(2012\)](#), [Yashar \(1999\)](#)). While the indigenous Maya movement played a notable role in post-war politics, Guatemala subsequently has had for instance no major indigenous political parties or leading presidential candidates unlike other countries. Our analysis speaks to the possible impact of socioeconomic inequalities between indigenous groups in explaining enduring divisions within Guatemala's indigenous movement. This discussion in turn has implications for future research on ethnic and indigenous politics.

Finally, in methodological terms, our analysis does several things with the ENCOVI data that are not standard in other analyses of horizontal inequalities. In addition to disaggregating beyond the major political cleavage (indigenous/non-indigenous) by indigenous ethnic group, we also consider and compare different indicators of horizontal inequality, looking both at educational outcomes and wages, and we analyse outcomes for children separately from adults. Further analysis along these lines would be useful in other countries as well. It is also clear that data remain a major constraint on such analysis in many countries, underscoring the value of the ENCOVI surveys used here.

This paper begins with discussion of ethnicity and inequality in Guatemala, followed by an outline of key findings and gaps in the related literature. Next, it presents the empirical specification used in this analysis and then turns to data and descriptive analysis. This is followed by results, discussion, and a conclusion.

## 2 Ethnicity and inequality in Guatemala

Guatemala, home to some 15 million people, is among the poorest and most unequal countries in Latin America. Its GDP per capita is approximately 7,700 USD per year (2015), roughly half of the regional average, and its incidence of poverty is high with an increasing trend (56,2 per cent in 2000, 53.7 per cent in 2011, and 59,3 per cent in 2014)<sup>2</sup>

Guatemala's indigenous population is second only to Bolivia in the region in terms of population share. Standard sources present somewhat varying numbers: [Gonzalez \(1994\)](#) estimates the indigenous population in the 1970s as between 44 and 66 per cent, and in the 1980s as 42-44 per cent – compared with 65-71 and 54-57 per cent in Bolivia. The Guatemalan census records 65 per cent indigenous in 1921, 56 per cent in 1940, 54 per cent in 1950, 44 per cent in 1973, and 42 per cent in 1981.<sup>3</sup> Estimates drawn from the ENCOVI surveys and based on self-identification are broadly on par with these figures: 41.6 per cent self-identify as indigenous in the 2000 survey, 37.4 in 2006, and 39.8 in 2011.

The indigenous population is disbursed throughout Guatemala, with the majority in the central and western highlands. Most of the indigenous population is of Maya descent, and classified into some 21 language groups ([Lewis et al. \(2016\)](#)).<sup>4</sup> The largest of these groups are Quiché (8-13 per cent by self-identification in the 2000-2011 ENCOVI), Kakchiquel (8-9 per cent), Kekchí (6-7 per cent), and Mam (4-6 per cent).

A long history of socioeconomic inequality between indigenous and ladino populations

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<sup>2</sup>Official numbers, Guatemalan National Institute of Statistics (INE).

<sup>3</sup>[Gonzalez \(1994\)](#), p. 29; [Steele \(1994\)](#), p. 98.

<sup>4</sup>Two additional language groups are classified here: Garifuna and Kaqchikel-K'iche'.

is well-documented. Simple statistics are illustrative: poverty incidence among the indigenous population is recorded as twice as high as among the non-indigenous population for 2000 and 2011 and 1.7 higher in 2014 (INE). Striking differences also exist between urban and rural (disproportionately indigenous) populations, as shown in Tables A.1- A.4. In 1989, 92.6 and 81.3 per cent of the indigenous were identified as poor and extremely poor, compared with 65.8 and 45.2 per cent for the non-indigenous population.<sup>5</sup> Indigenous people are overrepresented in the agricultural sector and in elementary occupations.

Historical expropriation of indigenous communal land, forced labour, exclusionary educational policies, and political disenfranchisement have all contributed to horizontal inequality in Guatemala, particularly between the indigenous and ladino populations ([World Bank \(2004\)](#), pp. 59-63; see also [Thorp et al. \(2006\)](#)). Major reforms were enacted during the brief democratic period from 1944 to 1954, including passage of the 1945 constitution which was the first to provide for specific rights to indigenous peoples. Still, according to the 1979 agricultural census, Guatemala's Gini Index for land distribution was 85.9, surpassed only by two Latin American countries - pre-reform Peru in 1961 and pre-reform Colombia in 1964 ([World Bank \(1995\)](#), p. 11). In contrast to other Latin American countries, unequal access to land has never been alleviated by a redistributive land reform ([Macours \(2014\)](#)).

The overthrow of Guatemala's democratically elected leftist government in 1954 brought to power a series of military dictatorships. A long civil war between the government and leftist guerrillas, with support among the indigenous and ladino peasantry, began in November 1960 with a failed coup and ended in December 1996 with the signing of Peace Accords between the government and the Unidad Revolucionaria Nacional Guatemalteca (URNG) ([Carey \(2004\)](#)). Indigenous populations were disproportionate victims of the war; the Historical Clarification Commission (Comisión para el Esclarecimiento Histórico - CEH) found that among identified individual victims, 83.3 per cent were Maya and 16.5 per cent ladino ([Comisión para el Esclarecimiento Histórico \(1999a\)](#), p. 183). During 1981-83, the Guatemalan Army targeted the Maya as an internal enemy and base of support and recruitment for the guerrillas, on this basis conducting indiscriminate massacres ([Comisión para el Esclarecimiento Histórico \(1999b\)](#), p. 49). In the Ixil region of Quiché, 70-90 per cent of villages were razed ([Comisión para el Esclarecimiento Histórico \(1999b\)](#), p. 50). The disproportionate impact of the war on some indigenous communities - in particular, the Ixil, Achi, Chuj, and Q'anjob'al - is documented by the CEH ([Comisión para el Esclarecimiento Histórico \(1999a\)](#), p. 186).

According to [Smith \(1991\)](#)'s classic statement on Maya nationalism, it 'became an identifiable cause in the early 1970s, was quiescent during the violence, and today is emerging as a real political movement - partly as a radical alternative to the traditional

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<sup>5</sup> [World Bank \(1995\)](#), p. 5, based on 1989 Encuesta Nacional Sociodemográfica.

Left' (p. 29; see also [Bastos and Camus \(2003\)](#)). The early timeline then for indigenous social movement formation in Guatemala is broadly similar to that in other Latin American countries ([Van Cott \(1995\)](#); [Brysk \(2000\)](#); [Yashar \(2005\)](#)). From the mid- to late-1980s, as [Warren \(1998\)](#) documents, the Maya movement took a leading role during Guatemala's peace process in support of educational and judicial reform, as well as of official recognition of the country's status as a multiethnic, multilingual, and multicultural nation, a point recognised for the first time in the Peace Accords via the Agreement on Identity and Rights of Indigenous Peoples (see also [Van Cott \(2000\)](#); [Sieder \(2007\)](#); [Brett \(2008\)](#)).

Despite these early advances, the indigenous movement subsequently had noticeably less influence in national politics in Guatemala than in other Latin American countries ([Yashar \(1999\)](#); [Madrid \(2012\)](#); [Muj García \(2012\)](#); [Pallister \(2013\)](#); [Vogt \(2015\)](#)). Guatemala has not elected an indigenous president, indigenous political parties have been comparatively weak and none have won significant shares in national polls, and there are no quotas or reserved seats for indigenous representatives. The weakness of indigenous politics at the national level in Guatemala is puzzling for a number of reasons, not least because it has the second largest indigenous population by percentage in the region, after Bolivia. Moreover, in the context of the literature on indigenous politics, as [Pallister \(2013\)](#) summarises, Guatemala also had many of the conditions identified as conducive to indigenous party formation: a prominent indigenous social movement, a fragmented and weak party system with relatively low barriers to entry, relatively weak competition from the left, and regional models to emulate from Bolivia and Ecuador (p. 125).

One proximate cause for the loss of momentum by the indigenous movement can be seen in the 1999 national referendum on constitutional reforms, during which indigenous leaders organised as the Indigenous Commission for Constitutional Reforms in support of various rights for indigenous populations. A centrepiece of the indigenous movement, the 'No' vote in the referendum was a major defeat ([Muj García \(2012\)](#), p. 5). More broadly, the literature points to the fragmentation and localism of indigenous social movements, highlighting the persistence of socio-political divisions within the indigenous population ([Madrid \(2012\)](#); [Yashar \(1999\)](#)), rooted both in the cultural, linguistic, and religious diversity of the indigenous population ([Pallister \(2013\)](#)) and in legacies of violence and state strategies of divide and rule ([Vogt \(2015\)](#)). An additional factor, [Pallister \(2013\)](#) argues, may be the existence of alternative avenues for indigenous representation at the municipal level which have supported a bifurcated system in which the majority of indigenous municipalities are now led by indigenous mayors and councils while party leadership at the national and departmental levels is primarily ladino. Exactly why indigenous mobilisation at the local level has not been scaled up remains puzzling, however. [Van Cott \(2007\)](#)'s work shows that in other contexts such as Bolivia and Ecuador, indigenous mobilisation at the local level served as a stepping stone to national party mobilisation, rather than an



inhibitor. [Pallister \(2013\)](#) offers one explanation highlighting both the salience of local identities and institutional rules (in particular, the role of ‘civic committees’ in Guatemala, through which candidates can contest municipal elections, but not elections at other levels, as in Bolivia and Ecuador).

The socio-political fragmentation of the indigenous community highlighted in the politics literature is also broadly consistent with ethnographic accounts, which document the diversity and localism of Guatemalan indigenous communities before, during, and after the civil war (see, e.g., [Wilson \(1999\)](#)). One telling example of such diversity is that Rigoberta Menchú, Guatemala’s best-known indigenous political activist, spoke only Quiché until she was twenty and then learned Spanish and other Mayan languages because of her involvement in the campesino movement ([Caudillo Félix \(1998\)](#), p. 113). Regional diversity more generally is underscored by [Klick \(2016\)](#)’s qualitative and quantitative analysis of local governance and human development outcomes in Guatemala’s 334 municipalities, which shows wide variability among indigenous communities, even across short distances.

### 3 Related literature

Related quantitative research in Guatemala to date has focused largely on indigenous as compared to ladino populations. [Cabrera et al. \(2015\)](#), for instance, explore linkages between fiscal policy, inequality, and the divide between indigenous and non-indigenous populations. [Ishida et al. \(2012\)](#) document disparities between indigenous and ladina women in the use of reproductive health services using nationally-representative data from the 2008-2009 National Survey of Maternal and Infant Health (ENSMI). [Chamrbagwala and Morán \(2011\)](#) find a strong negative impact of the civil war on the education of Maya individuals. [World Bank \(1995\)](#) used 1989 data showing the probability of being poor defined in terms of consumption is related to schooling, age, region, and indigenous status. Controlling for education and other variables, the marginal effect of indigenous status on the probability of being poor is estimated at 15.42 per cent (pp. 7-8; table 1.6).

Several studies have investigated educational and wage differentials among indigenous and non-indigenous populations. Particularly relevant to this study is [Steele \(1994\)](#), which uses data from the 1989 National Socio-Demographic Survey (Encuesta Nacional Socio-Demografica - ENSD) to document inequalities between indigenous and ladino populations in terms of poverty, the distribution of public services, years of schooling, literacy, child labour, occupation, and income. Using the Oaxaca method, analysis suggests that a significant share of earnings differentials between indigenous and ladino workers cannot not be attributed to differences in human capital (see also [Psacharopoulos \(1993\)](#)). For men, this is roughly half and for women, one-fourth - figures understood as upper bound



estimates of discrimination (Steele (1994), p. 125).

Using more recent household surveys for Bolivia, Ecuador, and Guatemala, Canelas and Salazar (2014) show that in the three countries, indigenous workers are paid less than non-indigenous workers and that nearly half of the wage gap is explained by differences in human capital endowments. Similarly, Atal et al. (2009) using data for 18 Latin American countries, found that ethnic wage differences are greater than gender differences and that educational attainment differentials play an important role in explaining the gap. In particular, an important share of the ethnic wage gap is due to the scarcity of minorities in high-paid positions. Hall and Patrinos (2004), using data for Bolivia, Ecuador, Guatemala, Mexico, and Peru, have also documented a sizable unexplained earnings gap between indigenous and non-indigenous populations, as well as large differences in educational attainment and access to health services. Cunningham and Jacobsen (2008) analyse data for Bolivia, Brazil, Guatemala, and Guyana and use simulations to show that within-group (rather than between-group) inequality is the main contributor to overall earnings inequality. They explore inequalities on the basis of gender, as well as dominant/subordinate ethnic status, defined by race in Brazil and Guyana and by indigeneity in Bolivia and Guatemala. Departing from the previous studies, Patrinos (1997) divides the Guatemalan indigenous sample into the main ethnic groups and finds that in 1989 different ethnicities presented widely different and dramatic results in terms of schooling, earnings, and returns to schooling.

In the context of this work, this paper makes three contributions to the literature on horizontal inequalities, education, and labour market outcomes in Latin America, and in Guatemala specifically. First, in addition to documenting inequalities between indigenous and ladino populations, it shows significant inequalities across indigenous ethnic groups (e.g., Quiché, Kekchí, Mam). This analysis is informed by and speaks to findings in the related anthropological and political science literature which suggest the continuing relevance to socio-political outcomes of ethnic and 'local' identities within the broader indigenous category. Our findings suggest their relevance also to socio-economic outcomes (which in turn may relate to socio-political outcomes). While some such inequalities have been documented in previous work through examination of wage differentials at the mean (Patrinos (1997)), our analysis also investigates variation in wages across the entire wage distribution. Further, we examine differences in educational attainment, primary school completion, and school entry age among Guatemalan children.

Second, we use more recent data than prior studies. As suggested above, much of the extant quantitative literature on Guatemala draws on survey data from 1989 or 2000, i.e., either during the civil war or shortly thereafter. By drawing on the 2000 and 2011 waves of the Guatemalan living standards surveys, we more fully capture the significant socio-economic changes that took place in Guatemala in the fifteen years since the war, as well

as in Latin America more broadly since the late 1990s.

Finally, the paper explores the implications of this empirical analysis for broader theories of ethnic and indigenous politics. In particular, it considers the relevance to broader understanding of the puzzling weakness of indigenous political mobilisation in Guatemala at the national level as compared to other Latin American countries such as Bolivia.

## 4 Empirical specification

### 4.1 School enrolment

To examine differences in children's school participation and educational progress over time between ethnic groups, we estimate a set of probit regressions of the following form:

$$Y_i^* = \alpha_i + X_i \beta_i + \varepsilon_i, \tag{1}$$
$$Y = \begin{cases} 1 & Y^* > 0 \\ 0 & \text{otherwise} \end{cases}$$

where  $Y_i$  is the outcome of interest and  $X_i$  is a vector of individual child characteristics and household variables that affect the child's educational outcomes. The vector of child-specific variables includes age, gender, and ethnic origin of the child (four dummy variables for the dominant minority groups and one dummy for all other indigenous groups). We also include variables that control for the family's demographic composition: whether the head of the household is female; number of children younger than 6 years; number of children (other than self) aged between 6-9, 10-14, and 15-18 years; number of female and male adults present in the home; and a set of variables that control for other family characteristics such as education of the household head, the presence of the mother in the household, the presence of the father in the household, and area of residence. Finally, we proxy household wealth with three dummies controlling for access to sanitation, electricity, and piped water.

We first examine schooling participation, then the age at which children enter formal schooling, and finally schooling completion. Our definition of schooling is based on whether the child is enrolled in school at the time of the survey. For the definition of the children's age of entry into the formal school system, we create a dummy variable equal to one if the child started school at age six or seven, the official entry age, and zero otherwise. For the final measure, we use a subsample of children aged 15-17. We create a dummy variable equal to one if the child has completed primary school and zero otherwise.

## 4.2 Earnings differentials

The standard procedure for analysing the determinants of earnings differentials for different subpopulations is to model earnings functions for each group and apply the Blinder-Oaxaca procedure. This method allows us to decompose the earnings differential at the mean in two terms: one corresponding to the composition effect, which measures differences in the observed characteristics of the groups, and a second term representing the wage structure effect, which accounts for the difference in returns between the groups. In this paper, we employ a two-fold Blinder-Oaxaca procedure where we use coefficients from a pooled regression with a group membership indicator, see [Jann \(2008\)](#). We then apply a quantile decomposition method to study earning differences across the entire wage distribution.

While a number of decomposition methods for parameters other than the mean have been proposed in the literature (see [Juhn et al. \(1993\)](#), [Machado and Mata \(2005\)](#) and [Melly \(2005\)](#)), we rely on the method proposed by [Firpo et al. \(2009\)](#) (FFL) because it allows us to compute the effect of each covariate on the unconditional wage distribution. Since the law of iterated expectations does not apply to quantiles, the idea underlying the FFL technique is that one can use the Recentered Influence Function (RIF), which is a transformation of the outcome variable, to determine the effect of covariates on the unconditional quantiles by using a conditional regression approach.

Let  $Y$  be labour earnings and  $Q_\tau$  the  $\tau$ -quantile. The recentered influence function of the  $\tau$ -quantile of  $Y$  is given by:

$$RIF(Y, Q_\tau) = Q_\tau + \frac{\tau - \mathbb{1}\{Y \leq Q_\tau\}}{f_Y(Q_\tau)}. \quad (2)$$

where  $\mathbb{1}\{\cdot\}$  is an indicator function expressing whether the outcome variable is smaller or equal to the quantile, and  $f_Y(\cdot)$  is the density of the marginal distribution on  $Y$  evaluated at the population  $\tau$ -quantile of the unconditional distribution of  $Y$ . As indicated by [Firpo et al. \(2009\)](#), the unconditional quantile regression  $E_y[RIF(Y, Q_\tau)|X]$ , can be estimated using a linear regression of the form:

$$RIF(Y, Q_\tau) = \alpha_i + X_i \beta_i + \varepsilon_i, \quad (3)$$

where  $X_i$  is a vector of covariates that determine labour earnings such as: age and gender of the individual, educational attainment, area and region of residence, occupational category, and employment category, i.e. self-employment, casual labour, and salaried work.

After computing the RIF for each group, we perform a detailed decomposition in the same spirit of the classical Blinder-Oaxaca methodology by relying on the following properties: a)  $E_y[RIF(Y, Q_\tau)] = Q_\tau$  and b)  $E_x[E_y[RIF(Y, Q_\tau)|X]] = Q_\tau$ . As in the previous analysis, we use *ladinos* as the majority group of reference.

## 5 Data and descriptive analysis

The analysis in this paper draws on individual level data from the 2000 and 2011 ENCOVI conducted by Guatemala's National Statistics Institute (Instituto Nacional de Estadística Guatemala - INE). ENCOVI is a cross-sectional survey representative of the Guatemalan population. The survey contains detailed information on household demographics, health, education, occupation and labour force participation, housing and asset ownership, household food and non-food expenditures, and income.

For the purposes of this paper, indigenous people are identified using a self-identification variable. While the sample does include a range of ethnic groups, we focus on four Mayan groups that have a relatively large presence (more than 5 per cent of the sample): Quiché, Kekchí, Kakchiquel, and Mam. We aggregate all the other Mayan and non-Mayan groups as 'other-indigenous'.<sup>6</sup> We use 'ladino' as the majority or dominant group.

For the analysis on educational outcomes, we restrict our data to children aged 7-17 years. Table 1 shows statistics on educational outcomes of interest for different ethnic groups. A quick look at the table reveals an improvement in educational indicators between 2000 and 2011 for all groups. In particular, the proportion of children aged 15-17 years that have completed primary education has almost doubled during the period of study. The table also suggests that after ladino children, Kakchiquel children have traditionally done better than any other indigenous group in Guatemala. Tables A.1 and A.2 in the Appendix provide summary statistics for all variables used in the estimation.

Table 1: Educational outcomes statistics

	Ladino	Indigenous	Quiché	Kekchí	Kakchiquel	Mam	Other Indigenous
<i>Panel A: 2000</i>							
School attendance	0.74	0.60	0.59	0.50	0.64	0.63	0.62
School entry age	7.10	7.50	7.48	7.87	7.08	7.64	7.55
Primary completed	0.65	0.35	0.37	0.25	0.51	0.31	0.32
<i>Panel B 2011</i>							
School attendance	0.81	0.79	0.78	0.82	0.78	0.78	0.77
School entry age	7.01	7.06	6.94	7.27	6.95	7.18	7.2
Primary completed	0.74	0.63	0.62	0.52	0.73	0.70	0.60

*Source: Author's calculation based on the ENCOVI 2000 and 2011. Primary completed computed for children 13+.*

For the analysis on earnings differentials, we restrict our data to working individuals aged 20-70 years. In the data, workers are classified as regular salaried, self-employed,

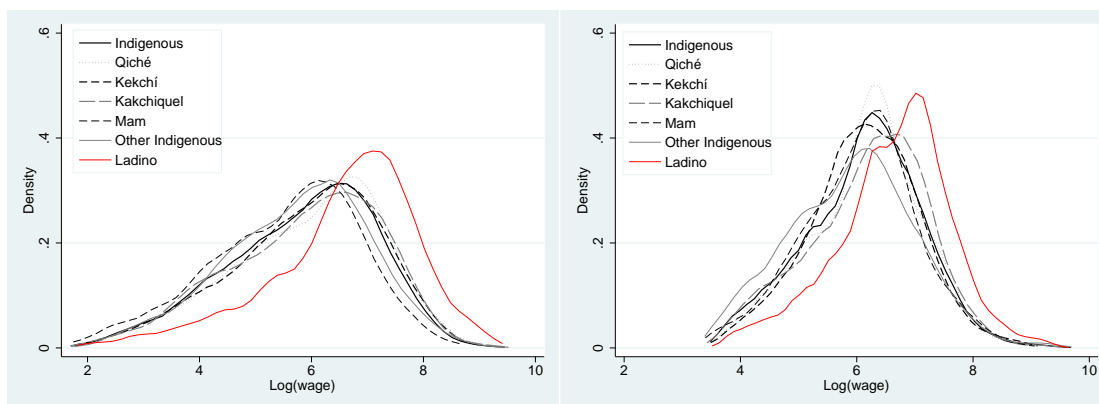
<sup>6</sup>There are two non-Mayan groups that together account for less than 1 per cent of the sample.

and casual labour. For salaried workers, wages can be paid in cash or in kind. For the latter case, we use the individual’s perceived value of the goods. Earnings are computed using labour income from primary occupation. Labour earnings are reported on a monthly basis at current prices for all workers. For this study, we deflate earnings to 2000 prices using the national consumer price index. We exclude from the sample non-paid family and non-family workers.

Figure 1 plots the kernel densities of the earnings distribution for six ethnic groups in Guatemala. Overall, the figure shows that the distributions have shifted to the right over time and that they have become taller and thinner, suggesting a higher concentration of earnings around the mean. However, earning differences between and within ethnic groups still persist. In particular, at 2011 the distributions of all indigenous groups are still at the left of that of ladinos. Also, ethnic minorities grouped as ‘other indigenous’ show a significant concentration of workers in the lower tail of the distribution, as evidenced by two sizable bumps in the left part of the distribution.

Tables A.3-A.4 provide summary statistics of the data on individual and household characteristics for the six ethnic groups for each sample year.

Figure 1: Kernel density of log real earnings, 2000 and 2011



Source: Authors’s calculation from ENCOVI 2000-11

## 6 Results

We begin the analysis by providing an overview of horizontal inequalities among ethnic groups over time. For this purpose, building on Stewart (2008), we rely on the Group Gini (GGINI) and the Group Theil indices, which loosely correspond to the classical Gini

Coefficient and the Theil Index weighted by the size of the population subgroups.<sup>7</sup> The outcomes of interest are labour earnings and years of schooling, so the indices can be interpreted as a measure of concentration of the total stock of any of the outcomes in one ethnic group. For instance, looking at education, a GGINI of zero would mean that all ethnic groups have the same mean years of schooling, while a GGINI of one would correspond to a situation where one ethnic group has exclusive access to all the education in the country.

Table 2 shows that from 2000 to 2011 HI in labour earnings and years of education decreased. While by construction, both indices provided different values, the rank of the measures remains the same in both cases, confirming an overall decrease of horizontal inequalities in the country.

Table 2: Horizontal inequality measures

Year	Labour income		Years of education	
	GGini	GTheil	GGini	GTheil
2000	0.148	0.048	0.134	0.039
2011	0.100	0.022	0.104	0.024
Percentage change	-48	-118	-29	-63

*Source: Author's calculation based on the ENCOVI 2000 and 2011.*

## 6.1 School enrolment

Table 3 provides the estimates of the probit models for all educational outcomes under study. We focus on the results of the variables of interest, i.e. the ethnicity variables. Complete estimations are available in the Appendix. Panel A of the table shows the results for the 2000 sample and Panel B those of 2011. There are some interesting results that deserve particular attention: first, inequalities in schooling outcomes with respect to the majority group have decreased for all ethnic groups between 2000 and 2011. In fact, by 2011 differences in the probability of school attendance and the age at which children enter the formal school system are not statistically significant for most ethnic groups, suggesting an overall positive trend towards equality in educational outcomes across ethnicities in Guatemala. However, not all groups seem to have benefited equally during the period of analysis.

<sup>7</sup>Stewart (2008) make a case for three aggregated measures of horizontal inequality, the GGINI, GTheil, and group-weighted coefficient of variation (GCOV).

Table 3: Educational outcomes. Probit models (marginal effects)

	Indigenous	Quiché	Kekchí	Kakchiquel	Mam	Other Indigenous
<i>Panel A: 2000</i>						
School attendance	-0.040*** (0.014)	-0.066*** (0.022)	-0.082*** (0.028)	-0.079*** (0.027)	0.018 (0.023)	0.031 (0.019)
School entry age	-0.113*** (0.026)	-0.062* (0.037)	-0.120*** (0.048)	-0.115*** (0.040)	-0.122*** (0.044)	-0.143*** (0.034)
Primary completed	-0.108*** (0.014)	-0.107*** (0.022)	-0.147*** (0.027)	-0.079*** (0.024)	-0.132*** (0.023)	-0.093*** (0.020)
<i>Panel B: 2011</i>						
School attendance	-0.016 (0.010)	-0.018 (0.014)	0.026 (0.016)	-0.040*** (0.016)	-0.013 (0.019)	-0.011 (0.019)
School entry age	-0.023 (0.020)	-0.073*** (0.030)	-0.020 (0.041)	-0.010 (0.034)	0.043 (0.039)	-0.008 (0.034)
Primary completed	-0.041*** (0.008)	-0.038*** (0.013)	-0.057*** (0.018)	-0.030* (0.016)	-0.082*** (0.018)	-0.029*** (0.015)

Note: Standard errors in parenthesis. Significance level at \* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

Second, the aggregated indigenous variable underestimates remaining differences in education for the most disadvantaged groups. For instance, while by 2011 the marginal effect of the indigenous dummy reports a not statistically significant effect of ethnicity on whether children enter the school system at the formal age, i.e. 6-7 years, the more disaggregated analysis shows that while this is true for most ethnic groups, Quiché children are still 7 per cent less likely to start school at the formal age than ladino children. To the extent that late entrance into the school system has been positively associated with a higher probability of school dropout, Quiché children are still quite disadvantaged in this respect.

Third, the impact of ethnicity on the probability of having completed primary school education by the age of 15-17 years is negative and significant for all ethnic groups in both years, suggesting that in spite of significant amelioration of school indicators, indigenous in Guatemala are still falling behind the dominant group.

## 6.2 Earnings differentials

We start by providing the results from the Blinder-Oaxaca decomposition for each ethnic group and sample year in Table 4. The first row of each panel shows the gap at the mean. The second row shows the amount of the gap that it is explained, i.e. the part due to differences in the observed characteristics of the groups. The third row shows the unexplained part, which accounts for the difference in returns between the groups. The first point to notice, is that there was an average reduction of 0.244 log points of the earnings gap between 2000 and 2011. This result is mostly driven by a reduction in the coefficients effect, i.e.



the explained part of the gap. The detailed decomposition in Table A.6 in the Appendix shows that the reduction is particularly due to higher endowments in terms of education for the indigenous group but also to an increase of the share of indigenous people among salaried workers.

Table 4: Blinder-Oaxaca decomposition

	Indigenous	Quiché	Kekchí	Kakchiquel	Mam	Other Indigenous
<i>Panel A: 2000</i>						
Total Gap	0.747	0.639	0.683	0.684	1.058	0.830
Explained	0.448	0.529	0.482	0.294	0.663	0.501
Unexplained	0.298	0.109	0.200	0.389	0.395	0.328
<i>Adding employment characteristics</i>						
Total Gap	0.747	0.639	0.683	0.684	1.058	0.830
Explained	0.579	0.564	0.590	0.485	0.865	0.579
Unexplained	0.168	0.075	0.093	0.199	0.194	0.251
<i>Panel B: 2011</i>						
Total Gap	0.503	0.464	0.503	0.427	0.565	0.702
Explained	0.270	0.344	0.387	0.075	0.407	0.417
Unexplained	0.231	0.119	0.108	0.350	0.156	0.285
<i>Adding employment characteristics</i>						
Total Gap	0.503	0.464	0.503	0.427	0.565	0.702
Explained	0.373	0.363	0.373	0.196	0.566	0.544
Unexplained	0.130	0.101	0.129	0.231	-0.002	0.158

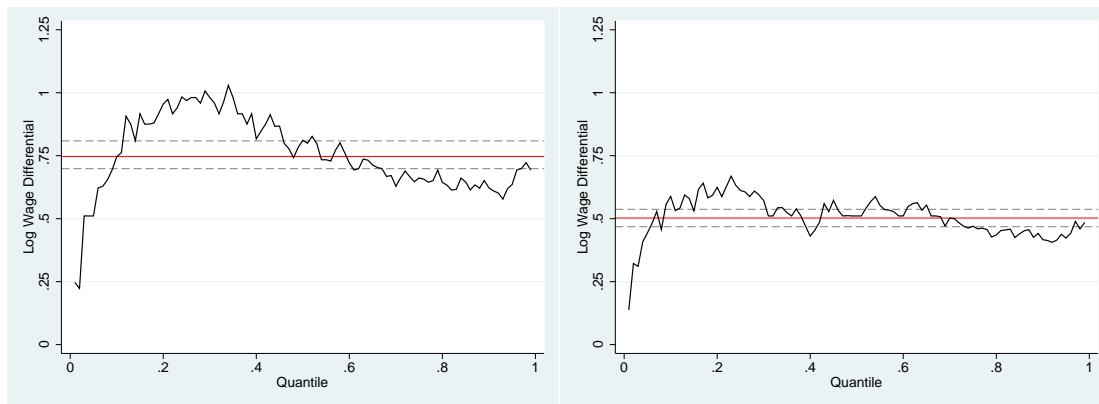
*Note: Author's calculation based on the ENCOVI 2000 and 2011.*

Figure 2 examines the changes in earnings inequality by plotting the differences in log labour earnings between indigenous people and ladinos for different percentiles of their earnings distributions for 2000 and 2011. The red line corresponds to the mean difference. The dashed lines correspond to two standard deviations from the mean. The figure highlights a sizable decline in the labour earnings gaps over time across the distribution, with the mean value moving from 0.75 in 2000 to 0.5 in 2011. Further, one can clearly see that the earnings differentials are considerably greater for the lower percentiles of the earnings distribution, in particular between the 10th and 30th percentile, and narrower after the mean, suggesting the existence of 'sticky floors' for indigenous workers in Guatemala.

Table 5 shows the results of the decomposition across the wage distribution for the aggregated indigenous group and the Quiché, Kekchí, Kakchiquel, Mam, and other indigenous groups separately. Table 6 shows the same results but this time including individual

and job characteristics for the same groups. Tables A.5 and A.6 in the Appendix, show the relative contribution of each group of control variables to the explained part of the gap.

Figure 2: Earnings differential by quantile, 2000 and 2011



Source: Authors's calculation from ENCOVI 2000-11

Overall, we see that all indigenous ethnic groups experience earnings gaps with respect to ladinos at the mean and across the earnings distribution; we also see that most of the gap is due to differences in observed characteristics like educational attainment and area of residence, which raises questions about the persistence of education gaps for indigenous populations, despite improvements in some schooling outcomes. Further, once we add to the list of control variables employment characteristics, we see that occupational distribution accounts for the majority of the explained part of the wage gap, suggesting that it is the type of job that indigenous people end up with, either by selection into or limited access to other kind of jobs, that mostly determines the earning differences among ethnic groups. In fact, at the lowest percentiles of the distribution, the over-representation of the Quiché, Kekchí, and Mam ethnic groups among skilled agricultural workers plays a bigger role than educational attainment explaining the gap. This point is of particular importance given the ethnic distribution of labour established in colonial times and later exacerbated with the expansion of coffee plantations, where indigenous people provided both the colonial and liberal state with important sources of cheap labour, [Caumartin \(2005\)](#).

From a more specific point of view, we see that the proportions of the explained part of the gap are high for all minority groups except the Kakchiquel. In most cases between 70 and 100 per cent of the gap is explained, while for the Kakchiquel group the unexplained part of the gap is higher, in particular at the lowest quantiles of the distribution. In summary, ethnic groups show very distinctive patterns of wages and wage gaps.

Table 5: RIF- OLS regressions

Quantile	Ethnic Wage Gap in 2000					Ethnic Wage Gap in 2011				
	0.10	0.25	0.50	0.75	0.90	0.10	0.25	0.50	0.75	0.90
<i>Indigenous</i>										
Difference	0.601	0.967	0.746	0.666	0.655	0.590	0.597	0.516	0.466	0.410
Explained	0.334	0.456	0.482	0.506	0.510	0.228	0.226	0.289	0.342	0.326
Unexplained	0.267	0.511	0.264	0.160	0.144	0.362	0.370	0.226	0.124	0.084
<i>Quiché</i>										
Difference	0.503	0.790	0.612	0.506	0.616	0.442	0.490	0.467	0.495	0.380
Explained	0.599	0.608	0.562	0.516	0.455	0.375	0.346	0.385	0.363	0.322
Unexplained	-0.095	0.181	0.050	-0.010	0.161	0.066	0.144	0.082	0.131	0.057
<i>Kekchí</i>										
Difference	0.525	0.800	0.723	0.605	0.582	0.407	0.530	0.599	0.518	0.519
Explained	0.324	0.592	0.553	0.458	0.487	0.398	0.362	0.494	0.385	0.327
Unexplained	0.201	0.208	0.169	0.146	0.009	0.009	0.167	0.104	0.133	0.192
<i>Kakchiquel</i>										
Difference	0.597	0.969	0.768	0.547	0.522	0.564	0.500	0.456	0.332	0.365
Explained	0.151	0.179	0.296	0.405	0.404	-0.056	-0.001	0.048	0.179	0.213
Unexplained	0.445	0.789	0.472	0.141	0.118	0.621	0.501	0.407	0.152	0.152
<i>Mam</i>										
Difference	0.965	1.268	1.092	1.068	0.905	0.569	0.664	0.598	0.617	0.464
Explained	0.815	0.804	0.689	0.615	0.583	0.453	0.386	0.461	0.411	0.395
Unexplained	0.150	0.464	0.403	0.453	0.321	0.115	0.278	0.136	0.205	0.069
<i>Other Indigenous</i>										
Difference	0.570	1.049	0.884	0.777	0.725	0.819	0.937	0.718	0.590	0.498
Explained	0.532	0.639	0.509	0.480	0.496	0.486	0.436	0.478	0.397	0.356
Unexplained	0.038	0.410	0.375	0.297	0.229	0.333	0.501	0.239	0.192	0.142

Note: Author's calculation based on the ENCOVI 2000 and 2011.

Table 6: RIF- OLS regressions with employment characteristics

Quantile	Ethnic Wage Gap in 2000					Ethnic Wage Gap in 2011				
	0.10	0.25	0.50	0.75	0.90	0.10	0.25	0.50	0.75	0.90
<i>Indigenous</i>										
Difference	0.602	0.968	0.747	0.667	0.655	0.590	0.597	0.516	0.466	0.411
Explained	0.576	0.680	0.626	0.569	0.533	0.455	0.407	0.393	0.382	0.333
Unexplained	0.026	0.287	0.121	0.098	0.122	0.136	0.190	0.123	0.084	0.078
<i>Quiché</i>										
Difference	0.504	0.790	0.612	0.507	0.617	0.442	0.490	0.468	0.495	0.380
Explained	0.700	0.679	0.579	0.514	0.459	0.420	0.391	0.408	0.360	0.316
Unexplained	-0.196	0.111	0.033	-0.007	0.158	0.022	0.099	0.060	0.135	0.064
<i>Kekchí</i>										
Difference	0.526	0.801	0.723	0.606	0.583	0.590	0.597	0.516	0.466	0.411
Explained	0.610	0.801	0.647	0.483	0.502	0.455	0.407	0.393	0.382	0.333
Unexplained	-0.085	0.000	0.076	0.123	0.081	0.136	0.190	0.123	0.084	0.078
<i>Kakchiquel</i>										
Difference	0.597	0.684	0.769	0.547	0.523	0.565	0.500	0.456	0.333	0.366
Explained	0.567	0.485	0.495	0.482	0.426	0.244	0.219	0.172	0.205	0.204
Unexplained	0.030	0.199	0.274	0.065	0.097	0.320	0.282	0.284	0.127	0.162
<i>Mam</i>										
Difference	0.966	1.269	1.092	1.069	0.913	0.569	0.665	0.599	0.618	0.465
Explained	1.321	1.215	0.888	0.655	0.570	0.822	0.663	0.635	0.450	0.392
Unexplained	-0.355	0.054	0.204	0.414	0.343	-0.253	0.001	-0.036	0.168	0.073
<i>Other Indigenous</i>										
Difference	0.571	1.050	0.885	0.778	0.726	0.820	0.938	0.718	0.591	0.499
Explained	0.701	0.770	0.591	0.513	0.514	0.804	0.652	0.596	0.436	0.366
Unexplained	-0.130	0.280	0.293	0.265	0.212	0.016	0.286	0.122	0.155	0.133

Note: Author's calculation based on the ENCOVI 2000 and 2011.

## 7 Discussion

These results suggest several broader implications and related avenues for future research. For one, consistent with the (non-economic) literature on ethnic politics in Guatemala that we explore above, these results underscore the relevance of diversity within the indigenous population to an understanding of horizontal inequality and ethnic politics in the country. In terms of future economic analyses on these topics for Guatemala, our findings suggest that the focus on the indigenous/non-indigenous divide found in much of the extant literature may obscure meaningful diversity within the indigenous population and that future work should consider further disaggregation of ethnic categories along the lines developed here. Such disaggregation also should be considered in related work on other Latin American contexts (as we discuss further below).

Our findings further offer additional evidence on the nature of this diversity, beyond that discussed in existing work. While the extant literature in political science and anthropology draws mainly on qualitative data, our analysis presents quantitative data drawn from nationally-representative surveys. While the extant literature focuses largely on diversity and division in sociopolitical terms, our analysis documents how ethnic boundaries within the indigenous population are marked additionally by socioeconomic differences apparent in educational and labour market outcomes.

How exactly socioeconomic diversity relates to sociopolitical division is another important question for future research. Further work in this area, in our view, has potential relevance to broader theories of ethnic politics in particular. Put another way, as reviewed above, the weakness of indigenous representation at the national-level in Guatemalan politics is a puzzle in light of what we know about indigenous politics elsewhere in Latin America. Previous literature attributes this weakness largely to the localism and diversity of Guatemala's indigenous communities, which in turn is linked to its comparative cultural, linguistic, and religious diversity; legacies of violent divide and rule; and possibly to institutional incentives in the electoral system. But the extent to which this explanation relies on explaining sociopolitical division through sociopolitical diversity is somewhat unsatisfying.

We posit that the socioeconomic inequality among indigenous groups documented here, in combination with the number and sizes of groups, can offer new leverage on understanding the puzzling weakness of national indigenous politics in Guatemala. Such socioeconomic diversity and inequality, we hypothesise, serves to dampen collective action along 'indigenous' lines, given dissimilarities in the experiences and incentives of members of indigenous ethnic groups. In such situations, socio-economic class may be a more unifying cleavage around which to mobilise in the national political arena, even for 'indigenous' individuals. This would appear broadly consistent with the observation that

indigenous leaders have tended to place their support behind leftist parties at the national level in Guatemala.

Moreover, simply in terms of numbers and sizes of groups, Guatemala's indigenous population in comparison to other Latin American countries', seems to be notably fractionalised. In Bolivia, for instance, where over 60 per cent of the population self-identified as indigenous in 2001 census, the vast majority of the indigenous population falls into one of two language groups, Quechua and Aymara. In comparison to Guatemala, where the largest indigenous language group, Quiché, is only 8-13 per cent, in Bolivia, the two largest groups were 31 and 25 per cent of the population respectively. To explore this hypothesis more fully, future work would need to provide systematic cross-national comparison of this sort of 'nested' or sub-group fractionalisation, along with comparative analysis of horizontal inequalities among the same groups.

A further avenue for future research relates to more disaggregated consideration of the structural and institutional roots of such disaggregated horizontal inequality. The literature on indigenous politics in Latin America focuses in considerable depth on the roots of inequality between indigenous and non-indigenous populations, but has devoted much less attention to differing experiences among indigenous communities. We expect, among other factors, the geographic location of groups and the structural bases of the economy to influence enduring diversity within the indigenous population. We also would look in particular to relations with colonial and post-colonial states (a blatant example of which is the disproportionate violence against particular indigenous groups by the Guatemalan military during the civil war). These two factors might in turn go together. In Bolivia, for instance, the agrarian reform after the 1952 national revolution influenced relationships to production and especially in the western highlands served to convert indigenous 'peasants' into strong supporters of the ruling party.

More specifically, our results as detailed above raise several related questions for future research. One set of questions - for which interdisciplinary collaboration might be particularly useful - concerns the factors and causal processes underlying the specific variation illustrated in educational and labour market outcomes among indigenous ethnic groups. Why, for instance, as the gap between indigenous and ladino children in school entry has narrowed overall, do we see Quiché children in particular lagging behind? In looking at earnings gaps, what factors explain the results for those self-identifying as Kakchiquel? Is there a more general explanation for the distinctive wage patterns observed for different groups? As above, we hypothesise that multiple factors are at work - including the geographic location of groups, historical ethnic and regional stratification of the economy, and differential legacies of civil war violence - but further research is needed.

Finally, from a policy standpoint, our results also speak to the promise - and limits - of existing efforts to support disadvantaged groups in Guatemala, as well as in other

countries. It is worth noting that progress toward addressing educational inequality goes a significant way toward supporting more equal wage outcomes, but at the same time the persistence of wage inequalities highlights the need to address additional factors, such as discrimination in the labour market. Moreover, the fact that gaps in educational and labour market outcomes remain higher for some indigenous ethnic groups than others suggests the need for continued policy attention to addressing the needs of disadvantaged populations in a disaggregated way.

## 8 Conclusion

Guatemala is an important case for the understanding of ethnic politics and horizontal inequality, both in Latin America and beyond. While the economic literature to date has documented the depth of horizontal inequalities between indigenous and non-indigenous Guatemalans, it has not fully considered the diversity within the indigenous population. Work in political science and anthropology on the other hand point to this diversity as important in understanding ethnic politics in the country, including the otherwise puzzling weakness of national indigenous mobilisation. This paper builds from both of these bodies of work, drawing on new analysis of individual-level data from the 2000 and 2011 ENCOVI survey to consider inequalities in educational and labour market outcomes between both ladino populations and indigenous populations and between ladino and diverse indigenous ethnic groups. Further, in analysing educational outcomes, we focus on Guatemalan children. And, while wage differentials at the mean have been documented in previous work for Guatemala, our analysis investigates variation across the entire wage distribution. The analysis documents a number of empirical patterns and explores the implications of these findings for understanding horizontal inequality and ethnic politics more broadly.

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# Appendix A

Table A.1: Descriptive statistics 2000 (children aged 7-17 years)

Variable	Ladino		Indigenous		Quiché		Kekchi'		Kakchiquel		Mam		Other Indigenous	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age	11.67	3.15	11.63	3.14	11.64	3.19	11.72	3.12	11.55	3.09	11.49	3.16	11.70	3.13
School attendance	0.74	0.44	0.60	0.49	0.59	0.49	0.50	0.50	0.64	0.48	0.63	0.48	0.62	0.49
Gender (male=1)	0.53	0.50	0.50	0.50	0.50	0.50	0.53	0.50	0.51	0.50	0.48	0.50	0.51	0.50
First born	0.45	0.50	0.40	0.49	0.41	0.49	0.39	0.49	0.42	0.49	0.39	0.49	0.40	0.49
Last born	0.30	0.46	0.29	0.46	0.29	0.46	0.28	0.45	0.29	0.45	0.29	0.45	0.31	0.46
Mother in hhold	0.91	0.29	0.92	0.28	0.91	0.28	0.90	0.30	0.95	0.21	0.90	0.30	0.91	0.28
Father in hhold	0.74	0.44	0.80	0.40	0.76	0.43	0.83	0.37	0.84	0.37	0.76	0.43	0.79	0.41
Hh living in couple	0.84	0.36	0.89	0.31	0.88	0.33	0.91	0.29	0.87	0.33	0.89	0.31	0.91	0.28
Hh education in years	4.01	4.14	1.89	2.75	1.79	2.64	1.64	2.72	2.70	2.97	1.34	2.28	1.84	2.79
Household size	6.76	2.41	7.60	2.43	7.60	2.64	7.97	2.50	7.24	2.16	7.45	2.18	7.69	2.51
No children aged 0-5	0.97	1.10	1.38	1.19	1.39	1.30	1.47	1.17	1.27	1.14	1.38	1.13	1.39	1.19
No children aged 6-9	0.71	0.77	0.88	0.80	0.84	0.80	0.94	0.83	0.82	0.76	0.96	0.81	0.86	0.81
No children aged 10-14	0.92	0.84	1.03	0.82	1.02	0.84	1.04	0.79	1.03	0.83	1.08	0.83	1.02	0.80
No children aged 15-18	0.46	0.64	0.56	0.71	0.62	0.77	0.63	0.70	0.46	0.65	0.52	0.67	0.56	0.74
No female adults (19+)	1.43	0.75	1.44	0.73	1.46	0.80	1.40	0.64	1.36	0.69	1.40	0.68	1.51	0.77
No male adults (19+)	1.27	0.82	1.31	0.80	1.26	0.79	1.48	0.85	1.30	0.85	1.12	0.70	1.35	0.76
Hhold has running water	0.59	0.49	0.56	0.50	0.62	0.49	0.34	0.47	0.57	0.50	0.65	0.48	0.60	0.49
Hhold has electricity	0.68	0.47	0.54	0.50	0.65	0.48	0.23	0.42	0.72	0.45	0.47	0.50	0.56	0.50
Hhold has sewage system	0.38	0.48	0.20	0.40	0.26	0.44	0.07	0.26	0.30	0.46	0.16	0.36	0.18	0.39
Urban area	0.46	0.50	0.29	0.45	0.29	0.45	0.26	0.44	0.33	0.47	0.17	0.38	0.34	0.47
Observations	6120		4396		861		779		869		649		1238	

Source: Author's calculation based on the ENCOVI 2000

Table A.2: Descriptive statistics 2011 (children aged 7-17 years)

Variable	Ladino		Indigenous		Quiché		Kekchí		Kakchiquel		Mam		Other Indigenous	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Age	11.91	3.09	11.83	3.09	11.92	3.12	11.74	3.05	11.71	3.09	11.87	3.05	11.86	3.07
School attendance	0.81	0.39	0.79	0.41	0.78	0.42	0.82	0.38	0.78	0.41	0.78	0.41	0.77	0.42
Gender (male=1)	0.52	0.50	0.51	0.50	0.52	0.50	0.52	0.50	0.48	0.50	0.52	0.50	0.51	0.50
First born	0.47	0.50	0.38	0.49	0.39	0.49	0.38	0.48	0.39	0.49	0.38	0.48	0.39	0.49
Last born	0.29	0.46	0.29	0.45	0.29	0.45	0.29	0.45	0.28	0.45	0.30	0.46	0.29	0.45
Mother in hhold	0.90	0.31	0.94	0.24	0.93	0.25	0.96	0.20	0.95	0.21	0.90	0.30	0.93	0.26
Father in hhold	0.71	0.46	0.79	0.41	0.75	0.43	0.88	0.32	0.82	0.38	0.71	0.46	0.76	0.43
Hh living in couple	0.55	0.50	0.66	0.47	0.64	0.48	0.66	0.47	0.74	0.44	0.56	0.50	0.64	0.48
Hh education in years	3.86	3.71	2.37	2.92	2.22	2.87	2.04	2.82	3.13	3.12	2.03	2.45	2.19	2.96
Household size	6.43	2.30	7.52	2.67	7.43	2.65	7.75	2.55	7.49	2.58	7.67	3.06	7.38	2.62
No children aged 0-5	0.69	0.87	0.98	1.04	0.89	0.97	1.20	1.11	0.94	1.00	1.07	1.16	0.97	1.04
No children aged 6-9	0.60	0.73	0.80	0.77	0.79	0.79	0.84	0.77	0.81	0.75	0.74	0.81	0.77	0.76
No children aged 10-14	0.92	0.86	1.16	0.90	1.11	0.88	1.20	0.86	1.18	0.90	1.22	1.01	1.17	0.92
No children aged 15-18	0.48	0.66	0.59	0.69	0.61	0.71	0.58	0.71	0.56	0.67	0.59	0.69	0.61	0.68
No female adults (19+)	1.44	0.80	1.57	0.88	1.64	0.90	1.38	0.73	1.60	0.91	1.66	0.99	1.49	0.78
No male adults (19+)	1.28	0.86	1.37	0.91	1.34	0.95	1.51	0.89	1.40	0.90	1.29	0.86	1.29	0.86
Hhold has running water	0.63	0.48	0.65	0.48	0.74	0.44	0.40	0.49	0.74	0.44	0.60	0.49	0.65	0.48
Hhold has electricity	0.77	0.42	0.68	0.47	0.83	0.38	0.29	0.45	0.84	0.37	0.70	0.46	0.53	0.50
Hhold has sewage system	0.34	0.47	0.20	0.40	0.18	0.39	0.03	0.18	0.41	0.49	0.14	0.34	0.15	0.35
Urban area	0.38	0.49	0.29	0.45	0.32	0.46	0.12	0.32	0.47	0.50	0.17	0.38	0.24	0.43
Observations	11249		7464		2495		1232		1676		849		1211	

Source: Author's calculation based on the ENCONVI 2011

Table A.3: Descriptive statistics 2000 (working individuals)

Variable	Ladino	Indigenous	Quiché	Kekchí	Kakchiquel	Mam	Other Indigenous
Age	40.81	41.51	41.28	41.26	41.02	42.47	42.03
Gender (male=1)	0.64	0.70	0.65	0.80	0.64	0.75	0.71
School years	5.57	2.70	2.75	2.48	3.17	1.82	2.67
<i>Employment characteristics</i>							
Salaried worker	0.49	0.27	0.31	0.31	0.30	0.15	0.23
Working part-time (< 35h per week)	0.23	0.27	0.32	0.18	0.26	0.31	0.27
<i>Occupations</i>							
Managers & senior officials	0.03	0.02	0.02	0.01	0.04	0.00	0.02
Professional occupations	0.09	0.04	0.03	0.05	0.04	0.04	0.06
Associate prof. & technical	0.04	0.01	0.02	0.01	0.01	0.02	0.01
Clerks	0.05	0.01	0.01	0.02	0.01	0.00	0.01
Craft and related trades workers	0.16	0.19	0.27	0.13	0.20	0.11	0.19
Sales & service workers	0.19	0.13	0.18	0.11	0.12	0.14	0.12
Skilled agricultural & fishery workers	0.16	0.31	0.23	0.42	0.26	0.47	0.29
Plant and machine operators	0.05	0.02	0.03	0.03	0.02	0.01	0.02
Elementary occupations	0.23	0.25	0.21	0.23	0.29	0.21	0.27
<i>Place of residence</i>							
Urban area	0.60	0.40	0.37	0.44	0.41	0.22	0.45
Metropolitan region	0.20	0.04	0.03	0.01	0.11	0.01	0.02
North region	0.06	0.20	0.01	0.78	0.00	0.01	0.25
Northeastern region	0.11	0.02	0.00	0.08	0.00	0.00	0.04
Southeastern region	0.16	0.02	0.00	0.00	0.00	0.00	0.07
Central region	0.15	0.22	0.05	0.01	0.78	0.00	0.01
Northwestern region	0.13	0.21	0.51	0.00	0.09	0.59	0.03
Southwestern region	0.08	0.26	0.36	0.00	0.00	0.36	0.57
Peten	0.09	0.04	0.04	0.12	0.01	0.02	0.02
Observations	4,750	2,911	673	503	747	300	688

Source: Author's calculation based on the ENCOVI 2000



Table A.4: Descriptive statistics 2011 (working individuals)

Variable	Ladino	Indigenous	Quiché	Kekchí	Kakchiquel	Mam	Other Indigenous
Age	41.03	41.08	42.03	40.51	39.98	41.49	41.23
Gender (male=1)	0.65	0.68	0.66	0.82	0.63	0.69	0.69
School years	5.66	3.28	3.21	2.79	3.96	2.69	3.01
<i>Employment characteristics</i>							
Salaried worker	0.50	0.27	0.28	0.22	0.34	0.18	0.23
Working part-time (< 35h per week)	0.23	0.29	0.29	0.25	0.25	0.35	0.36
<i>Occupations</i>							
Managers & senior officials	0.07	0.05	0.05	0.05	0.05	0.07	0.04
Professional occupations	0.08	0.04	0.04	0.05	0.04	0.02	0.04
Associate prof. & technical	0.05	0.03	0.03	0.02	0.03	0.02	0.05
Clerks	0.03	0.01	0.01	0.00	0.01	0.00	0.01
Craft & related trades workers	0.12	0.17	0.24	0.04	0.20	0.08	0.11
Sales & service workers	0.13	0.09	0.11	0.05	0.11	0.07	0.06
Skilled agricultural & fishery workers	0.13	0.23	0.13	0.45	0.17	0.27	0.34
Plant and machine operators	0.06	0.04	0.03	0.03	0.06	0.03	0.03
Elementary occupations	0.33	0.35	0.37	0.30	0.33	0.44	0.33
<i>Place of residence</i>							
Urban area	0.52	0.39	0.39	0.19	0.57	0.26	0.36
Metropolitan region	0.12	0.04	0.02	0.01	0.08	0.03	0.03
North region	0.03	0.14	0.00	0.65	0.00	0.00	0.30
Northeastern region	0.30	0.04	0.00	0.19	0.01	0.01	0.07
Southeastern region	0.13	0.00	0.00	0.00	0.00	0.00	0.02
Central region	0.16	0.21	0.02	0.01	0.71	0.01	0.04
Northwestern region	0.20	0.41	0.75	0.01	0.19	0.76	0.16
Southwestern region	0.03	0.14	0.21	0.03	0.00	0.18	0.35
Petén	0.03	0.02	0.00	0.11	0.00	0.01	0.03
Observations	9,371	5,100	1,741	716	1,402	483	757

Source: Author's calculation based on the ENCOVI 2011

Table A.5: Detailed decomposition across the earnings distribution

Quantile	Ethnic Wage Gap in 2000						Ethnic Wage Gap in 2011					
	Mean	0.10	0.25	0.50	0.75	0.90	Mean	0.10	0.25	0.50	0.75	0.90
<i>All Indigenous group</i>												
Difference	0.75	0.60	0.97	0.75	0.67	0.66	0.50	0.59	0.60	0.52	0.47	0.41
Explained	0.45	0.33	0.46	0.48	0.51	0.51	0.27	0.23	0.23	0.29	0.34	0.33
Gender (male=1)	-0.04	-0.05	-0.06	-0.04	-0.02	-0.02	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01
School years	0.33	0.31	0.32	0.33	0.38	0.39	0.21	0.17	0.19	0.23	0.26	0.26
Urban	0.08	0.11	0.13	0.10	0.05	0.03	0.03	0.05	0.04	0.03	0.02	0.02
Regions	0.07	-0.04	0.04	0.09	0.10	0.12	0.04	0.02	0.01	0.04	0.08	0.05
<i>Quiché</i>												
Difference	0.64	0.50	0.79	0.61	0.51	0.62	0.46	0.44	0.49	0.47	0.50	0.38
Explained	0.53	0.60	0.61	0.56	0.52	0.46	0.34	0.38	0.35	0.39	0.36	0.32
Gender (male=1)	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	-0.01	-0.01	0.00	0.00	0.00
School years	0.32	0.35	0.34	0.33	0.36	0.33	0.23	0.19	0.21	0.26	0.26	0.27
Urban	0.08	0.16	0.15	0.09	0.03	0.02	0.03	0.06	0.04	0.03	0.02	0.01
Regions	0.12	0.08	0.11	0.13	0.12	0.11	0.09	0.12	0.09	0.11	0.10	0.05
<i>Quekchi</i>												
Difference	0.68	0.53	0.80	0.72	0.61	0.58	0.50	0.59	0.60	0.52	0.47	0.41
Explained	0.48	0.32	0.59	0.55	0.46	0.49	0.27	0.23	0.23	0.29	0.34	0.33
Gender (male=1)	-0.10	-0.16	-0.16	-0.09	-0.05	-0.07	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01
School years	0.37	0.38	0.38	0.37	0.41	0.39	0.21	0.17	0.19	0.23	0.26	0.26
Urban	0.06	0.12	0.12	0.07	0.02	0.01	0.03	0.05	0.04	0.03	0.02	0.02
Regions	0.15	-0.03	0.25	0.20	0.08	0.16	0.04	0.02	0.01	0.04	0.08	0.05
<i>Kakchiquel</i>												
Difference	0.68	0.60	0.97	0.77	0.55	0.52	0.43	0.56	0.50	0.46	0.33	0.37
Explained	0.29	0.15	0.18	0.30	0.41	0.40	0.08	-0.06	0.00	0.05	0.18	0.21
Gender (male=1)	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
School years	0.28	0.28	0.29	0.28	0.31	0.29	0.16	0.14	0.15	0.18	0.17	0.18
Urban	0.07	0.12	0.12	0.07	0.03	0.02	-0.01	-0.02	-0.02	-0.01	-0.01	-0.01
Regions	-0.06	-0.27	-0.25	-0.07	0.05	0.09	-0.08	-0.17	-0.13	-0.13	0.00	0.02
<i>Mam</i>												
Difference	1.06	0.97	1.27	1.09	1.07	0.91	0.56	0.57	0.66	0.60	0.62	0.46
Explained	0.66	0.82	0.80	0.69	0.62	0.55	0.41	0.45	0.39	0.46	0.41	0.40
Gender (male=1)	-0.07	-0.11	-0.11	-0.06	-0.03	-0.05	-0.01	-0.02	-0.02	-0.02	-0.01	-0.01
School years	0.44	0.46	0.47	0.45	0.48	0.45	0.28	0.24	0.25	0.32	0.30	0.32
Urban	0.14	0.31	0.27	0.14	0.05	0.04	0.06	0.11	0.08	0.06	0.03	0.03
Regions	0.15	0.13	0.15	0.16	0.13	0.13	0.09	0.11	0.07	0.10	0.09	0.06
<i>Other Indigenous</i>												
Difference	0.83	0.57	1.05	0.88	0.78	0.73	0.70	0.82	0.94	0.72	0.59	0.50
Explained	0.50	0.53	0.64	0.51	0.48	0.50	0.42	0.49	0.44	0.48	0.40	0.36
Gender (male=1)	-0.04	-0.07	-0.07	-0.04	-0.02	-0.03	-0.02	-0.02	-0.02	-0.02	-0.01	-0.01
School years	0.34	0.36	0.35	0.34	0.38	0.37	0.24	0.21	0.22	0.28	0.28	0.29
Urban	0.05	0.10	0.10	0.06	0.02	0.01	0.04	0.07	0.05	0.04	0.02	0.02
Regions	0.15	0.12	0.24	0.14	0.11	0.16	0.15	0.22	0.18	0.18	0.11	0.06

Table A.6: Detailed decomposition with employment characteristics

Quantile	Ethnic Wage Gap in 2000						Ethnic Wage Gap in 2011					
	Mean	0.10	0.25	0.50	0.75	0.90	Mean	0.10	0.25	0.50	0.75	0.90
<i>All Indigenous group</i>												
Difference	0.75	0.60	0.97	0.75	0.67	0.66	0.50	0.59	0.60	0.52	0.47	0.41
Explained	0.58	0.58	0.68	0.63	0.57	0.53	0.37	0.45	0.41	0.39	0.38	0.33
School years	0.18	0.17	0.16	0.17	0.20	0.27	0.13	0.09	0.10	0.13	0.16	0.19
Urban	0.03	0.04	0.05	0.04	0.02	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Regions	0.06	-0.07	0.02	0.08	0.10	0.11	0.04	0.02	0.01	0.03	0.08	0.05
Job characteristics	0.17	0.30	0.26	0.20	0.12	0.04	0.09	0.15	0.15	0.12	0.05	0.01
Occupation	0.16	0.18	0.23	0.17	0.16	0.13	0.12	0.20	0.16	0.11	0.10	0.08
<i>Quiché</i>												
Difference	0.64	0.50	0.79	0.61	0.51	0.62	0.46	0.44	0.49	0.47	0.50	0.38
Explained	0.56	0.70	0.68	0.58	0.51	0.46	0.36	0.42	0.39	0.41	0.36	0.32
School years	0.18	0.20	0.18	0.17	0.21	0.24	0.14	0.10	0.11	0.15	0.17	0.20
Urban	0.03	0.06	0.06	0.04	0.01	0.00	0.01	0.02	0.02	0.01	0.01	0.01
Regions	0.07	-0.05	0.00	0.09	0.10	0.08	0.08	0.13	0.08	0.09	0.09	0.05
Job characteristics	0.17	0.34	0.29	0.18	0.08	0.03	0.09	0.15	0.14	0.12	0.03	0.00
Occupation	0.11	0.15	0.15	0.09	0.12	0.10	0.05	0.02	0.04	0.05	0.07	0.06
<i>Quekchi</i>												
Difference	0.68	0.53	0.80	0.72	0.61	0.58	0.50	0.59	0.60	0.52	0.47	0.41
Explained	0.59	0.61	0.80	0.65	0.48	0.50	0.37	0.45	0.41	0.39	0.38	0.33
School years	0.21	0.22	0.20	0.20	0.23	0.29	0.13	0.09	0.10	0.13	0.16	0.19
Urban	0.02	0.04	0.05	0.03	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Regions	0.12	-0.09	0.18	0.15	0.08	0.15	0.04	0.02	0.01	0.03	0.08	0.05
Job characteristics	0.10	0.21	0.14	0.12	0.05	-0.01	0.09	0.15	0.15	0.12	0.05	0.01
Occupation	0.23	0.38	0.38	0.23	0.18	0.15	0.12	0.20	0.16	0.11	0.10	0.08
<i>Kakchiquell</i>												
Difference	0.68	0.60	0.68	0.77	0.55	0.52	0.43	0.56	0.50	0.46	0.33	0.37
Explained	0.48	0.57	0.48	0.50	0.48	0.43	0.20	0.24	0.22	0.17	0.21	0.20
School years	0.15	0.15	0.15	0.15	0.17	0.21	0.10	0.08	0.08	0.10	0.12	0.14
Urban	0.03	0.04	0.03	0.03	0.01	0.01	-0.01	-0.01	-0.01	-0.01	0.00	0.00
Regions	0.02	-0.08	0.02	0.01	0.08	0.09	-0.03	-0.04	-0.04	-0.07	0.00	0.00
Job characteristics	0.15	0.30	0.15	0.17	0.08	0.02	0.06	0.09	0.10	0.08	0.02	0.00
Occupation	0.12	0.14	0.12	0.13	0.13	0.09	0.07	0.12	0.08	0.05	0.06	0.05
<i>Mam</i>												
Difference	1.06	0.97	1.27	1.09	1.07	0.91	0.56	0.57	0.66	0.60	0.62	0.46
Explained	0.86	1.32	1.21	0.89	0.65	0.57	0.57	0.82	0.66	0.63	0.45	0.39
School years	0.24	0.24	0.22	0.23	0.27	0.32	0.17	0.14	0.14	0.18	0.20	0.25
Urban	0.06	0.13	0.11	0.06	0.02	0.02	0.02	0.03	0.03	0.02	0.01	0.02
Regions	0.08	-0.04	0.01	0.10	0.10	0.11	0.08	0.12	0.05	0.08	0.08	0.06
Job characteristics	0.28	0.61	0.48	0.29	0.13	0.03	0.15	0.26	0.26	0.20	0.05	0.01
Occupation	0.27	0.49	0.47	0.26	0.19	0.17	0.16	0.29	0.20	0.16	0.11	0.07
<i>Other Indigenous</i>												
Difference	0.83	0.57	1.05	0.88	0.78	0.73	0.70	0.82	0.94	0.72	0.59	0.50
Explained	0.58	0.70	0.77	0.59	0.51	0.51	0.54	0.80	0.65	0.60	0.44	0.37
School years	0.20	0.21	0.18	0.19	0.20	0.25	0.15	0.12	0.12	0.16	0.19	0.22
Urban	0.02	0.04	0.04	0.03	0.01	0.00	0.02	0.02	0.02	0.01	0.01	0.01
Regions	0.07	-0.08	0.07	0.06	0.09	0.15	0.07	0.02	0.03	0.10	0.10	0.06
Job characteristics	0.20	0.42	0.33	0.21	0.11	0.03	0.14	0.24	0.24	0.18	0.05	0.02
Occupation	0.14	0.19	0.21	0.15	0.14	0.13	0.18	0.42	0.27	0.15	0.10	0.06