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Ethnic and Gender Wage Gaps in Ecuador

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Abstract[*]

Returns to labor for workers with similar endowments of productive characteristics in Ecuador are influenced by two characteristics that, arguably, should play no role on the determination of wages: gender and ethnicity. This paper analyzes wage gaps due to both characteristics in Ecuador for the period 2003-2007, applying a matching comparisons technique developed in Ñopo (2008). The results indicate ethnic wage gaps that are notably higher than gender wage gaps. Furthermore, ethnic wage gaps are higher among males than among females. Differences in human capital characteristics, however, explain almost one-half of the ethnic wage gaps but only a small fraction of the gender wage gaps. Both gender and ethnic wage gaps are more pronounced at the lower extremes of the earnings distribution.

1. Introduction

Latin America is a racially and ethnically diverse region, where the benefits of progress have not reached the population equally yet. Within the region, Ecuador can be regarded as paradigmatic, with one of the largest shares of indigenous population and an enormous incidence of poverty among the indigenous and Afro-descendants. While countries in the region are populated by a mix of indigenous and non-indigenous people, at present *mestizos*, individuals of mixed Spanish and indigenous descent, form the bulk of the region's population. Despite the economic potential that this cultural diversity and existing social capital could represent, socio-economic differences have persisted among ethnic groups since colonial times. Today, Latin America is one of the most unequal regions of the world, plagued by serious problems related to poverty, inequality and social exclusion, and indigenous people and other minority groups such as Afro-descendants face limited opportunities as they strive for a higher standard of living.

A number of interesting questions can be raised about the relationship between the process of economic development and labor market discrimination and lack of opportunities (Ashenfelter and Oaxaca, 1991). These questions include the impact that expected differential returns to education can have on labor time allocation and underinvestment in education due to the expectation of discrimination. If the difference in economic outcomes in the labor market for indigenous people were to be attributed to discrimination, rather than to differences in human capital endowments, this mechanism could possibly limit the human and economic development of millions of people. Alesina and La Ferrara (2004) assess the literature on the positive and negative effects that ethnic diversity can have on economic policies and outcomes, finding that racism and prejudices often lead to policies which are suboptimal from the point of view of society as a whole, and to the oppression of minorities, which may then disrupt political instability. However, the authors argue that an ethnic mix can also bring about diversification of abilities, experiences and cultures which may be productive, leading to innovation and creativity.

In Latin America, statistics for ethnic minorities reveal worse poverty and income outcomes across the region (Psacharopoulos and Patrinos, 1994; Gandelman, Ñopo and Ripani, 2008). These limitations are reflected in such phenomena as restricted access to public services, lack of political representation, lower labor market opportunities and prevalent discrimination (Thorp, 1998; Buvinic, Mazza and Deutsch, 2005; Inter-American Development Bank., 2008). Furthermore, the empirical evidence points toward important labor market earnings

disadvantages for workers from ethnic minorities across the region (Patrinos and Psacharopoulos, 1994; Patrinos and Hall, 2005; Ñopo, Saavedra and Torero, 2004). This pattern can be traced largely to lower human capital endowments, manifested in poorer educational performance and fewer years of job experience (Hernández-Zavala et al., 2006; Solano, 2002). Furthermore, returns to education have also been shown to vary substantially across ethnic groups (Gallardo, 2006). Other factors that contribute to this pattern of inequality and poverty include labor force participation in low-productivity and hence poorly remunerated activities (Gaviria, 2006).

Most of the literature on discrimination in labor markets consists of empirical studies in developed countries, where affirmative action policies have increasingly been implemented to close the gap between dominant and minority groups. Latin America has comparatively fewer empirical studies measuring discrimination against indigenous populations and exploring their potential economic costs (Saavedra et al., 2004; Patrinos and Psacharopoulos, 1994; Cunningham and Jacobsen, 2003; Patrinos and Hall, 2005; Inter-American Development Bank, 2008). The small number of studies mirrors the limited number of government policies currently in place to address the inequality between indigenous and non-indigenous people and its impact on the incidence of poverty for the former group.

This paper contributes to the recently growing literature addressing the issue of unexplained ethnic and gender differences in pay in Ecuador's labor markets with an entirely new methodology based on matching comparisons. The rest of the paper is organized as follows. The next section outlines the literature on wage gaps for Ecuador. Section 3 then describes the data set employed, defining the sample for the analysis and provide some descriptive statistics. In the following section we begin by describing the wage gap decomposition methodology developed by Ñopo (2008) and then present the results of the application of this methodology, first controlling for ethnicity and then for gender. Last, we present our conclusions and offer some policy recommendations in Section 5.

2. Wage Gaps in Ecuador

Three recent studies analyze labor market earnings and decompose wage differences between indigenous and non-indigenous workers in Ecuador, seeking to explore the extent to which human capital differences contribute to earnings disparities between these two groups in labor markets.

García-Aracil and Winter (2006) use Oaxaca-Blinder decompositions to measure the extent to which earnings differentials can be attributed to differences in human capital or to discrimination for wage-earners aged 12 to 65. The study identifies indigenous people as those who live in a household where there is at least one indigenous language-speaking inhabitant. Empirically, Garcia-Aracil and Winter instruments labor market participation with variables such as age and family composition (number of older and younger siblings in the household) in order to reduce bias due to selection into the labor markets. Their decomposition results, using the non-indigenous pay structure as reference, yield a total earnings difference of 104 percent between indigenous and non-indigenous workers, of which 0.46 (43.7 percent of the total) is due to difference in endowments and 0.59 (56.3 percent) is due to "unexplained" differences. According to the results, much of the non-indigenous/indigenous worker's earnings advantage (disadvantage) is primarily explained by the difference in endowments of education and urban residence, but most appears to be due to other sources (and discrimination is suspected to be one of them).

In the second study, Larrea and Montenegro (2006) calculate two separate regressions of labor earnings for indigenous and non-indigenous workers using 1998 ECV data and approximating ethnicity through language. Using traditional Oaxaca-Blinder decompositions, the authors report a total earnings differential between indigenous and non-indigenous workers of 69 percent, of which 0.12 (17.4 percent of the total) is due to endowment differences and 0.57 (82.6 percent) is due to discrimination using the non-indigenous pay structure as reference (Tables 3 and 4). The difference between Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) is considerable given that both use ECV data collected only one year apart from each other.

The household extended language-based definition of ethnicity used by both Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) has a limitation as it includes Spanish-speaking indigenous workers among non-indigenous workers. This could possibly

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underestimate wage differentials, since the lower earnings of indigenous workers will narrow the wage gap as well as the differences due to endowments and discrimination. Furthermore, this language-based approach includes other minority groups like Afro-descendants and biracial Afro-descendants who are Spanish speakers, and for whom there is consistent anecdotal evidence that points towards discriminatory treatments in everyday activities, possibly leading to biases and underestimates in the decomposition outcomes. Including non-indigenous residents with resident indigenous language speakers within indigenous households will likewise negatively bias estimates of differences. It should be noted as well that both studies use monthly earnings as the dependent variable. It can be argued that it does not accurately capture the return to productivity based on each worker's human capital endowments, as this variable is affected by each worker's decision on how many hours to allocate to their job throughout a month, not just the return on their labor. The choice of monthly earnings over hourly wages is more a measure of income inequality between the two groups, rather than of labor market discrimination, which should measure compensation rates per unit of time worked and abstract from the time allocation dimension of total earnings outcomes.

In the third study, Gallardo (2006) analyzes labor market differentials due to ethnicity among the indigenous and Afro-descendant population in Ecuador. Unlike the previous two studies, this uses ethnic self-identification as reported in the 2000 EMEDINHO survey. Another interesting difference with respect to the other two is the extended wage differential decomposition model for wage earners based on the traditional Oaxaca-Blinder methodology and a system of simultaneous equations. Such extension contributes to the analysis recognizing that educational investments, sector of employment, and area of residence might be influenced by ethnicity and intergenerational transmission of human capital (Black, Devereux and Salvanes, 2003). By decomposing these three variables separately using the Oaxaca-Blinder method, the author captures direct and indirect paths through which discrimination may affect wages in the labor market. Among Gallardo's findings is that low levels of educational attainment accompany higher rates of informal sector employment, and that returns to education in the labor market for both indigenous and Afro-descendant wage earners are lower than those of the mestizo and white population. The author also finds evidence that the intergenerational transmission of human capital from parents to children has negative education and labor market outcomes for the indigenous and Afro-descendant population. Among male workers, the direct effect on wage

differentials between indigenous and Afro-descendants and mestizo and white employees with similar endowments accounts for 27.1 percent of overall wage differences. Indirect channels via schooling, sector of employment, and area of residence account for 39.9 percent of the wage differential. More troublesome is the finding that for females, unexplained differences in pay accounts for 23.5 percent of the difference in wages between the two ethnic clusters, while indirect channels account for 56.9 percent. Table 1 comparatively shows the results of the Garcia-Aracil and Winter (2006), Larrea and Montenegro (2006) and Gallardo (2006) studies.

Gender-based wage differentials have also long been an area of concern that, compared to ethnicity-based differences, has shown recent analytical progress in Latin America and the Caribbean (Tenjo, Ribero and Bernat, 2004). Differences in labor outcomes between men and women have been addressed by the literature, particularly their correlation with formal education, informal employment, occupational segregation and its spillover effects in intra-household dynamics (Psacharopolous, 1994; Correia and Van Bronkhorst, 2000; Deutsch et al., 2004, Garcia-Aracil and Winkler, 2004). Recently, public policy and legislation in this area have been directed towards enforcing equal opportunity and treatment in the workplace and towards reducing the disparity in access to education and other social services which directly impacts the endowment of productive capacities in the individual. For instance, in Ecuador, labor legislation was put into effect in 1998 to provide protection and benefits to domestic employees, mostly women. However, a number of factors have stimulated the participation of women in the labor force, including unfulfilled economic needs, economic crises, increased male migration, increased schooling outcomes and decreasing fertility rates. Recent advances in women's labor outcomes do not imply that gender-based wage differentials are no longer an issue in the region. Indeed, nothing could be further from the truth, as gender-based wage differentials are still the norm throughout Latin America and the Caribbean.

According to the Correia and Van Bronkhorst (2000), Ecuador has made important advances in reducing gender disparities and addressing gender-related development issues as the country's disparities in educational and labor force participation have continued to close. Women's labor force participation has steadily increased since the 1980s, and women have made significant advances at the professional, managerial and technical levels (Correia and Van Bronkhorst, 2000.) In rural areas, women continue to have an important role in subsistence farming and commercial agriculture. However, gender disparities in educational and employment

opportunities are still significant and are more pronounced among indigenous populations than among non-indigenous populations.

The same study by García-Aracil and Winter (2006) outlined above for ethnic-based earnings differentials, documents that endowments account for slightly less than half of total earnings differentials between men and women. This means that more than half of the earnings disparity is unexplained by observable human capital characteristics. The study concludes that equalizing educational opportunities for girls will only marginally reduce female-male earning differentials. However, in the case of the female indigenous population, equalizing educational opportunities will be important in reducing the earning differential with other groups.

Ethnic minorities in Ecuador are largely concentrated in rural areas, where they are mostly employed in the agricultural sector, and on-farm employment constitutes the main source of income for most indigenous families (World Bank, 2004). Poverty in the country affects predominantly rural areas. Ethnic minorities still have limited or no access to land ownership and work mostly low-productivity land (De Ferranti et al., 2003). It is evident that this poor distribution of land reflects the historical and institutional legacy dating back to colonial times. MacIsaac and Rama (1997) find that the most dramatic wage gap in Ecuador was between jobs in agriculture and in the rest of the economy. Therefore, in Ecuador, the income of the rural poor indigenous worker is still tied to agricultural output in a sector characterized by lower economic outcomes for all workers compared to other sectors of the economy. The authors also found that ethnic background in Ecuador was statistically highly relevant in agriculture and in informal non-unionized activities, and that hourly earnings in agriculture were 30 percent lower than in the informal sector.

Labor outcomes in Ecuador could potentially be affected by the recent wave of emigration resulting from the 1999 financial crisis. Many believe that this phenomenon has generated a new form of discrimination against emigrants and their families in Ecuador, many of the indigenous. Emigrants and their families who stay behind are seen as irrational, unproductive, and dysfunctional for the national economy. The families who stay behind usually consist of female-headed households, as males have higher emigration rates. Furthermore, emigrants' children are perceived as having lower educational outcomes than non-emigrant children, as they are inclined to leave the country as their parents did, which encourages dropping out of high-school and university (Soruco, Piani and Rossi, 2008). If the current

emigration-based discrimination spills over to labor markets, women and indigenous people related to the emigrants could be at risk of suffering adverse labor outcomes as a consequence of this phenomenon.

This paper contributes to this recently growing literature by proposing new estimators for unexplained differences in labor earnings, focusing on the period 2003-2007. Next we turn to a description of the data sources.

3. The Data: Descriptive Statistics

Our empirical analysis is conducted using the Encuesta de Empleo, Desempleo, y Subempleo (ENEMDU) collected yearly by the Instituto Nacional de Estadísticas y Censos de Ecuador (INEC) for the period 2003-2007. The sample is defined by wage-earners and the self-employed reporting positive earnings, 15 to 65 years of age in the coastal, highland and Amazon regions of the country.

The self-identification question presented in the ENEMDU survey is "Do you consider yourself (…)? (1) indigenous, (2) white (3) *mestizo* (4) black (5) mulatto (6) other. Table 1 presents the proportion of the Ecuadorian population that reports being indigenous or Afro-descendant (black or mulatto). From this point onwards, the paper will refer to these populations as *ethnic minorities*. One of the traditional concerns attending the use of self-identification rather than native language to determine ethnicity was the "self-whitening" phenomenon where minorities would deny, for example, their "indigeneity" and thus would lead to statistical under-reporting. More recently, however, under-reporting seems unlikely as the identity of the indigenous population has been empowered in Ecuador through social mobilizations and the sequence of political events of this decade.

Traditionally, ethnic minorities in Ecuador have been predominantly rural; in 2003, 63 percent of the indigenous population was concentrated in rural areas.[1] However, in 2007, such percentage reduced to 58. At the same time, this period shows a reduction in the proportion of ethnic minorities, both nationally and in urban settings (Table 1). This suggests important reductions of ethnic minorities in rural areas, possibly influenced by effects of the 1999 financial crisis that stimulated internal and international migration.

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[1] Gallardo (2006), based on the ENEMDU/EMEDINHO, estimates that in the year 2000 some 77.8 percent of the indigenous population was concentrated in rural areas.

Both processes, the reduction of the proportion of ethnic minorities and their concentration in urban areas, are important and challenging questions for the understanding of the evolution of these populations' well-being in Ecuador. Another trend of interest has occurred in the gender dimension, as the proportion of female-headed households increased slightly during the period of analysis. Although that increase has not been statistically significant, it represents a trend that has been observed in many other countries of the region (Table 2).

Table 1. Proportion of Ethnic Minorities Population					
National	2003	2004	2005	2006	2007
Male	14.5	12.1	12.3	12.5	12.8
Female	14.0	11.7	12.4	12.6	11.4
Urban					
Male	9.4	7.2	8.4	8.3	9.1
Female	8.7	6.9	7.8	7.6	8.0

Source: ENEMDU 2003-2007 surveys

Table 2. Proportion of Female Headed-Households (%)	
2003	19.2
2004	19.5
2005	18.3
2006	19.7
2007	19.8

Source: ENEMDU 2003-2007 surveys

The educational gap between ethnic and non-minorities is still wide, particularly at the higher levels of education, but the difference has been narrowing as the levels of participation of ethnic minorities in secondary and higher education has slightly increased, while those of non-minorities have almost stayed constant (Table 3). The levels of non-schooling for ethnic minorities also showed a slight decline during 2003-2007. This suggests that in recent years there has been higher enrollment rates in school for ethnic minority children, as the total net primary enrollment rates in 2006 was 94.3 percent, up from 90.3 percent in 1999. In addition, during the period under consideration(?) women continued to increase their levels of enrollment in universities and professional institutes. Meanwhile, poverty and the 1999 financial crisis

continued to lead boys to enter the labor market at an early age and to lower their schooling outcomes.

Table 3. Highest Educational Level Achieved 2003-2007 (%)						
2003		Male			Female	
	Ethnic Minorities	Non-Minorities	Total	Ethnic Minorities	Non-Minorities	Total
None	12.4	4.1	5.3	21.9	5.4	7.8
Pre-School	0.7	0.2	0.3	0.9	0.2	0.3
Basic	61.5	50.6	52.2	54.3	47.3	48.3
*Bachillerato**	20.4	30.2	28.7	17.9	30.7	28.8
Superior	5	15	13.5	5	16.3	14.7
Total	100	100	100	100	100	100
2007		Male			Female	
	Ethnic Minorities	Non-Minorities	Total	Ethnic Minorities	Non-Minorities	Total
None	9	3.4	4.1	17.2	4.5	6.1
Pre-School	0.8	0.2	0.3	1.4	0.2	0.4
Basic	63.4	51.8	53.3	56.7	48.9	49.9
*Bachillerato**	21.2	28.5	27.5	18.6	28.9	27.6
Superior	5.6	16.2	14.8	6.1	17.4	16
Total	100	100	100	100	100	100

* The equivalent to the last three years of high school
Source: ENEMDU 2003-2007 surveys

The participation of ethnic minorities in low-income occupations such as day laborers, domestic employment and the self-employed, which predominantly includes informal sector workers, is high. However, male labor force participation in self-employment decreased considerably from 2003 to 2007, while male participation as day laborers increased. Meanwhile, the proportion of women is increasing in relation to that of men amongst the self-employed, as they comprise 36% versus 25% in 2007. Also, the proportion of self-employed female ethnic minorities is higher than that of non-minorities. Female ethnic minorities, in particular, are highly concentrated in domestic employment and amongst the self-employed.

Unemployment is particularly high among Afro-descendants. In 2007, according to INEC, while the national unemployment rate was at 7.9 percent, the rates for Afro-descendants were 11 percent overall and 17.5 percent among females. At the same time, the indigenous population unemployment rate was 6 percent.

Table 4 Occupational Category Distribution of Sample 2003-2007 (%)						
2003		Male			Female	
	Ethnic Minorities	Non-minorities	Total	Ethnic Minorities	Non-minorities	Total
Government employee	5.7	9.4	8.9	7.4	14.7	13.6
Private employee	21.9	28.9	27.8	16.2	27.3	25.8
Day laborer	26.8	27.2	27.1	12.5	5.9	6.8
Boss/employer	3.8	6	5.6	3.2	3.9	3.8
Self-employed	41.4	28.4	30.2	47.6	37.8	39.2
Domestic employee	0.5	0.2	0.3	13.1	10.4	10.7
Total	100	100	100	100	100	100
2007						
Government employee	6.7	9.2	8.9	9.4	14.1	13.5
Private employee	24.5	34.1	32.9	23.1	32	31
Day laborer	32	26.1	26.8	12.2	5.7	6.5
Boss/employer	3.1	6.4	6	1.7	3.9	3.7
Self-employed	33.4	23.8	25	42.3	35.2	36
Domestic employee	0.3	0.3	0.3	11.2	9.1	9.3
Total	100	100	100	100	100	100

Source: ENEMDU 2003-2007 surveys

The evolution of mean hourly wages for men and women of the indigenous and non-indigenous groups is presented in Table 5. The gender wage gap for 2007 (7.4 percent) is much smaller than the ethnic wage gap (44.9 percent).

Table 5 Mean Hourly Wages (current US$)					
Males	2003	2004	2005	2006	2007
Ethnic Minorities	0.7	0.69	0.8	0.81	0.96
Non-Indigenous	1.08	1.15	1.19	1.32	1.42
Male Wage Gap (%)	**0.54**	**0.67**	**0.49**	**0.63**	**0.48**
Females	2003	2004	2005	2006	2007
Ethnic Minorities	0.82	0.89	0.89	1.01	1.06
Non-Indigenous	1.15	1.26	1.28	1.43	1.53
Female Wage Gap (%)	**0.40**	**0.42**	**0.44**	**0.42**	**0.44**
Gender	2003	2004	2005	2006	2007
Females	1.0	1.1	1.1	1.3	1.4
Males	1.1	1.2	1.2	1.4	1.5
Gender Wage Gap (%)	**7.1**	**11.2**	**7.8**	**9.2**	**7.4**
Ethnicity	2003	2004	2005	2006	2007
Ethnic Minorities	0.8	0.8	0.9	0.9	1.0
Non-Minorities	1.1	1.2	1.3	1.4	1.5
Ethnic Wage Gap (%)	**44.9**	**48.7**	**45.4**	**48.2**	**44.9**

Note: Calculations based on data from ENEMDU 2003-2007 for the study's matched sample.

The evolution of these ethnic and gender-based wage differentials is analyzed next, exploring the extent to which these gaps can be explained as the result of differences in observable human capital characteristics.

4. Wage Gap Decompositions

Here we follow the approach introduced in Ñopo (2008) according to which the gaps are decomposed into four additive components:

- One component, denoted by ΔN in the ethnic-based decompositions and by ΔM in the gender-based ones, accounting for the fact there are certain combinations of human capital characteristics achieved by non-minorities (or males) but not by ethnic minorities (or females). An example of this is the fact that managerial positions in large firms, requiring high levels of education and experience and based in capital cities, are typically held by non-minorities and males but not by ethnic minorities and females.

- A second component, denoted by ΔE and by ΔF in the ethnic-based and gender-based decompositions respectively, accounting for the opposite situation of having combinations of human capital characteristics for which it is possible to find ethnic minorities and females but not non-minorities or males. Domestic servants are a typical example of this situation, as females and ethnic minorities tend to perform those duties for which no further education is required, as they are mostly rural migrants with limited experience.

- A third component, denoted by ΔX in both decompositions, accounts for the part of the wage gap that can be attributed to differences in distributions of observable characteristics of human capital.

- A fourth component denoted, by $\Delta 0$ in both decompositions, represents the part of the wage gap that cannot be explained on the basis of differences in observable human capital characteristics.

Such decompositions are computed after matching on observable human capital characteristics between individuals of the comparing groups (ethnic minorities vs. non-minorities and males vs. females).

5. Ethnic-based Wage Differentials

To perform the wage gap decompositions by ethnicity we match on four combinations of human capital characteristics. The first combination includes the area (rural or urban), education, gender and age. The second one adds to the previous list a dummy variable which identifies if the respondent is the head of household. The third combination builds on the second one by adding occupation (coded at a 1-digit classification). Finally, the fourth combination adds a variable which reports whether the respondent's income is complemented by remittances from abroad.

It is not surprising to note that as the number of matching characteristics increases the chances of finding appropriate matches in the comparing group decreases. That is, the common support shrinks (this is known in the non-parametric literature as the curse of dimensionality). While on the one hand it is important to use the most comprehensive number of matching variables, on the other hand that number cannot be so high that it reduces the set of comparable individuals to one that lacks representativeness. Next, Table 6 shows the measure of the common supports of the distributions of ethnic minorities and non-minority individuals for the different sets of matching characteristics. The table clearly illustrates that as the number of matching characteristics increases, the percentage of individuals for which it is possible to find matches is reduced, to the point that using the full set of characteristics implies that only slightly more than 70 percent of the sample can be matched.

Table 6. Size of Common Support Group: Ethnic Gap							
Year	*Urban*	*Urban and education*	*Urban, education and gender*	*Urban, education gender and age*	*Urban, education, gender, age and head of household*	*Urban, education, gender, age, head of household and occupation*	*Urban, education, gender, age, head of household, occupation and remittances*
2003	100%	100%	100%	96%	91%	69%	66%
2004	100%	100%	100%	93%	85%	63%	60%
2005	100%	100%	100%	94%	88%	66%	64%
2006	100%	100%	100%	94%	88%	65%	62%
2007	100%	100%	100%	95%	89%	65%	62%

Source: ENEMDU 2003-2007 based on authors' calculations.

Figures 1 to 4 illustrate the ethnic wage gap decompositions for the different combinations of observable characteristics that we are controlling for. The wage difference between ethnic minority and non-minority groups has fluctuated around 45 percent during the period of analysis. The ΔNs in the decompositions are positive and higher when the occupation variable is introduced, which suggests the existence of glass-ceiling effects in the form of barriers to access to certain human capital profiles. In other words, there are non-minorities with a combination of observable characteristics, particularly occupational characteristics, for which there are no comparable ethnic minorities. Furthermore, those non-minorities with combinations of observable characteristics that are not "matchable" to those of any minority individual have wages that are, on average, higher than those in the rest of the economy. The ΔEs in the decompositions are small and almost negative, whether positive or negative, and do not play an important role.

ΔXs become smaller as variables are introduced to the matching, particularly occupational category, which is also associated with an increase in ΔN. This accounts for the fact that there are certain combinations of human capital characteristics achieved by non-minorities but not by ethnic minorities. Decompositions controlling for whether the household received remittances from abroad did not change the wage gap decompositions between these two groups.

The unexplained component of the decomposition, $\Delta 0$, accounts for approximately a fifth of the difference in salaries between ethnic minorities and non-minorities. In comparison to the studies written for Ecuador and surveyed in the previous section, $\Delta 0$ is lower when matching comparisons is used vis-à-vis the traditional Oaxaca-Blinder methodology. This finding is relevant, as the latter has been found to typically overestimate the unexplained differences in pay due to the failure to take into account the differences in the supports of the distributions of observable characteristics (Ñopo, 2008). In this case of the ethnic wag gaps in Ecuador it has actually been found that the differences in the supports account for an important share of the gap (in the richest combination of characteristics, it contributes to almost one-third of the total gap).

Figures 1-4. Comparison of Ethnic Wage Gap Decompositions

Figure 1. Ethnic Wage Gaps and Controlling Components
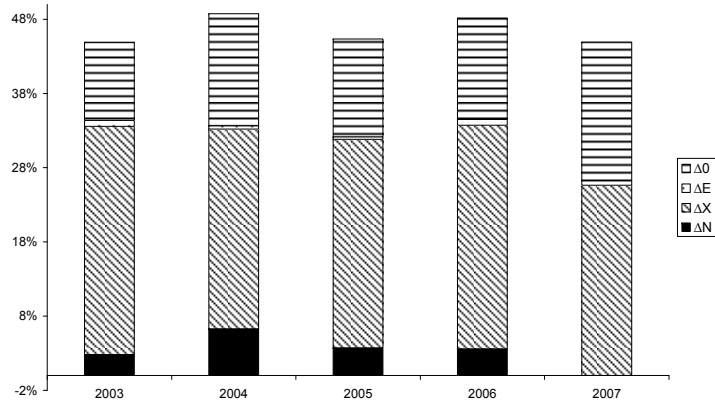**(Controlling by area, education, gender and age)**

Figure 2. Ethnic Wage Gaps and Controlling Components
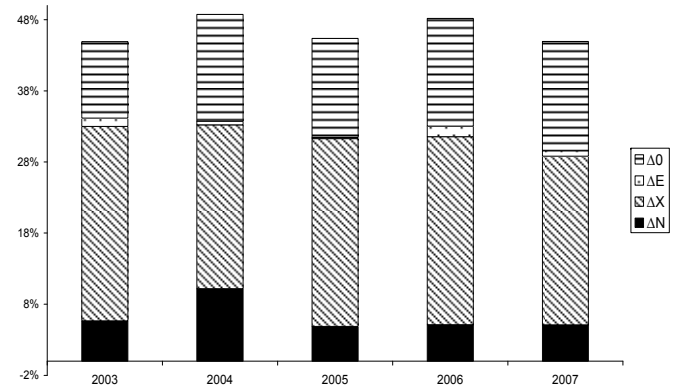**(Controlling by area, education, gender, age and head of household)**

Figure 3. Ethnic Wage Gaps and Controlling Components
(Controlling by area, education, gender, age, head of household and occupation)
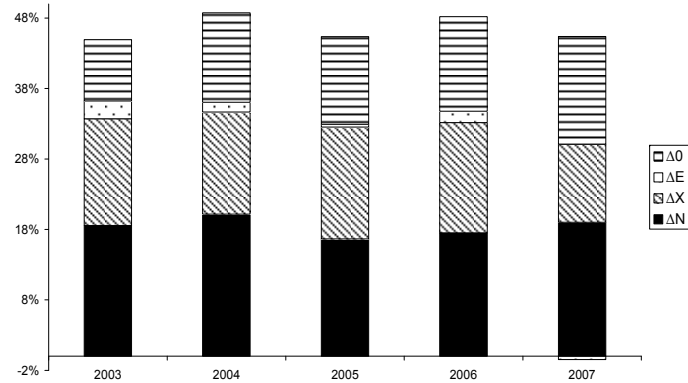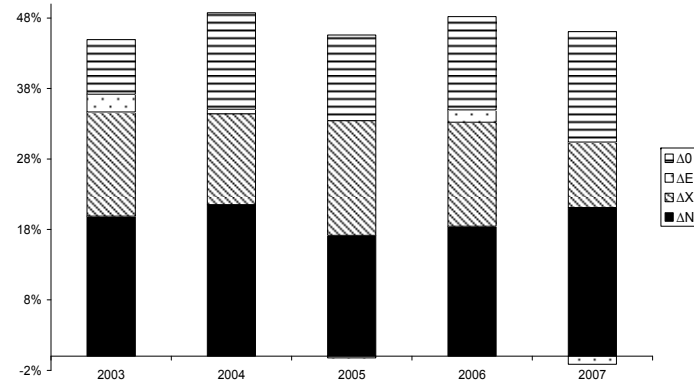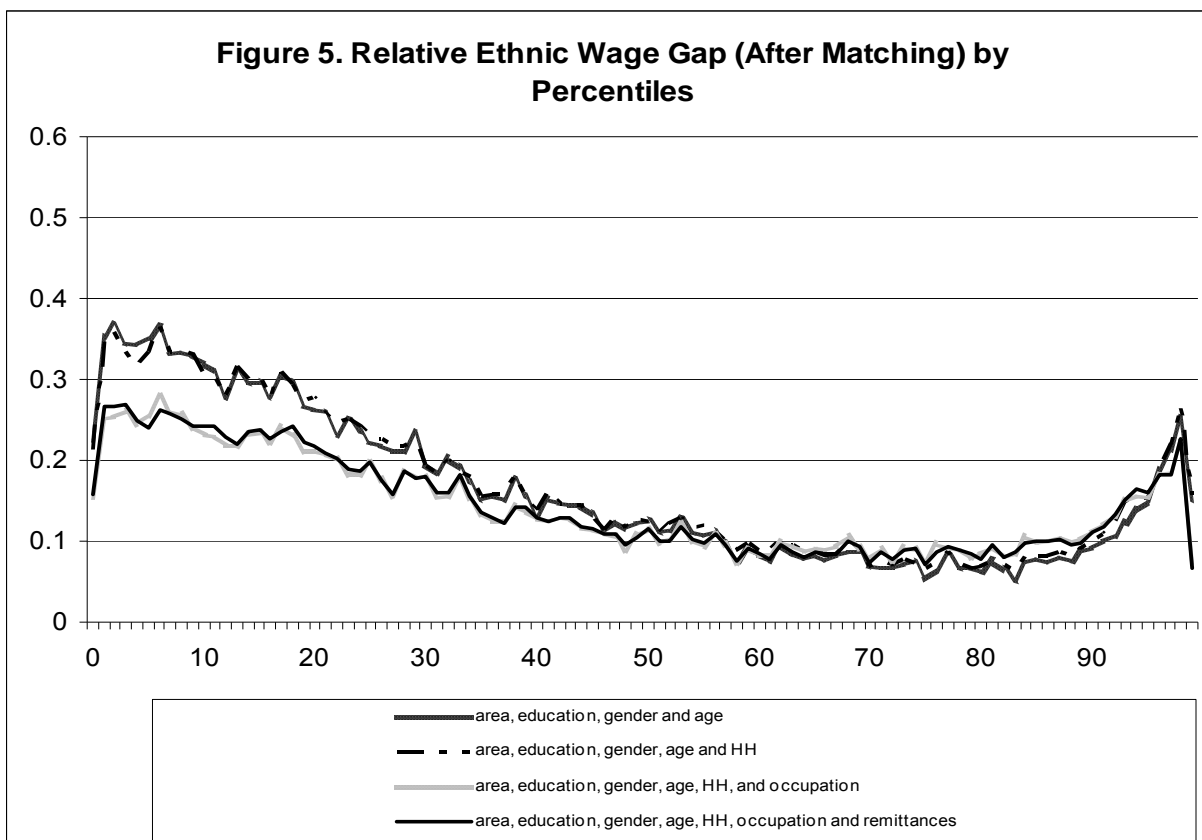

Figure 4. Ethnic Wage Gaps and Controlling Components
(Controlling by area, education, gender, age, head of household, occupation and remittances)

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In addition to permitting us to explore the wage gaps in and out of the common support of observable human capital characteristics, the matching methodology allows us to explore the distribution of gaps within the distribution of characteristics. Figure 5 shows the unexplained component of the ethnic wage gaps for different percentiles of the income distribution of minorities and non-minorities. For this result we use the pooled data set for the five years under study. Provided that the variable of interest is the wage gap, the salaries each year are normalized such that average female salaries are constant over time. Among the lower deciles of the income distribution, occupation is the most important variable, as it accounts for almost a third of the difference between these two groups. This outcome is likely due to the fact that ethnic minorities are clustered in agriculture and in informal sector employment, and the fact that the most dramatic wage gaps in Ecuador are still between jobs in agriculture and in the rest of the economy, as documented in our literature review. The income of ethnic minority workers is, moreover, tied to agricultural output in a sector characterized by lower economic outcomes compared to other sectors of the economy. Unexplained differences in pay between the two groups decrease as income increases and $\Delta 0$ is smallest between the 50th and 90th percentile of the distribution. Occupation itself does not account for any more of the wage difference than area, education, gender or age within those percentiles. However, towards the high end of the income distribution, $\Delta 0$ increases, and none of the control variables seem to account for this difference between ethnic minorities and non-minority groups.

Figure 5. Relative Ethnic Wage Gap (After Matching) by Percentiles

Legend:
- area, education, gender and age
- area, education, gender, age and HH
- area, education, gender, age, HH, and occupation
- area, education, gender, age, HH, occupation and remittances

6. Gender-based Wage Differentials

To perform the wage gap decomposition by gender, we matched men and women in our sample with the same four combinations of characteristics as in the case of the ethnicity-based matching exercise. The one obvious difference is that where we previously matched the indigenous and non-indigenous population by gender, now we match men and women by ethnicity. For these four combinations of characteristics, Table 7 shows the percentages of men and women who were paired, that is, the common support group.

|							
Table 7. Size of Common Support Group (total): Gender Gap							
Year	Urban	Urban and education	Urban, education and race	Urban, education, race and age	Urban, education, race, age and head of household	Urban, education, race, age, head of household and occupation	Urban, education, race, age, head of household, occupation and remittances
2003	100%	100%	100%	99%	94%	74%	70%
2004	100%	100%	100%	99%	95%	75%	71%
2005	100%	100%	100%	99%	95%	75%	71%
2006	100%	100%	100%	99%	95%	75%	71%
2007	100%	100%	100%	99%	94%	74%	71%

Source: ENEMDU 2003-2007 based on authors' calculations.

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Figures 6 to 9 present the results for the decomposition and each of its components. In this particular case, ΔM denotes the proportion of the difference which is due to the occurrence of certain characteristics among men which are unmatched in women. It follows that ΔF denotes the proportion of the difference which is due to the occurrence of certain characteristics among women which are unmatched in men. Wage differentials between men and women have fluctuated between 7.1 percent and 11.2 percent from 2003 to 2007 and are not as pronounced as the ethnicity-based wage gap discussed in the previous section.

The contribution of the endowment of productive characteristics to the total wage gap, ΔX, is negative. This indicates that despite having a higher endowment of combinations of human capital characteristics, women receive lower earnings than males. The ΔM component is small over the whole period but slightly higher in 2007. This may suggest the existence of a glass-ceiling effect, as there are males with combinations of observable characteristics for which there are no comparables females, and these males have wages that are, on average, higher than those of the rest of the population. The ΔF component accounts for a more significant proportion of the wage differentials in 2006. This suggests the existence of a "maid effect," as there are women with combinations of observable characteristics for which there are no comparables men, and these women have wages that are, on average, lower than those of the rest of the population.

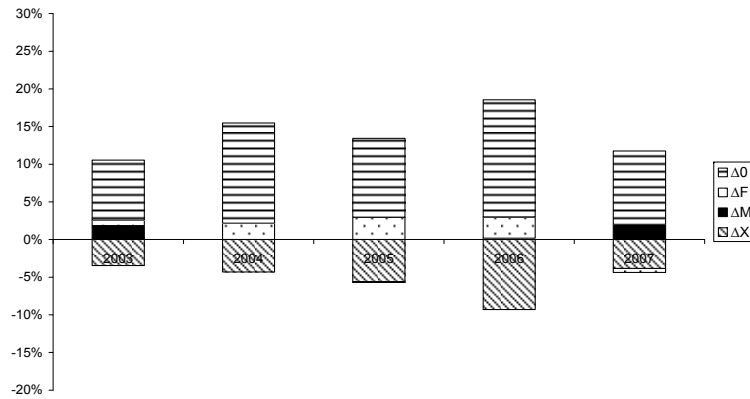# Figures 6-9. Comparison of Gender Gap Wage Decompositions

Figure 6. Gender Wage Gaps and Controlling Components
(Controlling by area, education, ethnicity and age)
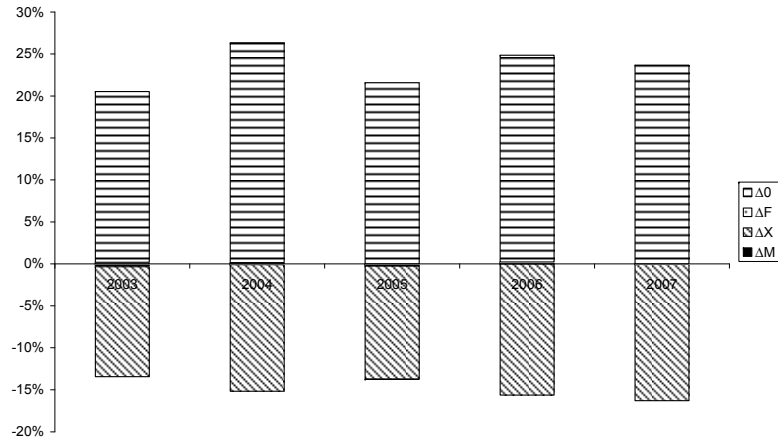
Figure 7. Gender Wage Gaps and Controlling Components
(Controlling by area, education, ethnicity, age and head of household)
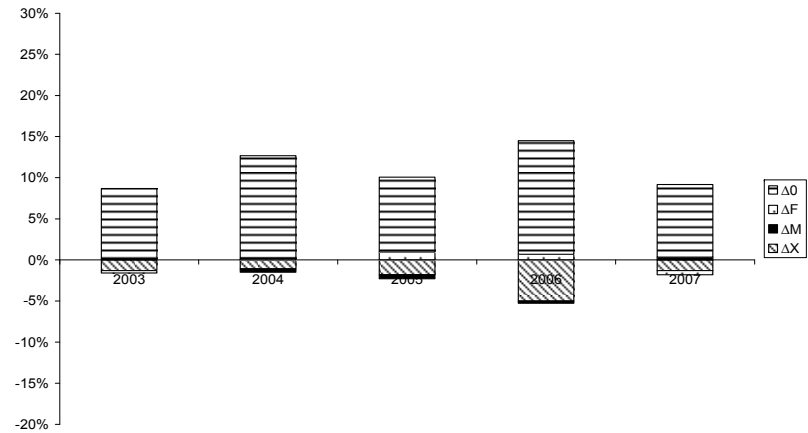
Figure 8. Gender Wage Gaps and Controlling Components
(Controlling by area, education, ethnicity, age, head of household and occupation)

Figure 9. Gender Wage Gaps and Controlling Components
(Controlling by area, education, ethnicity, age, head of household, occupation and remittances)
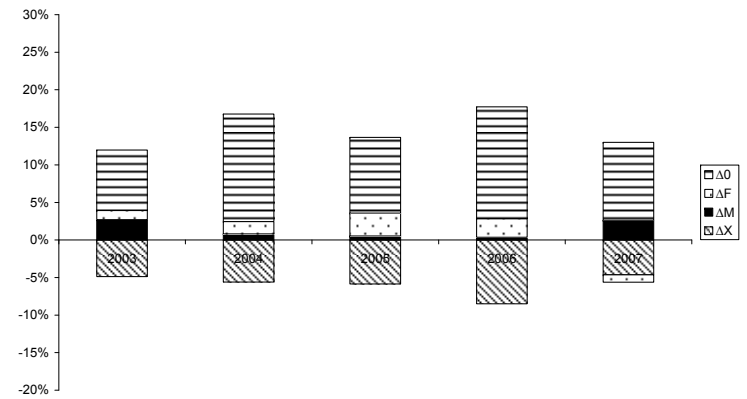

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Figure 10 shows the distribution of the unexplained component of the gender wage gap for different percentiles of the earnings distribution for females and males. That unexplained component of the gender-based wage gap is higher for those in the lower percentiles of the income distribution. Furthermore, the results suggest that when the head of household control is introduced into the matching, it reduces the unexplained component $\Delta 0$ by over a half. This is particularly the case between the 80th and 90th percentile of the income distribution, where being the head of household reduces $\Delta 0$ to zero. In the case of the lower percentiles of income distribution, the occupational variable has a significant effect of reducing $\Delta 0$. That is, while occupational sorting plays an important role on the determination of gender wage gaps among lower income individuals, it is household responsibilities (being head of household) what matters for those at the other extreme of the earnings distributions. This in turn calls for different policy approaches in order to combat gender disparities in labor markets

Figure 10. Relative Gender Wage Gap (After Matching) by Percentiles
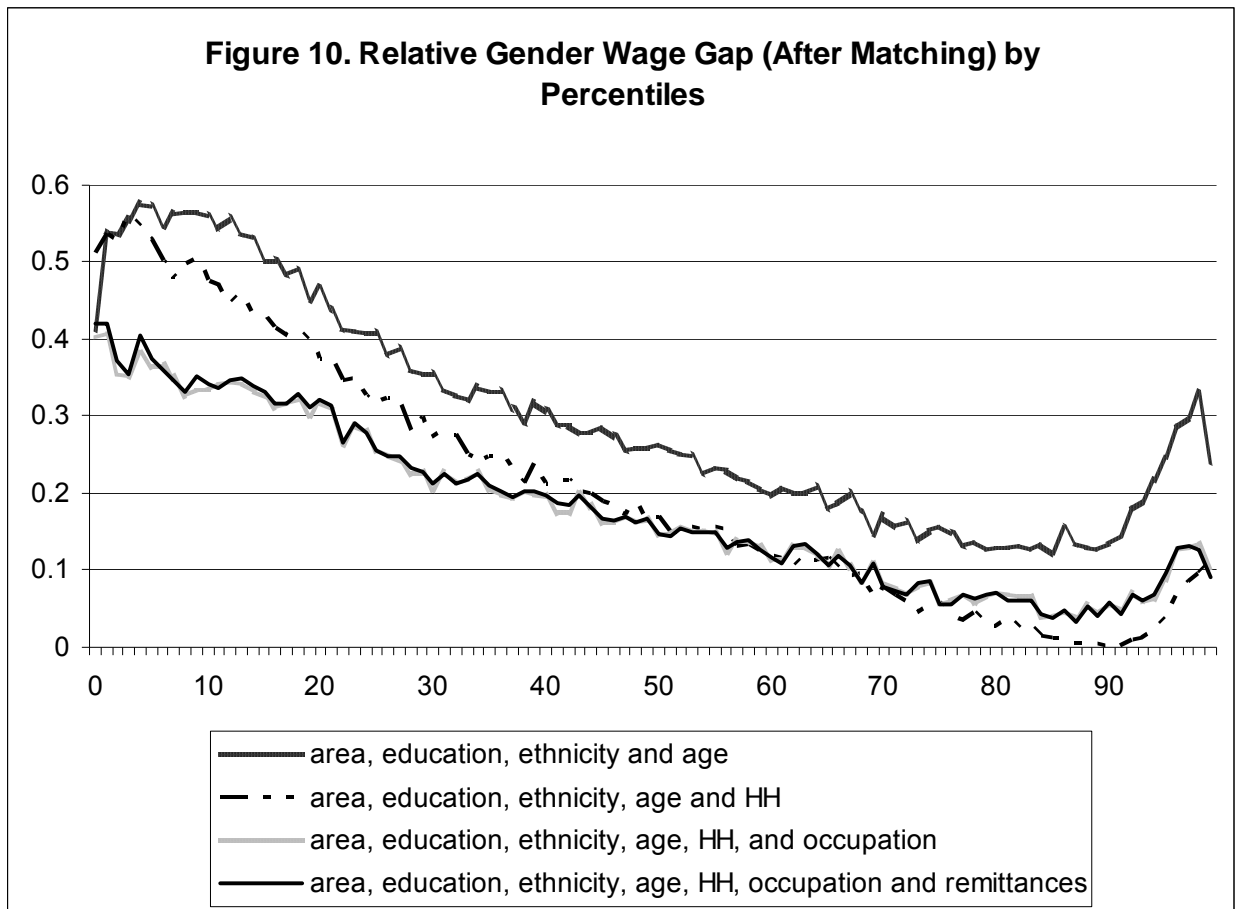
7. Conclusions

Summarizing, the results presented above indicate the following:

1. Ethnic wage gaps that are notoriously higher than those along the gender divide. Furthermore, the ethnic wage gaps are higher among males than among females.
2. While differences in human capital characteristics help to explain almost one-half of ethnic wage gaps, they account for only a very small fraction of the gender wage gaps.
3. Both, gender and ethnic wage gaps are more pronounced at the lower percentiles of the earnings distribution.
4. Occupational segregation imposes noticeable wage penalties on workers, especially among those with lower labor earnings.

On the basis of these results it can be inferred that policies aimed at reducing ethnic and gender disparities in earnings should also have impact on poverty reduction. Education in particular and human capital in general seems to be the obvious tool to reduce the ethnic wage gaps; this does not, however, promise to deliver reductions in gender wage gaps. On the other hand, for lower-earnings individuals, policies aimed at reducing occupational segregation also seem to be good tools for reducing both ethnic and gender wage gaps. For that purposes, labor intermediation services and informational campaigns (both in labor and educational markets) have proven fruitful in other economies.

Ethnic minorities in Ecuador are concentrated in agricultural and informal employment, segments of the labor markets with lower productivity than the rest of the economy. While training on the skills required by the modern economy may induce them to move out of these sectors, it is not clear that the demand side of the labor markets would generate spaces to absorb them in the short or medium run. It then becomes necessary to boost productivity in these underperforming sectors, facilitating stronger links with other participants in their production chains and adding value to them. Investments would be necessary, not only in terms of infrastructure, but also and probably more importantly in those individuals' human capital accumulation.

Gender and ethnicity serve as cumulative characteristics in their detrimental effect on individuals' labor markets performance. Consequently, it seems natural for a long-run strategy to focus on indigenous girls. As has been documented, indigenous girls underperform in a series of educational indicators with respect to boys. In that case, a relevant policy question is "how to generate incentives for household heads to send their girls to school?" It seems that the tool to generate those extra incentives has been already in place in Ecuador with the Bono Solidario and Bono de Desarrollo Humano. Minor adjustments to better target and serve this underprivileged segment of the population may deliver major results in the long run. Of course, this would have to be paired with a quality supply of educational services. While Ecuador has already implemented programs of bilingual education, these and other elements of school quality and pertinence would have to be in place to ensure low dropout rates among both girls and boys.

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Table 1a. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca Decomposition Outcomes (mestizo & white coefficients)

	Gallardo- Wage Decomposition[1]				Gallardo-Earnings Decomposition[1]			Garcia-Aracil and Winter[2]	Larrea and Montenegro[3]
	Self identification based		Language based		Language based			Language based	Language based
Component	Male	Female	Male	Female	Total	Male	Female	Male and Female	Male and Female
Explained	0.08	0.24	0.20	0.30	0.20	0.20	0.28	0.46	0.38
Unexplained	0.17	0.45	0.12	0.40	0.24	0.14	0.43	0.59	0.31
Total	0.25	0.70	0.32	0.70	0.44	0.33	0.71	1.04	0.69

[1] *Source: EMEDINHO and ENEMDUR 2000*

[2] *Source: Garcia-Aracil and Winter 2006*

[3] *Source: Larrea and Montenegro 2006*

Table 1b. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca Decomposition Outcomes (%) (mestizo & white coefficients)

	Gallardo- Wage Decomposition[1]				Gallardo-Earnings Decomposition[1]			Garcia-Aracil and Winter[2]	Larrea and Montenegro[3]
	Self identification based		Language based		Language based			Language based	Language based
Component	Male	Female	Male	Female	Total	Male	Female	Male and Female	Male and Female
Explained	32.93	34.96	61.71	42.45	45.42	59.19	39.15	43.72	55.43
Unexplained	67.07	65.04	38.29	57.41	54.58	40.81	60.85	56.28	44.72
Total	100	100	100	100	100	100	100	100	100

[1] *Source: EMEDINHO and ENEMDUR 2000*

[2] *Source: Garcia-Aracil and Winter 2006*

[3] *Source: Larrea and Montenegro 2006*