

ETHNICITY BASED WAGE DIFFERENTIALS IN ECUADOR'S LABOR  
MARKET

A Thesis

Presented to the Faculty of the Graduate School  
of Cornell University

in Partial Fulfillment of the Requirements for the Degree of  
Master of Science

by

María Lourdes Gallardo Montoya

August 2006

© 2006 María Lourdes Gallardo Montoya

## ABSTRACT

This study first offers a brief literature survey of labor market discrimination due to ethnicity against the indigenous and Afro-descendant population in Ecuador, a largely *mestizo* country. We use ethnic self-identification reported in the 2000 EMEDINHO survey as a proxy for ethnicity. Next, we introduce an extended wage differential decomposition model for wage earners based on the traditional Oaxaca-Blinder methodology and a system of simultaneous equations. Using the 2000 ENEMDUR employment survey we then estimate wage, education, sector and geographic outcome differentials due to endowments and due to discrimination between two designated ethnic clusters (i) indigenous people and Afro-descendants and (ii) *mestizos* and whites. This methodology allows us to identify and measure the direct and indirect channels through which discrimination impacts wages. We obtain higher estimates for discrimination based on a comparative analysis of our results versus two other studies available for the country. We find evidence also about the role that the intergenerational transmission of human capital from parents to children has on education and labor market outcomes.

## BIOGRAPHICAL SKETCH

María Lourdes was born and raised in Lima, Peru. She attended Cornell University, where she earned her Bachelor of Arts degree in Economics from the College of Arts and Sciences in 1998 and a Master in Public Administration from the Cornell Institute for Public Affairs in 2000. She worked at the World Bank and at the Inter-American Development Bank in Washington, DC, from 2000 to 2004, where she specialized in monitoring and evaluation of development operations. She has attended Cornell University from 2004 to 2006, and she expects to receive her Master in Science in Applied Economics and Management in August 2006. Currently she is a Consultant for the Asian Development Bank.

*A mis padres, Eduardo y Teresa Gallardo*

## ACKNOWLEDGEMENTS

First I would like to acknowledge the support I have received from the members of my Committee. I thank Professor Christopher Barrett for his comments and for challenging me through his feedback. I would also like to acknowledge Stephen Younger for his advice, teaching, support and particularly his patience with me throughout this process. Likewise I would like to thank my peers who provided me with comments in the AEM 765 seminar during Fall 2005 and Spring 2006. I would also like to recognize the Department of Romance Studies, particularly Eleanor Dozier, for their financial support during the last two years. I would also like to thank Ana Rosa Grippa, Lorenzo Oimas and Juan Manuel García in Lima for their feedback on my work and for the much needed Stata consulting. Thank you to Kristen Ebert-Wagner for formatting this document.

I would like to thank Eduardo and Teresa, my parents, for their unwavering emotional support during particularly difficult times. To them I dedicate this work. Thank you to Gonzalo, Eduardo, Patricia and Sebastian Gallardo for their love and for putting a smile of my face whenever I felt overwhelmed. I would like to express my appreciation to Lacey Johnson, Cristina Chiappe and Julie Stone for their friendship and encouragement during the last two years. Lastly, I would like to thank Giancarlo Gasha for his feedback, sense of humor and for making complex things easy for me.

## TABLE OF CONTENTS

BIOGRAPHICAL SKETCH.....	iii
DEDICATION .....	iv
ACKNOWLEDGEMENTS.....	v
TABLE OF CONTENTS .....	vi
LIST OF TABLES .....	vii
INTRODUCTION.....	1
CHAPTER I LITERATURE REVIEW.....	4
Ethnicity and Race in Latin America .....	4
Labor Market Discrimination in Latin America.....	10
Labor Market Discrimination in Ecuador .....	12
Labor Market Discrimination Literature .....	18
CHAPTER II ETHNICITY-BASED WAGE DISCRIMINATION?.....	22
Framework: The Oaxaca-Blinder Decomposition.....	22
Methodology: Extended Oaxaca-Blinder Decomposition .....	25
Methodological issues.....	31
Data Description .....	32
Descriptive Statistics .....	37
CHAPTER III EMPIRICAL RESULTS .....	42
Determinants of wage differentials for men.....	42
Determinants of wage differentials for women .....	54
Language Based Results .....	66
Comparison of Garcia-Aracil and Winters, Larrea and Montenegro and Gallardo Studies .....	73
Two Stage Least Square (2SLS) Estimation.....	77
Heckman Two Step Procedure .....	83
CONCLUSIONS.....	85
APPENDIX A: Decomposition of the Education, Sector and Rural Variables- Simultaneous Equation Model using the Indigenous Pay Structure as Reference.....	87
Males .....	87
Females .....	91
APPENDIX B: Language Based Model .....	95
Males .....	95
Females .....	103
APPENDIX C: Language Based-Earnings Differentials Results.....	111
Males and Females Mestizo and White .....	111
Males .....	119
Females .....	127
APPENDIX D: Garcia Aracil-Winter Model.....	135
APPENDIX E: Larrea-Montenegro Model.....	137
APPENDIX F: Comparison Of Oaxaca-Blinder Decomposition Outcomes: Different Authors .....	138
REFERENCES.....	141

## LIST OF TABLES

Table 1. Percentage of indigenous populations in Latin America, various years .....	9
Table 2. Percent change in headcount poverty rate for indigenous and non-indigenous people (between earliest and latest survey year).....	10
Table 3. Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) monthly earnings decomposition, non-indigenous coefficients .....	17
Table 4. Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) monthly earnings decomposition as percentages, non-indigenous coefficients.....	17
Table 5. Expected outcomes for semi-log wage regression .....	26
Table 6. List of main variables constructed using 2000 EMEDINHO and ENEMDUR surveys.....	34
Table 7. Population by ethnicity and area, different methods .....	38
Table 8. Educational attainment by ethnicity .....	40
Table 9. Employment statistics.....	41
Table 10. Mean wage gap ratios for sample.....	41
Table 11. Determinants of wages by ethnicity for males: OLS regression models .....	43
Table 12. Wage decomposition: Male <i>mestizo</i> and white coefficients.....	44
Table 13. Determinants of education by ethnicity for males: OLS regression .....	46
Table 14. Education decomposition: Male <i>mestizo</i> and white coefficients ...	47
Table 15. Determinants of sector of employment by ethnicity for males: OLS regression .....	48
Table 16. Sector decomposition: Male <i>mestizo</i> and white coefficients.....	50
Table 17. Determinants of geographic area by ethnicity for males: OLS regression .....	51
Table 18. Geographic area decomposition: Male <i>mestizo</i> and white coefficients .....	52
Table 19. Overall wage decomposition: Male <i>mestizo</i> and white coefficients .....	53
Table 20. Determinants of wages by ethnicity for females: Regression models Oaxaca-Blinder decomposition method .....	55
Table 21. Wage decomposition: Female <i>mestizo</i> and white coefficients.....	56
Table 22. Determinants of education by ethnicity for females: Regression models Oaxaca-Blinder decomposition method .....	58
Table 23. Education decomposition: Female <i>mestizo</i> and white coefficients .....	59
Table 24. Determinants of sector of employment by ethnicity for females: Regression models Oaxaca-Blinder decomposition method.....	60
Table 25. Sector decomposition: Female <i>mestizo</i> and white coefficients.....	62
Table 26. Determinants of geographic area by ethnicity for females: Regression models Oaxaca-Blinder decomposition method.....	63



Table 27. Geographic area decomposition: Female <i>mestizo</i> and white coefficients .....	63
Table 28. Overall wage decomposition: Female <i>mestizo</i> and white coefficients .....	65
Table 29. Mean education and wage outcomes, language v. self-determination approach .....	66
Table 30. Overall wage decomposition: Male Spanish speaker coefficients .....	68
Table 31. Overall wage decomposition: Female Spanish speaker coefficients .....	69
Table 32. Oaxaca-Blinder decompositions for Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) replicate models (monthly earnings) using EMEDINHO and ENEMDUR data and Non-Indigenous Coefficients .....	71
Table 33. Oaxaca-Blinder decompositions of replicas of Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) models (monthly earnings) using EMEDINHO and ENEMDUR data (%) and Non-Indigenous Coefficients .....	72
Table 34. Comparison of Gallardo (2006) and Ñopo, Saavedra and Torero (2004) Oaxaca-Blinder wage decompositions for Ecuador and Peru, respectively .....	74
Table 35. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca decomposition outcomes (mestizo & white coefficients).....	75
Table 36. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro(2006) Oaxaca decomposition outcomes (%) (mestizo & white coefficients).....	76
Table 37. Second stage results for 2SLS regression controlling for endogeneity in education and sector variables .....	78
Table 38. Determinants of wages by ethnicity for males and females: OLS regression models.....	78
Table 39. First stage results for wage 2SLS regression: education variable instruments .....	79
Table 40. First stage results for 2SLS wage regression: Sector variable instruments .....	81
Table 41. Wage determinants regression with Heckman Correction for sample bias (wage-earners).....	84
Table A.1. Education decomposition: Male Indigenous and Afro-descendant coefficients.....	87
Table A.2. Sector decomposition: Male Indigenous and Afro-descendant coefficients .....	88
Table A.3. Geographic area decomposition: Male indigenous and Afro-descendant coefficients.....	89
Table A.4. Wage decomposition: Male indigenous and Afro-descendant coefficients .....	89

Table A.5. Overall wage decomposition: Male indigenous and Afro-descendant coefficients.....	90
Table A.6. Education decomposition: Female indigenous and Afro-descendant coefficients.....	91
Table A.7. Sector decomposition: Female indigenous and Afro-descendant coefficients.....	92
Table A.8. Geographic area decomposition: Female indigenous and Afro-descendant coefficients.....	93
Table A.9. Wage decomposition: Female indigenous and Afro-descendant coefficients.....	93
Table A.10. Overall wage decomposition: Female indigenous and Afro-descendant coefficients.....	94
Table B.1. Education decomposition: Male Spanish-speaking coefficients ..	95
Table B.2. Sector decomposition: Male Spanish-speaking coefficients.....	96
Table B.3. Geographic area decomposition: Male Spanish-speaking coefficients.....	97
Table B.4. Wage decomposition: Male Spanish-speaking coefficients.....	97
Table B.5. Overall wage decomposition: Male Spanish-speaking coefficients.....	98
Table B.6. Education decomposition: Male indigenous language coefficients.....	99
Table B.7. Sector decomposition: Male indigenous language coefficients ..	100
Table B.8. Geographic area decomposition: Male indigenous language coefficients.....	101
Table B.9. Wage decomposition: Male indigenous language coefficients ..	101
Table B.10. Overall wage decomposition: Male indigenous language coefficients.....	102
Table B.11. Education decomposition: Female Spanish-speaking coefficients.....	103
Table B.12. Sector decomposition: Female Spanish-speaking coefficients.....	104
Table B.13. Geographic area decomposition: Female Spanish-speaking coefficients.....	105
Table B.14. Wage decomposition: Female Spanish-speaking coefficients.....	105
Table B.15. Overall wage decomposition: Female Spanish-speaking coefficients.....	106
Table B.16. Education decomposition: Female indigenous language coefficients.....	107
Table B.17. Sector decomposition: Female indigenous language coefficients.....	108
Table B.18. Geographic area decomposition: Female indigenous language coefficients.....	109
Table B.19. Wage decomposition: Female indigenous language coefficients.....	109

Table B.20. Overall wage decomposition: Female indigenous language coefficients .....	110
Table C.1. Education decomposition- <i>Mestizo</i> and white coefficients .....	111
Table C.2. Sector decomposition: <i>Mestizo</i> and white coefficients .....	112
Table C.3. Geographic area decomposition: <i>Mestizo</i> and white pay coefficients .....	113
Table C.4. Wage decomposition: <i>Mestizo</i> and white pay coefficients .....	113
Table C.5. Overall wage decomposition: <i>Mestizo</i> and white coefficients ...	114
Table C.6. Education decomposition: Indigenous and Afro-descendant coefficients .....	115
Table C.7. Sector decomposition: Indigenous and Afro-descendant coefficients .....	116
Table C.8. Geographic area decomposition: Indigenous and Afro-descendant coefficients .....	117
Table C.9. Wage decomposition: Indigenous and Afro-descendant coefficients .....	117
Table C.10. Overall wage decomposition: Indigenous and Afro-descendant coefficients .....	118
Table C.11. Education decomposition: <i>Mestizo</i> and white male coefficients .....	119
Table C.12. Sector decomposition: <i>Mestizo</i> and white male coefficients ...	120
Table C.13. Geographic area decomposition: <i>Mestizo</i> and white male coefficients .....	121
Table C.14. Wage decomposition: <i>Mestizo</i> and white male coefficients ...	121
Table C.15. Overall wage decomposition: <i>Mestizo</i> and white male coefficients .....	122
Table C.16. Education decomposition: Indigenous and Afro-descendant male coefficients .....	123
Table C.17. Sector decomposition: Indigenous and Afro-descendant male structure .....	124
Table C.18. Geographic area decomposition: Indigenous and Afro-descendant male coefficients .....	125
Table C.19. Wage decomposition: Indigenous and Afro-descendant male coefficients .....	125
Table C.20. Overall wage decomposition: Indigenous and Afro-descendant male coefficients .....	126
Table C.21. Education decomposition: <i>Mestizo</i> and white female coefficients .....	127
Table C.22. Sector decomposition: <i>Mestizo</i> and white female coefficients .....	128
Table C.23. Geographic area decomposition: <i>Mestizo</i> and white female coefficients .....	129
Table C.24. Wage decomposition: <i>Mestizo</i> and white female coefficients .....	129

Table C.25. Overall wage decomposition: Mestizo and white female coefficients .....	130
Table C.26. Education decomposition: Indigenous and Afro-descendant female coefficients .....	131
Table C.27. Sector decomposition: Indigenous and Afro-descendant female coefficients .....	132
Table C.28. Geographic area decomposition: Indigenous and Afro-descendant female coefficients .....	133
Table C.29. wage decomposition: Indigenous and Afro-descendant female coefficients .....	133
Table C.30. Overall wage decomposition: Indigenous and Afro-descendant female coefficients .....	134
Table D.1. Wage determinants with Heckman Correction for sample bias (wage-earners) based on replicate of Garcia-Aracil: Winter model using EMEDINHO and ENEMDUR 2000 data .....	135
Table E.1. Wage determinants based on replica of Larrea-Montenegro model using EMEDINHO and ENEMDUR 2000 data .....	137
Table F.1. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca-Blinder decomposition outcomes (indigenous and Afro-descendant coefficient).....	139
Table F.2. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca-Blinder decomposition outcomes (%) (indigenous and Afro-descendant coefficient).....	140

## INTRODUCTION

Latin America is a racially and ethnically diverse region. 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 its population. Despite the economic potential that this cultural diversity and existing social capital could represent for these countries, levels of well-being have not been equal between ethnic groups ever since colonial times. Thus, Latin America is today one of the most unequal regions of the world, plagued by serious problems related to poverty, inequality and social exclusion. There is evidence in everyday outcomes that indigenous people and other minority groups such as Afro-descendants face limited opportunities as they strive for a higher standard of living. These limitations are reflected in such phenomena as restricted access to public services, lack of political representation, deteriorated labor market opportunities and discrimination (Thorpe, 1998; Buvinic, Mazza and Ruthane, 2005). Furthermore, there is now some empirical evidence of labor market earnings disadvantage for indigenous workers across the region compared to non-indigenous workers (Patrinos and Psacharopoulos 1994; Patrinos and Hill 2006). This pattern can be traced largely to lower human capital endowments, manifested in fewer years of education and years of job experience, but also to labor force participation in activities that offer low returns, like agriculture and informal activity. Empirically, the non-endowment or unexplained portion of the difference in wages between groups can be attributed to discrimination.

Most of the literature on discrimination in the labor market consists of studies in developed countries where affirmative action policies are of increasing

importance in order to close the gap between dominant and minority groups. Latin America has few empirical studies based on estimation of wage differentials between groups in an attempt to quantify the economic costs of discrimination against indigenous populations (Saavedra, Torero and Ñopo (2004), Patrinos and Psacharopolous (1994) Patrinos and Hall (2006)). 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<sup>1</sup> for the former group.

A number of interesting questions can be raised about the relationship between the process of economic development and labor market discrimination (Ashenfelter and Oaxaca, 1991). If the difference in economic outcomes in the labor market for indigenous people is attributed to discrimination, rather than to differences in human capital endowments, this mechanism has the potential to limit the human and economic development of millions of people. This paper contributes to the growing literature addressing the issue of discrimination in Latin America and its impact on the economic outcomes of indigenous people in Ecuador, a largely understudied country which is amongst the poorest in the region, and coincidentally has a large indigenous population.

Using the 2000 Encuesta de Empleo, Desempleo y Subempleo en el Area Urbano y Rural (ENEMDUR) and the 2000 Encuesta de Medicion de Indicadores de la Niñez y Hogares (EMEDINHO) surveys, we conduct our

---

<sup>1</sup> Psacharopolous and Patrinos (1994) concluded that poverty among indigenous people is pervasive and that this group is systematically poorer than non-indigenous people.

empirical analysis not based on the common practice of approximating ethnicity through language, but instead using the more favored approach of ethnic self-identification. The methodology used to determine the portion of mean wage differentials between groups that is attributed to discrimination is a refinement of the Oaxaca-Blinder decomposition. This technique is applied to the Ordinary Least Square (OLS) log hourly wage function for male and female (i) indigenous and Afro-descendants and (ii) *mestizo* and white people. Our innovation to the traditional approach is the recognition that educational investment, sector of employment and area of residence might be influenced by ethnicity and intergenerational transmission of human capital. We therefore decompose these three variables separately, also by the same Oaxaca-Blinder method. Thus we can study the direct and indirect paths through which discrimination affects wages in the labor market. The direct paths are the discrimination effects on earnings, controlling for the observed endowments. The indirect paths are the effects of discrimination on observed endowments.

## CHAPTER I

### LITERATURE REVIEW

#### *Ethnicity and Race in Latin America*

Latin America's unique colonial history, and the unequal distribution of power and wealth that ensued between the different ethnic and racial groups in the region, form the basis for the conceptualization of race and ethnicity in the region today. Sociologists and anthropologists alike have treated racial inequality in Latin America either as "the result of an incomplete process of national integration or as an expression of class-based inequality"<sup>2</sup> (De Ferranti, Perry, Ferreira and Walton, 2003). During colonial times, Euro-descendants, or *criollos*, dominated the trade between Spain and its colonies and soon *mestizos* ascended in both the political, social and economic power structure. Van den Berghe (1972) argued that the policy of miscegenation under which the *mestizo* population increased emerged from Spain's need to unify itself with its colonies.

The history of exploitation of indigenous labor can clearly be traced to colonial times. According to the testimony left by chroniclers of Spanish America, the *encomienda* agricultural system under which Spanish and *mestizos* were granted control of the fertile land, its resources and population eventually became a system of effective slavery and exploitation of the indigenous population (Hanratty, 1989). On the other hand, arid land was not distributed, but rather left to the indigenous communities. Indigenous labor was also commonly exploited through the *mita* system through which workers were required to devote one year of their labor to some public or private Spanish

---

<sup>2</sup> De Ferranti et al. (2003), p. 3-4.



interest, such as constructing a church, a road, or a public building. According to Hanratty (1989), even though *mitayos* were paid for their labor, the amount was extremely small and often less than the debts accumulated through purchases from their employer, therefore requiring them to work for them indefinitely. Through debt perpetuation the *mita* system disintegrated into debt peonage and debts were commonly passed down to future generations. By 1535 black slaves were brought to the colonies from Africa. In comparison to the indigenous labor force, they were forced to work in the lowland sugar, coffee, cotton, tobacco and rice plantations along hot, humid coasts, where the highland indigenous population proved unable to adapt. As a result, Afro-descendent workers were subject to the same exploitative labor mechanisms as indigenous labor, but in different agro-ecosystems.

Even though independence from Spain brought the colonies the abolition of the *encomienda* and *mita* system during the 1800s, the vertical structure of political, social and economic power between the *mestizo* and indigenous population was perpetuated through everyday social and economic interactions. Prior to the revolution of 1944, indigenous migrant labor in Guatemala continued to be recruited by a variety of coercive techniques which, according to Psacharopolous and Patrinos (1994), included labor drafts and debt servitude. Compared to the wages earned in the agricultural sector by the non-indigenous population, particularly large landholders, indigenous workers have remained stranded in agricultural activities with very low returns to labor (Gallardo, 2000).

In the mid-1970s, in light of the tense political and social circumstances of the time in Latin America, scholars began to argue that differences in well-being

between demographic groups were partly based on racial and ethnic discrimination. More recently, sociologists like Baiocchi (2003) have argued that ethnic relations in the region today are a result of a history of power relations that created an uneven playing field by setting up a situation in which endowments, opportunities and expectation differ by ethnic groups.

Buvinic, Mazza and Deutsch (2005) argue that currently in Latin America the excluded populations, like the indigenous one, regularly suffer from invisibility, poverty, stigmatization and discrimination. So even though indigenous people no longer face institutionalized forms of discrimination as in colonial times, their human capital disadvantage compared to the non-indigenous populations is severe. In one of the most influential studies of the topic, Psacharopoulos and Patrinos (1994) concluded that indigenous people in the region are systematically poorer than non-indigenous people and that the pattern can be traced to lower human capital endowments. This disadvantage is a considerable barrier to competing fairly in the labor market and accordingly affects the return to their labor. Anecdotal evidence is reported every day in the region regarding instances of ethnic or racial discrimination in society, schools, the workplace and public and private institutions alike. It can be claimed that the economic outcomes that can be observed today among the indigenous population in Latin America, such as wages and labor supply, are the result of a centuries-long process of inequality in the accumulation of skills, experiences and opportunities. It could be suggested then that the perpetuation of discrimination in economic outcomes against the indigenous population throughout time, has been a factor in the intergenerational transmission of poverty and inequality in this group.

Despite political exclusion and limited political participation, the last decade has seen a rise in the number of indigenous movements trying to influence policy in Latin America. In Bolivia, Aymara and Guarani workers are leading highland-based protest movements opposing privatization and coca-leaf eradication techniques, among other issues, and were instrumental in the resignation of President Sánchez de Lozada in 2003. In Ecuador, indigenous groups demanding lower fuel prices brought the country to a standstill for several weeks in 2001. In 2002, the latter groups launched Lucio Gutiérrez to the presidency.

As indigenous groups in Latin America raise their voices for equal rights and economic opportunities there has been an increased demand for empirical studies regarding the differences in economic outcomes between indigenous and non-indigenous workers. Until the late 1980s, household surveys in the region did not lend themselves to measuring the extent of group-based inequalities as surveys did not include questions on self-identification of the race or ethnicity of individuals. Methodological issues such as the inadequacy of questions<sup>3</sup> aimed at determining the ethnicity of individual respondents have been blamed for this shortfall, which limited the ability of governments to address the issue of earnings inequality (Gonzalez, 1994). The nature of earlier surveys therefore led to wide discrepancies among sources on the size of the indigenous population in Latin America. Today, surveys in the region include questions regarding the language spoken by the individual, his/her parents as well as a self-identification question on race and

---

<sup>3</sup> Questions in ECV surveys approximate ethnicity of the individual by asking “What is your native tongue?” Those speaking indigenous languages were considered indigenous. The limitation of this approach is that it may exclude indigenous people who declare Spanish their native tongue or those who do not speak an indigenous language or deny the knowledge of it.

ethnicity. Most of the empirical literature approximates ethnicity with mother tongue (Psacharoplous and Patrinos 1994, Maclsaac 1993, Patrinos and Hall 2006, García-Aracil and Winter, 2006), yielding low estimates for the size of the population as indigenous people frequently speak Spanish as their native language. Only in recent years has bilingual education been instituted in countries like Ecuador, Bolivia and Peru, allowing indigenous people to learn in their native tongues despite the unfortunate stigma commonly associated with it.

Although indigeneity rates have been historically much higher, only 10 percent of the population of Latin America identify themselves as indigenous today (De Ferranti, Perry et al., 2003). However, these rates vary strongly across countries with Andean countries showing the largest percentages of indigenous people as a proportion of their total population (Table 1).

Household surveys in the region have also supported the claim that income levels among the indigenous population, as well as human development indicators such as education and health conditions, have consistently lagged behind those of the rest of the population.

Table 1. Percentage of indigenous populations in Latin America, various years

<i>Country</i>	<i>Indigenous</i>
<i>Latin America</i>	
Argentina	1.0
Bolivia	71.0
Brazil	0.4
Chile	8.0
Colombia	1.8
Costa Rica	0.8
Ecuador	38.0
El Salvador	7.0
Guatemala	66.0
Honduras	15.0
Mexico	14.0
Nicaragua	5.0
Panama	10.0
Paraguay	1.5
Peru	47.0
Uruguay	0.4
Venezuela	0.9
<i>Other</i>	
Canada	1.0
United States	0.9

*Source: DeFerranti, Perry, Ferreira and Walton, 2003.*

In a recent study of the impact of the Indigenous People's Decade (1994-2004) on material and human development gains for indigenous people in Latin America, Patrinos and Hall (2005) found that few gains were made overall in income poverty reduction during this period for this group (Table 2). More worrisome is the authors' finding that being indigenous increases an individual's probability of being poor; the relationship being about the same at the beginning and at the close of the decade.

Patrinos and Hall (2005) found that, in addition to lower schooling outcomes for the indigenous population in the region, there is strong evidence of labor earnings disadvantage for indigenous people. The labor earnings that indigenous people derive from each year of schooling are lower relative to

non-indigenous workers, and this gap widens at higher education levels. According to the authors, lower labor market returns to education can explain a significant proportion of earnings gap between indigenous and non-indigenous population. The study reports that at the end of the Indigenous People’s Decade, the portion of the indigenous/non-indigenous labor earnings difference that is “unexplained” due to discrimination or other unidentified factors fell on average across Latin America. However, this “unexplained” component grew considerably for Ecuador and Peru. Since these two Andean countries have the third and fourth highest rates of indigenous population in the region (Table 1), the increase in discrimination in earnings should not be ignored. Also, the two countries share a common historical Inca and colonial legacy as the countries were united until 1830. So we next discuss the findings of labor earning differential studies for Peru.

Table 2. Percent change in headcount poverty rate for indigenous and non-indigenous people (between earliest and latest survey year)

<i>Country</i>	<i>Non-indigenous</i>	<i>Indigenous</i>
Bolivia (1997-2002)	-8.0	Change < 0.1
Ecuador (1994-2003)	+14.0	Change < 0.1
Guatemala (1989-2000)	-25.0	-15
Mexico (1992-2002)	-5.0	Change < 0.1
Peru (1994-2000)	+3.0	Change < 0.1

*Source: Patrinos and Hall (2006).*

### *Labor Market Discrimination in Latin America*

Ñopo, Saavedra and Torero (2004) study the relationship between ethnic exclusion and earnings in urban Peru using a score-based procedure to approximate the racial differences and mixtures in the country. Using Oaxaca-Blinder decompositions and a semi-parametric technique for the estimation of

distributions of the difference in hourly earnings, they found that among wage-earners there are racially related earning differences in favor of White and *mestizo* individuals after controlling for a large set of human capital characteristics. For private wage earners the wage gap between white vs. indigenous and blacks is 28.4 percent of which 45 percent is due to difference in characteristics and 55 percent is due to difference in returns or discrimination. Between *mestizos* vs. indigenous and blacks the wage gap is 17.4 percent of which 25 percent is due to difference in characteristics and 75 percent is due to discrimination. In the case of the self-employed, none of the earning differences attributable to race were substantially above zero. An interesting finding of this study was that when respondents were asked to score themselves in what they thought was the intensity of their physical characteristics in 5 different racial groups they scored themselves with higher values of white intensity and lower values of indigenous intensities (compared to those issued by the enumerator). This leads to the consideration of the role of “self-whitening” at the time of self-identification on surveys which may in turn bias the estimation of the size of the indigenous population and the indigenous-non-indigenous earnings differentials.

Maclsaac’s (1994) results over a decade ago for Peru contrast with those presented by Ñopo, Saavedra and Torero (2004). Basic Oaxaca-Blinder wage decompositions with 1991 Peruvian data reveal that the proportion of the overall earnings differentials that is due to the productive characteristics of individuals is roughly 50 percent. This means that if indigenous workers were endowed with the same productive characteristics as non-indigenous workers, the earnings differential between them would narrow by 50 percent.

Therefore, wage discrimination against the indigenous population can account for as much as 50 percent of the overall earnings differential.

Motivated by this historical and empirical evidence, the next section looks at how indigenous and Afro-descendant workers have fared in the labor market in comparison to *mestizo* and white workers in Ecuador.

### *Labor Market Discrimination in Ecuador*

Ecuadorian journalist Irene León (2000) suggests that ethnic based discrimination in Ecuador is a structural issue expressed not only through daily individual relationships, but as a part of the collective social, cultural and economic relationships that have prevailed since colonial times. A 2004 perceptions-based study of discrimination in urban and rural areas in Ecuador, funded by the Inter American Development Bank found that 53 and 73 percent of indigenous people and Afro-descendants, respectively, characterize Ecuadorian society as discriminatory. In this study, Sanchez (2004) found that 60 percent of those surveyed thought that the white and *mestizo* population is the most discriminatory group in society. However, 61 percent of those surveyed admitted to not understanding the concept of ethnic or racial discrimination and 72 percent of those who did understand belonged to the highest quintile of the income distribution. This finding is an indicator of the poor level of awareness among indigenous and Afro-descendant people regarding social and economic mechanisms of discrimination in the workplace and in everyday life. This lack of awareness may increase the probability that indigenous workers in the lower quintiles of the income distribution accept discriminatory economic outcomes in the labor market, as they might be unable to recognize discriminatory wage behavior from an employer.



Larrea and Montenegro (2006) found evidence in Ecuador, based on logistic regression models and the 1998 Encuesta de Condiciones de Vida (ECV) data, that indigenous people have statistically significantly greater difficulty escaping from poverty than the rest of society, even controlling for human capital endowments, labor and regional conditions. For example, an indigenous male who has completed secondary education has a 60 percent probability of being poor, compared to 35 percent for a non-indigenous person with the same background.

According to the 2004 World Bank Poverty Assessment for Ecuador, poverty affects predominantly rural areas, where 70 percent of the indigenous population lives. As is to be expected, indigenous workers in rural areas tend to be employed in the agricultural sector and on-farm employment therefore constitutes the main source of income for most indigenous families. These families 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. Rama and Maclsaac (1997) found 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.

Given that capital investments are not realistically accessible to indigenous people in Ecuador and that poverty likely leads to low wage elasticity of labor supply of its workers, labor market conditions largely determine the economic outcomes of this group. Therefore, the issue of discrimination in the labor market, which creates wage differences between groups due to non-productive determinants such as ethnicity or race, is an issue of concern.

Larrea and Montenegro (2006) suggest that as land has become scarcer during the last decades as a result of population growth, land ownership fragmentation and soil erosion, indigenous household incomes have come to depend more on off-farm agricultural and non-agricultural income sources, mostly wage labor. Low-skill indigenous workers tend to find off-farm employment in the informal sector due to its lack of institutional barriers to entry. In this sector, they engage in short-run, low-salaried relationships.

Two recent studies decompose labor market earnings differences between indigenous and non-indigenous workers in Ecuador, seeking to explore the extent to which discrimination in the labor market contributes to the disparities between these two groups. 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. By this definition, some 7.5 percent of the survey sample is classified as indigenous. The authors state that self-identification, which is not available through the 1999 ECV, would probably yield a larger indigenous population estimate. The 1998 and 1999 ECV did not survey the Amazon

region of the country which according to the Instituto Nacional de Estadísticas y Censos de Ecuador (INEC) accounts for 4.6 percent of the population and is predominantly indigenous. For the specification of the earnings equation, the authors use the logarithm of monthly earnings as the dependent variable, computed from the 1999 ECV dataset. Their sample includes only wage earners, therefore the authors use Heckman's two-step procedure to correct for selection bias. The authors argue that amongst this group, at any one time, labor market participation is typically higher for indigenous than non-indigenous workers therefore generating a bias in the measurement of the ethnicity gap. However, empirically, Garcia-Aracil and Winter's choice of instruments for the two-step Heckman procedure is not entirely satisfactory as it includes variables such as age, which surely affects earnings directly. Another dubious instrument included by the authors is the number of older and younger siblings in the household, a direct indicator of household structure on which labor force participation, and thus earnings, depends. Unfortunately we cannot comment on the regression outcomes for this study as these were not reported.

The decomposition results by Garcia-Aracil and Winter (2006), 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 or discrimination. According to the results, much of the non-indigenous/indigenous worker's earnings advantage is primarily explained by the difference in endowments of education and urban residence. But most appears due to discrimination. We will pursue

this idea in our study by expanding the Oaxaca-Blinder decomposition to these factors.

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. The sample includes both wage earners and own account workers. Using traditional Oaxaca-Blinder decompositions the authors report a total earnings differential between indigenous and non-indigenous workers of 69 percent out 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 (Table 3 and 4). The difference between Garcia-Aracil and Winter and Larrea and Montenegro is considerable given that both use ECV data collected only one year apart from each other. It seems unlikely that the difference in sample could explain this large inconsistency in results.<sup>4</sup> Using the indigenous pay structure, most of the earnings gap is explained by endowment differences, mostly in schooling and employment of indigenous workers in the informal sector. The definition used to define formal/informal is not specified by the authors in the study. Furthermore, the authors report that an estimated 74 percent of the labor earnings gap for both men and women is due to endowment differences, mostly in education and in sector, as indigenous workers concentrate in agriculture, informal sector and in the rural area. The remaining 26 percent is attributed to labor market discrimination. On the other hand the authors also report that for male workers only 45

---

<sup>4</sup> The primary results reported by Larrea and Montenegro (2006) are based on the indigenous pay structure. The results based on the non indigenous structure, despite being mentioned in a table, are not highlighted in the study. Also, detailed endowment and pay structure decomposition information using the non indigenous group as reference is omitted.

percent of the earnings gap can be attributed to labor market discrimination. These results imply a disproportionately large weight of females in the sample, unusual in these types of study, where the female sample is relatively small compared to the male sample.

Table 3. Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) monthly earnings decomposition, non-indigenous coefficients

Component	Garcia-Aracil and Winter <sup>1</sup>	Larrea and Montenegro <sup>2</sup>
	Male and Female	Male and Female
Explained	0.456	0.120
Unexplained (Discrimination)	0.587	0.571
Total	1.042	0.691

<sup>1</sup> Source: Garcia-Aracil and Winter (2006)

<sup>2</sup> Source: Larrea and Montenegro (2006)

Table 4. Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) monthly earnings decomposition as percentages, non-indigenous coefficients

Component	Garcia-Aracil and Winter <sup>1</sup>	Larrea and Montenegro <sup>2</sup>
	Male and Female	Male and Female
Explained	43.724	17.366
Unexplained (Discrimination)	56.276	82.634
Total	100	100

<sup>1</sup> Source: Garcia-Aracil and Winter (2006)

<sup>2</sup> Source: Larrea and Montenegro (2006)

The household extended language-based definition of ethnicity used by both Garcia-Aracil and Winter and Larrea and Montenegro mistakenly includes Spanish speaking indigenous workers among the non-indigenous workers possibly underestimating the wage differences since the lower earnings of indigenous workers will narrow the wage gap and the differences due to endowment differences and discrimination. Furthermore, this language-based approach includes other minority groups like Afro-descendants and mulattos who are Spanish speakers, and for whom the available literature reports discriminatory outcomes in every day 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. The use of monthly earnings as dependent variables in the specification of both studies is also questionable since it doesn't accurately capture the return to productivity based on each worker's human capital endowments. 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 to 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 time worked and abstract from the time allocation dimension of total earnings outcomes.

#### *Labor Market Discrimination Literature*

Cain (1986) argues that the study of the economics of labor market discrimination is motivated by two problems. First is the inequality created by long-term differences in the economic welfare among groups. Second is the inequality of long-term differences in average wage rates among groups of workers based on traits such as sex, race or ethnicity, when the groups can be presumed to be equally productive.

The neoclassical theory of discrimination is based on equilibrium in perfectly competitive labor markets characterized by wage-taking behavior, free entry and exit, perfect contracting, and labor market outcomes that are ultimately determined by preferences, technology, and the distribution of endowments (Jacobsen and Skillman 2004) Most theories of labor market discrimination today are based on this neoclassical approach, and most relax the assumption

of the absence of market distortions in order to allow for the occurrence of discrimination. Since the neoclassical theory is almost entirely a demand-side theory, the supply side of the labor market will be “effectively neutralized by the assumption that minority and majority groups of workers have equal productive capacity and have equal tastes of work.” (Cain 1989).<sup>5</sup>

In his influential study “The Economics of Discrimination”, Becker (1957, rev. 1971) proposed that money can be used as a measure of discrimination. He suggested that if an individual has a “taste for discrimination” he must act “as if he were willing to pay something either directly or in the form of a reduced income, to be associated with some persons instead of others.”<sup>6</sup> Becker argued that these “tastes” are the most immediate causes of discrimination and they affect market relationships by causing market discrimination against a group. Becker proposed that if a psychic disutility is associated with the hiring of an employee, regardless of his productive endowments, then there is prejudice. This prejudicial or discriminatory behavior in labor markets, he proposed, can derive from any of three sources: employers, other employees, or customers for the products of workers targeted by discrimination. Cain (1986) opposed Becker’s formulation and argued that “tastes” should not be allowed to “define away discrimination”.<sup>7</sup> He argued that although prejudice by an employer, fellow employee or customer can lead to discriminatory outcomes in the labor market, they are “unlikely to be the major force of the disparities in the wages and incomes between groups.”<sup>8</sup>

---

<sup>5</sup> Cain in Ashenfelter and Layard, eds. (1989) p. 709.

<sup>6</sup> Becker (1957, rev. 1971) p. 14.

<sup>7</sup> Cain in Ashenfelter and Layard, eds. (1989) p. 695.

<sup>8</sup> Cain in Ashenfelter and Layard, eds. (1989) p. 696

De Ferranti, Perry, Ferreira and Walton (2003) maintain that even though observed differences between minority and majority groups are commonly attributed to discrimination, the process of creating these differences involves a complex interaction between individual choice, opportunities, and the institutions with which individuals interact throughout their lifetimes. That means that outcomes that can be observed today, such as wages and labor supply, are the result of a lifelong process of accumulation of experiences, human capital, preferences, and constraints. Therefore, much of the latest available literature on the economics of discrimination, such as Schultz (1991), suggests that discrimination can be thought of in economic terms as differences in economic opportunities between groups that cannot be fully accounted for in terms of the skills and productive endowments of these groups. Along these lines, Altonji and Blank (1999) argue that instances of labor market discrimination can be defined as a situation in which persons who provide labor market services and who are equally as productive in a physical or material sense are treated unequally in a way that is related to an observable characteristic such as race, ethnicity, or gender. Therefore, differential labor market outcomes such as wages and benefits, in the presence of discrimination, arise solely from having the prejudicially treated demographic attribute. Workers with the same preferences and productivity but without that attribute confront no variation in labor market opportunities.

Modern approaches to the study of discrimination, such as Anderson, Fryer and Holt (2005), rely heavily on experimental data based on psychology and economics to uncover the mechanisms behind discriminatory behavior in the labor market. These experiments have allowed economists to distinguish between “the effects of underlying biases in preferences for one’s in-group



from the effects of information-based forms of discrimination.”<sup>9</sup> Another interesting area of current research on the subject of discrimination is that undertaken by Postlewaite and Silverman (2005) who study the impact of self-isolation mechanisms through which groups invest less in social integration activities, which in the long-term can limit the group’s economic outcomes. If minority groups expect to be discriminated against in the labor market even before entering it, they will be less likely to invest in either social or economic integration activities. Therefore, the danger of perpetuating discrimination in the market, as Tajfel (1970) suggested, is that attitudes of prejudice lead to new forms of discriminatory behavior that create new economic or social disparities, perpetuating a vicious circle.

---

<sup>9</sup> Anderson, Fryer and Holt (2005), p.1.

## CHAPTER II

### ETHNICITY-BASED WAGE DISCRIMINATION?

#### *Framework: The Oaxaca-Blinder Decomposition*

The type of evidence most frequently used to measure discrimination is drawn from statistical analysis using multiple regression techniques. Following the neo-classical theory of discrimination, researchers attempting to measure the amount of the wage differential attributable to demand-side discrimination try to control for supply-side factors through use of regression analysis (Jacobsen and Skillman 2004).

The standard and, by far, the most widely used procedure by economists to measure discrimination was developed simultaneously by Oaxaca (1973) and Blinder (1973) and is based on an Ordinary Least Square (OLS) estimation of a wage equation of the semi-log functional form:

$$\ln(W) = X\beta + \varepsilon$$

where  $W$  is the worker's labor market wages,  $X$  is a vector of individual productive characteristics, the  $\beta$  coefficients reflect the returns that the market yields to a unit change in characteristics and  $\varepsilon$  is an error term that reflects measurement error as well as the effect of unmeasured factors.

The Oaxaca-Blinder wage decomposition technique in general requires estimating two separate regression functions, in our sample by ethnicity, one for the majority group, the *mestizo* and white population (hereafter denominated by "*mestizo*" and by the superscript  $M$ ), and one for the minority

group, the indigenous population and Afro-descendant population (hereafter denominated by “indigenous” and by the superscript *I*):

$$\ln(W_j^M) = X_j^M \beta^M + \varepsilon_j^M \quad (1)$$

$$\ln(W_j^I) = X_j^I \beta^I + \varepsilon_j^I \quad (2)$$

Rather than taking language as a proxy for ethnicity as Larrea and Montenegro (2005) and García-Aracil and Winter (2006) do, we define it based on each individuals’ response to the question “*You consider yourself...(white, black, indigenous, mestizo, mulatto, other)*” uniquely available in the EMEDINHO 2000 dataset, described below. According to the World Bank (1993), the self-identification or self-perception method of defining the reference ethnic population appears to be more accurate since it avoids language proficiency issues and allows the individual a choice. In our analysis, we also separate regressions (1) and (2) for men and women of each ethnicity, respectively, in order to isolate the effect of discrimination based on ethnicity and minimize the effects of gender-based heterogeneity in our estimates. Another advantage of this method is that the differences between the coefficients for the explanatory variables can also be compared and discussed by ethnicity and gender. Also, this method allows both the returns to various productive factors and the intercept to vary by ethnicity and gender.

In comparing indigenous and *mestizo* wages we can calculate how much indigenous workers would earn if they were to receive payment based on the *mestizo* relationship between personal characteristics and wages. In other words, we perform counterfactual analysis as if the wage structure (or coefficients) currently faced by *mestizos* also applied to indigenous workers. Conversely, we could also measure how much the *mestizo* worker would fare

relative to the average indigenous worker if he/she were subject to the indigenous wage relationship. Note that using a different reference group gives different decompositions and that there is no definite best way to decide between these two references structures. This should be treated therefore as an index number problem. The empirical results section will report the results using the coefficients for both groups separately but our analysis will use *mestizos* as the reference group since they are a much larger group.

The expected value of the difference between *mestizos* and indigenous workers is:

$$E[\ln(W_j^M) - \ln(W_j^I)] = \bar{X}^M \beta^M - \bar{X}^I \beta^I \quad (3)$$

Adding and subtracting  $\bar{X}^I \beta^M$  from the right hand side of equation (3) yields:

$$E[\ln(W_j^M) - \ln(W_j^I)] = (\bar{X}^M - \bar{X}^I) \beta^M + \bar{X}^I (\beta^M - \beta^I) \quad (4)$$

Thus, the overall wage differential between indigenous and *mestizo* wage earners can be decomposed into two components: one is the portion attributable to differences in the mean endowment of productive characteristics  $(\bar{X}^M - \bar{X}^I)$  evaluated with the *mestizo* pay structure  $\beta^M$  and the other portion is attributable to differences in the returns  $(\beta^M - \beta^I)$  that *mestizo* and indigenous workers receive for the same endowment of income generating characteristics  $X$ . This last component is taken as reflecting wage discrimination relative to the null hypothesis that both groups should receive the same return to their productive characteristics in the absence of discrimination, i.e.  $H_0 = (\beta^M = \beta^I)$ . A simple wage differential between the two groups is not evidence for the existence of discrimination in the labor

market since these differentials could arise purely from inter-group differences in endowment of productive characteristics ( $\bar{X}^M - \bar{X}^I$ ).

Discrimination as mentioned in the previous section therefore arises if wage differentials are due to differences in economic returns to a similar endowment of productive characteristics between two groups, in other words,  $\beta^M > \beta^I$ . In the case of Ecuador, we expect to reject the null hypothesis stated above and that  $\beta^M - \beta^I > 0$ .

*Methodology: Extended Oaxaca-Blinder Decomposition*

We use the logarithm of hourly wages as our dependent variable, so coefficient estimates can be interpreted as the mean percentage change in wages due to one unit change in the explanatory variable. By using hourly wages instead of monthly earnings like the Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) studies do, we accurately capture the monetary return to each worker's productivity, regardless of hours worked throughout the month. The control variables are years of education, years of work experience, a dummy variable for sector of employment (formal versus informal) and a dummy variable for geographic area of residence (urban versus rural). Table 5 presents the expected outcomes for the semi-log wage regression.

Black, Devereux and Salvanes (2003) propose that family background is associated with the educational attainment of children. Given the low rates of education associated with the indigenous and Afro-descendent population in Ecuador, it is highly likely that personal educational attainment might be a function of ethnicity as well as of their own parents' educational attainment,

i.e., there may be intergenerational transmission of human capital. In the standard Oaxaca-Blinder decomposition, these differences are considered endowments, i.e., not a product of discrimination. But some of the difference in education levels may well be due to discrimination in schools, or to discrimination suffered by one's parents at school. By extending the use of the Oaxaca-Blinder method to the educational attainment variable ( $Q$ ), decomposing the difference in years of schooling between the indigenous and *mestizo* workers into the explained and unexplained components, we will identify indirect pathways for the transmission of discrimination that eventually affects wage outcomes for workers via ethnic discrimination in schools. We thereby extend the traditional Oaxaca-Blinder decomposition of wages to the education variable using separate OLS regressions with respect to a vector  $Z$  including parental educational achievement characteristics and parental language.

Table 5. Expected outcomes for semi-log wage regression

Independent variable	Expected Sign	Intuition
Years of Education	Positive	Human capital theory- investments made in education enhances workers' productivity and income.
Years of Work Experience	Positive	Human capital theory- investments made in human resources enhances workers' productivity and income.
Sector (Formal=1)	Positive	Dual labor market theory- wages in the formal sector are considerably higher than those in the informal sector
Geographic Area (Rural=1)	Negative	Poverty and depressed incomes affects predominantly rural areas in Ecuador (World Bank 2004, Larrea and Montenegro 2006).

Similar arguments can be made for extending the Oaxaca-Blinder decomposition to the sector of employment and geographic area of residence variables. Ecuador, like most low income countries, has a dual labor market, with wages in the formal sector considerably higher than those in the informal sector (Maclsaac and Rama 1997; Patrinos and Hall 2006). If there is discrimination in access to this sector, then our decomposition should account for that, too. In addition, the indigenous population is highly concentrated in rural areas as mentioned in our literature review, thus we consider the determining role of geographic area of birth of the parents in determining the geographic outcome of their children via a vector  $V$  of parent's geographic characteristics. In turn, the sector of employment ( $S$ ) variable will be regressed on a vector  $U$  of educational and occupational characteristics of worker's parents. This will allow us to further identify indirect channels for the transmission of discrimination that have an effect on children's wage differentials. In general, this extended version of the traditional Oaxaca-Blinder method that we will be using, in contrast to most studies exploring wage discrimination, allows us to capture and measure the direct (via the log hourly wage function) and the indirect effects (via educational attainment, sector and residential choices) of discrimination on wage differentials.

The first stage regressions are specified in equations (5), (6), (7) and (8). Equations (5), (6) and (7) present the functions for the education ( $Q$ ), sector ( $S$ ) and rural ( $R$ ) variables, where  $\gamma$ ,  $\lambda$  and  $\psi$  are a vector of coefficients corresponding to the returns to a unit change in the independent variables and  $\nu$ ,  $\omega$  and  $\sigma$  are the error terms for each linear regression, respectively. Equation (8) is the global log wage functions from (1) and (2) with respect to years of work experience ( $X$ ), educational attainment ( $Q$ ) from (5), sector of

employment ( $S$ ) from (6) and geographic area of residence ( $R$ ) from (7).

Equations (9)-(12) show the expected values of each function.

From this point we proceed to algebraically manipulate and decompose (9)-(12) according to the Oaxaca-Blinder method.

$$(5) Q = Z\gamma_1 + \nu$$

$$(6) S = U\lambda_1 + \omega$$

$$(7) R = V\psi_1 + \sigma$$

$$(8) \ln(W) = \beta_0 + X\beta_1 + Q\beta_2 + S\beta_3 + R\beta_4 + \varepsilon$$

$$(9) E(Q) = E(Z)\gamma_1 = Z\gamma_1$$

$$(10) E(S) = E(U)\lambda_1 = U\lambda_1$$

$$(11) E(R) = E(V)\psi_1 = V\psi_1$$

$$(12) E(\ln(W)) = \beta_0 + E(X)\beta_1 + E(Q)\beta_2 + E(S)\beta_3 + E(R)\beta_4 = \\ \beta_0 + X\beta_1 + Q\beta_2 + S\beta_3 + R\beta_4$$

Subtracting the expected values for the wage differences of each population (equation (12)) we get



$$(13) E(\ln W_M - \ln W_I) = [\beta_0^M + E(X^M)\beta_1^M + E(Q^M)\beta_2^M + E(S^M)\beta_3^M + E(R^M)\beta_4^M] - [\beta_0^I + E(X^I)\beta_1^I + E(Q^I)\beta_2^I + E(S^I)\beta_3^I + E(R^I)\beta_4^I]$$

$$(14) E(\ln W_M - \ln W_I) = E[\beta_0^M + E(X^M)\beta_1^M + E(Q^M)\beta_2^M + E(S^M)\beta_3^M + E(R^M)\beta_4^M] - [E(\beta_0^M + E(X^I)\beta_1^M + E(Q^I)\beta_2^M + E(S^I)\beta_3^M + E(R^I)\beta_4^M)] + [E(\beta_0^M + E(X^I)\beta_1^M + E(Q^I)\beta_2^M + E(S^I)\beta_3^M + E(R^I)\beta_4^M)] - [E(\beta_0^I + E(X^I)\beta_1^I + E(Q^I)\beta_2^I + E(S^I)\beta_3^I + E(R^I)\beta_4^I)]$$

$$(15) E(\ln W_M - \ln W_I) = (\beta_0^M - \beta_0^I) + E(X^M - X^I)\beta_1^M + E(X^I)(\beta_1^M - \beta_1^I) + E(Q^M - Q^I)\beta_2^M + E(Q^I)(\beta_2^M - \beta_2^I) + E(S^M - S^I)\beta_3^M + E(S^I)(\beta_3^M - \beta_3^I) + E(R^M - R^I)\beta_4^M + E(R^I)(\beta_4^M - \beta_4^I)$$

This is the standard Oaxaca-Blinder decomposition of wage differentials into differences in endowments and returns to those endowments, or discrimination. However, we have argued that the endowments of schooling, sector of employment, and area of residence may also be affected by discrimination. If we apply the same decomposition to equations (9) to (11) and substitute into (15), we get:

$$(16) E(\ln W_M - \ln W_I) = (\beta_0^M - \beta_0^I) + E(X^M - X^I)\beta_1^M + E(X^I)(\beta_1^M - \beta_1^I) + [E(Z^M - Z^I)\gamma^M + E(Z^I)(\gamma^M - \gamma^I)]\beta_2^M + [E(U^M - U^I)\lambda^M + E(U^I)(\lambda^M - \lambda^I)]\beta_3^M + [E(V^M - V^I)\lambda^M + E(V^I)(\lambda^M - \lambda^I)]\beta_4^M$$

In Equation (16)  $E(Z^M - Z^I)\beta_2^M$ ,  $E(U^M - U^I)\beta_3^M$  and  $E(V^M - V^I)\beta_4^M$  are the endowment elements of the Oaxaca-Blinder decompositions of the education (Q), sector (S) and rural (R) variables, respectively, and  $(\beta_0^M - \beta_0^I)$ ,  $E(X^M)(\beta^M - \beta^I)$ ,  $\beta_2^M E(Z^I)(\gamma^M - \gamma^I)$ ,  $\beta_3^M E(U^I)(\lambda^M - \lambda^I)$  and  $\beta_4^M E(V^I)(\psi^M - \psi^I)$  are the unexplained components, with the last three reflecting indirect discrimination in schooling, sector, and area of residence, respectively.

Equation (16) presents our final model which attributes the labor market wage differentials for both *mestizos* and indigenous workers into: (a) the difference in the endowment of productive characteristics between the two groups evaluated with respect to the *mestizo* return and (b) the difference in the returns to the endowments of each group which captures discrimination.

The mechanisms by which discrimination operate are rather subtle, therefore by further decomposing the effects of the variables we can capture the direct effects on wage differentials by  $[(\beta_0^M - \beta_0^I) + E(X^M - X^I)\beta_1^M + E(X^I)(\beta^M - \beta^I)]$  and the indirect effects by

$$[E(Z^M - Z^I)\gamma^M + E(Z^I)(\gamma^M - \gamma^I)]\beta_2^M + [E(U^M - U^I)\lambda^M + E(U^I)(\lambda^M - \lambda^I)]\beta_3^M + [E(R^M - R^I)\lambda^M + E(R^I)(\lambda^M - \lambda^I)]\beta_4^M$$

Of course, the investment choice of endowments may reflect the expectation of discrimination against the individual. If indigenous students know that they will suffer discrimination in the labor market in the form of lower returns to education, they will choose to acquire less education. Since these estimates cannot capture this effect, they will underestimate the importance of discrimination from our regression and overestimate the effect of the

endowments. Likewise, vectors  $Z$  and  $U$  which include the endowment of productive characteristics of the parents, which may also reflect the prior discrimination suffered by the parents, leading also to underestimation of the coefficient of discrimination for those regressions.

For comparative purposes we also replicate the Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) models to the best of our ability, given the limitations of the difference in datasets. This allows us to compare the different outcomes due to (i) the difference in ethnicity definitions, and (ii) differences in methodology, especially the allowance for possible indirect effect of discrimination. Therefore, we will also present the results of our model using language as a proxy for ethnicity and earnings as the dependent variable.

#### *Methodological issues*

Given that our sample only includes wage earners and that this could pose a sample selection bias to our model, we use the two-step Heckman procedure to correct it and estimate the probability that a worker will join the labor force as a wage earner. The vector of instruments to be used includes the number of males and females in the household following age brackets: 0-5, 6-15, 16-25, 26-60 and 61-99, respectively.

Arguably, the relation between the education and sector variables and the dependent variable can also be treated as endogenous as the expectation of being discriminated against in the labor market could lead workers, particularly indigenous and Afro-descendants, to make lower investments in education. By the same reason, these workers could naturally cluster in low-skill and low-

paying jobs in the informal sector. Therefore we will also run a two-stage least squares model and compare its results to those of the system of simultaneous equation outlined above. The first stage will address the issue of endogeneity in both the education and sector variables regressed on a vector of instruments including parental educational and occupational characteristics. The second stage will incorporate the instrumented variables into the hourly log wage regression. A concern is being able to instrument adequately for the sector variable. We will therefore use the Sargan Test of over-identifying restrictions.

### *Data Description*

Our empirical analysis will be conducted using the Encuesta de Empleo, Desempleo, y Subempleo en el Area Urbano y Rural (ENEMDUR) and the Encuesta de Medición de Indicadores de la Niñez y los Hogares (EMEDINHO). Data for both surveys was collected by the Instituto Nacional de Estadísticas y Censos de Ecuador (INEC) concurrently in November 2000. EMEDINHO's ethnicity and social capital module was particularly designed to facilitate the study of discrimination in Ecuador, among other issues, as part of a joint effort by national and international institutions, including UNICEF. The 2000 EMEDINHO survey included ethnicity related questions that had not been previously incorporated into population/household surveys in the country, despite the significant presence of indigenous and Afro-descendant people. One of the most noteworthy contributions of the survey is the ethnic self-identification question discussed in the *Framework* section, which is the definition of ethnicity we adopt in this study. Therefore, the 2000 EMEDINHO is an important source of indicators of the social situation of the indigenous

and Afro-descendant populations, and in combination with the ENEMDUR survey offers an opportunity for an in-depth study of the challenges they face in the labor market. ENEMDUR has information for people age 5+ on job characteristics, occupation, sector, hours worked, wages (from primary and secondary employment) and earnings (including transfers) for those employed at the time of survey. EMEDINHO has individual demographic and educational information, as well as educational and occupational information about the individual's parents. Parent's information will be useful in our study as we use it to address the impact of inter-generational transmission of human capital which was discussed in the previous section. The 1998 and 1999 Encuesta de Condiciones de Vida (ECV) that Larrea and Montenegro (2006) and Garcia-Aracil and Winter (2006) use have more detailed income modules than ENEMDUR. This module captures monetary and non-monetary income and transfers for wage-earners and self-employed workers separately. Also, the ECV gathers more in-depth information about characteristics of the worker's place of employment compared to ENEMDUR. This information is better suited to construct a strong variable for sector of employment (formal v. informal) than ENEMDUR.

Table 6 presents a list of variables constructed for the study using the 2000 EMEDINHO and ENEMDUR surveys.

Table 6. List of main variables constructed using 2000 EMEDINHO and ENEMDUR surveys

<b>Variables constructed</b>	<b>Definition</b>
Monthly wages	$\Sigma$ (Primary and Secondary monthly employment wages in US\$)
Monthly earnings	$\Sigma$ (Primary and Secondary monthly employment wages + capital income + transfers in US\$)
Number of hours worked per month	$\Sigma$ (Number of hours worked per month in primary and secondary employment by month)
Hourly wages	(Monthly wages in US\$) / ( Number of hours worked per week * 4.29)
Log hourly wages	Ln(hourly wages)
Wage earners	Dummy for agricultural and non-agricultural employee and laborers, government employee, domestic worker  0= Non wage-earners 1=Wage-earners
Formal sector	Dummy for employees that have formal appointment or those with definite and indefinite contracts  0= Informal 1=Formal
Rural	Dummy for rural residence  0= Urban 1= Rural residence
Ethnicity	Self-identification based  1= Indigenous, Mulatto and Afro-descendant  2= White or <i>mestizo</i>

Table 6. (Continued).

<b>Variables constructed</b>	<b>Definition</b>
Language	Dummy for language spoken by the individual  0= Only Spanish  1= Indigenous language as primary or secondary language
No education	Dummy for individual with zero years of education 0= Other 1= Zero years of education
Less than primary	Dummy for individual with incomplete primary education  0= Other 1= Less than primary
Primary	Dummy for individual with complete primary education  0= Other 1= Complete primary
Secondary	Dummy for individual with complete secondary education  0= Other 1= Complete secondary
University	Dummy for individual with complete university education  0= Other 1= Complete university
Agriculture	Dummy for individual employed in agriculture sector  0= Other 1= Employed in agriculture
Mining	Dummy for individual employed in mining sector  0= Other 1= Employed in mining

Table 6. (Continued).

<b>Variables constructed</b>	<b>Definition</b>
Manufacture	Dummy for individual employed in manufacture sector 0= Other 1= Employed in manufacture
Utilities	Dummy for individual employed in utility sector 0= Other 1= Employed in utilities
Construction	Dummy for individual employed in construction sector 0= Other 1= Employed in construction
Commerce	Dummy for individual employed in commerce sector 0= Other 1= Employed in commerce
Transportation	Dummy for individual employed in transportation sector 0= Other 1= Employed in transportation
Finance	Dummy for individual employed in finance sector 0= Other 1= Employed in finance
Services	Dummy for individual employed in service industry 0= Other 1= Employed in services
Years of schooling	Number of years of schooling of the individual (assuming primary= 6 years, secondary=5 years, university=5 years)
Years of experience	Number of years of experience Age – (Number of years of education + 5)
No education information	Dummy for individual with missing education information



Table 6. (Continued).

<b>Variables constructed</b>	<b>Definition</b>
No occupation information	Individual with missing occupation information
Father born in rural area	Individual's father was born in a rural area 0= Born in urban area 1= Born in rural area
Mother born in rural area	Individual's father was born in a rural area 0= Born in urban area 1= Born in rural area

### *Descriptive Statistics*

Using the self-identification question available through EMEDINHO, indigenous people are 6.2 percent of the population and indigenous and Afro-descendent combined make up 9.5 percent of the total population of Ecuador (Table 7).<sup>10</sup> If we were to use language as a proxy for ethnicity, just as García-Aracil and Winter (2006) and Larrea and Montenegro (2006) do, the indigenous population is estimated at only 5.1 percent. The self-identification question thus provides a slightly higher and presumably more accurate approximation of the size of the indigenous population and we will adopt it for the rest of our analysis.<sup>11</sup> Across the country, 77.8 percent of the indigenous and Afro-descendant population is concentrated in rural areas where they make up 16.5 percent of the population, as compare to 5.3 percent in urban areas. In comparison, 65.8 percent of the *mestizo* and white population are urban.

<sup>10</sup> We include indigenous and Afro-descendant as one group because the small size of the Afro-descendant sample would have not allowed us to make any inferences about that group separately.

<sup>11</sup> There is a big contrast between these figures and those presented in Table 1 which in the case of Ecuador puts the indigenous population at 38 percent. We have been unable to obtain the original data sources from which that estimate was produced.

Table 7. Population by ethnicity and area, different methods<sup>12</sup>

Ethnicity proxy:	Total		Urban		Rural	
	<i>Mestizo</i> & White	Indigenous & Afro-descendant	<i>Mestizo</i> & White	Indigenous & Afro-descendant	<i>Mestizo</i> & White	Indigenous & Afro-descendant
By self-declaration	87.8	9.5	91.7	5.3	81.1	16.5
By language	93.3	5.1*	96.3	1.4*	88.1	11.0*

\*Indigenous only

Source: EMEDINHO 2000

Our sample is defined by (i) indigenous and Afro-descendant and (ii) *mestizo* and white wage-earners 15 to 65 years of age in the coastal, highland and Amazon regions of the country. By selecting only wage-earners rather than the self-employed<sup>13</sup> as the population of study, we focus on the group vulnerable to prejudice based on employer perception. This decision possibly creates a sample selection bias which is addressed through a Heckman selection correction. In the case of sector of employment we use worker's contract stability (i.e. workers with formal appointment, definite or indefinite contracts) to proxy for formal sector of employment.

The educational gap between the indigenous and non-indigenous groups is wide, with literacy rates more than 15 percentage points lower for the indigenous and Afro-descendant group compared to that of the *mestizo* and white group (Table 8). There is also an especially large difference in the literacy rates of indigenous and Afro-descendant women compared to the *mestizo* and white female group: more than 20 percent.

<sup>12</sup> Note that the totals don't add up to 100% since (i) by self-declaration we do not include in our sample people who answered "other"; and (ii) by language we do not include in our sample people who report speaking a foreign language.

<sup>13</sup> Larrea and Montenegro (2006) include both wage-earners and the self-employed in their sample.

The average indigenous and Afro-descendant worker has six years of education (pre-school included) which puts them below the primary completion line and which is well below the national average. Indigenous and Afro-descendant workers also have close to three fewer years of schooling than the average *mestizo* and white worker. Table 8 also shows the wide disparities between the two groups' educational attainment at both the secondary and university level of education.

Table 9 compares employment statistics for the indigenous and non-indigenous group. Analyzing average monthly earnings for wage earners and self employed in our sample, we find a strong correlation between being *mestizo* or white and higher earnings in the labor market. The mean hourly wage for the indigenous and Afro-descendant male worker in our sample is only 70 percent of the *mestizo* and white group mean hourly wage (Table 10). Indigenous and Afro-descendant women fare even worse with wages reaching only 55 percent of their *mestizo* and white counterpart. Thus, differences in wages in our sample are not only across ethnicities but also across gender lines.

Table 8. Educational attainment by ethnicity

	Ethnicity		<i>Mestizo</i> and White		Indigenous and Afro- descendant		Total
	<i>Mestizo/</i> White	Indigenous/ Afro- descendant	Males	Females	Males	Females	All
Sample: People 15-65 years of age							
Literacy rate (%)	94.4	78.1	95.1	93.7	83.2	73.3	93.0
Years of education	8.6	6.0	8.6	8.5	6.2	5.7	8.2
Less than primary (%)	34.1	55	33.7	34.5	51	59.2	35.5
Primary completion (%)	35.5	33.4	36.4	34.6	37.1	29.9	35.2
Secondary completion (%)	24.0	9.7	22.7	25.4	10.3	9.6	23.1
University completion (%)	6.3	1.5	7.2	5.5	1.6	1.3	6.1
<i>N</i>	32456	4193	15884	16572	2057	2136	36649
Sample: Wage-earners and self employed 15-65 years of age							
Literacy rate (%)	94.8	79.6	94.9	94.6	81.6	75.8	93.3
Years of education	9.3	6.8	8.7	10.6	6.8	7.0	9.0
Less than primary (%)	11.7	22.7	12.4	10.3	23.7	20.7	12.7
Primary completion (%)	32.4	34.5	34.6	28.3	36.3	31.0	32.6
Secondary completion (%)	27.0	11.7	23.5	33.6	10.7	13.8	25.5
University completion (%)	9.6	2.2	8.7	11.4	1.9	2.8	8.9
	10280	1200	6947	3333	834	366	11480

Source: ENEMDUR 2000

Table 9. Employment statistics

	Ethnicity		<i>Mestizo</i> and Whites		Indigenous and Afro-descendant		Total
	<i>Mestizo/</i> White	Indigenous/Afro -descendant	Males	Females	Males	Females	
Sample: People 15-65 years of age							
Formal sector employed (%)	23.8	18.9	28.8	19.7	22.5	15.4	23.3
Self-employed (%)	36.5	39.3	37.6	35.5	43.0	33.3	35.4
Wage-earner (%)	54.1	42.7	56.1	50.5	46.2	39.7	51.7
Hours worked per week	45.1	44.9	47.2	41.3	47.3	41.5	44.4
Sample: Wage-earners 15-65 years of age							
Formal sector employed (%)	25.1	16.1	22.5	30	14.7	18.7	24.2
Hours worked per week	46.23	49.94	47.61	43.42	50.18	49.43	46.63
Mean wage (US\$ per hour)	0.61	0.40	0.61	0.60	0.43	0.33	0.58

Source: ENEMDUR 2000

Table 10. Mean wage gap ratios for sample

Ratio (Indigenous and Afro-Descendant / <i>Mestizo</i> & White)	
<i>Mestizo</i> & White : Indigenous & Afro-descendant	0.66
<i>Mestizo</i> & White males : Indigenous & Afro-descendant males	0.70
<i>Mestizo</i> & White females :Indigenous & Afro-descendant females	0.55

Source: ENEMDUR 2000

## CHAPTER III

### EMPIRICAL RESULTS

#### *Determinants of wage differentials for men*

As mentioned earlier, our empirical analysis of the decomposition outcomes is based on the *mestizo* and white pay structure (i.e. estimated coefficients) because that is the overwhelming majority of the labor pool. We present the results of the decompositions using the indigenous and Afro-descendant pay structure as a base in Appendix A.

Table 11 presents the OLS results of the log hourly wages regression for male wage earners by ethnic group. The signs of the coefficients are as expected from Table 5. According to these results, there is evidence that in Ecuador, *mestizo* and white wage earners receive close to 25 percent higher return from the labor market for an extra year of schooling, relative to the indigenous and Afro-descendant group. Also, despite the fact that the indigenous group has a higher mean years of work experience, *mestizo* and white workers receive a 40 percent higher return for an extra year of experience. The formal sector variable coefficient confirms higher wage returns to formal employment compared to informal, again favoring *mestizo* and white wage earners. On the other hand, living in rural areas has a negative effect on the level of income for *mestizo* and white workers and their indigenous and Afro-descendant counterparts.

Table 11. Determinants of wages by ethnicity for males: OLS regression models

Independent Variable	Indigenous & Afro-descendants		<i>Mestizo</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
Years of schooling	6.763	0.063***	8.690	0.082***
		0.009		0.004
Years of experience	21.233	0.010***	20.210	0.014***
		0.003		0.001
Formal	0.338	0.347***	0.381	0.366***
		0.073		0.026
Rural	0.452	-0.141**	0.304	-0.130***
		0.068		0.025
Constant		-1.885***		-2.030***
		0.115		0.046
$R^2$		0.212		0.316

Source: EMEDINHO and ENEMDUR 2000

The Oaxaca-Blinder decomposition of the OLS hourly wage regression using *mestizo* and white coefficients from Table 12 yields a wage difference between the two ethnic clusters of 24.6 percent (0.246) out of which a large portion, 72.9 percent (0.179) is due to the difference in endowments and 27 percent (0.07) is “unexplained” or due to discrimination. Most of the explained and unexplained differences between the two groups are due to the difference in education endowments. Appendix A-Table A.4 shows the decomposition results using the indigenous and Afro-descendant coefficients as reference where 59.4 percent of the wage difference between the two groups is due to endowments and 40.6 percent is due to discrimination. The decomposition of the OLS hourly wage regression provides the direct channels through which discrimination affects hourly wages. Next we decompose the education, sector and rural variables to identify the indirect channels through which discrimination affects hourly wages.

Table 12. Wage decomposition: Male *mestizo* and white coefficients

Variables	Contribution of each variable to (Log) wage differential		Contribution as a percentage of total wage differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.014	0.070	-5.632	28.369
Years of Schooling	0.158	0.131	64.347	53.280
Formal	0.016	0.006	6.343	2.565
Rural	0.019	0.005	7.835	2.073
Constant	--	-0.145	--	-59.179
Total	0.179	0.067	72.892	27.108
Overall	0.246		100	

Source: EMEDINHO and ENEMDUR 2000

Regression results for the education variable (Table 13) provide evidence regarding the influence of parents' educational achievement over their children's educational outcomes. Indigenous and Afro-descendant wage earners whose parents have completed primary or less experience a negative effect on their own educational outcomes. For this same group, maternal education at the university level has the potential to increase the education of wage earners by 4 years, a 30 percent higher educational return to their children than *mestizo* and white maternal university education. Hence the importance of promoting secondary and advanced education among indigenous and Afro-descendant females as part of national educational strategy in Ecuador.

The "cost" to education associated to speaking a native language is also statistically significant as there is a negative effect of the father speaking a native language over the educational outcomes of their sons. Despite the large presence of indigenous population in rural areas, bilingual education was not officially institutionalized in Ecuador until 1992. Hence, lower educational outcomes for indigenous males who speak a native language, attending a Spanish speaking educational system are not surprising. De la Torre's (1996)



account of overt discrimination in the schooling system in Ecuador by *mestizo* and white teachers and students against indigenous boys and girls captures unmeasured types of disincentives to educational attainment like harassment and shame.

The decomposition of the education variable (Table 14) shows that the educational difference between an indigenous and a *mestizo* wage earner is 1.9 years. Most of this difference in educational outcomes between the two groups, 1.1 years (56 percent), is due to unexplained differences or discrimination and 0.8 years (44 percent) is due to difference in endowments. Discrimination in education can be interpreted as prejudicial attitudes that a student will encounter in school. However, it can also be interpreted as unequal access to schooling or quality of education. This phenomenon would be common in rural areas where only recently the educational system become officially bilingual and the quality of teachers and infrastructure is lower than in urban areas. It is also possible that some of this difference in endowments is due to multi-generational discrimination effects. The highest contributors to discrimination in education are father's years of schooling and absence of education.

In terms of the endowment composition, father's language and no maternal education are the highest contributors to the difference between the two ethnic clusters. See Table A.1 in Appendix A for the decomposition of the education variable using the indigenous and Afro-descendant coefficients as reference.

Table 13. Determinants of education by ethnicity for males: OLS regression

Independent Variable	Indigenous & Afro-descendants		<i>Mestizo</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
<i>Father</i>				
No education	0.430	-2.588**	0.295	-0.088
		1.231		0.516
Less than primary	0.126	-0.618	0.148	-0.339
		0.975		0.383
Primary	0.181	-0.933	0.198	0.491*
		0.810		0.281
Secondary	0.131	0.405	0.152	0.668*
		0.952		0.353
University	0.048	5.239**	0.091	1.972***
		2.092		0.521
Missing info	0.022	-2.191	0.022	-0.341
		2.515		0.680
Schooling (yrs)	5.066	-0.127	5.066	0.103**
		0.126		0.052
Language	0.253	-1.356*	0.253	-1.912**
		0.773		0.806
<i>Mother</i>				
No education	0.428	-1.718	0.283	-3.123***
		1.227		0.512
Less than primary	0.116	-2.372***	0.150	-2.222***
		0.905		0.391
Primary	0.162	-0.856	0.194	-0.176
		0.834		0.285
Secondary	0.165	0.100	0.164	0.696**
		0.895		0.328
University	0.505	2.778*	0.093	4.004***
		1.554		0.465
Missing info	0.010	1.601	0.005	1.045
		2.039		0.953
Schooling (yrs)	5.493	-0.076	6.772	-0.326***
		0.126		0.049
Language	0.235	-0.646	0.179	-0.058
		0.800		0.837
Constant		10.401***		10.722***
		1.180		0.530
Adjusted R <sup>2</sup>		0.266		0.135

Source: EMEDINHO and ENEMDUR 2000

Table 14. Education decomposition: Male *mestizo* and white coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
Less than primary	-0.008	0.035	-0.388	1.822
No education	0.012	1.075	0.617	55.819
Primary	0.009	0.257	0.443	13.362
Secondary	0.015	0.034	0.745	1.785
University	0.085	-0.156	4.399	-8.089
Missing info	0.006	0.041	0.297	2.125
Schooling (yrs)	0.149	1.167	7.707	60.558
Language	0.451	-0.141	23.398	-7.305
<i>Mother</i>				
Less than primary	-0.075	0.017	-3.881	0.904
No education	0.452	-0.601	23.446	-31.184
Primary	-0.006	0.110	-0.289	5.718
Secondary	0.000	0.098	-0.012	5.084
University	0.169	0.062	8.778	3.211
Missing info	-0.005	-0.005	-0.246	-0.278
Schooling (yrs)	-0.417	-1.375	-21.633	-71.346
Language	0.013	0.138	0.658	7.159
Constant	--	0.320	--	16.618
Total	0.848	1.078	44.039	55.961
Overall		1.927		100

Source: EMEDINHO and ENEMDUR 2000

The results in Table 15 for the OLS regression of the sector dummy variable (formal=1), show that low educational attainment by male wage earners' parents increases the probability of the worker's employment in the informal sector in a statistically significant way for indigenous and Afro-descendant wage earners. Another statistically significant finding is that if maternal education is less than primary it will reduce the likelihood of wage earners obtaining employment in the formal sector. This is the hypothesis that initially leads us to extend the Oaxaca-Blinder decomposition to the sector variable.

The decomposition of sector with respect to mestizo and white coefficients, however, shows that the difference in sector outcomes is 0.043 and that the endowment component accounts for the total difference (Table 16).

Therefore, it is the difference in productive endowments particularly those stemming from parental educational attainment and parental employment in agriculture, that fully explain the difference in sectorial outcome and not discrimination.

Table 15. Determinants of sector of employment by ethnicity for males: OLS regression

Independent Variable	Indigenous & Afro-descendants		<i>Mestizo</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
<i>Father</i>				
No education	0.430	-0.344**	0.295	0.016
		0.143		0.055
Less than primary	0.126	-0.105	0.148	0.019
		0.107		0.040
Primary	0.181	-0.100	0.198	0.077**
		0.096		0.032
Secondary	0.131	0.109	0.152	0.023
		0.122		0.042
University	0.048	0.335	0.091	0.066
		0.213		0.065
Schooling (yrs)	0.022	-0.024	0.022	0.007
		0.016		0.006
No education info	5.066	0.185	5.066	-0.112
		0.263		0.079
Language	0.253	-0.023	0.253	-0.050
		0.094		0.068
Formal sector	0.386	0.424	0.393	0.028*
		0.212		0.017
Agriculture	0.577	0.238	0.446	-0.197**
		0.191		0.084
Manufacturing	0.050	0.334	0.067	0.017
		0.227		0.093
Construction	0.079	0.379*	0.069	-0.172*
		0.213		0.093
Commerce	0.053	0.448**	0.082	-0.032
		0.215		0.089
Transportation	0.020	0.588***	0.042	-0.101
		0.223		0.094

Source: EMEDINHO and ENEMDUR 2000

Table 15. (Continued).

Independent Variable	Indigenous & Afro- descendants		<i>Mestizo</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
<i>Father (cont'd)</i>				
Finance	0.016	0.389	0.030	0.015
		0.286		0.104
Services	0.106	0.420**	0.149	0.012
		0.190		0.086
No occupation info	0.090	0.424*	0.094	-0.039
		0.212		0.088
<i>Mother</i>				
No education	0.428	-0.108	0.283	-0.132**
		0.145		0.059
Less than primary	0.116	0.048	0.150	-0.101**
		0.103		0.042
Primary	0.162	0.057	0.194	0.055
		0.099		0.034
Secondary	0.165	-0.062	0.164	0.030
		0.107		0.038
University	0.505	0.161	0.093	0.129**
		0.181		0.062
No education info	0.010	0.306	0.005	0.070
		0.303		0.062
Schooling (yrs)	5.493	-0.014	6.772	-0.025***
		0.015		0.006
Language	0.235	-0.061	0.179	0.018
		0.100		0.067
Formal	0.221	0.080	0.168	0.007
		0.058		0.018
Agriculture	0.247	0.498***	0.133	-0.118*
		0.110		0.061
Manufacturing	0.041	0.503***	0.032	-0.163**
		0.137		0.081
Construction	0.045	0.391**	0.027	-0.093
		0.188		0.079
Commerce	0.046	0.450***	0.046	-0.034
		0.148		0.068
Finance	0.010	0.522*	0.010	-0.066
		0.268		0.099
Services	0.220	0.622***	0.220	-0.004
		0.126		0.062
No occupation info	0.379	0.561***	0.379	-0.012
		0.133		0.064
Constant		-0.167		0.594***
		0.290		0.120
Adjusted R <sup>2</sup>		0.138	0.0794	

Table 16. Sector decomposition: Male *mestizo* and white coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	-0.002	0.155	-5.091	363.772
Less than primary	0.000	0.016	0.981	36.673
Primary	0.001	0.032	3.146	75.121
Secondary	0.001	-0.011	1.164	-26.299
University	0.003	-0.013	6.629	-30.161
No education info	0.002	-0.007	4.422	-15.462
Schooling (yrs)	0.011	0.159	24.919	373.550
Language	0.012	-0.007	27.476	-15.796
Formal	-0.001	0.045	-1.578	105.205
Agriculture	0.026	-0.251	60.598	-590.022
Mining	0.000	-0.002	0.000	-5.214
Manufacturing	0.000	-0.016	0.722	-36.831
Utilities	0.000	0.000	-0.074	-0.045
Construction	0.002	-0.044	4.012	-102.732
Commerce	-0.001	-0.026	-2.144	-60.006
Transportation	-0.002	-0.014	-5.090	-32.849
Finance	0.000	-0.006	0.467	-14.242
Services	0.001	-0.043	1.224	-101.577
No occupation info	0.000	-0.042	-0.405	-97.456
<i>Mother</i>				
No education	0.019	-0.010	44.712	-23.787
Less than primary	-0.003	-0.017	-7.959	-40.646
Primary	0.002	0.000	4.111	-0.600
Secondary	0.000	0.015	-0.024	35.766
University	0.006	0.002	12.826	-3.740
No info	0.000	-0.002	-0.747	-5.338
Schooling (yrs)	-0.032	-0.061	-74.771	-143.585
Language	-0.004	0.018	-9.073	43.161
Formal	-0.001	-0.052	-2.057	-121.197
Agriculture	0.014	-0.152	31.606	-356.686
Manufacturing	0.000	-0.028	-0.641	-64.920
Construction	0.002	-0.022	3.734	-50.720
Commerce	0.000	-0.022	-0.990	-52.428
Finance	0.000	-0.006	-0.850	-13.988
Services	0.000	-0.137	-0.115	-322.715
No info	-0.001	-0.217	-2.416	-508.967
Constant	--	0.761	--	1786.039
Total	0.051	-0.008	118.331	-18.722
Overall		0.043		100

Source: EMEDINHO and ENEMDUR 2000

The OLS results for the determinants of geographic area (rural=1) displayed in Table 17 show that for both the indigenous and Afro-descendant and *mestizo* and whites wage earners if the parent's were born in a rural area children are also more likely to live in a rural area. Information from the National Census of 2001 quoted by Larrea and Montenegro (2006) shows that only 6 percent of indigenous people migrated within Ecuador during the five-year period previous to the census compared to 9 percent of non- indigenous people.

Table 17. Determinants of geographic area by ethnicity for males: OLS regression

Independent Variable	Indigenous & Afro-descendants		<i>Mestizo</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
Father born in rural area	0.620	0.405***	0.736	0.366***
		0.051		0.018
Mother born in rural area	0.447	-0.224***	0.519	-0.140***
		0.047		0.014
Constant		0.803***		0.645***
		0.036		0.014
$R^2$		0.2993		0.188

Source: EMEDINHO and ENEMDUR 2000

The decomposition of the rural area dummy (Table 18) variable yields a total difference in geographic outcome of -0.148, meaning that high estimates of this regression are for the indigenous and Afro-descendant groups as they tend to reside mostly in rural areas and the low estimates are for the *mestizo* and white groups. Difference in endowments in this case accounts for 35.4 percent and the unexplained difference for 64.6 percent. The decomposition of this variable with respect to the indigenous and Afro-descendant coefficients is likewise presented in Appendix A-Table A.3.

Table 18. Geographic area decomposition: Male *mestizo* and white coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.043	0.025	28.661	-16.521
Mother born in rural area	-0.010	0.037	6.785	-25.223
Constant	--	-0.158	--	106.298
Total	-0.053	-0.096	35.447	64.554
Overall	-0.148		100	

Source: EMEDINHO and ENEMDUR 2000

Using the simultaneous equations model presented in the methodology section and the extended Oaxaca-Blinder decomposition, the regression coefficients from the OLS regression presented in Table 12 and the education, sector and geographic decompositions presented above, Table 19 reports the overall wage differentials and its explained and unexplained components according to the *mestizo* and white coefficients (see Appendix A-Table A.5 for the results using the indigenous and Afro-descendant coefficients). The tables also present the direct and indirect effects of discrimination over each variable and on the overall wage differences.



Table 19. Overall wage decomposition: Male *mestizo* and white coefficients

Variables	Contribution of each variable to (Log) wage differential			Contribution as a percentage of total wage differential		
	Endowments	Direct Discrimination	Indirect Discrimination	Endowments	Direct Discrimination	Indirect Discrimination
Yrs of Experience	-0.014	0.070	--	-5.632	28.369	--
Yrs of Schooling	0.070	0.131	0.088	28.337	53.280	36.009
Formal	0.018	0.006	-0.003	7.530	2.565	-1.187
Rural	0.007	0.005	0.012	2.777	2.073	5.058
Constant	--	-0.145	--	--	-59.179	--
Total	0.081	0.067	0.098	33.012	27.108	39.880
Overall		0.246			100.0	

Source: EMEDINHO and ENEMDUR 2000

Taking the *mestizo* and white coefficients as reference, we find that of the 25 percent (0.25) wage difference, 67.1 percent (0.17) is due to discrimination and 32.9 percent (0.08) is due to difference in endowments. Of the overall wage difference 27.1 percent is transmitted through direct channels and 39.8 percent indirectly, mainly through education. Note that a simple Oaxaca-Blinder decomposition would attribute the indirect discrimination to endowment differences, thus suggesting that only 27 percent of wage differentials are due to discrimination, vs. the 67 percent that the more detailed decomposition reveals. Using the indigenous coefficients as reference, 56.9 percent (0.14) of the difference in wages between the two ethnic clusters is due to discrimination. Direct discrimination accounts for 25.7 percent of the wage difference and indirect discrimination for 31.4 percent. In sum, expanding the decomposition changes considerably the estimate of discrimination's impact on labor market outcomes, with much of the effect coming from discrimination in education.

#### *Determinants of wage differentials for women*

The OLS regression results for women (Table 20) show that despite *mestizo* and white wage earners having higher average years of schooling and higher returns to an extra year of education, the difference between the two ethnic clusters is not as striking as that between males. Indigenous and Afro-descendant women receive on average 8 percent less in wage return per year of education than *mestizo* and white women. On the contrary, the wage return to years of experience favors indigenous and Afro-descendant women over the *mestizo* and white group. Formal sector of employment has a statistically significant positive and much larger effect on log hourly wages in the case of

*mestizo* and white women than for indigenous and Afro-descendant women. Living in a rural area has a negative effect on the hourly wages of the *mestizo* group, similar to the males of the same ethnic cluster.

Table 20. Determinants of wages by ethnicity for females: Regression models Oaxaca-Blinder decomposition method

Independent Variable	Indigenous & Afro-descendants		<i>Mestizos</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
Years of schooling	7.043	0.095*** 0.014	10.546	0.103*** 0.103
Years of experience	18.666	0.015*** 0.014	17.224	0.001*** 0.002
Formal	0.407	0.188 0.126	0.556	0.400*** 0.041
Rural	0.342	-0.126 0.115	0.170	-0.103** 0.052
Constant	1	-2.497*** 0.209	1	-2.432*** 0.064
$R^2$		0.2514		0.358

Source: EMEDINHO and ENEMDUR 2000

The Oaxaca-Blinder decomposition of the log hourly wage equation using the *mestizo* and white coefficients, yields an overall wage difference between the females of both ethnic clusters of 55 percent (0.55), much larger than the difference for males, of which 76.8 percent (0.43) is explained by difference in endowments and 23.2 percent (0.12) is unexplained or due to discrimination (Table 21). Using the indigenous coefficients as reference, 0.36 (65.1 percent) of the difference is due to difference in endowments and 0.19 (34.9 percent) is due to discrimination (Appendix A- Table A.9). For females, the highest contributor to difference in endowments is the different outcomes in education and the highest contributor to the discrimination component is the wide difference in returns to sector outcomes between the two ethnic clusters, favoring the *mestizo* and white group.

Table 21. Wage decomposition: Female *mestizo* and white coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Yrs of Experience	-0.014	-0.091	-2.517	-16.359
Yrs of Schooling	0.362	0.060	65.329	10.897
Formal	0.060	0.086	10.752	15.583
Rural	0.018	0.008	3.195	1.418
Constant	--	0.065	--	11.702
Total	0.425	0.129	76.759	23.241
Overall	0.554		100	

Source: EMEDINHO and ENEMDUR 2000

The OLS regression for education shows that the transmission of educational outcomes from parents to daughters is influenced mostly by the father's educational attainment. In the indigenous and Afro-descendant case, if the father has less than primary or no education it has a statistically significant effect of lowering the daughter's educational attainment by 3 to 4.5 years. A father's university degree increases the educational attainment of his daughter by 1.4 years (Table 22). Comparing these results to those of males we observe that mother's education statistically influences the educational outcomes of sons and father's education statistically influences the educational outcomes of daughters, the benefits of having a parent's university education being higher for sons. Similarly, the educational cost to children of no schooling by the father, most likely to be the head of the household, is greater for sons.

The results of the Oaxaca-Blinder decomposition of the education variable using *mestizo* and white coefficients as reference (Table 23) produce an educational attainment differential of 3.5 years of which 0.8 years (23.5 percent) is due to difference in endowments and the majority, 2.7 years (76.5 percent), is due to discrimination. Therefore, difference in access to education

among other unexplained factors contributes to the differential educational attainment between female indigenous and *mestizo* wage earners. Using the indigenous and Afro-descendant coefficients the difference of wages due to endowment is 30.5 percent and the difference due to discrimination is 69.5 percent (Appendix A-Table A.6). The share attributed to unexplained differences or discrimination is mainly due to the difference between the coefficients of fathers of both ethnic groups with no education and their differential returns to schooling.

Table 24 presents the determinants of sector of employment for females. The decomposition of the sector variable yields a 0.149 differential in sector outcomes between indigenous and Afro-descendants and *mestizo* and white wage earners. Using the latter group's coefficients as reference we find that 56.8 percent of the gap is due to endowment differences and 43.6 percent is due to discrimination (Table 25). Most of the difference in endowments is due to the difference in means between the two ethnic clusters in the parents' employment in an agricultural occupation.

For determinants of geographic area for females refer to Table 26. As in the case of males, given the geographical concentration of the indigenous population in rural areas, the decomposition of the geographic area variable for females yields high estimates for this group of wage earners and low estimates for *mestizo* and white wage earners (Table 27). Therefore the cost of residing in a rural area is higher for the *mestizo* and white population compared to indigenous and Afro-descendants.

Table 22. Determinants of education by ethnicity for females: Regression models Oaxaca-Blinder decomposition method

Independent Variable	Indigenous & Afro-descendants		<i>Mestizo</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
<i>Father</i>				
No education	0.373	-4.521*** 1.547	0.263	-1.029 0.730
Less than primary	0.161	-3.140*** 1.149	0.145	-1.506*** 0.552
Primary	0.193	-1.457 1.358	0.209	-0.119 0.426
Secondary	0.197	0.537 1.602	0.145	0.354 0.462
University	0.037	2.216 2.284	0.128	1.376** 0.671
Missing info	0.003	0.685 2.311	0.005	-0.017 1.119
Schooling (yrs)	5.475	-0.245 0.166	6.985	0.031 0.069
Language	0.209	-0.731 1.246	0.018	-2.774 1.696
<i>Mother</i>				
No education	0.372	-1.529 1.806	0.274	-0.963 0.816
Less than primary	0.134	-1.314 1.373	0.131	-1.380** 0.615
Primary	0.148	0.169 1.350	0.190	0.315 0.476
Secondary	0.232	-0.302 1.402	0.168	1.222** 0.449
University	0.067	3.208 2.116	0.132	3.681*** 0.664
No info	0.001	-2.046 0.652	0.006	0.018 1.384
Schooling (yrs)	6.201	-0.037 0.190	7.213	-0.312*** 0.076
Language	0.223	-1.354 1.297	0.017	-0.243 1.369
Constant		11.880*** 1.648		12.616*** 1.180
Adjusted R <sup>2</sup>		0.264		0.0896

Source: EMEDINHO and ENEMDUR 2000

Table 23. Education decomposition: Female *mestizo* and white coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.113	1.302	3.228	37.170
Less than primary	0.024	0.264	0.684	7.523
Primary	-0.002	0.259	-0.052	7.386
Secondary	-0.019	-0.036	-0.529	-1.031
University	0.124	-0.032	3.547	-0.900
No info	0.000	-0.002	-0.001	-0.053
Schooling (yrs)	0.047	1.513	1.344	43.195
Language	0.530	-0.427	15.138	-12.200
<i>Mother</i>				
No education	0.094	0.131	2.693	3.726
Less than primary	0.005	0.020	0.134	0.571
Primary	0.013	0.022	0.373	0.620
Secondary	-0.084	0.354	-2.385	10.106
University	0.241	0.032	6.868	0.907
No info	0.000	0.002	0.003	0.062
Schooling (yrs)	-0.316	-1.703	-9.008	-48.612
Language	0.050	0.248	1.426	7.070
Constant	--	0.735	--	20.998
Total	0.822	2.681	23.462	76.538
Overall		3.502		100

Source: EMEDINHO and ENEMDUR 2000

Table 24. Determinants of sector of employment by ethnicity for females:  
Regression models Oaxaca-Blinder decomposition method

Independent Variable	Indigenous & Afro- descendants		<i>Mestizo</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
<i>Father</i>				
No education	0.373	-0.096	0.263	-0.071
		0.204		0.082
Less than primary	0.161	-0.007	0.145	-0.079
		0.134		0.060
Primary	0.193	0.021	0.209	0.040
		0.146		0.048
Secondary	0.197	0.104	0.145	0.128**
		0.195		0.054
University	0.037	0.302	0.128	0.149*
		0.365		0.088
Schooling (yrs)	0.003	0.000	0.005	-0.005
		0.025		0.008
No education info	5.475	-0.329***	6.985	-0.089
		0.108		0.178
Language	0.209	0.064	0.018	-0.065
		0.131		0.126
Formal sector	0.386	0.001	0.391	0.018
		0.078		0.025
Agriculture	0.516	0.860***	0.331	-0.141
		0.118		0.088
Mining	0.007	1.042***	0.014	-0.122
		0.393		0.142
Manufacturing	0.064	1.039***	0.077	0.004
		0.393		0.096
Construction	0.090	0.824***	0.067	-0.105
		0.200		0.106
Commerce	0.053	0.993***	0.118	-0.015
		0.195		0.094
Transportation	0.005	1.037***	0.053	-0.065
		0.230		0.095
Services	0.121	0.759***	0.186	0.062
		0.191		0.087
No occupation info	0.073	0.848***	0.097	0.030
		0.229		0.094

Source: EMEDINHO and ENEMDUR 2000



Table 24. (Continued).

Independent Variable	Indigenous & Afro-descendants		<i>Mestizos</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
<i>Mother</i>				
No education	0.372	0.079	0.274	-0.189**
		0.227		0.087
Less than primary	0.134	0.162	0.131	-0.103
		0.166		0.065
Primary	0.148	0.130	0.190	-0.070
		0.165		0.052
Secondary	0.232	0.084	0.168	-0.064
		0.184		0.055
University	0.067	0.032	0.132	0.142*
		0.263		0.083
No education info	0.001	-0.096	0.006	0.041
		0.244		0.150
Schooling (yrs)	6.201	0.001	7.212	-0.025***
		0.023		0.008
Language	0.223	-0.105	0.017	-0.081
		0.125		0.113
Formal	0.252	0.144	0.179	0.033
		0.087		0.026
Agriculture	0.256	0.376*	0.087	-0.119
		0.210		0.084
Manufacturing	0.040	0.254	0.047	-0.081
		0.210		0.094
Construction	0.042	0.480	0.030	-0.221*
		0.292		0.114
Commerce	0.029	0.238	0.075	-0.074
		0.301		0.088
Finance	0.068	1.066***	0.030	-0.032
		0.237		0.115
Services	0.184	0.864***	0.243	-0.041
		0.251		0.081
No occupation info	0.375	0.840***	0.456	0.013
		0.260		0.084
Constant		-1.274***		0.862***
		0.423		0.144
Adjusted R <sup>2</sup>		0.158		0.0656

Table 25. Sector decomposition: Female *mestizo* and white coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.008	0.010	5.200	6.458
Less than primary	0.001	-0.012	0.845	-7.861
Primary	0.001	0.004	0.407	2.425
Secondary	-0.007	0.005	-4.483	3.149
University	0.013	-0.006	9.023	-3.861
No info	0.000	0.001	-0.167	0.425
Schooling (yrs)	-0.008	-0.029	-5.337	-19.515
Language	0.012	-0.027	8.325	-18.058
Formal	0.000	0.023	-0.101	15.734
Agriculture	0.026	-0.516	17.495	-346.430
Mining	-0.001	-0.008	-0.609	-5.225
Manufacturing	0.000	-0.067	0.037	-44.686
Utilities	0.000	-0.009	0.000	-6.330
Construction	0.002	-0.083	1.566	-55.927
Commerce	-0.001	-0.053	-0.668	-35.814
Transportation	-0.003	-0.006	-2.069	-3.684
Finance	-0.001	0.001	-0.308	0.830
Services	0.004	-0.084	2.757	-56.388
No info	0.001	-0.060	0.470	-40.264
<i>Mother</i>				
No education	0.019	-0.100	12.407	-66.913
Less than primary	0.000	-0.036	0.235	-23.869
Primary	-0.003	-0.030	-1.942	-19.925
Secondary	0.004	-0.035	2.940	-23.141
University	0.009	0.007	6.229	4.960
No info	0.000	0.000	0.132	0.097
Schooling (yrs)	-0.025	-0.163	-16.983	-109.279
Language	0.017	0.005	11.198	3.503
Formal	-0.004	-0.077	-2.517	-51.816
Agriculture	0.020	-0.127	13.458	-84.951
Manufacturing	-0.001	-0.014	-0.394	-9.041
Construction	0.003	-0.029	1.671	-19.528
Commerce	-0.003	-0.009	-2.262	-6.094
Finance	0.001	-0.074	0.816	-49.785
Services	-0.002	-0.166	-1.610	-111.427
No info	0.001	-0.310	0.690	-208.217
Constant	--	2.137	--	1433.995
Total	0.084	0.065	56.757	43.550
Overall	0.149		100	

Source: EMEDINHO and ENEMDUR 2000

Table 26. Determinants of geographic area by ethnicity for females:  
Regression models Oaxaca-Blinder decomposition method

Independent Variable	Indigenous & Afro- descendants		<i>Mestizos</i> and Whites	
	Mean $X_I$	$\beta_I$	Mean $X_N$	$\beta_N$
Father born in rural area	0.644	-0.397***	0.783	-0.275***
		0.070		0.024
Mother born in rural area	0.491	-0.172***	0.593	-0.126***
		0.060		0.016
Constant		0.682***		0.460***
		0.054		0.023
$R^2$		0.266		0.150

Source: EMEDINHO and ENEMDUR 2000

Table 27. Geographic area decomposition: Female *mestizo* and white  
coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.038	0.079	22.196	-45.808
Mother born in rural area	-0.013	0.022	7.476	-13.064
Constant	--	-0.222	--	129.200
Total	-0.051	-0.121	29.672	70.328
Overall	-0.172		100	

Tables 28 and 29 present the results based on the extended Oaxaca decomposition introduced in the methodology section. Based on the *mestizo* pay structure, direct discrimination accounts for 23.2 percent and indirect discrimination for 56.9 percent of the overall wage difference of 0.554 amongst the two ethnic clusters for female wage earners. As observed, most of the discrimination on log hourly wages comes through indirect channels, particularly education. Hence the importance of capturing this effect and identifying the channel through which it affects wages, particularly for policy purposes, through our extended decomposition and not overlooking it as through traditional Oaxaca-Blinder decompositions of earnings. Discrimination

therefore accounts for a total of 80.1 percent of the difference in wages for females. Based on the indigenous and Afro-descendant pay structure, discrimination accounts for 81.6 percent.

Table 28. Overall wage decomposition: Female *mestizo* and white coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct Discrimination	Indirect Discrimination	Endowments	Direct Discrimination	Indirect Discrimination
Yrs of Experience	-0.014	-0.091	--	-2.517	-16.359	--
Yrs of Schooling	0.085	0.060	0.277	15.327	10.897	50.002
Formal	0.034	0.086	0.026	6.069	15.583	4.682
Rural	0.005	0.008	0.012	0.948	1.418	2.247
Constant	--	0.065	--	--	11.702	--
Total	0.110	0.129	0.315	19.828	23.241	56.931
Overall		0.554			100	

Source: EMEDINHO and ENEMDUR 2000

### *Language Based Results*

Appendix B presents the results of our method using the language-based definition of ethnicity as Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) did. We have classified individuals who reported speaking an indigenous language as their first or second language as indigenous. Note that this approach only classifies the population as either “Indigenous person who speaks an indigenous language” and “Only Spanish speakers”. This definition produces Oaxaca-Blinder decomposition results of higher wage differentials but lower discrimination estimates in log hourly wages than those using self-definition as proxy for ethnicity. A language-based definition of ethnicity classifies Spanish speaking indigenous people, which are more likely to have access to better education most likely in urban areas, as non-indigenous. Therefore the wage and educational gap between the two groups will likely be higher with the language than the self-definition approach as those speaking an indigenous language will have worse wage and educational outcomes (Table 29).

Table 29. Mean education and wage outcomes, language v. self-determination approach

	Self-determination approach		Language-based approach	
	Indigenous	Non-indigenous	Indigenous	Non-indigenous
Years of education	6.8	9.3	5.3	9.1
Mean hourly wage (US\$)	0.40	0.61	0.35	0.59

Source: EMEDINHO and ENEMDUR 2000

The overall log hourly wage differential between males of these two groups is 38 percent (0.38) of which 51.5 percent (0.20) is due to difference in endowments and 48.5 percent (0.18) is due to discrimination using Spanish speaker coefficients as reference (Table 30). Since Spanish-speaking indigenous people will be classified as non-indigenous through the language-based approach to ethnicity, there will be more within-group variation which could potentially reduce the unexplained portion of wage differentials. Also note that the indigenous speaking population is statistically a distinct subpopulation of the indigenous population by self-identification. Table 30 shows that indirect discrimination, particularly through education, contributes significantly to the overall wage differences between indigenous and non-indigenous people.

For females, the overall wage differential is 70 percent (0.70) of which 42.5 percent (0.3) is due to difference in endowments and 57.5 percent (0.8) is due to discrimination, mainly through the indirect channels of education (Table 31).

Table 30. Overall wage decomposition: Male Spanish speaker coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.026	-0.024	--	-6.946	-6.445	--
Years of Schooling	0.173	0.046	0.089	45.537	12.120	23.531
Formal	0.032	-0.042	0.004	8.457	-11.157	0.971
Rural	0.017	0.056	0.046	4.416	14.658	12.149
Constant	--	0.010	--	--	2.708	--
Total	0.195	0.045	0.139	51.464	11.885	36.651
Overall		0.379			100.0	

Source: EMEDINHO and ENEMDUR 2000



Table 31. Overall wage decomposition: Female Spanish speaker coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Yrs of Experience	-0.041	-0.238	--	-5.848	-34.190	--
Yrs of Schooling	0.279	-0.049	0.269	40.188	-7.000	38.644
Formal	0.041	0.020	0.038	5.912	2.829	5.447
Rural	0.016	0.035	0.048	2.242	4.997	6.885
Constant	--	0.277	--	--	39.894	--
Total	0.295	0.045	0.354	42.494	6.530	50.976
Overall		0.695			100.000	

Source: EMEDINHO and ENEMDUR 2000

Next, we replicate the models of Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) using the 2000 EMEDINHO and ENEMDUR databases. We use earnings rather than wages as our dependent variable and we employ the language based definition of ethnicity in order to assess the comparability of our results to theirs. When we run their models on our data the Oaxaca-Blinder decomposition yields overall lower earnings differentials. The astonishingly large overall log monthly earning differential estimated by Garcia-Aracil and Winter (2006) of 1.04 differs from our estimate of 75 percent running their model with our data. Larrea and Montenegro's estimate of the earning differential, 69 percent, is 60 percent larger than our estimate of 0.44 (Tables 32 and 33). Note, however, that these earnings differentials are still much larger than the wage differentials reported in the previous section. Furthermore, our estimate for the unexplained component or discrimination, using Larrea and Montenegro's model, is approximately 50 percent of theirs. The vast majority of the difference in earnings for this model in the replicate is explained by difference in endowments rather than discrimination as were the author's original findings. A possible source of discrepancy between our estimates and those of the authors' is the construction of the earnings variable. As reported in our *Data Description* section, the 1998 and 1999 ECV surveys contains earned and unearned income data which could account for the higher earnings difference estimates of both the Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) studies compared to the earnings variables constructed using 2000 ENEMDUR data.

Table 32. Oaxaca-Blinder decompositions for Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) replicate models (monthly earnings) using EMEDINHO and ENEMDUR data and Non-Indigenous Coefficients

	Garcia-Aracil and Winter <sup>1</sup>	Garcia-Aracil and Winter Replicate <sup>2</sup>	Larrea and Montenegro <sup>3</sup>	Larrea and Montenegro Replicate <sup>2</sup>
<b>Explained</b>	0.456	0.254	0.120	0.261
<b>Unexplained (Discrimination)</b>	0.586	0.499	0.571	0.182
<b>Total</b>	1.042	0.752	0.691	0.443

<sup>1</sup> Source: Garcia-Aracil and Winter 2006

<sup>2</sup> Source: EMEDINHO and ENEMDUR 2000

<sup>3</sup> Source: Larrea and Montenegro 2006

Table 33. Oaxaca-Blinder decompositions of replicas of Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) models (monthly earnings) using EMEDINHO and ENEMDUR data (%) and Non-Indigenous Coefficients

	Garcia-Aracil and Winter <sup>1</sup>	Garcia-Aracil and Winter Replicate <sup>2</sup>	Larrea and Montenegro <sup>3</sup>	Larrea and Montenegro Replicate <sup>2</sup>
<b>Explained</b>	43.724	33.777	17.366	58.916
<b>Unexplained (Discrimination)</b>	56.276	66.356	82.634	41.084
<b>Total</b>	100	100	100	100

<sup>1</sup> Source: Garcia-Aracil and Winter 2006

<sup>2</sup> Source: EMEDINHO and ENEMDUR 2000

<sup>3</sup> Source: Larrea and Montenegro 2006

*Comparison of Garcia-Aracil and Winters, Larrea and Montenegro and Gallardo Studies*

A comparative illustration of our main results, based on the different methods and approaches to ethnicity presented thus far with respect to the two other studies available for Ecuador is provided in Tables 35 and 36. The three studies conclude that education is the primary direct channel through which discrimination affects the monthly earnings and hourly wages outcomes of the indigenous population (and Afro-descendant population in our study).

However, the obvious advantage of our empirical method is that it allows us to capture the direct and indirect channels through which discrimination impacts the wage outcomes of the indigenous and Afro-descendant population.

The wage approach used in our study is a better method to measure discrimination regarding worker productivity. The earnings approach of Larrea and Montenegro (2006) and Garcia-Aracil and Winter (2006) is better suited to capturing overall inequality as earnings will be a function of time allocated to wage generating employment and other non-wage income. If we only focus on the wage component of earnings there is also a possibility that discrimination is affecting the number of hours worked, i.e., there is discrimination in the number of hours of employment offered by the employer offers to the employee. This could be a source of bias in the earnings estimate. Another source of discrepancy with respect to Larrea and Montenegro's results is that they include the self-employed in their sample.

Despite the discrepancy between our earnings results and those of Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2004) there is similarity

with the wage differential and Oaxaca-Blinder decomposition results obtained by Ñopo, Saavedra and Torero (2004) in Peru, which was presented in our literature review and is comparatively in Table 34.

Table 34. Comparison of Gallardo (2006) and Ñopo, Saavedra and Torero (2004) Oaxaca-Blinder wage decompositions for Ecuador and Peru, respectively

	Gallardo (2006) <sup>1</sup>		Ñopo, Saavedra and Torero
	Ecuador		(2004) <sup>2</sup>
	Male	Females	Peru
			Male an Females
Explained	0.081	0.243	0.055
Unexplained	0.165	0.452	0.125
Total	0.246	0.695	0.1795

<sup>1</sup> Source: EMEDINHO and ENEMDUR 2000

<sup>2</sup> Source: 2000 Living Standards and Measurement Survey

By expanding the decomposition, the estimate of discrimination's impact on labor market outcomes changes considerably and it leads us to contemplate if it is discrimination *per se* that is the problem in affecting wage differentials between indigenous and non-indigenous people or rather structural issues in the provision of basic services like education, which all studies demonstrate is the principal direct and indirect channel for the transmission of differences in outcomes between the two groups. In the next section we will present the results to some methodological refinements to our simultaneous equation model.

Table 35. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca decomposition outcomes (mestizo & white coefficients)

Component	Gallardo- Wage Decomposition <sup>1</sup>				Gallardo-Earnings Decomposition <sup>1</sup>			Garcia-Aracil and Winter <sup>2</sup>		Larrea and Montenegro <sup>3</sup>	
	Self identification based		Language based		Total	Language based		Language based		Language based	
	Male	Female	Male	Female		Male	Female	Male and Female	Male and Female	Male and Female	
<b>Explained</b>	0.081	0.243	0.195	0.295	0.198	0.195	0.279	0.4556		0.383	
<b>Unexplained (Discrimination)</b>	0.165	0.452	0.121	0.399	0.238	0.135	0.434	0.5864		0.309	
<b>Total</b>	0.246	0.695	0.316	0.695	0.435	0.33	0.713	1.042		0.691	

<sup>1</sup> Source: EMEDINHO and ENEMDUR 2000

<sup>2</sup> Source: Garcia-Aracil and Winter 2006

<sup>3</sup> Source: Larrea and Montenegro 2006

Table 36. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro(2006) Oaxaca decomposition outcomes (%) (mestizo & white coefficients)

Component	Gallardo- Wage Decomposition <sup>1</sup>				Gallardo-Earnings Decomposition <sup>1</sup>			Garcia-Aracil and Winter <sup>2</sup>		Larrea and Montenegro <sup>3</sup>	
	Self identification based		Language based		Total	Language based		Language based		Language based	
	Male	Female	Male	Female		Male	Female	Male and Female	Male and Female	Male and Female	Male and Female
<b>Explained</b>	32.927	34.964	61.709	42.446	45.422	59.191	39.147	43.724		55.427	
<b>Unexplained (Discrimination)</b>	67.073	65.036	38.291	57.410	54.578	40.808	60.853	56.276		44.718	
<b>Total</b>	100	100	100	100	100	100	100	100		100	

<sup>1</sup> Source: EMEDINHO and ENEMDUR 2000

<sup>2</sup> Source: Garcia-Aracil and Winter 2006

<sup>3</sup> Source: Larrea and Montenegro 2006



### *Two Stage Least Square (2SLS) Estimation*

The second stage results of the 2SLS regression (Table 37) display coefficients for the log hourly wage regression that are approximately similar to those obtained from the OLS regression (which are presented again in Table 38 below), with the exception of the sector variable. In the case of male wage earners, this coefficient significantly changes in magnitude and in the case of female wage earners the direction of the coefficient's sign changes after being instrumented. The instruments include education and occupation of the parents. (For the complete list of instruments see Tables 39 and 40.) The low values of the F-test for the sector instruments and the low P-values for the Sargan test<sup>14</sup> of the male and female *mestizo* regressions, confirm our concern of poor instrumentation of sector of employment. The results of the Sargan Test of over-identifying restrictions reject the null hypothesis that the instruments for the sector regression are acceptable. Another reason for the low explanatory power of the first-stage sector regression might be the simple definition of formal sector that was used as only comprising those workers who hold a stable employment contract. This definition likely does not capture the real-world complexity of selection into stable, high-paying jobs vs. low-return self-employment, so the sector variable may include considerable measurement error.

---

<sup>14</sup> The Sargan test of over-identifying restrictions tests the validity of instrumental variables. The null hypothesis being tested is that the instrumental variables are uncorrelated with the wage residuals, and therefore they are acceptable instruments.

Table 37. Second stage results for 2SLS regression controlling for endogeneity in education and sector variables

Dependent Variable	Males		Females	
	Indigenous	<i>Mestizo</i>	Indigenous	<i>Mestizo</i>
<b>Independent Variables</b>				
Log of hourly wage				
Years of schooling	0.040** 0.019	0.067*** 0.015	0.144*** 0.037	0.144*** 0.027
Years of experience	0.008** 0.003	0.011*** 0.002	0.022*** 0.006	0.015*** 0.004
Formal sector	0.726*** 0.215	0.862*** 0.217	0.379 0.358	-0.011 0.378
Rural sector	-0.106 0.083	-0.038 0.042	0.042 0.139	-0.087 0.068
Constant	-1.818*** 0.187	-2.057*** 0.116	-3.119*** 0.352	-2.728*** 0.191
Adjusted R <sup>2</sup>	0.169	0.251	0.180	0.314
Observations	834	6947	366	3333
<b>Sargan Test (P-value)</b>	0.949	0.005	0.6277	0.0021

Source: EMEDINHO and ENEMDUR 2000

Table 38. Determinants of wages by ethnicity for males and females: OLS regression models

Independent Variable	Indigenous & Afro-descendants		<i>Mestizo</i> and Whites	
	Male $\beta$ s	Female $\beta$ s	Male $\beta$ s	Female $\beta$ s
Years of schooling	0.063*** 0.009	0.095*** 0.014	0.082*** 0.004	0.103*** 0.103
Years of experience	0.010*** 0.003	0.015*** 0.014	0.014*** 0.001	0.001*** 0.002
Formal	0.347*** 0.073	0.188 0.126	0.366*** 0.026	0.400*** 0.041
Rural	-0.141** 0.068	-0.126 0.115	-0.130*** 0.025	-0.103** 0.052
Constant	-1.885*** 0.115	-2.497*** 0.209	-2.030*** 0.046	-2.432*** 0.064
R <sup>2</sup>	0.212	0.251	0.316	0.358

Source: EMEDINHO and ENEMDUR 2000

Table 39. First stage results for wage 2SLS regression: education variable instruments

Dependent Variable	Males		Females	
	Indigenous	<i>Mestizo</i>	Indigenous	<i>Mestizo</i>
<b>Years of Education</b>				
<b>Independent Variables</b>				
<i>Father</i>				
No education	-2.432***	0.148	-2.455	-0.917
	1.219	0.464	1.772	0.666
Less than primary	-0.770	-0.124	-2.763**	-1.400***
	0.941	0.346	1.243	0.485
Primary	-0.380	0.197	-0.903	-0.269
	0.707	0.256	1.287	0.385
Secondary	1.133	0.389	0.541	0.009
	0.895	0.313	1.391	0.443
University	4.743***	1.606***	1.705	1.204*
	1.683	0.467	2.101	0.625
No education info	-4.581**	-0.288	-2.034**	0.253
	2.043	0.542	0.178	1.156
Years of education	-0.186	0.066	-0.109	-0.002
	0.128	0.046	0.178	0.066
Language	-1.047	-1.155*	-0.840	-1.946
	0.829	0.650	0.869	1.533
Formal Sector	-1.075***	0.024	-0.611	-0.312
	0.324	0.148	0.648	0.230
Agriculture	-2.209*	-0.745	4.242***	-2.476***
	1.325	0.612	0.358	0.549
Mining	-0.660	--	3.804*	-0.562
	1.596	--	2.074	0.826
Manufacturing	-2.041	1.700***	4.496***	-1.375**
	1.426	0.657	1.523	0.613
Utilities	--	2.299***	7.555**	--
	--	0.752	3.295	--
Construction	-1.593	-0.166	3.122**	-1.803**
	1.434	0.681	1.262	0.720
Commerce	-0.909	1.164*	5.175***	-0.593
	1.444	0.644	1.268	0.598
Transportation	-0.352	1.102*	7.029***	-1.207**
	1.506	0.649	1.440	0.607
Finance	-0.707	2.182***	--	0.174
	1.568	0.800	--	0.830
Services	-0.292	1.683***	4.996***	-0.213
	1.389	0.628	1.101	0.538
No occupation info	-0.815	0.138	2.613***	1.688281*
				**

Table 39. (Continued).

Dependent Variable	Males		Females	
	Indigenous	Mestizo	Indigenous	Mestizo
<b>Independent Variables</b>				
<i>Mother</i>				
No education	-1.513	-3.037***	-4.613	-2.033***
	1.086	0.445	2.211	0.757
Less than primary	-1.976**	-2.210***	-0.831	-1.324**
	0.779	0.344	1.722	0.569
Primary	-1.062	-0.482*	0.156	-0.094
	0.681	0.257	1.311	0.439
Secondary	-0.240	0.319	-0.661	0.764*
	0.881	0.284	1.149	0.421
University	1.807	2.957***	1.320	2.772***
	1.286	0.406	1.747	0.602
No education info	3.375**	0.266	-4.613**	0.461
	1.721	0.749	1.949	1.510
Years of Education	-0.116	-0.366***	-0.072	-0.366***
	0.117	0.042	0.198	0.069
Language	0.071	0.063	-0.419	-0.264
	0.848	0.587	0.883	1.232
Formal Sector	-0.006	-0.111	-0.305	0.264
	0.523	0.217	0.760	0.302
Agriculture	2.330***	0.284	0.315	-1.117*
	0.853	0.401	3.339	0.586
Manufacturing	2.848***	-0.821	3.071	-0.301
	1.023	0.509	3.796	0.659
Construction	0.200	-0.771	1.573	-1.252
	1.159	0.555	3.512	0.814
Commerce	2.143**	0.358	3.904	-0.795
	1.043	0.453	3.751	0.623
Finance	1.708	-0.366	3.904	-0.622
	1.331	0.702	3.409	0.868
Services	2.814***	1.002**	2.191	-0.264
	0.892	0.402	3.321	0.516
No occupation info	2.418***	0.939**	2.191	0.258
	0.889	0.395	3.321	0.510
Constant	13.355***	13.333**	7.581*	18.023***
	1.972	0.839	4.105	1.054
Adjusted R <sup>2</sup>	0.486	0.381	0.490	0.306
Observations	834	6947	366	3333
P-value	0.00	0.00	.	0.00

Source: EMEDINHO and ENEMDUR 2000

Table 40. First stage results for 2SLS wage regression: Sector variable instruments

Dependent Variable	Males		Females	
	Indigenous	<i>Mestizo</i>	Indigenous	<i>Mestizo</i>
<b>Independent Variables</b>				
<i>Father</i>				
No education	-0.339**	0.040	-0.077	-0.065
	0.143	0.055	0.198	-0.082
Less than primary	-0.109	0.034	0.000	-0.089
	0.105	0.040	0.130	0.116
Primary	-0.088	0.076**	0.063	0.024
	0.096	0.032	0.152	0.047
Secondary	0.140	0.011	0.166	0.122**
	0.123	0.040	0.204	0.053
University	0.318	0.033	0.409	0.124
	0.205	0.065	0.367	0.086
No education info	0.143	-0.082	-0.377***	-0.125
	0.271	0.077	0.116	0.170
Years of education	-0.025	0.009	-0.003	-0.005
	0.016	0.006	0.025	0.008
Language	0.019	-0.031	0.073	-0.074
	0.100	0.070	0.142	0.125
Formal Sector	-0.015	0.007	0.025	-0.023
	0.058	0.020	0.097	0.029
Agriculture	0.233	-0.134*	0.853***	-0.117
	0.164	0.081	0.120	0.086
Mining	0.429*	--	1.001***	-0.118
	0.258	--	0.370	0.140
Manufacturing	0.296	0.035	0.960***	0.015
	0.206	0.090	0.223	0.094
Utilities	--	-0.008	1.409***	--
	--	0.102	0.363	--
Construction	0.367*	-0.160*	0.771***	-0.079
	0.191	0.090	0.207	0.105
Commerce	0.378**	-0.015	0.988***	-0.015
	0.191	0.086	0.204	0.092
Transportation	0.502**	-0.101	1.000***	-0.055
	0.207	0.092	0.237	0.094
Finance	0.332	-0.007	--	0.012
	0.278	0.102	--	0.107
Services	0.375**	0.007	0.722***	0.066
	0.167	0.102	0.192	0.085
No occupation info	0.344**	-0.047	0.836***	0.000
	0.182	0.085	0.181	0.091

Source: EMEDINHO and ENEMDUR 2000

Table 40. (Continued).

Dependent Variable	Males		Females	
	Indigenous	<i>Mestizo</i>	Indigenous	<i>Mestizo</i>
<i>Independent Variables</i>				
<i>Mother</i>				
No education	-0.137	-0.114**	0.108	-0.169*
	0.154	0.057	0.218	0.087
Less than primary	0.037	-0.089**	0.174	-0.089
	0.107	0.041	0.160	0.064
Primary	0.023	0.037	0.098	-0.068
	0.105	0.033	0.168	0.051
Secondary	-0.051	0.024	0.036	-0.051
	0.113	0.037	0.190	0.054
University	0.172	0.102	-0.116	0.143*
	0.185	0.062	0.285	0.082
No education info	0.276	0.039	-0.098	0.091
	0.334	0.104	0.253	0.148
Years of Education	-0.016	-0.022***	0.010	-
	0.016	0.006	0.024	0.023***
Language	-0.031	0.030	-0.046	-0.073
	0.105	0.069	0.138	0.116
Formal Sector	0.028	0.022	-0.129	-0.006
	0.078	0.029	0.118	0.040
Agriculture	0.511***	-0.069	0.387*	-0.056
	0.105	0.060	0.105	0.083
Manufacturing	0.462***	-0.163**	0.304	-0.059
	0.139	0.080	0.308	0.093
Construction	0.344*	-0.082	0.540*	-0.182
	0.179	0.078	0.323	0.113
Commerce	0.432***	-0.030	0.217	-0.073
	0.149	0.067	0.317	0.087
Finance	0.482*	-0.053	0.961	-0.017
	0.265	0.096	0.239	0.112
Services	0.506***	-0.006	0.651***	-0.076
	0.108	0.059	0.221	0.077
No occupation info	0.424***	-0.007	0.563**	-0.032
	0.107	0.058	-0.984	0.076
Constant	0.073	0.592***	0.371***	0.925***
	0.239	0.114	0.239	0.133
Adjusted R <sup>2</sup>	0.158	0.117	0.162	0.086
Observations	834	6947	366	3333
P-value	0.00	0.00	.	0.00

At this point, given the poor instrumentation in the first stage of the 2SLS model, we prefer to proceed with the empirical analysis using OLS in the main system of simultaneous equations that was outlined in the methodology section.

#### *Heckman Two Step Procedure*

Table 41 presents the results for Heckman's two-step procedure for correction of selection bias in the hourly wage function. The correction yields similar coefficients on the second stage (log hourly wage regression) to those obtained by the OLS regression (Table 38). Heckman's instrumentation procedure reveals the statistically significant deterring effect of the presence in the household of young boys and girls age 0-15 on the probability of indigenous and non-indigenous female workers joining the labor force as wage earners. On the other hand, the presence of other adult women age 26-60 increases the probability of women workers being wage earners. Also, the presence of older men and women age 61-99 in the home reduces the probability of workers being wage earners. A likely explanation for this result is that women that have young children and older adults at home to take care of at home, opt for intermittent self-employment in informal sector activities rather than less flexible employment as wage earners, particularly in the formal sector. The coefficients on the Inverse Mills Ratios are not significant, indicating that selection may not affect the OLS results. Since the selection bias is not significant we proceed with the analysis of our results based on the OLS based model of simultaneous equation outlined in the methodology section.

Table 41. Wage determinants regression with Heckman Correction for sample bias (wage-earners)

	Males		Females	
	Indigenous	<i>Mestizo</i>	Indigenous	<i>Mestizo</i>
Dependent Variable: Log of hourly wage				
Independent Variables				
Years of schooling	0.059*** 0.008	0.075*** 0.002	0.084*** 0.011	0.098*** 0.003
Years of experience	0.007*** 0.002	0.011*** 0.001	0.013*** 0.003	0.010*** 0.001
Formal sector	0.323*** 0.057	0.345*** 0.019	0.314*** 0.091	0.359*** 0.028
Rural sector	-0.187*** 0.057	-0.143*** 0.019	-0.217** 0.086	-0.120*** 0.028
Constant	-1.571*** 0.178	-1.595*** 0.060	-2.344*** 0.329	-2.323*** 0.100
Inverse Mills Ratio	-0.218 0.172	-0.374 0.062	-0.040 0.180	-0.072 0.230
<i>Instruments</i>				
Number of Males age 0-5 at home	0.038 0.040	0.096*** 0.017	-0.120** 0.049	-0.052*** 0.019
Number of Males age 6-15 at home	-0.030 0.029	-0.014 0.012	-0.008 0.034	-0.070*** 0.014
Number of Males age 16-25 at home	-0.001 0.030	0.005 0.011	-0.063 0.043	-0.034** 0.015
Number of Males age 26-60 at home	0.008 0.047	0.053*** 0.015	-0.082 0.054	-0.159*** 0.018***
Number of Males age 61-99 at home	-0.539*** 0.075	-0.390*** 0.026	-0.291*** 0.096	-0.268*** 0.031
Number of Males age 0-5 at home	0.078* 0.041	0.092*** 0.018	-0.055 0.047	-0.049** 0.020
Number of Females age 6-15 at home	-0.062** 0.030	0.001 0.013	-0.045 0.036	-0.069*** 0.014
Number of Females age 16-25 at home	-0.011 0.038	0.031** 0.014	0.195*** 0.036	0.072*** 0.013
Number of Females age 26-60 at home	0.081 0.052	-0.032* 0.017	0.119** 0.054	0.314*** 0.016
Number of Females age 61-99 at home	-0.010 0.095	-0.087*** 0.028	-0.165* 0.096	-0.168*** 0.027
Constant	-0.195*** 0.073	-0.144*** 0.026	-0.938*** 0.086	-0.914*** 0.029
P-value	0.00	0.00	0.00	0.00
Observations	885	7364	389	3468

Source: EMEDINHO and ENEMDUR 2000



## CONCLUSIONS

Discrimination against the indigenous and Afro-descendant population in a predominantly *mestizo* country like Ecuador and their lower economic and social outcomes is not a recent phenomenon. Statistics presented in this study show 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.

For males, labor market discrimination, 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 discrimination via schooling, sector of employment and area of residence, accounts for 39.9 percent of the wage differential. More troublesome is the finding that for females, labor market discrimination accounts for 23.5 percent of the difference in wages between the two ethnic clusters while indirect discrimination accounts for 56.9 percent. Ethnicity therefore carries a cost in the labor market for indigenous and Afro-descendant wage earners.

The obvious benefit of our extended Oaxaca-Blinder decomposition method over those of Garcia-Aracil and Winter (2006) and Larrea and Montenegro (2006) is that it allows us to capture the indirect channels through which discrimination affects wages and which are transmitted in an intergenerational pattern, i.e. the discrimination that affected parents acquisition of human capital in turn had an impact on their children's human capital and labor

outcomes. Furthermore, by identifying these indirect channels we have been able to obtain higher and more intuitive and reliable estimates for the sources of overall discrimination, which are very relevant to the design of equity-promoting policies and legislation to address and penalize the negative impact of prejudicial behavior of teachers towards students and of employers towards employees. The empirical results show that education is the main indirect channel through which discrimination occurs. This finding can be attributed to current differences in access to education between indigenous and non-indigenous people. This finding bears important public policy implications that would address the inequalities in the bilingual educational system in Ecuador. Policies should thus focus in bridging the gap between the quality of education in urban versus rural schools. The results also provide evidence that indigenous people rational anticipation of discrimination induces underinvestment in education and labor skills in formal sector employment. Ignoring this natural behavioral response leads to systematic underestimation of the magnitude of discrimination in explaining indigenous-non-indigenous wage differentials.

**APPENDIX A: Decomposition of the Education, Sector and Rural Variables-Simultaneous Equation Model using the Indigenous Pay Structure as Reference**

*Males*

Table A.1. Education decomposition: Male Indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.350	0.737	18.159	38.276
Less than primary	-0.014	0.041	-0.708	2.142
Primary	-0.016	0.282	-0.841	14.646
Secondary	0.009	0.040	0.452	2.078
University	0.225	-0.296	11.684	-15.374
Missing info	0.037	0.010	1.906	0.516
Schooling (years)	-0.184	1.499	-9.545	77.809
Language	0.320	-0.010	16.595	-0.502
<i>Mother</i>				
No education	0.249	-0.398	12.901	-20.639
Less than primary	-0.080	0.023	-4.143	1.166
Primary	-0.027	0.132	-1.407	6.836
Secondary	0.0000	0.098	-0.002	5.074
University	0.117	0.114	6.091	5.899
Missing info	-0.007	-0.003	-0.377	-0.147
Schooling (years)	-0.097	-1.695	-5.021	-87.958
Language	0.140	0.011	7.270	0.547
Constant	--	0.320	--	16.618
Total	1.021	0.905	53.015	46.986
Overall		1.927		100

Source: EMEDINHO and ENEMDUR 2000

Table A.2. Sector decomposition: Male Indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.047	0.106	109.232	249.449
Less than primary	-0.002	0.018	-5.459	43.112
Primary	-0.002	0.035	-4.077	82.343
Secondary	0.002	-0.013	5.484	-30.619
University	0.014	-0.024	33.795	-57.327
No education info	-0.003	-0.002	-7.287	-3.753
Schooling (years)	-0.035	0.204	-81.500	479.968
Language	0.005	-0.001	12.767	-1.086
Formal	0.000	0.044	0.219	103.408
Agriculture	-0.031	-0.194	-73.208	-456.216
Mining	0.003	-0.005	6.390	-11.604
Manufacturing	0.006	-0.021	13.930	-50.039
Utilities	--	0.000	--	-0.121
Construction	-0.004	-0.038	-8.862	-89.859
Commerce	0.013	-0.039	29.824	-91.974
Transportation	0.013	-0.029	29.552	-67.491
Finance	0.005	-0.011	12.403	-26.173
Services	0.018	-0.061	42.053	-142.406
No occupation info	0.002	-0.044	4.429	-102.290
<i>Mother</i>				
No education	0.016	-0.007	36.668	-15.743
Less than primary	0.002	-0.022	3.791	-52.396
Primary	0.002	0.000	4.228	-0.717
Secondary	0.000	0.015	0.048	35.694
University	0.007	-0.003	15.956	-6.870
No education info	-0.001	-0.001	-3.256	-2.828
Schooling (years)	-0.018	-0.076	-41.338	-177.018
Language	0.013	0.001	30.793	3.296
Formal	-0.010	-0.042	-24.448	-98.806
Agriculture	-0.057	-0.082	-132.912	-192.168
Manufacturing	0.001	-0.029	1.977	-67.538
Construction	-0.007	-0.013	-15.732	-31.254
Commerce	0.006	-0.028	13.022	-66.440
Finance	0.003	-0.009	6.729	-21.568
Services	0.009	-0.146	20.381	-343.211
No occupation info	0.050	-0.268	117.201	-628.584
Constant	--	0.761	--	1786.039
Total	0.065	-0.023	152.793	-52.793
Overall	0.043		100	

Source: EMEDINHO and ENEMDUR 2000

Table A.3. Geographic area decomposition: Male indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.047	0.029	31.760	-19.619
Mother born in rural area	-0.016	0.043	10.827	-29.265
Constant	--	-0.158	--	106.298
Total	-0.063	-0.085	42.586	57.414
Overall		-0.148		100

Source: EMEDINHO and ENEMDUR 2000

Table A.4. Wage decomposition: Male indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.0105	0.066	-4.266	27.003
Years of Schooling	0.1207	0.168	49.170	68.458
Formal	0.0148	0.007	6.020	2.888
Rural	0.0209	0.003	8.515	1.393
Constant	--	-0.145	--	-59.179
Total	0.146	0.100	59.438	40.562
Overall		0.246		100

Source: EMEDINHO and ENEMDUR 2000

Table A.5. Overall wage decomposition: Male indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct Discrimination	Indirect Discrimination	Endowments	Direct Discrimination	Indirect Discrimination
Years of Experience	-0.010	0.066	--	-4.266	27.003	--
Years of Schooling	0.064	0.168	0.057	26.067	68.458	23.102
Formal	0.023	0.007	-0.008	9.198	2.888	-3.178
Rural	0.009	0.003	0.012	3.626	1.392	4.889
Constant	--	-0.145	--	--	-59.179	--
Total	0.085	0.100	0.061	34.625	40.562	24.813
Overall		0.246			100.0	

Source: EMEDINHO and ENEMDUR 2000

*Females*

Table A.6. Education decomposition: Female indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.497	0.918	14.176	26.223
Less than primary	0.050	0.238	1.425	6.782
Primary	-0.022	0.279	-0.638	7.973
Secondary	-0.028	-0.027	-0.802	-0.758
University	0.200	-0.107	5.715	-3.067
Missing info	0.002	-0.004	0.055	-0.109
Schooling (years)	-0.370	1.930	-10.569	55.108
Language	0.140	-0.037	3.989	-1.051
<i>Mother</i>				
No education	0.129	0.096	3.674	2.745
Less than primary	0.005	0.020	0.149	0.557
Primary	0.007	0.028	0.200	0.793
Secondary	0.021	0.250	0.590	7.131
University	0.210	0.062	5.985	1.790
Missing info	-0.010	0.012	-0.281	0.345
Schooling (years)	-0.038	-1.980	-1.078	-56.542
Language	0.278	0.019	7.943	0.553
Constant	--	0.735	--	20.998
Total	1.069	2.433	30.530	69.470
Overall		3.502		100

Source: EMEDINHO and ENEMDUR 2000

Table A.7. Sector decomposition: Female indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.011	0.007	7.102	4.556
Less than primary	0.000	-0.011	0.071	-7.086
Primary	0.000	0.004	0.215	2.617
Secondary	-0.005	0.003	-3.648	2.314
University	0.027	-0.020	18.325	-13.162
No education info	-0.001	0.001	-0.614	0.872
Schooling (years)	0.0001	-0.037	0.045	-24.897
Language	-0.012	-0.002	-8.178	-1.555
Formal	0.0000	0.023	-0.007	15.640
Agriculture	-0.159	-0.332	-106.363	-222.573
Mining	0.008	-0.016	5.183	-11.017
Manufacturing	0.013	-0.079	8.533	-53.182
Utilities	0.013	-0.023	8.773	-15.104
Construction	-0.018	-0.063	-12.342	-42.020
Commerce	0.065	-0.119	43.397	-79.879
Transportation	0.050	-0.058	33.250	-39.003
Finance	--	0.001	--	0.522
Services	0.050	-0.130	33.604	-87.235
No occupation info	0.020	-0.079	13.262	-53.056
<i>Mother</i>				
No education	-0.008	-0.074	-5.211	-49.295
Less than primary	-0.001	-0.035	-0.371	-23.262
Primary	0.005	-0.038	3.618	-25.485
Secondary	-0.006	-0.024	-3.872	-16.329
University	0.002	0.015	1.399	9.790
No education info	-0.001	0.001	-0.310	0.539
Schooling (years)	0.001	-0.189	0.843	-127.104
Language	0.022	0.000	14.427	0.274
Formal	-0.016	-0.065	-10.801	-43.532
Agriculture	-0.063	-0.043	-42.440	-29.054
Manufacturing	0.002	-0.016	1.241	-10.675
Construction	-0.005	-0.021	-3.617	-14.240
Commerce	0.011	-0.023	7.265	-15.621
Finance	-0.040	-0.033	-26.796	-22.173
Services	0.051	-0.220	34.286	-147.322
No occupation info	0.068	-0.378	45.824	-253.352
Constant	--	2.137	--	1433.996
Total	0.084	0.065	56.092	43.908
Overall	0.149		100	

Source: EMEDINHO and ENEMDUR 2000



Table A.8. Geographic area decomposition: Female indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.055	0.096	32.070	-55.681
Mother born in rural area	-0.018	0.027	10.178	-15.767
Constant	--	-0.222	--	129.120
Total	-0.073	-0.099	42.248	57.752
Overall	-0.172		100	

Source: EMEDINHO and ENEMDUR 2000

Table A.9. Wage decomposition: Female indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.022	-0.084	-3.781	-15.096
Years of Schooling	0.332	0.090	59.910	16.316
Formal	0.028	0.118	5.047	21.287
Rural	0.022	0.004	3.907	0.706
Constant	--	0.065	--	11.702
Total	0.361	0.193	65.084	34.916
Overall	0.554		100	

Source: EMEDINHO and ENEMDUR 2000

Table A.10. Overall wage decomposition: Female indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct Discrimination	Indirect Discrimination	Endowments	Direct Discrimination	Indirect Discrimination
Years of Experience	-0.021	-0.084	--	-3.780	-15.094	--
Years of Schooling	0.101	0.090	0.231	18.289	16.314	41.616
Formal	0.016	0.118	0.012	2.831	21.285	2.216
Rural	0.009	0.004	0.010	1.651	0.706	1.845
Constant	--	0.065	--	--	11.701	--
Total	0.105	0.193	0.253	18.990	34.912	45.677
Overall		0.554			100	

Source: EMEDINHO and ENEMDUR 2000

## APPENDIX B: Language Based Model

*Males*

Table B.1. Education decomposition: Male Spanish-speaking coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.056	3.177	1.736	98.806
Less than primary	-0.014	0.229	-0.432	7.123
Primary	0.031	0.130	0.975	4.040
Secondary	0.003	-0.054	0.093	-1.683
University	0.118	-0.264	3.671	-8.207
Missing info	-0.007	--	-0.230	--
Schooling (years)	0.212	2.442	6.599	75.964
Language	1.582	-1.722	49.222	-53.574
<i>Mother</i>				
No education	0.950	-0.936	29.531	-29.110
Less than primary	-0.217	-0.030	-6.743	-0.928
Primary	-0.023	0.113	-0.709	3.507
Secondary	-0.007	0.420	-0.212	13.058
University	0.289	0.141	8.985	4.373
Missing info	0.004	--	0.137	--
Schooling (years)	-0.843	-1.886	-26.219	-58.653
Language	-0.015	0.104	-0.474	3.239
Constant	--	-0.768	--	-23.885
Total	2.120	1.095	65.931	34.069
Overall		3.215		100

Source: EMEDINHO and ENEMDUR 2000

Table B.2. Sector decomposition: Male Spanish-speaking coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.001	0.410	0.902	406.549
Less than primary	0.001	0.033	0.932	32.344
Primary	0.006	0.034	5.600	33.801
Secondary	0.000	0.007	0.158	6.796
University	0.005	0.014	4.936	13.518
No education info	0.000	--	0.192	--
Schooling (years)	0.013	0.277	13.027	274.901
Language	0.044	0.075	43.340	74.807
Formal	-0.007	-0.006	-6.414	-5.703
Agriculture	0.045	0.125	44.523	123.763
Mining	0.000	0.002	0.000	1.633
Manufacturing	0.000	0.010	0.064	10.249
Utilities	0.000	0.000	-0.149	-0.010
Construction	0.010	0.063	9.681	62.727
Commerce	-0.002	-0.016	-1.618	-15.645
Transportation	-0.002	-0.002	-2.393	-1.948
Finance	0.000	0.000	-0.019	-0.003
Services	0.001	0.012	0.519	11.470
No occupation info	-0.002	0.010	-1.934	10.116
<i>Mother</i>				
No education	0.040	-0.060	39.593	-59.880
Less than primary	-0.008	0.005	-8.386	5.108
Primary	0.005	-0.034	5.159	-34.069
Secondary	0.000	0.002	-0.268	2.354
University	0.010	-0.008	9.518	-7.630
No education info	0.000	--	0.404	--
Schooling (years)	-0.065	-0.065	-64.001	-64.350
Language	-0.031	0.069	-30.510	68.254
Formal	-0.005	-0.074	-5.169	-73.571
Agriculture	0.016	-0.115	15.466	-113.934
Manufacturing	0.000	-0.026	0.105	-25.869
Construction	0.005	-0.066	4.809	-65.785
Commerce	0.000	0.022	0.279	21.554
Finance	0.000	0.000	-0.009	-0.003
Services	0.003	-0.093	2.843	-91.824
No occupation info	0.009	-0.093	8.515	-92.455
Constant	--	-0.501	--	-496.964
Total	0.090	0.010	89.699	10.301
Overall		0.101		100

Source: EMEDINHO and ENEMDUR 2000

Table B.3. Geographic area decomposition: Male Spanish-speaking coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.095	-0.059	19.723	12.158
Mother born in rural area	-0.034	-0.010	6.938	2.152
Constant	--	-0.285	--	59.029
Total	-0.129	-0.354	26.660	73.340
Overall	-0.483		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.4. Wage decomposition: Male Spanish-speaking coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.026	-0.024	-6.946	-6.445
Years of Schooling	0.262	0.046	69.068	12.120
Formal	0.0358	-0.042	9.428	-11.157
Rural	0.0628	0.056	16.565	14.658
Constant	--	0.010	--	2.708
Total	0.334	0.045	88.116	11.884
Overall	0.379		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.5. Overall wage decomposition: Male Spanish-speaking coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.026	-0.024	--	-6.946	-6.445	--
Years of Schooling	0.173	0.046	0.089	45.537	12.120	23.531
Formal	0.032	-0.042	0.004	8.457	-11.157	0.971
Rural	0.017	0.056	0.046	4.416	14.658	12.149
Constant	--	0.010	--	--	2.708	--
Total	0.195	0.045	0.139	51.464	11.885	36.651
Overall		0.379			100.0	

Source: EMEDINHO and ENEMDUR 2000

Table B.6. Education decomposition: Male indigenous language coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	1.506	1.726	46.855	53.686
Less than primary	-0.125	0.340	-3.883	10.573
Primary	-0.085	0.246	-2.636	7.651
Secondary	0.005	-0.056	0.145	-1.736
University	0.600	-0.746	18.656	-23.192
Missing info	--	-0.007	--	-0.230
Schooling (years)	-1.109	3.764	-34.502	117.066
Language	-0.093	-0.047	-2.893	-1.459
<i>Mother</i>				
No education	0.467	-0.454	14.537	-14.116
Less than primary	-0.164	-0.082	-5.113	-2.558
Primary	-0.129	0.219	-3.998	6.796
Secondary	0.017	0.396	0.528	12.319
University	-0.316	0.745	-9.814	23.172
Missing info	--	0.004	--	0.137
Schooling (years)	0.399	-3.127	12.395	-97.267
Language	0.086	0.003	2.684	0.081
Constant	--	-0.768	--	-23.885
Total	1.060	2.155	32.962	67.038
Overall		3.215		100

Source: EMEDINHO and ENEMDUR 2000

Table B.7. Sector decomposition: Male indigenous language coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.188	0.223	186.572	220.922
Less than primary	-0.015	0.048	-14.739	48.019
Primary	-0.025	0.065	-24.619	64.025
Secondary	-0.000	0.007	-0.056	7.010
University	-0.020	0.039	-19.750	38.207
No education info	--	0.000	--	0.192
Schooling (years)	-0.137	0.427	-135.725	423.683
Language	0.117	0.002	116.122	2.037
Formal	-0.007	-0.005	-7.265	-4.854
Agriculture	0.085	0.084	84.632	83.671
Mining	-0.002	0.004	-2.400	4.034
Manufacturing	0.000	0.010	0.880	9.434
Utilities	0.000	0.000	-0.010	-0.160
Construction	0.039	0.034	39.073	33.343
Commerce	0.022	-0.040	22.057	-39.321
Transportation	0.004	-0.009	4.321	-8.662
Finance	--	0.000	--	-0.021
Services	-0.037	0.049	-36.264	48.254
No occupation info	-0.014	0.022	-13.559	21.742
<i>Mother</i>				
No education	0.009	-0.029	8.750	-29.039
Less than primary	-0.018	0.014	-17.355	14.077
Primary	0.037	-0.067	37.119	-66.032
Secondary	-0.000	0.002	-0.135	2.221
University	0.043	-0.041	42.324	-40.435
No education info	--	0.000	--	0.404
Schooling (years)	-0.023	-0.108	-21.639	-106.726
Language	0.036	0.002	36.044	1.704
Formal	-0.035	-0.044	-34.947	-43.801
Agriculture	-0.060	-0.039	-59.706	-38.773
Manufacturing	-0.001	-0.025	-0.534	-25.233
Construction	-0.041	-0.021	-40.353	-20.629
Commerce	-0.021	0.043	-20.852	42.687
Finance	--	0.000	--	-0.012
Services	0.036	-0.126	35.728	-124.718
No occupation info	0.083	-0.168	82.497	-166.446
Constant	--	-0.501	--	-497.016
Total	0.248	-0.147	246.212	-146.212
Overall		0.101		100

Source: EMEDINHO and ENEMDUR 2000



Table B.8. Geographic area decomposition: Male indigenous language coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.064	-0.090	13.174	18.707
Mother born in rural area	-0.025	-0.019	5.176	3.914
Constant	--	-0.285	--	59.030
Total	-0.089	-0.394	18.350	81.650
Overall	-0.483		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.9. Wage decomposition: Male indigenous language coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.029	-0.022	-7.522	-5.869
Years of Schooling	0.234	0.074	61.781	19.407
Formal	0.051	-0.058	13.480	-15.209
Rural	0.097	0.022	25.534	5.690
Constant	--	0.010	--	2.708
Total	0.354	0.026	93.273	6.727
Overall	0.379		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.10. Overall wage decomposition: Male indigenous language coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.029	-0.022	--	-7.522	-5.869	--
Years of Schooling	0.077	0.074	0.157	20.363	19.406	41.414
Formal	0.126	-0.058	-0.075	33.183	-15.207	-19.706
Rural	0.018	0.022	0.079	4.685	5.697	20.847
Constant	--	0.010	--	--	2.708	--
Total	0.192	0.026	0.161	50.710	6.735	42.556
Overall		0.379			100.0	

Source: EMEDINHO and ENEMDUR 2000

*Females*

**Table B.11. Education decomposition: Female Spanish-speaking coefficients**

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.337	0.896	6.409	17.028
Less than primary	-0.010	-0.101	-0.180	-1.919
Primary	-0.014	0.161	-0.267	3.067
Secondary	-0.008	0.181	-0.156	3.438
University	0.171	-0.120	3.255	-2.272
No education info	0.0000	-0.028	-0.000	-0.534
Schooling (years)	0.010	-0.437	0.192	-8.306
Language	1.967	-2.111	37.388	-40.128
<i>Mother</i>				
No education	0.275	2.218	5.232	42.166
Less than primary	0.011	0.244	0.202	4.646
Primary	0.013	0.391	0.245	7.425
Secondary	-0.014	0.242	-0.257	4.604
University	0.429	0.069	8.153	1.301
No education info	0.001	--	0.014	--
Schooling (years)	-0.756	0.390	-14.375	7.423
Language	0.270	0.225	5.127	4.269
Constant	--	0.358	--	6.812
Total	2.682	2.579	50.980	49.020
Overall		5.260		100

Source: EMEDINHO and ENEMDUR 2000

Table B.12. Sector decomposition: Female Spanish-speaking coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.014	0.142	6.454	68.309
Less than primary	-0.000	0.024	-0.165	11.484
Primary	0.003	0.045	1.605	21.540
Secondary	-0.003	0.073	-1.198	35.110
University	0.016	-0.012	7.683	-5.803
No education info	0.000	0.001	-0.018	0.480
Schooling (years)	-0.010	-0.072	-5.002	-34.646
Language	0.014	-0.026	6.729	-12.610
Formal	-0.002	0.491	-0.865	235.472
Agriculture	0.007	-0.130	3.325	-62.152
Manufacturing	-0.010	0.006	-4.791	3.020
Utilities	0.002	--	0.865	--
Construction	0.000	-0.027	0.214	-12.842
Commerce	0.009	0.009	4.525	4.253
Transportation	0.003	--	1.383	--
Finance	0.000	-0.002	-0.009	-0.772
Services	0.020	0.019	9.430	8.924
No occupation info	0.007	0.008	3.348	3.581
<i>Mother</i>				
No education	0.041	0.028	19.443	13.322
Less than primary	0.001	-0.041	0.316	-19.568
Primary	-0.004	-0.047	-1.950	-22.636
Secondary	0.001	-0.015	0.446	-7.294
University	0.015	0.007	7.294	3.105
No education info	0.000	--	0.098	--
Schooling (years)	-0.057	0.088	-27.512	42.318
Language	0.004	0.191	1.907	91.722
Formal	-0.013	-0.148	-6.376	-71.136
Agriculture	0.037	-0.059	17.541	-28.226
Manufacturing	0.005	-0.029	2.202	-14.054
Construction	0.007	-0.013	3.457	-6.260
Commerce	-0.004	-0.008	-1.903	-3.881
Finance	0.001	-0.003	0.358	-1.636
Services	-0.001	-0.128	-0.473	-61.227
No occupation info	0.008	-0.166	3.689	-79.623
Constant	--	-0.105	--	-50.321
Total	0.109	0.100	52.046	47.954
Overall	0.209		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.13. Geographic area decomposition: Female Spanish-speaking coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.105	0.065	18.231	-11.152
Mother born in rural area	-0.037	-0.0448	6.333	7.751
Constant	--	-0.456	--	78.837
Total	-0.142	-0.436	24.564	75.436
Overall	-0.578		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.14. Wage decomposition: Female Spanish-speaking coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.041	-0.238	-5.847	-34.188
Years of Schooling	0.548	-0.049	78.829	-7.000
Formal	0.079	0.020	11.362	2.828
Rural	0.063	0.035	9.127	4.997
Constant	--	0.277	--	39.892
Total	0.650	0.045	93.471	6.530
Overall	0.695		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.15. Overall wage decomposition: Female Spanish-speaking coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.041	-0.238	--	-5.848	-34.190	--
Years of Schooling	0.279	-0.049	0.269	40.188	-7.000	38.644
Formal	0.041	0.020	0.038	5.912	2.829	5.447
Rural	0.016	0.035	0.048	2.242	4.997	6.885
Constant	--	0.277	--	--	39.894	--
Total	0.295	0.045	0.354	42.494	6.530	50.976
Overall		0.695			100.000	

Source: EMEDINHO and ENEMDUR 2000

Table B.16. Education decomposition: Female indigenous language coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.778	0.455	14.789	8.647
Less than primary	-0.006	-0.105	-0.106	-1.993
Primary	-0.106	0.254	-2.022	4.822
Secondary	0.013	0.150	0.243	3.039
University	0.911	-0.859	17.311	-16.328
No education info	0.002	-0.030	0.041	-0.574
Schooling (years)	0.237	-0.664	4.510	-12.624
Language	-0.086	-0.059	-1.627	-1.114
<i>Mother</i>				
No education	1.275	1.218	24.234	23.164
Less than primary	0.022	0.233	0.425	4.422
Primary	-0.183	0.586	-3.471	11.141
Secondary	0.006	0.223	0.106	4.241
University	-0.616	1.113	-11.713	21.168
No education info	--	0.001	--	0.014
Schooling (years)	-0.970	0.604	-18.436	11.483
Language	0.489	0.005	9.296	0.101
Constant	--	0.358	--	6.812
Total	1.766	3.494	33.580	66.420
Overall		5.260		100

Source: EMEDINHO and ENEMDUR 2000

Table B.17. Sector decomposition: Female indigenous language coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.084	0.072	40.059	34.676
Less than primary	-0.001	0.025	-0.608	11.924
Primary	-0.022	0.071	-10.717	33.853
Secondary	0.006	0.065	2.875	31.025
University	0.091	-0.087	43.570	-41.691
No education info	0.000	0.001	-0.055	0.517
Schooling (years)	0.027	-0.110	13.006	-52.640
Language	-0.012	-0.001	-5.529	-0.350
Formal	0.018	0.471	8.829	225.694
Agriculture	-0.045	-0.078	-21.514	-37.292
Manufacturing	-0.007	0.003	-3.296	1.526
Utilities	--	0.002	--	0.865
Construction	-0.009	-0.018	-4.151	-8.473
Commerce	-0.028	0.047	-13.585	22.359
Transportation	--	0.003	--	1.382
Finance	0.000	-0.002	--	-0.780
Services	-0.016	0.054	-7.603	25.950
No occupation info	--	0.014	--	6.927
<i>Mother</i>				
No education	0.053	0.0153	25.437	7.316
Less than primary	-0.001	-0.039	-0.627	-18.619
Primary	0.020	-0.071	9.375	-33.952
Secondary	0.000	-0.014	-0.130	-6.7161
University	-0.084	0.105	-40.092	50.488
No education info	--	0.000	--	0.098
Schooling (years)	-0.106	0.137	-50.643	65.445
Language	0.191	0.005	91.437	2.158
Formal	-0.069	-0.093	-33.006	-44.479
Agriculture	-0.007	-0.016	-3.247	-7.435
Manufacturing	-0.012	-0.013	-5.506	-6.342
Construction	--	-0.006	--	-2.802
Commerce	0.034	-0.046	16.190	-21.972
Finance	--	-0.0027	--	-1.277
Services	0.041	-0.1697	19.679	-81.357
No occupation info	0.172	-0.3303	82.427	-158.333
Constant	--	-0.1049	--	-50.302
Total	0.318	-0.110	152.573	-52.610
Overall	0.2086		100	

Source: EMEDINHO and ENEMDUR 2000



Table B.18. Geographic area decomposition: Female indigenous language coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	-0.167	0.126	28.920	-21.841
Mother born in rural area	0.005	-0.087	-0.884	14.968
Constant	--	-0.456	--	78.837
Total	-0.162	-0.4161	28.036	71.964
Overall	-0.578		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.19. Wage decomposition: Female indigenous language coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.0854	-0.1929	-12.2798	-27.7558
Years of Schooling	0.5985	-0.0992	86.1081	-14.2790
Formal	0.0668	0.0318	9.6127	4.5778
Rural	0.0902	0.0080	12.9775	1.1464
Constant	--	0.2773	--	39.8922
Total	0.6702	0.0249	96.4184	3.5816
Overall	0.695		100	

Source: EMEDINHO and ENEMDUR 2000

Table B.20. Overall wage decomposition: Female indigenous language coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.085	-0.193	--	-12.280	-27.756	--
Years of Schooling	0.201	-0.099	0.398	28.915	-14.279	57.193
Formal	0.102	0.032	-0.035	14.670	4.578	-5.057
Rural	0.025	0.008	0.065	3.638	1.146	9.339
Constant	--	0.277	--	--	39.892	--
Total	0.243	0.025	0.427	34.944	3.582	61.475
Overall		0.695			100.000	

Source: EMEDINHO and ENEMDUR 2000

**APPENDIX C:**  
**Language Based-Earnings Differentials Results**

*Males and Females Mestizo and White*

Table C.1. Education decomposition- *Mestizo* and white coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.126	2.099	3.268	54.509
Less than primary	-0.018	0.143	-0.459	3.714
Primary	0.029	0.164	0.751	4.251
Secondary	0.000	0.222	0.010	5.772
University	0.149	-0.145	3.865	-3.756
No education info	-0.004	-0.008	-0.112	-0.219
Schooling (years)	0.158	1.062	4.107	27.576
Language	1.666	-1.890	43.274	-49.097
<i>Mother</i>				
No education	0.728	0.300	18.909	7.781
Less than primary	-0.125	-0.008	-3.241	-0.214
Primary	-0.016	0.163	-0.414	4.221
Secondary	-0.007	0.129	-0.180	3.339
University	0.334	0.083	8.672	2.166
No education info	--	--	--	--
Schooling (years)	-0.840	-0.854	-21.824	-22.178
Language	0.112	0.163	2.911	4.223
Constant	--	-0.063	--	-1.626
Total	2.292	1.558	59.538	40.462
Overall		3.850		100

*Source: EMEDINHO and ENEMDUR 2000*

Table C.2. Sector decomposition: Mestizo and white coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.008	0.313	6.099	235.514
Less than primary	0.000	0.041	-0.260	31.248
Primary	0.004	0.023	3.308	17.147
Secondary	0.000	0.008	0.026	6.018
University	0.007	0.003	5.383	2.048
No education info	0.000	0.000	-0.068	0.279
Schooling (years)	0.004	0.219	2.803	165.082
Language	0.041	0.041	30.855	30.923
Formal	-0.006	0.225	-4.805	169.722
Agriculture	0.037	0.103	28.026	77.746
Mining	0.000	0.001	0.000	0.976
Manufacturing	-0.001	0.023	-0.539	17.452
Utilities	0.001	0.000	0.383	0.017
Construction	0.007	0.044	5.027	33.476
Commerce	0.001	0.006	0.567	4.678
Transportation	-0.001	0.000	-0.699	0.081
Finance	0.001	-0.002	0.621	-1.426
Services	0.006	0.019	4.617	14.281
No occupation info	0.001	0.013	0.824	9.620
<i>Mother</i>				
No education	0.040	-0.059	30.145	-44.516
Less than primary	-0.006	-0.015	-4.170	-11.595
Primary	0.001	-0.030	0.916	-22.680
Secondary	0.000	0.010	-0.042	7.166
University	0.014	-0.001	10.446	-1.125
No education info	0.000	--	0.241	--
Schooling (years)	-0.063	-0.065	-47.573	-49.101
Language	-0.030	0.137	-22.421	103.098
Formal	-0.009	-0.130	-6.494	-97.699
Agriculture	0.020	-0.103	14.958	-77.834
Manufacturing	0.001	-0.023	0.989	-17.574
Construction	0.005	-0.047	3.907	-35.267
Commerce	-0.001	0.000	-0.405	-0.254
Finance	0.000	0.000	-0.057	-0.138
Services	0.002	-0.109	1.320	-82.002
No occupation info	0.010	-0.131	7.216	-98.889
Constant	--	-0.475	--	-357.615
Total	0.094	0.038	71.142	28.858
Overall		0.133		100

Source: EMEDINHO and ENEMDUR 2000

Table C.3. Geographic area decomposition: *Mestizo* and white pay coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	0.087	0.034	17.141	6.576
Mother born in rural area	0.021	0.033	4.036	6.545
Constant	--	0.335	--	65.703
Total	0.108	0.402	21.176	78.824
Overall	0.510		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.4. Wage decomposition: *Mestizo* and white pay coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.032	-0.054	-7.279	-12.298
Years of Schooling	0.289	0.035	66.430	7.983
Formal	0.058	-0.046	13.398	-10.548
Rural	0.074	-0.018	16.894	-4.021
Constant	--	0.128	--	29.441
Total	0.3891	0.0459	89.444	10.556
Overall	0.435		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.5. Overall wage decomposition: *Mestizo* and white coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.032	-0.053	--	-7.274	-12.290	--
Years of Schooling	0.172	0.035	0.117	39.495	7.977	26.841
Formal	0.041	-0.046	0.017	9.525	-10.541	3.864
Rural	0.016	-0.017	0.058	3.676	-4.018	13.324
Constant	--	0.128	--	--	29.421	--
Total	0.198	0.046	0.192	45.422	10.549	44.029
Overall		0.435			100.0	

Source: EMEDINHO and ENEMDUR 2000

Table C.6. Education decomposition: Indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	1.111	1.114	28.830	28.904
Less than primary	-0.051	0.176	-1.325	4.578
Primary	-0.107	0.299	-2.769	7.767
Secondary	-0.001	0.223	-0.015	5.792
University	0.543	-0.539	14.087	-13.978
No education info	0.028	-0.041	0.737	-1.068
Schooling (years)	-0.430	1.650	-11.164	42.824
Language	-0.172	-0.052	-4.476	-1.343
<i>Mother</i>				
No education	0.877	0.151	22.764	3.907
Less than primary	-0.119	-0.014	-3.099	-0.353
Primary	-0.151	0.298	-3.923	7.727
Secondary	0.000	0.122	-0.006	3.163
University	-0.187	0.604	-4.848	15.678
No education info	--	0.003	--	0.074
Schooling (years)	-0.293	-1.401	-7.600	-36.369
Language	0.271	0.004	7.026	0.103
Constant	--	-0.063	--	-1.625
Total	1.319	2.535	34.219	65.781
Overall		3.853		100

Source: EMEDINHO and ENEMDUR 2000

Table C.7. Sector decomposition: Indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.155	0.166	116.636	124.976
Less than primary	-0.010	0.051	-7.561	38.549
Primary	-0.014	0.042	-10.900	31.355
Secondary	0.000	0.008	0.000	6.043
University	0.000	0.010	-0.197	7.629
No education info	-0.002	0.002	-1.150	1.361
Schooling (years)	-0.118	0.341	-88.668	256.553
Language	0.081	0.001	60.932	0.847
Formal	0.021	0.198	15.959	148.958
Agriculture	0.074	0.067	55.647	50.125
Mining	-0.004	0.005	-2.964	3.941
Manufacturing	0.005	0.017	3.770	13.143
Utilities	--	0.001	--	0.400
Construction	0.026	0.025	19.820	18.683
Commerce	-0.013	0.020	-9.789	15.034
Transportation	-0.002	0.001	-1.167	0.548
Finance	0.003	-0.004	2.381	-3.185
Services	-0.046	0.071	-34.475	53.373
No occupation info	-0.013	0.027	-10.039	20.482
<i>Mother</i>				
No education	0.011	-0.030	7.996	-22.367
Less than primary	0.004	-0.025	3.351	-19.116
Primary	0.026	-0.055	19.784	-41.548
Secondary	0.000	0.009	0.331	6.793
University	0.023	-0.011	17.468	-8.147
No education info	--	0.000	--	0.241
Schooling (years)	-0.021	-0.107	-16.094	-80.580
Language	0.104	0.003	78.173	2.505
Formal	-0.059	-0.079	-44.765	-59.428
Agriculture	-0.051	-0.033	-38.337	-24.539
Manufacturing	-0.005	-0.017	-3.610	-12.975
Construction	-0.025	-0.016	-18.993	-12.367
Commerce	--	-0.001	--	-0.658
Finance	--	0.000	--	-0.195
Services	0.041	-0.149	31.214	-111.896
No occupation info	0.114	-0.236	85.794	-177.467
Constant	--	-0.475	--	-357.615
Total	0.306	-0.173	230.548	-130.548
Overall		0.133		100

Source: EMEDINHO and ENEMDUR 2000



Table C.8. Geographic area decomposition: Indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	0.100	0.021	19.683	4.013
Mother born in rural area	0.036	0.018	7.055	3.535
Constant	--	0.335	--	65.715
Total	0.136	0.374	26.738	73.262
Overall	0.510		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.9. Wage decomposition: Indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.038	-0.047	-8.721	-10.856
Years of Schooling	0.267	0.060	60.607	13.806
Formal	0.079	-0.067	18.183	-15.333
Rural	0.062	-0.006	14.235	-1.361
Constant	--	0.128	--	29.441
Total	0.367	0.068	84.304	15.696
Overall	0.435		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.10. Overall wage decomposition: Indigenous and Afro-descendant coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.038	-0.047	--	-8.720	-10.854	--
Years of Schooling	0.090	0.060	0.173	20.735	13.803	39.861
Formal	0.182	-0.067	-0.103	41.913	-15.330	-23.733
Rural	0.017	-0.006	0.045	3.907	-1.361	10.343
Constant	--	0.128	--	--	29.435	--
Total	0.252	0.068	0.115	57.836	15.693	26.471
Overall		0.435			100.0	

Source: EMEDINHO and ENEMDUR 2000

*Males*

Table C.11. Education decomposition: *Mestizo* and white male coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.033	3.213	1.034	100.442
Less than primary	-0.008	0.260	-0.263	8.115
Primary	0.038	0.143	1.193	4.455
Secondary	0.004	-0.037	0.121	-1.153
University	0.122	-0.258	3.816	-8.058
No education info	-0.008	--	-0.235	--
Schooling (years)	0.224	2.448	6.993	76.549
Language	1.486	-1.590	46.458	-49.706
<i>Mother</i>				
No education	0.946	-1.040	29.577	-32.500
Less than primary	-0.199	-0.062	-6.231	-1.945
Primary	-0.027	0.104	-0.850	3.263
Secondary	-0.005	0.417	-0.169	13.029
University	0.285	0.141	8.912	4.405
No education info	0.004	--	0.133	--
Schooling (years)	-0.851	-1.955	-26.617	-61.115
Language	0.056	-0.008	1.765	-0.252
Constant	--	-0.677	--	-21.169
Total	2.099	1.099	65.638	34.362
Overall		3.199		100

Source: EMEDINHO and ENEMDUR 2000

Table C.12. Sector decomposition: *Mestizo* and white male coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.002	0.395	1.591	411.385
Less than primary	0.001	0.031	0.712	32.121
Primary	0.005	0.031	5.507	32.451
Secondary	0.000	0.002	0.192	2.086
University	0.004	0.012	4.589	12.450
No education info	0.000	--	0.205	--
Schooling (years)	0.013	0.280	13.897	291.327
Language	0.050	0.073	51.878	76.429
Formal	-0.006	-0.019	-6.387	-19.402
Agriculture	0.042	0.138	43.549	143.536
Mining	0.000	0.002	0.079	1.800
Manufacturing	0.000	0.012	0.018	12.198
Utilities	--	--	--	--
Construction	0.009	0.067	9.803	69.751
Commerce	-0.001	-0.015	-1.168	-15.305
Transportation	-0.002	-0.002	-2.013	-1.780
Finance	0.000	0.000	0.296	0.047
Services	0.002	0.012	1.724	12.485
No occupation info	-0.002	0.011	-1.665	11.075
<i>Mother</i>				
No education	0.037	-0.053	38.974	-54.636
Less than primary	-0.007	0.005	-7.413	4.712
Primary	0.005	-0.032	5.686	-33.374
Secondary	0.000	0.009	-0.230	9.478
University	0.010	-0.007	10.379	-6.804
No education info	0.000	--	0.423	--
Schooling (years)	-0.064	-0.075	-66.294	-77.602
Language	-0.038	0.064	-39.129	66.165
Formal	-0.005	-0.066	-5.694	-68.490
Agriculture	0.013	-0.116	13.826	-120.812
Manufacturing	0.000	-0.026	0.041	-27.398
Construction	0.004	-0.066	4.442	-68.990
Commerce	0.001	0.021	0.654	21.857
Finance	0.000	0.000	0.098	0.035
Services	0.003	-0.090	3.632	-93.932
No occupation info	0.010	-0.097	10.703	-100.627
Constant	--	-0.495	--	-515.143
Total	0.089	0.007	92.904	7.096
Overall		0.096		100

Source: EMEDINHO and ENEMDUR 2000

Table C.13. Geographic area decomposition: *Mestizo* and white male coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	0.094	0.057	19.573	11.781
Mother born in rural area	0.033	0.012	6.957	2.385
Constant	--	0.285	--	59.305
Total	0.128	0.353	26.529	73.471
Overall	0.481		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.14. Wage decomposition: *Mestizo* and white male coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.023	-0.010	-7.019	-3.099
Years of Schooling	0.231	0.081	70.068	24.538
Formal	0.044	-0.044	13.257	-13.190
Rural	0.097	-0.022	29.436	-6.665
Constant	--	-0.024	--	-7.326
Total	0.349	-0.019	105.741	-5.741
Overall	0.330		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.15. Overall wage decomposition: *Mestizo* and white male coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.023	-0.010	--	-7.022	-3.100	--
Years of Schooling	0.152	0.081	0.079	46.010	24.549	24.087
Formal	0.041	-0.044	0.003	12.321	-13.195	0.941
Rural	0.026	-0.022	0.071	7.882	-6.668	21.525
Constant	--	-0.024	--	--	-7.329	--
Total	0.195	-0.019	0.154	59.191	-5.744	46.552
Overall		0.330			100.0	

Source: EMEDINHO and ENEMDUR 2000

Table C.16. Education decomposition: Indigenous and Afro-descendant male coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	1.486	1.760	46.466	55.011
Less than primary	-0.108	0.359	-3.381	11.232
Primary	-0.092	0.273	-2.889	8.537
Secondary	0.005	-0.038	0.167	-1.199
University	0.601	-0.737	18.800	-23.042
No education info	--	-0.008	--	-0.235
Schooling (years)	-1.106	3.778	-34.583	118.125
Language	-0.060	-0.044	-1.885	-1.362
<i>Mother</i>				
No education	0.414	-0.508	12.951	-15.874
Less than primary	-0.114	-0.148	-3.549	-4.626
Primary	-0.127	0.205	-3.982	6.395
Secondary	0.014	0.397	0.442	12.418
University	-0.325	0.751	-10.174	23.492
No education info	--	0.004	--	0.133
Schooling (years)	0.447	-3.254	13.987	-101.719
Language	0.049	0.000	1.519	-0.006
Constant	--	-0.677	--	-21.169
Total	1.084	2.115	33.889	66.111
Overall		3.199		100

Source: EMEDINHO and ENEMDUR 2000

Table C.17. Sector decomposition: Indigenous and Afro-descendant male structure

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.180	0.217	187.667	225.309
Less than primary	-0.011	0.043	-11.627	44.460
Primary	-0.023	0.060	-24.222	62.180
Secondary	0.000	0.002	0.109	2.169
University	-0.018	0.034	-18.561	35.600
No education info	--	0.000	--	0.205
Schooling (years)	-0.139	0.432	-144.334	449.557
Language	0.121	0.002	126.212	2.095
Formal	-0.009	-0.016	-9.279	-16.509
Agriculture	0.087	0.093	90.225	96.860
Mining	-0.002	0.004	-2.586	4.466
Manufacturing	0.001	0.011	0.801	11.415
Utilities	--	--	--	--
Construction	0.042	0.035	43.280	36.274
Commerce	0.022	-0.037	22.451	-38.924
Transportation	0.004	-0.008	4.171	-7.963
Finance	--	0.000	--	0.344
Services	-0.037	0.051	-38.968	53.178
No occupation info	-0.014	0.023	-14.730	24.140
No education	0.011	-0.026	11.024	-26.685
Less than primary	-0.013	0.011	-13.911	11.210
Primary	0.036	-0.063	37.711	-65.400
Secondary	0.000	0.009	0.215	9.033
University	0.038	-0.035	39.857	-36.281
No education info	--	0.000	--	0.423
Schooling (years)	-0.014	-0.124	-14.736	-129.160
Language	0.024	0.002	25.403	1.633
Formal	-0.032	-0.039	-33.142	-41.042
Agriculture	-0.063	-0.040	-65.794	-41.193
Manufacturing	0.000	-0.026	-0.239	-27.118
Construction	-0.041	-0.021	-42.685	-21.863
Commerce	-0.020	0.042	-21.261	43.772
Finance	--	0.000	--	0.133
Services	0.037	-0.124	38.736	-129.036
No occupation info	0.084	-0.170	87.167	-177.092
Constant	--	-0.495	--	-515.143
Total	0.249	-0.153	258.953	-158.953
Overall		0.096		100

Source: EMEDINHO and ENEMDUR 2000



Table C.18. Geographic area decomposition: Indigenous and Afro-descendant male coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	0.064	0.086	13.388	17.966
Mother born in rural area	0.024	0.021	4.990	4.352
Constant	--	0.285	--	59.305
Total	0.088	0.392	18.378	81.622
Overall	0.481		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.19. Wage decomposition: Indigenous and Afro-descendant male coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.024	-0.009	-7.272	-2.845
Years of Schooling	0.183	0.129	55.454	39.152
Formal	0.059	-0.059	17.804	-17.738
Rural	0.084	-0.009	25.362	-2.591
Constant	--	-0.024	--	-7.326
Total	0.301	0.029	91.349	8.651
Overall	0.330		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.20. Overall wage decomposition: Indigenous and Afro-descendant male coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.024	-0.009	--	-7.272	-2.845	--
Years of Schooling	0.120	0.129	0.063	36.398	39.151	19.055
Formal	0.152	-0.059	-0.093	46.103	-17.737	-28.299
Rural	0.015	-0.009	0.068	4.545	-2.591	20.636
Constant	--	-0.024	--	--	-7.326	--
Total	0.263	0.029	0.038	79.775	8.651	11.392
Overall		0.330			99.8	

Source: EMEDINHO and ENEMDUR 2000

*Females*

**Table C.21. Education decomposition: Mestizo and white female coefficients**

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.275	1.020	5.298	19.666
Less than primary	0.006	-0.078	0.112	-1.500
Primary	-0.007	0.128	-0.137	2.469
Secondary	-0.003	0.141	-0.067	2.712
University	0.172	-0.116	3.311	-2.245
No info	0.000	-0.027	-0.001	-0.525
Schooling (years)	0.030	-0.372	0.569	-7.166
Language	2.008	-2.188	38.708	-42.169
<i>Mother</i>				
No education	0.290	2.154	5.587	41.521
Less than primary	0.021	0.240	0.412	4.631
Primary	0.016	0.410	0.317	7.907
Secondary	-0.012	0.256	-0.224	4.931
University	0.410	0.066	7.902	1.271
No info	0.001	--	0.012	--
Schooling (years)	-0.739	0.403	-14.238	7.774
Language	0.328	0.197	6.318	3.802
Constant	--	0.158	--	3.044
Total	2.795	2.393	53.879	46.121
Overall		5.188		100

Source: EMEDINHO and ENEMDUR 2000

Table C.22. Sector decomposition: Mestizo and white female coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.012	0.102	6.046	51.292
Less than primary	0.000	0.028	0.109	13.852
Primary	0.003	0.036	1.329	18.301
Secondary	-0.001	0.071	-0.612	35.456
University	0.015	-0.010	7.722	-5.243
No education info	0.000	0.001	-0.021	0.471
Schooling (years)	-0.012	-0.093	-5.951	-46.675
Language	0.015	-0.003	7.622	-1.378
Formal	-0.003	0.498	-1.296	250.277
Agriculture	0.042	-0.326	21.124	-163.681
Mining	-0.002	--	-0.819	--
Manufacturing	0.001	-0.049	0.311	-24.575
Utilities	--	--	--	--
Construction	0.005	-0.065	2.554	-32.525
Commerce	-0.003	-0.001	-1.518	-0.345
Transportation	-0.003	--	-1.748	--
Finance	0.000	0.005	0.020	2.672
Services	0.001	-0.005	0.617	-2.597
No occupation info	0.000	-0.010	-0.071	-5.074
<i>Mother</i>				
No education	0.041	-0.002	20.751	-1.237
Less than primary	0.002	-0.047	0.768	-23.589
Primary	-0.005	-0.048	-2.418	-23.984
Secondary	0.001	-0.013	0.254	-6.630
University	0.016	0.005	7.973	2.752
No education info	0.000	--	0.087	--
Schooling (years)	-0.058	0.069	-29.229	34.505
Language	0.001	0.213	0.515	107.002
Formal	-0.016	-0.146	-8.064	-73.143
Agriculture	0.026	0.136	12.852	68.287
Manufacturing	0.003	0.023	1.496	11.565
Construction	0.006	0.027	2.775	13.741
Commerce	-0.003	-0.001	-1.691	-0.348
Finance	0.001	-0.003	0.288	-1.320
Services	0.000	-0.030	0.064	-15.280
No occupation info	0.016	-0.038	7.871	-18.872
Constant	--	-0.226	--	-113.383
Total	0.099	0.100	49.707	50.293
Overall	0.199		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.23. Geographic area decomposition: Mestizo and white female coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	0.103	-0.079	18.327	-13.985
Mother born in rural area	0.035	0.044	6.220	7.816
Constant	--	0.458	--	81.623
Total	0.138	0.423	24.546	75.454
Overall	0.561		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.24. Wage decomposition: Mestizo and white female coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.031	-0.171	-4.340	-23.958
Years of Schooling	0.451	0.037	63.265	5.238
Formal	0.097	-0.046	13.555	-6.497
Rural	0.077	-0.023	10.793	-3.158
Constant	--	0.322	--	45.103
Total	0.594	0.119	83.272	16.728
Overall	0.713		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.25. Overall wage decomposition: Mestizo and white female coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.031	-0.171	--	-4.340	-23.956	--
Years of Schooling	0.243	0.037	0.208	34.084	5.238	29.176
Formal	0.048	-0.046	0.049	6.739	-6.497	6.818
Rural	0.019	-0.023	0.058	2.664	-3.158	8.132
Constant	--	0.322	--	--	45.100	--
Total	0.279	0.119	0.315	39.147	16.726	44.127
Overall		0.713			100.0	

Source: EMEDINHO and ENEMDUR 2000

Table C.26. Education decomposition: Indigenous and Afro-descendant female coefficients

Variables	Contribution of each variable to educational differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.787	0.509	15.161	9.803
Less than primary	0.004	-0.076	0.076	-1.464
Primary	-0.089	0.210	-1.722	4.054
Secondary	0.007	0.130	0.133	2.512
University	0.912	-0.857	17.579	-16.513
No info	0.003	-0.030	0.048	-0.574
Schooling (years)	0.239	-0.581	4.598	-11.196
Language	-0.119	-0.060	-2.303	-1.158
<i>Mother</i>				
No education	1.270	1.174	24.473	22.635
Less than primary	0.042	0.220	0.805	4.238
Primary	-0.222	0.649	-4.277	12.500
Secondary	0.005	0.239	0.103	4.604
University	-0.621	1.097	-11.973	21.145
No info	--	0.001	--	0.012
Schooling (years)	-0.971	0.636	-18.722	12.258
Language	0.520	0.005	10.031	0.089
Constant	--	0.158	--	3.044
Total	1.765	3.424	34.011	65.989
Overall		5.188		100

Source: EMEDINHO and ENEMDUR 2000

Table C.27. Sector decomposition: Indigenous and Afro-descendant female coefficients

Variables	Contribution of each variable to sector differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
<i>Father</i>				
No education	0.063	0.051	31.777	25.573
Less than primary	0.001	0.027	0.441	13.523
Primary	-0.021	0.060	-10.421	30.055
Secondary	0.004	0.065	2.000	32.852
University	0.082	-0.077	41.049	-38.570
No education info	0.000	0.001	-0.065	0.515
Schooling (years)	0.040	-0.145	20.296	-72.934
Language	0.013	0.000	6.283	-0.038
Formal	0.024	0.471	12.177	236.855
Agriculture	-0.092	-0.192	-46.161	-96.426
Mining	--	-0.002	--	-0.820
Manufacturing	-0.023	-0.025	-11.473	-12.796
Utilities	--	--	--	--
Construction	-0.016	-0.044	-7.915	-22.062
Commerce	--	-0.004	--	-1.863
Transportation	--	-0.003	--	-1.749
Finance	0.000	0.005	-0.021	2.692
Services	0.011	-0.015	5.666	-7.647
No occupation info	0.010	-0.020	5.070	-10.215
<i>Mother</i>				
No education	0.040	-0.001	20.192	-0.674
Less than primary	-0.002	-0.043	-1.234	-21.592
Primary	0.023	-0.075	11.519	-37.927
Secondary	0.000	-0.012	-0.185	-6.193
University	-0.070	0.091	-35.072	45.799
No education info	--	0.000	--	0.087
Schooling (years)	-0.098	0.108	-49.140	54.418
Language	0.209	0.005	105.035	2.504
Formal	-0.070	-0.092	-35.166	-46.057
Agriculture	0.126	0.036	63.160	17.996
Manufacturing	0.015	0.011	7.752	5.311
Construction	0.021	0.012	10.315	6.205
Commerce	--	-0.004	--	-2.040
Finance	--	-0.002	--	-1.033
Services	0.010	-0.041	5.208	-20.427
No occupation info	0.049	-0.071	24.752	-35.755
Constant	--	-0.226	--	-113.406
Total	0.350	-0.151	175.838	-75.838
Overall	0.199		100	

Source: EMEDINHO and ENEMDUR 2000



Table C.28. Geographic area decomposition: Indigenous and Afro-descendant female coefficients

Variables	Contribution of each variable to geographic differential		Contribution as a percentage of total differential	
	Endowments	Unexplained	Endowments	Unexplained
Father born in rural area	0.174	-0.150	31.032	-26.691
Mother born in rural area	-0.004	0.083	-0.718	14.754
Constant	--	0.458	--	81.623
Total	0.1701	0.3910	30.3138	69.6862
Overall	0.561		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.29. Wage decomposition: Indigenous and Afro-descendant female coefficients

Variables	Contribution of each variable to (Log) earnings differential		Contribution as a percentage of total earnings differential	
	Endowments	Unexplained	Endowments	Unexplained
Years of Experience	-0.063	-0.139	-8.793	-19.505
Years of Schooling	0.413	0.076	57.901	10.602
Formal	0.125	-0.075	17.513	-10.455
Rural	0.060	-0.005	8.378	-0.743
Constant	--	0.322	--	45.103
Total	0.535	0.178	74.998	25.002
Overall	0.713		100	

Source: EMEDINHO and ENEMDUR 2000

Table C.30. Overall wage decomposition: Indigenous and Afro-descendant female coefficients

Variables	Contribution of each variable to (Log) earnings differential			Contribution as a percentage of total earnings differential		
	Endowments	Direct discrimination	Indirect discrimination	Endowments	Direct discrimination	Indirect discrimination
Years of Experience	-0.063	-0.139	--	-8.790	-19.498	--
Years of Schooling	0.140	0.076	0.272	19.686	10.598	38.195
Formal	0.220	-0.075	-0.095	30.783	-10.451	-13.277
Rural	0.018	-0.005	0.042	2.523	-0.743	5.887
Constant	--	0.322	--	--	45.087	--
Total	0.315	0.178	0.220	44.202	24.993	30.805
Overall		0.713			100.0	

Source: EMEDINHO and ENEMDUR 2000

## APPENDIX D: Garcia Aracil-Winter Model

Table D.1. Wage determinants with Heckman Correction for sample bias (wage-earners) based on replicate of Garcia-Aracil: Winter model using EMEDINHO and ENEMDUR 2000 data

Dependent Variable	Indigenous	Non-Indigenous
Log of monthly earnings		
Independent Variables		
Years of schooling	0.100***	0.090***
	0.012	0.002
Years of experience	0.036***	0.037***
	0.012	0.002
Years of experience squared	-0.0004**	-0.0005***
	0.0002	0.00004
Log of hours worked	0.263**	0.490***
	0.136	0.020
Gender (Female=1)	-0.514***	-0.287***
	0.095	0.015
Urban (=1)	0.218**	0.135***
	0.098	0.020
Constant	1.874***	1.523***
	0.689	0.110
Instruments		
Age	-0.007*	0.007***
	0.004	0.001
Mother's years of education	0.007	0.021***
	0.009	0.001
Number of Males 0-5 at home	-0.052	0.008
	0.058	0.012
Number of Males 6-15 at home	0.075**	-0.117***
	0.038	0.009
Number of Males 16-25 at home	-0.109**	-0.020**
	0.048	0.008
Number of Males 26-60 at home	-0.001	-0.017
	0.082	0.011
Number of Males 61-99 at home	-0.253**	-0.259***
	0.130	0.022

*Source: EMEDINHO and ENEMDUR 2000*

Table D.1. (Continued).

Dependent Variable	Indigenous	Non-Indigenous
Log of monthly earnings		
Independent Variables		
Number of Females 0-5 at home	-0.101*	0.016
	0.056	0.013
Number of Females 6-15 at home	-0.097**	-0.129***
	0.045	0.009
Number of Females 16-25 at home	0.011	0.011
	0.049	0.009
Number of Females 26-60 at home	-0.099	0.093***
	0.078	0.012
Number of Females 61-99 at home	-0.185	-0.032
	0.138	0.021
Constant	-0.641***	-0.972***
	0.171	0.029
Wald Chi2(4)	198.740	3752.120
Observations	231	9011

## APPENDIX E: Larrea-Montenegro Model

Table E.1. Wage determinants based on replica of Larrea-Montenegro model using EMEDINHO and ENEMDUR 2000 data

	Indigeno us	Non-Indigenous
<b>Dependent Variable</b>		
Log of monthly earnings		
<b>Independent Variables</b>		
Years of schooling	0.056* 0.028	-0.003 0.009
Years of schooling squared	0.001 0.002	0.004*** 0.000
Years of experience	0.0280 0.0202	0.0296*** 0.00425
Years of experience squared	0.000 0.001	-0.001*** 0.000
Years of experience cubed	- 0.000003 0.00001	0.000003* 0.000
Log hours worked per week	0.454** 0.152	0.513*** 0.028
Formal sector (=1)	0.512*** 0.092	0.320*** 0.028
Agriculture (=1)	-0.365*** 0.092	-0.07** 0.027
Domestic Worker (=1)	-0.658* 0.358	0.100 0.231
Wage-earner (=1)	-0.113 0.278	0.596*** 0.229
Laborer (=1)	0.006 0.272	0.479** 0.228
Self-employed (=1)	-0.538* 0.325	-0.125 0.228
Coast (=1)	-- --	-0.020 0.018
Highlands (=1)	0.124 0.123	-- --
Amazon (=1)	0.182 0.155	0.056 0.061
Household head (=1)	0.110 0.103	0.228*** 0.021
Constant	1.189* 0.649	0.843*** 0.254
<b>R-squared</b>	0.363	0.410
<b>Observations</b>	442	12607

Source: EMEDINHO and ENEMDUR 2000

**APPENDIX F: Comparison Of Oaxaca-Blinder Decomposition Outcomes:  
Different Authors**

Table F.1. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca-Blinder decomposition outcomes (indigenous and Afro-descendant coefficient)

Component	Gallardo- Wage Decomposition <sup>1</sup>				Gallardo-Earnings Decomposition <sup>1</sup>			Garcia-Aracil and Winter <sup>2</sup>	Larrea and Montenegro <sup>3</sup>
	Self identification based		Language based		Language based			Language based	Language based
	Male	Female	Male	Female	Total	Male	Female	Male and Female	Male and Female
<b>Explained</b>	0.105	0.105	-0.017	0.243	0.252	0.263	0.315	0.6633	0.383
<b>Unexplained (Discrimination)</b>	0.14	0.446	0.098	0.452	0.183	0.067	0.398	0.3787	0.309
<b>Total</b>	0.246	0.551	0.081	0.695	0.435	0.33	0.713	1.042	0.691

<sup>1</sup> Source: EMEDINHO and ENEMDUR 2000

<sup>2</sup> Source: Garcia-Aracil and Winter 2006

<sup>3</sup> Source: Larrea and Montenegro 2006

Table F.2. Comparison of Gallardo, Garcia Aracil and Winter (2006) and Larrea and Montenegro (2006) Oaxaca-Blinder decomposition outcomes (%) (indigenous and Afro-descendant coefficient)

Component	Gallardo- Wage Decomposition <sup>1</sup>				Gallardo-Earnings Decomposition <sup>1</sup>			Garcia-Aracil and Winter <sup>2</sup>	Larrea and Montenegro <sup>3</sup>
	Self identification based		Language based		Language based			Language based	Language based
	Male	Female	Male	Female	Total	Male	Female	Male and Female	Male and Female
<b>Explained</b>	42.683	19.056	-20.988	34.964	57.836	79.775	44.202	63.656	55.427
<b>Unexplained (Discrimination)</b>	56.911	80.944	120.988	65.036	42.164	20.043	55.798	36.344	44.718
<b>Total</b>	100	100	100	100	100	100	100	100	100

<sup>1</sup> Source: EMEDINHO and ENEMDUR 2000

<sup>2</sup> Source: Garcia-Aracil and Winter 2006

<sup>3</sup> Source: Larrea and Montenegro 2006



## REFERENCES

Altonji, Joseph G. and Blank, Rebecca M. (1999). "Race and Gender in the Labor Market." In Gene M. Grossman and Kenneth Rogoff, eds., *Handbook of Labor Economics*, Vol.3. Amsterdam, The Netherlands: Elsevier Science Publishers B.V.

Anderson, Lisa, Fryer, Roland G., Holt, Charles A. (2005). "Discrimination: Experimental Evidence from Psychology and Economics, in William Rogers, ed., *Handbook of Economics of Discrimination*, forthcoming.

Ashenfelter, Orley and Oaxaca, Ronald L. (1991). "Labor Market Discrimination and Economic Development." In Nancy Birdsall and Richard Sabot, eds., *Unfair advantage: Labor Market Discrimination in Developing Countries*. Washington, D.C.: The World Bank.

Baiocchi, Gianpaolo (2003). *After Dependency: New Approaches to (New) Inequalities in Latin America and the Caribbean in the Sociological Literature*. Washington, D.C.: The World Bank.

Becker, Gary S. (1957, rev. 1971) "The Economics of Discrimination." Second Edition. The University of Chicago Press.

Birdsall, N. and R. Sabor, eds. (1991) "Unfair Advantage Labor Market Discrimination in Developing Countries." Washington, D.C.: The World Bank.

Black, S.E., Devereux, P.J., and Salvanes, K.G. (2003). "Is Education inherited? Understanding Intergenerational Transmission of Human Capital". Mimeo, The Norwegian School of Economics and Business Administration and IZA.

Blinder, Alan S. (1973). "Wage Discrimination: Reduced Form and Structural Estimates." *The Journal of Human Resources*, Vol.8, No.4, pp. 436-455.

Bourguignon, François, Ferreira, Francisco H.G. and Leite, Phillippe, G. (2002). "Beyond Oaxaca-Blinder: Accounting for Differences in Household Income Distributions Across Countries." Texto Para Discussão No.452. Departamento de Economia. PUC-RIO.

Buvinic, Mayra; Jacqueline Mazza and Deutsch, Ruthane, eds. (2005) "Social Inclusion and Economic Development in Latin America." John Hopkins University Press.

Cain, Glen G. (1986). "The Economic Analysis of Labor Market Discrimination: A Survey." In Orley Ashenfelter and Richard Layard eds., *Handbook of Labor*

*Economics*, Vol.1. Amsterdam, The Netherlands: Elsevier Science Publishers B.V.

Cunningham, Wendy and Jacobsen, Joyce P. (2003). "Earnings Inequality Within and Across Gender, Racial, and Ethnic Groups in Latin America." Washington, D.C.: World Bank.

De Ferranti, David, Perry, Guillermo E., Ferreira, Francisco H.G., Walton, Michael (2003). "Inequality in Latin America and the Caribbean: Breaking with History?" Washington D.C.: The World Bank.

De la Torre Espinosa, Carlos (1996). "El Racismo en Ecuador: Experiencias de los indios de Clase Media" Consejo Latinoamericano de Ciencias Sociales. Buenos Aires, Argentina.

Deutsch, Ruthane, Morrison, Andrew, Piras, Claudia and Ñopo, Hugo (2001). "Working within Confines: Occupational Segregation by Gender for Three Latin American Countries" Washington D.C.: Inter-American Development Bank.

Hanratty, Dennis. (1989). "Ecuador: A Case Study." Library of Congress Federal Research Division.

Gallardo, Maria Lourdes. (2000). "The Alleviation of Social Exclusion of the Indigenous Communities in Peru: the Impact of the Social Investment Fund". MPA Thesis. Cornell University.

García-Aracil, Adela and Winter, Carolyn (2006). "Gender and Ethnicity differentials in School Attainment and Labor Market Earnings in Ecuador" *World Development*, Vol. 34, pp.289-307.

Gonzalez, Mary Lisbeth. (1994). "How Many Indigenous People?" In Harry A. Patrinos and George Psacharopolous, eds., *Indigenous People and Poverty in Latin America*. Washington, D.C.: The World Bank.

Jacobsen, Joyce P. and Skillman, Gilbert L. (2004). "Labor Markets and Employment Relationships: A Comprehensive Approach." Oxford: Blackwell Publishing.

Larrea, Carlos and Montenegro Torres, Fernando (2005). "Ecuador." In Harry A. Patrinos and Gillette Hall eds., *Indigenous Peoples, Poverty and Human Development in Latin America: 1994-2004*. Washington, D.C.: The World Bank.

Leon, Irene (2001). "Ecuador: For diversity and Pluralism"  
<http://www.hri.ca/racism/meetings/ecadorforum2.shtml>

Machado, Jose A.F. and Mata, Jose (2005). "Counterfactual Decomposition of Changes in Wage Distributions Using Quantile Regression." *Journal of Applied Econometrics*, 20, pp. 445-465.

Maclsaac, Donna (1994). "Peru." In Harry A. Patrinos and George Psacharopoulos, eds., *Indigenous People and Poverty in Latin America*. Washington, D.C.: The World Bank.

Maclsaac, Donna and Rama, Martin (1997). "Determinants of Hourly Earnings in Ecuador: the Role of Labor Market Regulations." Policy Research Working Paper Series No.1717. Washington, D.C.: The World Bank.

Ñopo, Hugo, Saavedra, Jaime and Torero, Máximo (2004). "Ethnicity and Earnings in Urban Peru." GRADE. Lima, Peru.

Oaxaca, Ronald L. (1973). "Male-Female Wage Differentials in Urban Labor Market." *International Economic Review*, 14(3), pp.693-709.

Oaxaca, Ronald L. and Ransom, Michael, R. (1994). "On Discrimination and the Decomposition of Wage Differentials" *Journal of Econometrics*, 61, pp.154-157.

Oaxaca, Ronald L. and Ransom, Michael, R. (1999). "Identification in Detailed Wage Decompositions." *The Review of Economics and Statistics*. Vol.81, No.1, pp.154-157.

Patrinos, Harry A. (1994). "The Costs of Ethnicity: An International Review." In Harry A. Patrinos and George Psacharopoulos, eds., *Indigenous People and Poverty in Latin America*. Washington, D.C.: The World Bank.

Patrinos, Harry A. and Hall, Gillette (2005). "Indigenous Peoples, Poverty and Human Development in Latin America: 1994-2004." Washington, D.C.: The World Bank.

Patrinos, Harry A. and Psacharopoulos, George, eds. (1994). "Indigenous People and Poverty in Latin America: An Empirical Analysis." Washington, D.C.: The World Bank.

Postlewaite, Andrew and Silverman, Dan, (2004). "Social Isolation and Inequality." Penn Institute for Economic Research Working Paper 05-001. University of Pennsylvania.

Sanchez, Jhon Anton (2004). "Informe: Racismo y Discriminacion Racial en Ecuador 2004." Ecuador: Secretaria Tecnica del Frente Social, SISPAE.

Schultz, T.P. (1991). "Labor Market Discrimination: Measurement and Interpretation." In Nancy Birdsall and Richard Sabot, eds., *Unfair advantage: Labor Market Discrimination in Developing Countries*. Washington, D.C.: The World Bank.

Tajfel, H. (1970). "Experiments in intergroup discrimination." *Scientific American*, 223, pp.96-102.

Telles, Edward E. (2004). "Race in Another America: The Significance of Skin Color in Brazil". Princeton University Press. Princeton and Oxford.

Thorpe, Rosemary (1998). "Progress, Poverty and Exclusion: An Economic History of Latin America in the 20<sup>th</sup> Century." Johns Hopkins University Press.

Van den Berghe, Pierre L. (1972). "Race and Ethnicity; Essays in Comparative Sociology." New York: Basic Books, Inc.

World Bank (1993). "Indigenous People in Latin America: HRO Dissemination Notes." Human Resources Development and Operations Policy Department. Washington, DC.

Younger, Stephen (2002). "Consultoría sobre un estudio de discriminación en el Mercado laboral del Ecuador." Cornell University.