Poverty in Latin America

Sources Of Welfare Disparities in Ecuador

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Abstract

This paper contributes to the analysis of spatial poverty in Ecuador by deepening the understanding of the constraints faced by the poor in the country through an investigation of the role of portable characteristics (human capital) and geography in explaining welfare. At the national level, the results indicate that these characteristics explain 72 percent of the differences in welfare level between urban and rural areas, while returns to these characteristics account for 28 percent of the

difference. Comparing a leading and a lagging region, such as the coast versus the Amazon, the characteristics explain about 90 percent of the welfare differential in urban areas, while the returns explain about 30 percent of the welfare differential in rural areas. Among the characteristics analyzed, education is the most important variable for explaining differences in living conditions between urban and rural areas in Ecuador.

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♦ Background paper for the regional study on poverty in Latin America at the World Bank. These are views of the authors and do not necessarily reflect those of the World Bank, its executive directors, or the countries they represent.

Countries in Latin America continue to struggle to share the benefits of economic growth with the poor segments of their population. The progress towards achieving the first Millennium Development Goal of eradicating extreme poverty by 2015 is still far from being achieved in most Latin American countries. Another feature common in many countries in the region is geographic disparities in living standards that persist over time in spite of overall economic growth.

A better understanding of which factors influence disparities in living standards is crucial to provide better guidance to poverty reduction strategies. Two opposing views present divergent explanations on which factors are likely to influence the spatial distribution of poverty. The “concentration view” holds that poor areas arise from the persistent concentration in these areas of individuals with personal attributes that inhibit growth in their living standards. According to this view, otherwise identical individuals will have the same growth prospects independently of where they live. Thus, geography does not play a causal role in explaining the level of and growth in living standards. The other view holds that “geography” itself is the cause of the high level of poverty and weak growth of living standards over time. In areas better endowed with local public goods, such as better access to infrastructure and other basic services (electricity, water and sanitation), geographic externalities may facilitate the exit of poor households from poverty. This paper provides an applied framework to analyze which of these two views better explains spatial disparities in poverty in Ecuador.

Ecuador is located in northwestern South America, with an ethnically diverse population comprised of *mestizos* (62 percent), Amerindians (25 percent), immigrants from European countries as well as unmixed descendants of early Spanish colonist (10 percent) and Afro-Ecuadorians (3 percent). The population of over 13,750,000 people (in 2008) is growing at a rate of 1.1 percent per year,¹ and one of every four Ecuadorians is between 15 and 29 years old. Nearly 60 percent of its population lives in urban areas and the rest in the rural sector. Ecuador’s economy depends heavily on oil exports, which accounts for an average of 35 percent of GDP (1997-2001). In the past three decades, GDP per capita growth has been low, at an average of 1.7 percent annually during 1970-2002. GDP volatility has been high, mainly as a consequence of external shocks such as downturns in commodity prices, as well as unstable fiscal policy. At the end of 1999 Ecuador faced a severe economic crisis due to several factors: external economic shocks, “El Niño” weather phenomenon (1997) and poor economic management. The economy recovered after the 1999 crisis, with GDP per capita rising to 2.1, 6.5 and 4.5 percent in 2003, 2004 and 2005, respectively. Average inflation fell from an annual rate of 52.2 percent in 1999 to 7.9 percent in 2003, 2.7 percent in 2004 and 2.1 percent in 2005.²

Poverty and inequality remain a major concern for Ecuador. According to the World Bank’s Poverty Assessment for Ecuador (2004), poverty increased from 40 percent in 1990 to 45 percent in 2001 (mainly as a consequence of the 1999 crisis), and fell to around 36 percent between 2001 and 2004 (mainly as a consequence of macroeconomic stabilization). While poverty declined in both urban and rural areas, in 2004 the rural poverty rate was still more than twice the urban poverty rate.

With these differences in mind, the goal of this paper is to evaluate how much of the difference in standards for living across areas and regions in Ecuador can be attributed to disparities in the mobile non-geographic variables, and how much to location differences in the returns to those characteristics. The paper follows closely the methodological framework of Ravallion and Wodon (1999), in which they propose a methodology for decomposing the differentials in living standards between geographical areas into: a) differences in non-geographic characteristics and b) differences in returns to those characteristics.

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¹ World Development Indicators database, April 2008.

² Idem.

The paper is structured as follows. Section 1 presents a brief description of the data, and Section 2 presents the model. Section 3 discusses the national-level results from the model using regression analysis to test the relationship between different household characteristics and welfare. Section 4 carries out the decompositions at the national level to analyze the relative importance of characteristics and returns to characteristics on welfare. Section 5 discusses the extension of the model to allow for comparisons within and across regions. Section 6 concludes.

1. Data Source

This analysis uses data from the Living Conditions Survey (*Encuesta de Condiciones de Vida*—ECV) for 2005-2006. The ECV is a micro-level dataset collected by Ecuador's National Statistics and Census Institute (*Instituto Nacional de Estadística y Censos*—INEC). The ECV collects information about individual characteristics like gender, age, education, main activity, income, household's attributes, and detailed information on the expenses of the household. The survey is representative at the national level and by urban and rural areas. Other representative areas include Quito, Guayaquil, Cuenca and Machala. The survey design was stratified, multi-staged and clustered. At the first and second stages the units were selected with probability proportional to the number of households on them, while at the third stage households were selected with equal probability. Weights are then necessary to get suitable estimations. The final sample size was 13,581 households, 8,065 in urban area and 5,516 in rural areas (Table 1).

Table 1. Households by Region

Region	Urban	Rural	Total
Sierra	3,815	3,451	7,266
Costa	3,770	1,537	5,307
Oriente	480	528	1,008
Total	8,065	5,516	13,581

Source: Own calculations based on ECV.

Nation-wide, the ECV indicates that urban households have an average consumption of one and a half times the poverty line, while the mean consumption of rural households is almost equal to the poverty line.

2. Model

A linear model is used to estimate the contribution of location differences in living standards after controlling for non-geographic attributes. The dependent variable is the logarithm of the welfare ratio, which is a proxy for living standards, and the independent variables are household attributes. These are two different regression equations, one for each area (urban and rural). The model is as follows:

$$\ln W_i = \alpha_U + \beta'_U \mathbf{X}_i + \delta'_U \mathbf{G}_i + \varepsilon_{Ui} \quad (i \in U), \quad (1)$$

$$\ln W_i = \alpha_R + \beta'_R \mathbf{X}_i + \delta'_R \mathbf{G}_i + \varepsilon_{Ri} \quad (i \in R), \quad (2)$$

where W_i denotes the welfare ratio, defined as the per capita consumption deflated or divided by a national poverty line at the household i , $\mathbf{X}_i$ is a vector of non-geographic variables for the household i , $\mathbf{G}_i$ is a vector of geographical dummy variables (provinces), and U and R denote the urban and rural

areas. The error terms, ε_{Ui} and ε_{Ri} , are assumed to be independent and identically distributed with zero mean; α_U , α_R , β_U , β_R , δ_U and δ_R are the parameters to be estimated.³

Based on the above specification, differences in living standards between different geographic areas may be attributed to two main factors:

1. differences in the mobile non-geographic characteristics between urban and rural areas, holding all else constant, i.e. differences between X_{Ui} and X_{Ri} ; or
2. differences in the returns to characteristics, holding all else constant, i.e. differences between β_U and β_R .

The vectors $\mathbf{X}_i$ and $\mathbf{G}_i$ of explanatory variables include the following:

- *Demographics*. The number of babies, children, teenagers and adults; age of the household head and their squared values; gender of the household head; household structure (household head married with spouse, single without spouse, separated/divorced/widowed without spouse, and married without spouse present); and ethnicity of household head (indigenous, mixed raced, white, black, other).
- *Education*. Level of education according to the household head and his/her spouse years of schooling (none, one to four, five to seven, eight to 10, 11 to 13 and 14 or more years).
- *House ownership*. Four categories: own, rent, own and paying, other.
- *Occupation status*. Whether the household head is an employee, employer, self-employed, employee without pay, farm laborer, owner-farmer, self-employed farm laborer or not working.
- *Geography*. In addition to urban and rural areas, there are dummies for each of the 21 provinces⁴ (the ECV excludes the Galápagos islands): Azuay, Bolívar, Cañar, Carchi, Cotopaxi, Chimborazo, El Oro, Esmeraldas, Guayas, Imbabura, Loja, Los Ríos, Manabí, Morona Santiago, Napo, Orellana, Pastaza, Pichincha, Tungurahua, Sucumbíos and Zamora.

Several of the variables mentioned above are categorical, therefore it is necessary to leave one category as a reference group. Those categories are: Pichincha province (the location of Quito, Ecuador's capital), male household head, married with spouse, no education of household head, no education of spouse, owner of house, and employee.

Analogous equations to (1) and (2) are estimated by region in order to allow for variation of coefficients across regions, as follows:

$$\ln W_i = \alpha_{Uk} + \beta'_{Uk} \mathbf{X}_i + \varepsilon_{Uki} \quad (i \in Uk), \quad (1')$$

$$\ln W_i = \alpha_{Rk} + \beta'_{Rk} \mathbf{X}_i + \varepsilon_{Rki} \quad (i \in Rk), \quad (2')$$

where Uk and Rk denote the urban and rural areas of region k , respectively; $k = S, C, O$ denotes Sierra ("mountain"), Costa ("coast") and Oriente ("east" or "jungle"). These regions are conformed by the following provinces:

³ The omitted variables are assumed to be uncorrelated with place of residence, otherwise the estimates of geographic effects will be biased.

⁴ Note: The provinces of Santa Elena and Santo Domingo de los Tsachilas were created in 2007, and were not used in the survey data employed by this study.

- Sierra: Azuay, Bolívar, Cañar, Carchi, Cotopaxi, Chimborazo, Imbabura, Loja, Tungurahua and Pichincha provinces, which account for 47 percent of households in Ecuador.
- Costa: El Oro, Esmeraldas, Guayas, Los Ríos and Manabí provinces, which account for 49 percent of households in Ecuador.
- Oriente: Morona Santiago, Napo, Orellana, Pastaza, Sucumbíos and Zamora provinces, which account for 4 percent of the households in the country.

The urban-rural composition in the first two regions is similar, with 65 percent of the households in the urban area in the case of Sierra and 75 percent in the case of Costa. In the Oriente region, approximately 61 percent of households are in rural areas.

3. Estimates from the Model at the National Level

This section estimates the returns to each one of the household characteristics at the national level, by urban and rural areas, using linear regression. This is the necessary first step before subsequently moving on to the decomposition analysis.

The explanatory variables from equations (1) and (2) included in the model explain approximately 59 percent and 52 percent of the variability in the welfare ratio for urban and rural areas, respectively (Table 2).⁵ The estimated effects differ by areas. However, these effects are significant and with the expected sign by area. The analysis indicates the following:

- An increase in household size and having a female household head is correlated with lower consumption; the welfare ratio for a household head with spouse is less than the welfare ratio of a household head without spouse; an increase in the household head's age increases the welfare ratio; and the welfare ratio is lower for indigenous household heads.
- The welfare ratio of a household head with some education is greater than the welfare ratio of a household head with no education, and the same result applies to the education of the spouse. The returns to education of the household head's spouse are significant in both urban and rural areas, but higher in urban areas.
- Consumption is lower in households that do not own their house (rent, paying, other) compared to households with their own house.
- Welfare ratios are higher for employers or owner-farmers than for employees, and lower for the self-employed, employees without pay, farm laborers, self-employed farm laborers or those not working.
- On average, consumption in several provinces is lower than in Pichincha province, which includes the national capital. Estimated coefficients for rural and urban areas are different for some provinces.

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⁵ In order to estimate the parameters and their standard errors, the survey design was taken into account.

Table 2. Regressions for Log Welfare Ratio

Explanatory variables	Urban		Rural	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-0.336 *	0.101	-0.279 *	0.107
Province				
Azuay	0.142 *	0.040	-0.001	0.085
Bolívar	-0.265 *	0.077	-0.238 *	0.090
Cañar	-0.027	0.049	0.071	0.091
Carchi	-0.333 *	0.047	-0.438 *	0.095
Cotopaxi	-0.169 *	0.055	-0.063	0.085
Chimborazo	-0.198 *	0.056	-0.202 *	0.089
El Oro	-0.186 *	0.039	-0.145	0.094
Esmeraldas	-0.191 *	0.044	-0.174 *	0.084
Guayas	-0.247 *	0.036	-0.057	0.089
Imbabura	-0.200 *	0.042	-0.294 *	0.100
Loja	-0.077 **	0.043	-0.272 *	0.094
Los Ríos	-0.382 *	0.039	-0.112	0.086
Manabí	-0.358 *	0.047	-0.189 *	0.082
Morona Santiago	0.020	0.083	-0.601 *	0.166
Napo	-0.221	0.139	-0.351 *	0.141
Pastaza	-0.123 *	0.052	-0.374 *	0.158
Tungurahua	-0.035	0.039	-0.089	0.077
Zamora	-0.197 *	0.084	-0.298 *	0.092
Sucumbíos	-0.002	0.044	-0.209 *	0.085
Orellana	-0.039	0.055	-0.335 **	0.175
Demographics				
Number of babies	-0.296 *	0.036	-0.376 *	0.032
Number of babies squared	0.035	0.021	0.076 *	0.018
Number of children	-0.272 *	0.014	-0.264 *	0.015
Number of children squared	0.024 *	0.004	0.024 *	0.004
Number of teenagers	-0.209 *	0.022	-0.141 *	0.023
Number of teenagers squared	0.015	0.010	0.012 **	0.007
Number of adults	-0.109 *	0.016	-0.076 *	0.017
Number of adults squared	0.005 *	0.002	0.007 *	0.003
Sex of the head	-0.022	0.027	-0.091 *	0.036
No spouse, single	0.253 *	0.052	0.092 **	0.048
No spouse, separated/divorced/widowed	0.227 *	0.048	0.206 *	0.037
No spouse, married	0.422 *	0.065	0.459 *	0.070
Age of household head	0.028 *	0.003	0.020 *	0.003
Age of household head squared	-0.0002 *	0.000	-0.0002 *	0.000
Mixed race (mestizo) household head	0.071 **	0.040	0.214 *	0.038
White household head	0.167 *	0.049	0.261 *	0.054
Black household head	0.026	0.053	0.274 *	0.060

Mixed race (mulato) household head	0.041	0.050	0.262 *	0.068
Other ethnicity household head	0.093	0.350	----	
Education of Household Head				
1 - 4 years	0.255 *	0.047	0.156 *	0.028
5 - 7 years	0.452 *	0.046	0.276 *	0.029
8 - 10 years	0.572 *	0.047	0.397 *	0.037
11 - 13 years	0.765 *	0.051	0.520 *	0.050
14 - + years	1.135 *	0.056	0.913 *	0.101
Education of Spouse				
1 - 4 years	0.020	0.043	0.036	0.030
5 - 7 years	0.124 *	0.044	0.086 *	0.029
8 - 10 years	0.156 *	0.046	0.144 *	0.040
11 - 13 years	0.267 *	0.045	0.216 *	0.052
14 - + years	0.472 *	0.048	0.512 *	0.075
House Ownership				
Rent	-0.130 *	0.018	0.042	0.060
Own and paying	-0.004	0.036	0.269 *	0.127
Other	-0.146 *	0.020	-0.057 *	0.027
Position in Occupation				
Employer	0.313 *	0.027	0.297 *	0.052
Self-employed	-0.051 *	0.017	-0.062 *	0.031
Employee no pay	0.057	0.048	-0.154 *	0.054
Farm labourer	-0.131 *	0.030	-0.169 *	0.026
Owner farmer	0.238 *	0.055	0.217 *	0.039
Self-employed farm labourer	-0.232 *	0.057	-0.197 *	0.029
Not working	-0.046 **	0.027	-0.302 *	0.041

Source: Own calculations based on ECV.

Note: Number of observations: 7950 (urban) and 5481 (rural). $R^2=0.59$ (urban) and 0.52 (rural), * indicates that the coefficient is significant at the 5 percent level, and ** at the 10 percent level. The base categories are: Pichincha area (Quito belongs to that area), male household head, married with spouse, indigenous household head, no education of household head, no education of spouse, own house and employee.

According to the F tests, the null hypothesis $H_o : \beta_{l,U} = \beta_{l,R}, \dots, \beta_{l_M,U} = \beta_{l_M,R}$, where β_{l_m} is the coefficient for the category m of variable l and M is the number of categories of this variable—i.e., the hypothesis that the effects of all categories of variable l are the same in urban and rural areas—is rejected for almost all variables (Table 3). In other words, all the explanatory variables but education of the spouse have different effects in urban than in rural sectors.

Table 3. Test of Equality of Coefficients Between Urban and Rural Regressions

Variable	Number of restrictions	T value / F value	P value	Test (5% level)
Constant	1	-2.61	0.01	Rejected
Province	20	5.38	0.00	Rejected
Demographics	18	5.87	0.00	Rejected
Education variables	10	2.04	0.03	Rejected
Education of Household Head	5	2.95	0.01	Rejected
Education of Spouse	5	0.63	0.68	Not rejected

House Ownership	3	5.16	0.00	Rejected
Position in occupation	7	5.58	0.00	Rejected

Source: Own calculations based on ECV Survey.

Annex 1 presents the results for the three regions chosen in the analysis using equations (1') and (2'). The Oriente region (mainly the rural part) is very different to the rest of the regions in characteristics and on returns. By contrast the Sierra (including Quito) and Costa (including Guayaquil) appear to be more similar on characteristics and returns.

4. Decompositions at the National Level

In light of the salient differences in per capita income between rural-urban areas and across provinces, the following analysis considers the contribution of household characteristics to per capita income differences. These differences may come from differences in characteristics (for example, a lower level of education in rural areas) or from differences in the returns to characteristics (for example, a lower impact of education on earnings and thereby a lower per capita income in rural areas). In some cases, the differences in characteristics and in the returns to characteristics reinforce each other, but in other cases they might not. This is analyzed using the Oaxaca-Blinder decomposition of the income gap between assets and returns to those assets (Blinder 1973 and Oaxaca 1973). The estimates from equations (1) and (2) are used to analyze the comparisons. Three types of geographic comparisons are examined: i) the difference in mean welfare ratios between urban and rural areas, ii) the difference within the urban and rural sectors across provinces, and iii) the difference between urban and rural areas within a given province.

The first questions concern the overall differential in living standards between urban and rural areas at the national level. This entails a comparison of urban-rural differentials in mean welfare ratios, given by (3):

$$\begin{aligned}
& E[\log W_i | i \in U, \mathbf{X}_i = \mathbf{X}_U] - E[\log W_i | i \in R, \mathbf{X}_i = \mathbf{X}_R] \\
& = (\alpha_U - \alpha_R) + (\beta'_U \mathbf{X}_U - \beta'_R \mathbf{X}_R) + \sum_j (p_{Uj} \delta_{Uj} - p_{Rj} \delta_{Rj}) \quad (3)
\end{aligned}$$

where $\mathbf{X}_U$ and $\mathbf{X}_R$ are the sample means for urban and rural areas respectively, and p_{Uj} and p_{Rj} are the proportions of province j 's population in each area.

Table 4 shows the result obtained for equation (3) using the coefficients showed in Table 2 and the means reported in Annex Table A1. The difference in the intercepts, -0.057, gives the difference between the fitted log welfare ratio for a married couple, both illiterate, with a male indigenous household head who owns a house and is an employee living in the urban Pichincha area, and a household with the same characteristics located in the rural Pichincha area. Among the non-geographic variables that could cause the differential impact in urban and rural areas, house ownership is a minor factor. The next variable in order of significance is the occupation of household head, while most of the differential is due to demographic variables and education. In fact, demographics accounts for around 32 percent of the differential in log welfare ratio and education for 68.5 percent approximately, which is explained by both higher levels and higher returns to education in urban sector. The difference due to the geographic variable is small, which indicates that, controlling for other characteristics, the gap between Pichincha province and all other provinces in urban areas is almost of the same order in magnitude as the gap in rural areas.

Table 4. Contribution of Variables to Average Level of Log Welfare Ratio

	Urban	Rural	Urban- Rural Difference
Mean log welfare ratio	0.689	-0.024	0.713
Decomposition			
Constant	-0.336	-0.279	-0.057
Geographic variables	-0.158	-0.141	-0.017
Demographic variables	0.418	0.185	0.233
Education variables	0.817	0.328	0.489
House ownership variable	-0.054	-0.007	-0.046
Occupation variable	0.001	-0.110	0.111

Source: Own calculations based on ECV Survey.

The comparison between urban areas or rural areas of two provinces is based simply on the comparison of the coefficients of province dummy variables in Table 2. For the urban areas, only in Azuay is the coefficient estimate positive, while in the rural areas all of the significant province coefficient estimates are negative. Households living in Pichincha appear to be better off or equal to their urban and rural counterparts from other provinces, after controlling for the non-geographic characteristics.

The second component of the right side in equation (3) reflects differentials in urban and rural consumptions due to both differences in returns and in characteristics. It does not quantify structural differences, which is accomplished by comparing the expected gain in consumption from living in urban areas of a given province over rural areas, given the national means of all non-geographic characteristics, $\mathbf{X}^*$. For province j this is given by:

$$\begin{aligned}
& E[\log W_i | i \in U, \mathbf{G}_i = \mathbf{G}^j, \mathbf{X}_i = \mathbf{X}^*] - E[\log W_i | i \in R, \mathbf{G}_i = \mathbf{G}^j, \mathbf{X}_i = \mathbf{X}^*] \\
& = (\alpha_U - \alpha_R) + (\boldsymbol{\beta}'_U - \boldsymbol{\beta}'_R) \mathbf{X}^* + (\delta_{Uj} - \delta_{Rj})
\end{aligned} \tag{4}$$

where $\mathbf{G}^j$ is a vector with zeros in all its entries except for entry j if the household belongs to province j . The first term in equation (4) is the same as in equation (3), and the second term gives the effect of urban-rural differences in the returns to household characteristics. The sum of these two terms is 0.24, which can be obtained from coefficients in Table 2 and means at national level in Table A1, and accounts for the difference between the conditional log consumption of households living in urban and rural areas of the Pichincha province when conditioning on national means. The third term is close to zero for seven of the provinces, meaning that in these provinces the differences in expected log consumptions between urban and rural areas are similar to Pichincha province (Table 5). For most of the remaining provinces, the differences are moderate to large; this suggests that residence in a given province is related to differences in expected consumption, once we control for household characteristics. The province of Morona Santiago has the largest difference in consumption between urban and rural area.

Table 5. Differences $(\delta_{Uj} - \delta_{Rj})$ and Expected Gain by Province

Province	Difference Urban - Rural	Expected gain
Azuay	0.142	0.380
Bolívar	-0.027	0.211
Cañar	-0.098	0.140
Carchi	0.105	0.343
Cotopaxi	-0.106	0.132
Chimborazo	0.004	0.242
El Oro	-0.041	0.197
Esmeraldas	-0.017	0.221
Guayas	-0.189	0.049
Imbabura	0.094	0.332
Loja	0.195	0.433
Los Ríos	-0.270	-0.032
Manabí	-0.169	0.069
Morona Santiago	0.621	0.859
Napo	0.130	0.368
Pastaza	0.250	0.488
Tungurahua	0.054	0.292
Zamora	0.101	0.339
Sucumbíos	0.207	0.445
Orellana	0.296	0.534

Source: Own calculations based on ECV.

To estimate the importance of characteristics and returns obtained from these characteristics in explaining welfare differences between urban and rural areas, we analyze each of these factors separately.

- i) *Geographic profile of living standards.* This reflects the differentials in returns between urban and rural areas, isolating the structural component, i.e., controlling for all non-geographical attributes. The geographic log welfare ratio is defined as:

$$\ln GEO_U^j = E[\log W_i | i \in U, \mathbf{G}_i = \mathbf{G}^j, \mathbf{X}_i = \mathbf{X}^*] = \alpha_U + \boldsymbol{\beta}_U' \mathbf{X}^* + \delta_{Uj}' \quad (5)$$

$$\ln GEO_R^j = E[\log W_i | i \in R, \mathbf{G}_i = \mathbf{G}^j, \mathbf{X}_i = \mathbf{X}^*] = \alpha_R + \boldsymbol{\beta}_R' \mathbf{X}^* + \delta_{Rj}' \quad (6)$$

Any differences between the log of welfare ratio in (5) and (6), for a given province, are due to differences in the returns to the common characteristics $\mathbf{X}^*$.

- ii) *Concentration profile of living standards.* This reflects the spatial concentration of non-geographic characteristics, by isolating the effects of non-geographic attributes controlling for geographic variables. The concentration log welfare ratio is defined as:

$$\log CON_U^j = E(\log W_i | \mathbf{X}_i = \mathbf{X}_U^j) = \alpha_N + \boldsymbol{\beta}_N' \mathbf{X}_U^j$$

$$\log CON_R^j = E(\log W_i | \mathbf{X}_i = \mathbf{X}_R^j) = \alpha_N + \boldsymbol{\beta}_N' \mathbf{X}_R^j,$$

where $\mathbf{X}_U^j$ and $\mathbf{X}_R^j$ represent the mean characteristics of the households living in the province j for the urban and rural areas, respectively; α_N and $\boldsymbol{\beta}_N$ are the weighted average parameters:

$$\alpha_N = p_U(\alpha_U + \sum p_{Uj}\delta_{Uj}) + p_R(\alpha_R + \sum p_{Rj}\delta_{Rj}),$$

$$\beta_N = p_U\beta_U + p_R\beta_R.$$

For most of the provinces, as was expected, both geographic and concentration urban welfare ratios are lower than the unconditional ones (Table 6). However, the reasons are not the same. In the geographic profile, this is because urban households tend to have better characteristics than households at national level. In the concentration profile, this is because the returns to better characteristics tend to be larger in urban areas than nationally. By analogous reasoning, average consumption for geographic and concentration simulations in rural areas is larger compared to an unconditional profile.

Table 6. Welfare Ratios by Province and by Urban/Rural Area (logarithms)

Province	Geographic Profile		Concentration Profile		Unconditional Profile	
	Urban	Rural	Urban	Rural	Urban	Rural
Pichincha	0.69	0.45	0.68	0.26	0.91	0.25
Azuay	0.83	0.45	0.70	0.17	1.06	0.16
Bolívar	0.42	0.21	0.70	0.04	0.66	-0.23
Cañar	0.66	0.52	0.43	0.12	0.63	0.16
Carchi	0.36	0.01	0.59	0.18	0.49	-0.26
Cotopaxi	0.52	0.39	0.68	0.09	0.74	0.00
Chimborazo	0.49	0.25	0.77	-0.03	0.81	-0.26
El Oro	0.50	0.31	0.59	0.34	0.63	0.16
Esmeraldas	0.50	0.28	0.51	0.05	0.53	-0.07
Guayas	0.44	0.39	0.59	0.11	0.58	0.06
Imbabura	0.49	0.16	0.55	0.03	0.59	-0.26
Loja	0.61	0.18	0.75	0.15	0.90	-0.15
Los Ríos	0.31	0.34	0.49	0.22	0.33	0.11
Manabí	0.33	0.26	0.55	0.09	0.42	-0.08
Morona Santiago	0.71	-0.15	0.60	-0.12	0.84	-0.74
Napo	0.47	0.10	0.84	-0.13	0.86	-0.50
Pastaza	0.57	0.08	0.63	-0.24	0.72	-0.61
Tungurahua	0.65	0.36	0.68	0.18	0.88	0.07
Zamora	0.49	0.15	0.57	0.05	0.59	-0.25
Sucumbíos	0.69	0.24	0.64	0.18	0.86	-0.02
Orellana	0.65	0.12	0.26	-0.11	0.42	-0.43

Source: Own calculations based on ECV Survey.

There are important and positive correlations between geographic and unconditional profiles (0.73 for urban, 0.91 for rural and 0.91 for national), and between concentration and unconditional profiles (0.72 for urban, 0.87 for rural and 0.96 for national), meaning that both structural differentials (returns) and disparities in characteristics (endowments) are important to explain urban-rural differences in welfare ratios within provinces.

Mean consumption—conditional on non-geographic variables set at national level—is higher in urban than in rural areas, meaning that the returns are larger for the urban sector than for rural areas. When the welfare ratio is simulated setting all parameters at the national level and explanatory variables at the mean of the province, urban measures are also higher compared to the rural ones. This is due to household characteristics that tend to increase living standards, such as education, which is higher in urban than in rural sectors.

In order to calculate profiles at the national level, equations analogous to (1) and (2) were estimated without province dummies (Table 7). The results indicate that characteristics are more important in explaining differences between urban and rural sector at the national level. Characteristics explain around 72 percent of the differential in welfare ratio, while returns explain 28 percent.

Table 7. Welfare Ratios at National Level by Urban/Rural Area (logarithms)

Profile	Urban	Rural
Geographic	0.527	0.326
Concentration	0.625	0.112
Unconditional	0.689	-0.024

Source: Own calculations based on ECV Survey.

Poverty Measures

This section presents the same analysis as above, but based on poverty rates instead of log welfare ratios. Assuming normally distributed errors, and conditioning on national sample means, the conditional probabilities of being poor for a household living in province j of urban and rural areas are represented as:

$$P[\log W_i < 0 \mid i \in U, \mathbf{G}_i = \mathbf{G}^j, \mathbf{X}_i = \mathbf{X}^*] = \Phi \left[-(\alpha_U + \beta'_U \mathbf{X}^* + \delta_{Uj}) / \sigma_U \right]$$

$$P[\log W_i < 0 \mid i \in R, \mathbf{G}_i = \mathbf{G}^j, \mathbf{X}_i = \mathbf{X}^*] = \Phi \left[-(\alpha_R + \beta'_R \mathbf{X}^* + \delta_{Rj}) / \sigma_R \right]$$

where σ_U and σ_R are the standard deviations of the errors in the urban and rural regressions and Φ is the cumulative density of the standard normal distribution. Similarly, to calculate the simulated poverty rates based on the concentration profile, the weighted average of urban and rural parameters are used.

The sources of the differences between simulations and the unconditional (actual) poverty rates are characteristics or changes in returns to those characteristics, and the assumption that logarithm of welfare ratio follows a normal distribution. Thus, the poverty rates for the unconditional profile were calculated assuming a normal distribution.

For most of the provinces, the concentration, geographic, and unconditional measures of poverty are all lower for urban than for rural areas (Table 8). The correlations between the geographic and unconditional (normal) profiles are 0.72 for urban and 0.91 for rural, and are very close to the correlations between concentration and unconditional (actual) profiles, which are 0.69 and 0.88 for urban and rural areas, respectively. The conclusions are similar to those discussed above, meaning that both returns and characteristics explain the differences in welfare ratios within each province, while at the national level characteristics are more important.

Table 8. Poverty Rates by Province and by Urban/Rural Area

Province	Geographic Profile		Concentration Profile		Unconditional Profile (normal)		Unconditional Profile	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Pichincha	8.2	18.4	8.5	30.1	11.5	36.3	12.7	42.5
Azuay	4.7	18.4	8.0	36.8	7.9	41.2	5.0	43.0
Bolívar	19.6	33.5	8.0	47.0	19.1	62.3	11.6	65.9
Cañar	9.1	14.8	19.4	40.8	20.1	41.5	13.8	41.1
Carchi	23.6	48.9	11.7	35.9	25.9	64.2	28.0	64.3
Cotopaxi	14.7	21.9	8.5	43.0	16.5	49.9	14.6	48.5
Chimborazo	16.1	30.9	6.0	52.0	14.3	64.2	16.0	68.3
El Oro	15.5	27.1	11.9	24.9	20.2	41.0	15.3	41.6
Esmeraldas	15.8	29.0	15.0	46.0	24.1	53.6	25.9	53.3
Guayas	18.6	21.6	11.6	41.5	22.2	46.9	22.4	46.2
Imbabura	16.2	37.7	13.2	47.8	21.7	64.2	21.0	68.1
Loja	10.8	36.0	6.5	38.6	11.7	58.4	8.4	63.4
Los Ríos	26.7	24.9	16.2	33.1	33.0	44.0	33.7	45.5
Manabí	25.2	30.0	13.4	42.6	29.0	54.5	31.8	61.2
Morona Santiago	7.6	61.7	11.4	59.3	13.4	84.8	17.0	77.2
Napo	17.3	42.0	4.6	60.1	12.9	75.4	16.9	71.3
Pastaza	12.7	43.8	10.3	68.4	16.9	79.9	11.9	76.0
Tungurahua	9.3	23.5	8.4	36.4	12.1	46.2	11.7	46.9
Zamora	16.1	38.0	12.5	46.4	21.9	63.5	21.4	68.2
Sucumbíos	8.3	31.4	9.7	36.0	12.7	50.8	11.4	50.8
Orellana	9.5	40.8	30.2	58.8	28.9	72.6	23.9	66.5

Source: Own calculations based on ECV Survey.

5. Decompositions at the Regional Level

This section expands the analysis from national to regional level. The analysis clearly reveals that for both the Sierra and the Costa, demographics and education account for the largest share in total log welfare ratio (Table 9). In the Costa, demographic factors account for about 28 percent of the differential in log welfare ratio, and education for more than 79 percent. In the Sierra, demographic factors account for about 32 percent of the differential in log welfare ratio, and education for more than 74 percent. In Oriente, the difference in the constant term accounts for the largest share in living standards, which means that a married couple, both illiterate, with male indigenous household head who owns a house and is an employee living in the urban Oriente has a mean log welfare ratio 0.72 higher than a household with the same characteristics located in the rural Oriente.

Table 9. Contribution of Variables to Average Level of Log Welfare Ratio by Region

	Urban-Rural Difference		
	Sierra	Costa	Oriente
Mean log welfare ratio	0.868	0.516	1.142
Decomposition			
Constant term	-0.090	-0.075	0.720
Demographic variables	0.242	0.166	-0.272
Education variables	0.682	0.383	0.494
House ownership variable	-0.089	-0.024	-0.042
Position in occupation variable	0.122	0.065	0.242

Source: Own calculations based on ECV Survey.

Comparison between urban and rural areas within each of the regions is analogous to that of national level: the concentration profile uses weighted parameters from specifications (1') and (2') and the means for urban and rural areas of the respective region, while the geographic profile was obtained by setting the mean at the regional level and the parameters estimated using (1') and (2'). To compare across the regions of the same area (urban/rural), the concentration measure uses the means of each region only for the area of interest (urban/rural) and weighted returns for the two regions in the comparison from the regressions that were estimated separately for each region. The geographic effect uses the weighted means for the two regions in the comparison and the estimated coefficients for each region and area of interest. The results are presented below.

In the Sierra and Costa, the disparities in the concentration profile between urban and rural areas are larger than the differences in the geographic profile, which means that *characteristics* are the major explanation behind welfare differentials in urban and rural areas. In the Oriente, which is mainly rural (approximately 61 percent of households), both returns and characteristics are important in order to explain the differences in welfare ratio between urban and rural sector (Figure 1). The same conclusions emerged using the poverty rates shown in Table 10.

Figure 1. Decomposition of Welfare Ratios (logarithms) Within Regions

Source: Own calculations based on ECV Survey.

Table 10. Poverty Rates by Region and Within Region

Province	Geographic Profile		Concentration Profile		Unconditional Profile (normal)		Unconditional Profile	
	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Sierra	9.4	22.3	5.9	36.5	12.5	49.8	12.8	52.6
Costa	19.2	32.4	16.6	43.6	23.0	48.6	24.2	51.0
Oriente	23.6	59.4	12.0	43.6	16.5	68.7	16.3	67.6

Source: Own calculations based on ECV Survey.

For the Oriente, characteristics and returns each explain around 50 percent of the difference in log-welfare ratios between urban and rural sector (Figure 2). In the Sierra and Costa, characteristics explain approximately 30 percent and 34 percent of the differentials, respectively.

Figure 2. Decomposition of Welfare Differences (logaritms) Within Regions

Source: Own calculations based on ECV Survey.

The urban-rural composition of the Sierra and Costa are similar, with 65 percent of the households in urban areas in the case of Sierra and 75 percent in the case of Costa, while Oriente is mainly rural, at 61 percent approximately. In terms of poverty, Costa is the lagging region in the urban sector while Oriente is behind in the rural area.

The comparison between Oriente and Costa on the one hand and Sierra and Costa on the other in urban areas reveals that urban welfare differences are mostly due to returns, rather than characteristics. In the former case, concentration plays a role also, but in spite of the fact that Oriente has better characteristics than Costa, which yields a difference in the concentration profile, it is smaller than the difference in the returns. In the second comparison, both regions have similar characteristics, which lead to a differential only in returns (Figure 3). In the rural sector, both geographic and concentration effects explain the disparities in poverty rates between Sierra and Oriente. Characteristics explain the main differential between Costa and Oriente, although there is a difference in returns as well (Figure 4).

Figure 3. Decomposition of Poverty Rates. Urban Areas

Figure 4. Decomposition of Poverty Rates. Rural Areas

Source: Own calculations based on ECV Survey.

In sum, returns explain about 90 percent of the differences in log welfare ratio between the urban areas of Oriente and Costa and about 70 percent between the urban areas of Sierra and Costa (Figure 5). The differential between the rural areas of Sierra and Oriente is explained by returns and characteristics, while the differences between Costa and Oriente are mainly due to characteristics.

Figure 5. Decomposition of Welfare Differences Between Regions

6. Conclusions

Overall, the results of the study indicate that at the national level, urban-rural differences in welfare ratios are mainly due to characteristics, which account for almost three-quarters of the difference. Comparisons in living standards within a given region across urban and rural areas reveal that in the Sierra and Costa regions, characteristics are also the main source of differences in welfare. In the Oriente, both characteristics and returns are important to explain the welfare level differences between urban and rural areas.

The empirical results indicate that among the characteristics analyzed, education was the variable with the largest contribution to explain the differential in mean log welfare ratio between urban and rural areas, as was expected. Other non-geographic characteristics also contribute to the difference, but to a lesser extent.

According to the results obtained from both urban and rural areas in the simulated welfare ratios and the simulated poverty rates within each province, differences in living standards between urban and rural areas can be attributed to disparities in non-geographic variables and to differences in the returns to those characteristics. This indicates that poor areas are poor not only because households with observable non-geographic characteristics that favor poverty are settled there, but because there are differences in the returns to those characteristics by location.

Comparisons in living standards between a leading and a lagging region reveal that for urban areas, the differences between Oriente and Costa and between Sierra and Costa are due to returns. In the case of rural areas, the differentials between Costa and Oriente are explained by characteristics, while the differences between Sierra and Oriente are explained by both returns and characteristics.

The findings suggest that government programs increasing the portable human capital endowments of poor people can be a major step forward towards increasing the equality of opportunities for welfare. The analysis also reveals that returns between regions may be substantially different, which suggests that migration is not equalizing returns. To accelerate this process, governments can try to eliminate impediments to labor mobility and facilitate the movement of people towards areas of economic opportunity. Finally, there may be cases of poor and relatively isolated regions inhabited by a significant number of people who for cultural reasons are more attached to land and thus less eager to migrate to

areas of better economic opportunities. In specific circumstances, territorial interventions aimed at turning around the economy of a region may be the best approach to improve the livelihoods of the poor.

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Table A1. Means/Percentages and Standard Errors

Variable	Urban		Rural		National	
	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent
Province						
Azuay	4.0%	0.2%	7.0%	1.2%	4.9%	0.4%
Bolívar	0.5%	0.2%	3.0%	0.6%	1.3%	0.2%
Cañar	0.9%	0.2%	3.1%	0.6%	1.6%	0.3%
Carchi	1.0%	0.2%	1.9%	0.5%	1.3%	0.2%
Cotopaxi	1.1%	0.3%	6.3%	1.0%	2.7%	0.4%
Chimborazo	2.0%	0.4%	6.2%	1.1%	3.3%	0.5%
El Oro	5.3%	0.7%	3.7%	0.9%	4.8%	0.5%
Esmeraldas	2.5%	0.4%	3.9%	0.8%	3.0%	0.4%
Guayas	33.5%	1.3%	11.7%	2.4%	26.7%	1.2%
Imbabura	2.8%	0.5%	3.1%	0.8%	2.9%	0.4%
Loja	2.1%	0.4%	5.6%	1.1%	3.2%	0.4%
Los Ríos	4.6%	0.7%	7.5%	1.4%	5.5%	0.7%
Manabí	7.7%	1.1%	12.1%	2.0%	9.1%	1.0%
Morona Santiago	0.4%	0.1%	2.1%	0.7%	0.9%	0.2%
Napo	0.3%	0.1%	0.9%	0.4%	0.5%	0.2%
Pastaza	0.5%	0.2%	1.1%	0.7%	0.7%	0.2%
Tungurahua	2.7%	0.5%	6.2%	1.0%	3.8%	0.5%
Zamora	0.2%	0.1%	1.1%	0.4%	0.5%	0.2%
Sucumbíos	0.5%	0.2%	1.9%	0.6%	1.0%	0.2%
Orellana	0.4%	0.2%	1.0%	0.4%	0.6%	0.2%
Pichincha	26.8%	1.3%	10.4%	2.2%	21.7%	1.1%
Demographics						
Number of babies	0.2	0.0	0.3	0.0	0.3	0.0
Number of babies squared	0.3	0.0	0.4	0.0	0.3	0.0
Number of children	0.8	0.0	1.1	0.0	0.9	0.0
Number of children squared	1.6	0.0	2.7	0.1	1.9	0.0
Number of teenagers	0.5	0.0	0.6	0.0	0.5	0.0
Number of teenagers squared	0.8	0.0	1.1	0.0	0.9	0.0
Number of adults	2.4	0.0	2.4	0.0	2.4	0.0
Number of adults squared	5.8	0.1	5.5	0.1	5.7	0.1
Female household head	23.3%	0.6%	15.7%	0.7%	20.9%	0.5%
Male household head	76.7%	0.6%	84.3%	0.7%	79.1%	0.5%
No spouse, single	7.2%	0.3%	5.8%	0.4%	6.8%	0.3%

No spouse, separate/divorced/widow	22.8%	0.6%	17.1%	0.6%	21.0%	0.5%
No spouse, married	1.6%	0.2%	2.1%	0.2%	1.7%	0.1%
Spouse, married	68.4%	0.7%	75.0%	0.8%	70.5%	0.5%
Age of household head	45.9	0.2	48.1	0.3	46.6	0.2
Age of household head squared	2346.6	24.2	2585.3	35.7	2421.6	20.2
Mixed race (<i>mestizo</i>) household head	82.0%	0.7%	73.7%	1.6%	79.4%	0.7%
White household head	8.7%	0.5%	5.6%	0.5%	7.7%	0.4%
Black household head	2.9%	0.3%	3.1%	0.5%	3.0%	0.3%
Mixed race (<i>mulato</i>) household head	2.9%	0.3%	1.5%	0.3%	2.5%	0.2%
Other ethnicity household head	0.1%	0.0%	0.0%	0.0%	0.05%	0.02%
Indigenous	3.4%	0.4%	16.2%	1.5%	7.4%	0.6%
Education of Household Head						
1 - 4 years	8.6%	0.4%	22.1%	0.8%	12.8%	0.4%
5 - 7 years	28.9%	0.8%	43.2%	1.0%	33.4%	0.6%
8 - 10 years	14.2%	0.5%	7.3%	0.4%	12.0%	0.4%
11 - 13 years	21.2%	0.6%	7.4%	0.5%	16.9%	0.4%
14 - + years	23.5%	1.1%	4.3%	0.6%	17.5%	0.8%
None	3.6%	0.3%	15.7%	0.7%	7.4%	0.3%
Education of Spouse						
1 - 4 years	5.1%	0.3%	13.9%	0.6%	7.8%	0.3%
5 - 7 years	18.0%	0.6%	32.4%	0.9%	22.5%	0.6%
8 - 10 years	10.9%	0.5%	7.6%	0.5%	9.9%	0.4%
11 - 13 years	16.7%	0.5%	5.6%	0.5%	13.2%	0.4%
14 - + years	14.8%	0.7%	2.4%	0.3%	10.9%	0.5%
None / No spouse	34.6%	0.7%	38.2%	1.0%	35.7%	0.6%
House Ownership						
Rent	25.0%	0.8%	3.2%	0.5%	18.1%	0.6%
Own and paying	3.6%	0.4%	0.8%	0.1%	2.7%	0.3%
Other	14.5%	0.5%	19.6%	1.0%	16.1%	0.5%
Own and paid	56.9%	0.9%	76.4%	1.1%	63.0%	0.7%
Position in Occupation						
Employer	8.5%	0.4%	2.1%	0.2%	6.5%	0.3%
Self-employed	27.8%	0.7%	10.3%	0.8%	22.3%	0.6%
Employee without pay	1.5%	0.1%	1.6%	0.2%	1.5%	0.1%
Farm labourer	3.3%	0.4%	21.7%	1.2%	9.1%	0.5%
Owner farmer	1.0%	0.1%	6.2%	0.6%	2.7%	0.2%

Self-employed farm labourer	1.6%	0.2%	32.4%	1.3%	11.3%	0.5%
Not working	13.2%	0.5%	6.6%	0.6%	11.2%	0.4%
Employee	42.9%	0.8%	19.0%	1.0%	35.4%	0.7%

Table A2. Means/Percentages and Standard Errors, Sierra Region

Variable	Urban		Rural		Sierra Region	
	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent
Demographics						
Number of babies	0.2	0.0	0.3	0.0	0.2	0.0
Number of babies squared	0.3	0.0	0.4	0.0	0.3	0.0
Number of children	0.7	0.0	1.0	0.0	0.8	0.0
Number of children squared	1.4	0.1	2.5	0.1	1.8	0.1
Number of teenagers	0.5	0.0	0.6	0.0	0.5	0.0
Number of teenagers squared	0.8	0.0	1.1	0.0	0.9	0.0
Number of adults	2.4	0.0	2.4	0.0	2.4	0.0
Number of adults squared	5.6	0.1	5.1	0.1	5.4	0.1
Female household head	22.6%	1.0%	20.1%	0.9%	21.7%	0.7%
Male household head	77.4%	1.0%	79.9%	0.9%	78.3%	0.7%
No spouse, single	9.2%	0.6%	7.3%	0.5%	8.5%	0.4%
No spouse, separate/divorced/widow	18.9%	0.8%	17.3%	0.8%	18.3%	0.6%
No spouse, married	2.0%	0.3%	3.1%	0.4%	2.4%	0.2%
Spouse, married	69.9%	1.0%	72.3%	1.0%	70.7%	0.7%
Age of household head	46.0	0.4	49.2	0.5	47.1	0.3
Age of household head squared	2358.9	35.9	2700.1	47.5	2480.2	29.3
Mixed race (<i>mestizo</i>) household head	83.7%	1.0%	68.9%	2.2%	78.5%	1.0%
White household head	7.3%	0.7%	4.9%	0.5%	6.4%	0.5%
Black household head	1.7%	0.3%	1.7%	0.6%	1.7%	0.3%
Mixed race (<i>mulato</i>) household head	1.6%	0.3%	1.0%	0.3%	1.4%	0.2%
Other ethnicity household head	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%
Indigenous	5.7%	0.8%	23.5%	2.2%	12.0%	1.0%

Education of Household

Head

1 - 4 years	7.0%	0.6%	21.1%	1.0%	12.0%	0.6%
5 - 7 years	28.6%	1.3%	44.1%	1.3%	34.1%	1.0%
8 - 10 years	12.9%	0.7%	6.2%	0.6%	10.5%	0.5%
11 - 13 years	21.0%	0.9%	6.8%	0.6%	16.0%	0.6%
14 - + years	27.5%	1.8%	4.9%	1.0%	19.5%	1.3%
None	3.0%	0.4%	16.9%	1.0%	7.9%	0.5%

Education of Spouse

1 - 4 years	5.0%	0.5%	14.1%	0.7%	8.3%	0.4%
5 - 7 years	17.0%	0.9%	29.7%	1.1%	21.5%	0.7%
8 - 10 years	11.3%	0.7%	5.8%	0.6%	9.3%	0.5%
11 - 13 years	16.6%	0.8%	4.6%	0.6%	12.3%	0.6%
14 - + years	17.0%	1.1%	3.0%	0.6%	12.0%	0.8%
None / No spouse	33.1%	1.0%	42.8%	1.4%	36.5%	0.8%

House Ownership

Rent	31.6%	1.1%	4.2%	0.8%	21.8%	0.8%
Own and paying	4.3%	0.7%	1.1%	0.2%	3.2%	0.5%
Other	15.9%	0.8%	20.1%	1.2%	17.4%	0.7%
Own and paid	48.2%	1.2%	74.6%	1.4%	57.6%	0.9%

Position in Occupation

Employer	8.9%	0.6%	2.6%	0.3%	6.6%	0.4%
Self-employed	24.4%	0.8%	11.5%	1.0%	19.8%	0.7%
Employee without pay	1.3%	0.2%	1.8%	0.2%	1.5%	0.1%
Farm labourer	1.6%	0.3%	14.1%	1.2%	6.0%	0.5%
Owner farmer	0.9%	0.2%	4.2%	0.6%	2.1%	0.2%
Self-employed farm labourer	2.2%	0.3%	35.3%	1.8%	14.0%	0.8%
Not working	13.3%	0.8%	6.6%	0.9%	10.9%	0.6%
Employee	47.4%	1.1%	24.0%	1.5%	39.1%	0.9%

Source: Own calculations based on ECV Survey.

Table A3. Means/Percentages and Standard Errors, Costa Region

Variable	Urban		Rural		Costa Region	
	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent
Demographics						
Number of babies	0.3	0.0	0.3	0.0	0.3	0.0
Number of babies squared	0.3	0.0	0.4	0.0	0.3	0.0
Number of children	0.9	0.0	1.0	0.0	0.9	0.0
Number of children squared	1.8	0.1	2.4	0.1	2.0	0.1
Number of teenagers	0.5	0.0	0.5	0.0	0.5	0.0
Number of teenagers squared	0.9	0.0	1.1	0.1	0.9	0.0
Number of adults	2.5	0.0	2.5	0.0	2.5	0.0
Number of adults squared	6.0	0.1	5.8	0.2	6.0	0.1
Female household head	24.1%	0.8%	10.3%	0.9%	20.7%	0.7%
Male household head	75.9%	0.8%	89.7%	0.9%	79.3%	0.7%
No spouse, single	5.5%	0.4%	4.1%	0.6%	5.2%	0.4%
No spouse, separate/divorced/widow	26.3%	0.9%	17.7%	1.1%	24.1%	0.7%
No spouse, married	1.2%	0.2%	0.8%	0.3%	1.1%	0.2%
Spouse, married	67.0%	0.9%	77.4%	1.3%	69.6%	0.8%
Age of household head	46.1	0.3	47.4	0.6	46.4	0.3
Age of household head squared	2355.0	33.7	2518.6	59.1	2395.9	29.4
Mixed race (<i>mestizo</i>) household head	80.7%	0.9%	85.0%	1.6%	81.8%	0.8%
White household head	9.9%	0.7%	6.2%	0.9%	9.0%	0.5%
Black household head	4.0%	0.5%	5.6%	1.0%	4.4%	0.4%
Mixed race (<i>mulato</i>) household head	3.9%	0.5%	2.5%	0.5%	3.6%	0.4%
Other ethnicity household head	0.1%	0.1%	0.0%	0.0%	0.10%	0.05%
Indigenous	1.3%	0.3%	0.8%	0.3%	1.1%	0.2%
Education of Household Head						
1 - 4 years	10.0%	0.6%	25.0%	1.4%	13.8%	0.6%
5 - 7 years	29.1%	1.1%	40.9%	1.5%	32.1%	0.9%
8 - 10 years	15.1%	0.7%	7.7%	0.7%	13.3%	0.6%
11 - 13 years	21.3%	0.8%	7.7%	0.8%	17.9%	0.7%

14 - + years	20.2%	1.3%	3.4%	0.6%	16.0%	1.0%
None	4.3%	0.4%	15.4%	1.2%	7.0%	0.5%

Education of Spouse

1 - 4 years	5.1%	0.4%	13.2%	1.1%	7.2%	0.4%
5 - 7 years	18.6%	0.9%	35.3%	1.7%	22.8%	0.9%
8 - 10 years	10.5%	0.6%	9.7%	1.1%	10.3%	0.5%
11 - 13 years	16.6%	0.8%	6.4%	0.8%	14.1%	0.6%
14 - + years	13.0%	0.9%	1.3%	0.3%	10.1%	0.7%
None / No spouse	36.1%	1.0%	34.2%	1.4%	35.6%	0.8%

House Ownership

Rent	19.2%	1.1%	1.4%	0.4%	14.7%	0.9%
Own and paying	3.1%	0.5%	0.4%	0.2%	2.5%	0.4%
Other	13.4%	0.7%	20.0%	1.9%	15.1%	0.7%
Own and paid	64.3%	1.2%	78.1%	2.0%	67.8%	1.1%

Position in Occupation

Employer	8.2%	0.6%	1.5%	0.4%	6.5%	0.5%
Self-employed	31.1%	1.0%	9.4%	1.4%	25.7%	0.9%
Employee without pay	1.6%	0.2%	1.3%	0.3%	1.6%	0.2%
Farm labourer	4.7%	0.6%	34.4%	2.1%	12.1%	0.9%
Owner farmer	1.2%	0.2%	9.8%	1.2%	3.3%	0.4%
Self-employed farm labourer	0.9%	0.2%	24.6%	1.8%	6.9%	0.7%
Not working	13.5%	0.7%	7.2%	0.9%	11.9%	0.6%
Employee	38.7%	1.1%	11.7%	1.3%	32.0%	1.0%

Table A4. Means/Percentages and Standard Errors, Oriente Region

Variable	Urban		Rural		Oriente Region	
	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent	Mean / Percentage	Std. Err. of Mean / Percent
Demographics						
Number of babies	0.3	0.0	0.5	0.0	0.4	0.0
Number of babies squared	0.3	0.0	0.7	0.1	0.5	0.1
Number of children	0.9	0.1	1.5	0.1	1.3	0.1
Number of children squared	1.8	0.2	4.7	0.5	3.6	0.3
Number of teenagers	0.6	0.1	0.8	0.1	0.7	0.1
Number of teenagers squared	1.0	0.1	1.8	0.2	1.5	0.2
Number of adults	2.1	0.1	2.4	0.1	2.3	0.1
Number of adults squared	4.7	0.3	5.9	0.4	5.4	0.3
Female household head	18.7%	2.1%	12.6%	2.0%	15.0%	1.5%
Male household head	81.3%	2.1%	87.4%	2.0%	85.0%	1.5%
No spouse, single	9.9%	1.7%	3.7%	0.9%	6.2%	0.9%
No spouse, separate/divorced/widow	16.5%	2.0%	13.1%	1.8%	14.4%	1.4%
No spouse, married	1.4%	0.5%	1.7%	0.7%	1.5%	0.5%
Spouse, married	72.2%	2.5%	81.5%	2.3%	77.9%	1.8%
Age of household head	41.6	1.0	44.0	0.9	43.1	0.7
Age of household head squared	1933.6	99.3	2157.1	91.6	2069.5	69.1
Mixed race (mestizo) household head	77.0%	2.1%	50.3%	6.8%	60.8%	4.6%
White household head	8.7%	1.8%	6.6%	1.5%	7.4%	1.2%
Black household head	2.2%	0.7%	0.2%	0.2%	1.0%	0.3%
Mixed race (mulato) household head	2.6%	1.6%	0.8%	0.5%	1.5%	0.7%
Other ethnicity household head	0.0%	0.0%	0.0%	0.0%	0.00%	0.00%
Indigenous	9.5%	1.7%	42.0%	7.4%	29.3%	5.2%
Education of Household Head						
1 - 4 years	6.4%	1.2%	14.2%	2.1%	11.1%	1.4%
5 - 7 years	30.3%	2.4%	49.0%	3.4%	41.7%	2.6%
8 - 10 years	15.4%	1.4%	12.1%	1.7%	13.4%	1.2%
11 - 13 years	23.6%	1.7%	9.5%	1.7%	15.0%	1.5%
14 - + years	23.2%	3.0%	5.4%	1.3%	12.4%	1.7%
None	1.0%	0.4%	9.9%	1.6%	6.4%	1.1%

Education of Spouse

1 - 4 years	4.6%	0.9%	15.1%	2.0%	11.0%	1.5%
5 - 7 years	20.7%	1.9%	35.9%	2.6%	29.9%	2.0%
8 - 10 years	12.9%	2.0%	10.1%	1.7%	11.2%	1.3%
11 - 13 years	20.9%	1.9%	8.2%	1.5%	13.2%	1.4%
14 - + years	12.1%	1.8%	3.5%	1.0%	6.9%	1.0%
None / No spouse	28.9%	2.6%	27.1%	2.2%	27.8%	1.7%

House Ownership

Rent	33.3%	3.4%	5.3%	1.8%	16.2%	2.3%
Own and paying	2.4%	0.9%	0.8%	0.4%	1.4%	0.4%
Other	14.8%	1.9%	14.0%	2.3%	14.3%	1.6%
Own and paid	49.5%	3.3%	80.0%	3.1%	68.0%	2.9%

Position in Occupation

Employer	9.4%	1.8%	2.3%	0.9%	5.1%	0.9%
Self-employed	18.0%	1.5%	6.9%	1.6%	11.2%	1.3%
Employee without pay	1.2%	0.7%	1.9%	0.6%	1.7%	0.5%
Farm labourer	4.0%	0.9%	10.8%	2.1%	8.2%	1.3%
Owner farmer	0.7%	0.4%	2.0%	0.6%	1.5%	0.4%
Self-employed farm labourer	5.3%	1.3%	50.8%	5.4%	33.0%	4.5%
Not working	6.8%	1.3%	3.8%	1.0%	5.0%	0.8%
Employee	54.5%	2.7%	21.4%	3.4%	34.4%	3.2%

Table A5. Regressions for Log Welfare Ratio, Sierra Region

Explanatory variables	Urban Sierra		Rural Sierra	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-0.543 *	0.150	-0.453 *	0.130
Demographics				
Number of babies	-0.290 *	0.072	-0.369 *	0.047
Number of babies squared	0.013	0.050	0.060 *	0.025
Number of children	-0.286 *	0.024	-0.267 *	0.024
Number of children squared	0.033 *	0.007	0.026 *	0.006
Number of teenagers	-0.223 *	0.041	-0.126 *	0.033
Number of teenagers squared	0.019	0.020	0.008	0.012
Number of adults	-0.138 *	0.026	-0.058 *	0.026
Number of adults squared	0.006	0.004	0.008 *	0.004
Sex of the head	-0.065	0.044	-0.068	0.051
No spouse, single	0.144	0.091	0.092	0.064
No spouse, separate/divorced/widow	0.211 *	0.087	0.251 *	0.057
No spouse, married	0.333 *	0.098	0.479 *	0.082
Age of household head	0.030 *	0.005	0.020 *	0.004
Age of household head squared	0.000 *	0.000	0.000 *	0.000
Mixed race (<i>mestizo</i>) household head	0.103 *	0.049	0.132 *	0.042
White household head	0.212 *	0.069	0.212 *	0.071
Black household head	0.102	0.103	0.026	0.141
Mixed race (<i>mulato</i>) household head	0.183 *	0.078	0.276 **	0.143
Other ethnicity household head				
Education of Household Head				
1 - 4 years	0.423 *	0.090	0.180 *	0.035
5 - 7 years	0.705 *	0.086	0.352 *	0.041
8 - 10 years	0.843 *	0.084	0.499 *	0.056
11 - 13 years	1.064 *	0.094	0.701 *	0.074
14 - + years	1.479 *	0.100	1.233 *	0.141
Education of Spouse				
1 - 4 years	-0.014	0.081	0.029	0.038
5 - 7 years	0.060	0.082	0.096 *	0.043
8 - 10 years	0.078	0.085	0.124 *	0.059
11 - 13 years	0.167 *	0.084	0.264 *	0.064
14 - + years	0.364 *	0.089	0.408 *	0.088
House Ownership				
Rent	-0.203 *	0.023	0.050	0.078
Own and paying	-0.006	0.051	0.395 *	0.125
Other	-0.214 *	0.030	-0.081 *	0.033
Position in Occupation				
Employer	0.259 *	0.039	0.330 *	0.063
Self-employed	-0.010	0.026	-0.011	0.041
Employee without pay	0.075	0.063	-0.207 *	0.071
Farm labourer	-0.148 **	0.083	-0.258 *	0.043
Owner farmer	0.242 *	0.090	0.281 *	0.052
Self-employed farm labourer	-0.227 *	0.081	-0.203 *	0.039
Not working	-0.032	0.043	-0.255 *	0.058

Source: Own calculations based on ECV Survey.

Note: Number of observations: 3780 (urban) and 3436 (rural). $R^2=0.59$ (urban) and 0.48 (rural), * indicates that the coefficient is significant at 5 percent level, and ** at 10 percent level. The base categories are: male household head, married with spouse, indigenous household head, no education of household head, no education of spouse or no spouse, own house and employee.

Table A6. Regressions for Log Welfare Ratio, Costa Region

Explanatory variables	Urban Costa		Rural Costa	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-0.308 *	0.133	-0.233	0.151
Demographics				
Number of babies	-0.275 *	0.042	-0.348 *	0.049
Number of babies squared	0.028	0.023	0.069 *	0.025
Number of children	-0.271 *	0.017	-0.278 *	0.020
Number of children squared	0.022 *	0.004	0.030 *	0.005
Number of teenagers	-0.198 *	0.025	-0.133 *	0.034
Number of teenagers squared	0.010	0.010	0.011	0.010
Number of adults	-0.089 *	0.019	-0.079 *	0.028
Number of adults squared	0.004	0.003	0.002	0.004
Sex of the head	0.024	0.036	-0.022	0.062
No spouse, single	0.297 *	0.063	0.150 **	0.083
No spouse, separate/divorced/widow	0.201 *	0.055	0.171 *	0.054
No spouse, married	0.550 *	0.091	0.647 *	0.183
Age of household head	0.027 *	0.004	0.020 *	0.004
Age of household head squared	0.000 *	0.000	0.000 *	0.000
Mixed race (<i>mestizo</i>) household head	-0.153 *	0.074	0.033	0.134
White household head	-0.077	0.083	-0.027	0.142
Black household head	-0.188 *	0.080	0.021	0.143
Mixed race (<i>mulato</i>) household head	-0.199 *	0.084	0.014	0.146
Other ethnicity household head	-0.212	0.377		
Education of Household Head				
1 - 4 years	0.180 *	0.049	0.162 *	0.047
5 - 7 years	0.330 *	0.047	0.218 *	0.043
8 - 10 years	0.447 *	0.052	0.316 *	0.055
11 - 13 years	0.629 *	0.055	0.354 *	0.065
14 - + years	0.939 *	0.061	0.650 *	0.101
Education of Spouse				
1 - 4 years	0.002	0.046	0.063	0.053
5 - 7 years	0.140 *	0.047	0.100 *	0.046
8 - 10 years	0.188 *	0.049	0.190 *	0.054
11 - 13 years	0.309 *	0.049	0.188 *	0.082
14 - + years	0.504 *	0.055	0.596 *	0.144
House Ownership				
Rent	-0.044	0.028	0.025	0.102
Own and paying	-0.031	0.055	-0.251	0.281
Other	-0.097 *	0.027	0.011	0.039
Position in Occupation				
Employer	0.345 *	0.038	0.250 *	0.113
Self-employed	-0.081 *	0.024	-0.123 *	0.059
Employee without pay	0.020	0.071	-0.078	0.113
Farm labourer	-0.178 *	0.032	-0.077	0.049
Owner farmer	0.178 *	0.074	0.180 *	0.062
Self-employed farm labourer	-0.206 *	0.097	-0.156 *	0.051
Not working	-0.071 *	0.036	-0.326 *	0.070

Source: Own calculations based on ECV Survey.

Note: Number of observations: 3697 (urban) and 1520 (rural). $R^2=0.55$ (urban) and 0.50 (rural), * indicates that the coefficient is significant at 5 percent level, and ** at 10 percent level. The base categories are: male household head, married with spouse, indigenous household head, no education of household head, no education of spouse or no spouse, own house and employee.

Table A7. Regressions for Log Welfare Ratio, Oriente Region

Explanatory variables	Urban Oriente		Rural Oriente	
	Coefficient	Standard Error	Coefficient	Standard Error
Constant	-0.390	0.388	-1.111 *	0.311
Demographics				
Number of babies	-0.540 *	0.159	-0.413 *	0.091
Number of babies squared	0.221 **	0.128	0.123 *	0.048
Number of children	-0.377 *	0.058	-0.289 *	0.042
Number of children squared	0.038 *	0.019	0.020 *	0.008
Number of teenagers	-0.225 *	0.081	-0.193 *	0.066
Number of teenagers squared	0.044	0.034	0.016	0.019
Number of adults	-0.038	0.050	-0.118 *	0.048
Number of adults squared	-0.005	0.007	0.014 *	0.006
Sex of the head	-0.124	0.089	-0.089	0.096
No spouse, single	0.931 *	0.307	0.164	0.172
No spouse, separate/divorced/widow	0.820 *	0.293	0.205	0.151
No spouse, married	1.161 *	0.393	0.741 *	0.227
Age of household head	0.020 **	0.011	0.046 *	0.011
Age of household head squared	0.000	0.000	0.000 *	0.000
Mixed race (<i>mestizo</i>) household head	0.151 **	0.084	0.569 *	0.072
White household head	0.127	0.113	0.548 *	0.121
Black household head	0.053	0.185	0.646 *	0.146
Mixed race (<i>mulato</i>) household head	-0.091	0.127	0.571 *	0.140
Other ethnicity household head				
Education of Household Head				
1 - 4 years	0.037	0.269	0.088	0.109
5 - 7 years	0.108	0.257	0.215 *	0.098
8 - 10 years	0.263	0.258	0.318 *	0.097
11 - 13 years	0.273	0.265	0.509 *	0.124
14 - + years	0.555 *	0.258	0.307 *	0.144
Education of Spouse				
1 - 4 years	0.427 **	0.249	0.074	0.148
5 - 7 years	0.651 *	0.305	0.049	0.123
8 - 10 years	0.701 *	0.279	0.268 *	0.126
11 - 13 years	0.859 *	0.288	0.244 **	0.132
14 - + years	1.005 *	0.310	0.660 *	0.181
House Ownership				
Rent	-0.138 *	0.054	-0.069	0.094
Own and paying	0.169	0.180	0.000	0.111
Other	-0.079	0.082	-0.053	0.083
Position in Occupation				
Employer	0.245 *	0.069	0.147	0.191
Self-employed	-0.126 **	0.069	-0.024	0.081
Employee without pay	-0.011	0.243	-0.464 *	0.170
Farm labourer	-0.367 *	0.087	-0.372 *	0.091
Owner farmer	0.412	0.424	0.190 **	0.098
Self-employed farm labourer	-0.421 *	0.134	-0.435 *	0.063
Not working	-0.059	0.104	-0.412 *	0.117

Source: Own calculations based on ECV Survey.

Note: Number of observations: 473 (urban) and 525 (rural). $R^2=0.58$ (urban) and 0.70 (rural), * indicates that the coefficient is significant at 5 percent level, and ** at 10 percent level. The base categories are: male household head, married with spouse, indigenous household head, no education of household head, no education of spouse or no spouse, own house and employee.

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