

Comparisons of Urban and Rural Poverty Determinants in Cameroon

By

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Abstract

The purpose of this paper is to determine the key variables that affect urban and rural living standards and hence poverty, as well as to identify the factors that explain the existing poverty differences between rural and urban households in Cameroon. Moreover, since incidence of poverty is higher in rural than in urban areas, the study investigates whether this is due to the existence of endowments of inferior quality in rural areas or to low productivity of these endowments. The purpose of the paper is achieved by using both ordinary least squares (OLS) regressions to examine the general welfare status of households, and quantile regressions to analyze the living standards of households at different points on the distribution of consumption expenditures, as well as by decomposing the differences in living standards using the Oaxaca-Blinder (1973) decomposition method in combination with an OLS regression model. The living standards measure used in this study is total expenditure per adult equivalent, while the data used is derived from the Cameroonian household surveys (ECAM2 and ECAM3), which were conducted, respectively, in 2001 and 2007 by the National Institute of Statistics (NIS).

The results of the study indicate that human resources, as well as social and physical capital, play a major role in the improvement of welfare. The study reveals a certain number of demographic effects in urban and rural areas, of which the most significant is caused by household size, which contributes to the reduction of household consumption expenditures. Moreover, the regions where the households reside also affect consumption expenditures and poverty. There are also significant differences in the occupations of household heads. Those who work in the services sector and trade are better-off than those working in the other sectors of the economy. However, quantile regression results on the relationship between household expenditures and some of the explanatory variables are different from those obtained by using OLS regressions. The results of the study derived with the help of the Oaxaca-Blinder decomposition method show that 59% of the welfare gap between urban and rural areas may be explained by differences in the characteristics, particularly physical assets and education. The remaining 41% of the welfare gap is explained by discrimination. The results of the study are used to make recommendations on poverty reduction policies in Cameroon.

Keywords: Poverty, OLS, Quantile Regression, Determinants, Oaxaca-Blinder decomposition method, Cameroon

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1. Introduction

1.1 Statement of the Problem

Poverty reduction is one of the major priorities of development efforts in developing countries as the Millennium Development Goals (MDGs) attest. Poverty generally refers to a state in which a person or household is unable to satisfy the basic needs required to maintain a generally accepted adequate minimum living standard. Poverty is quite persistent in many developing economies, and to a lesser extent in industrialized economies.

According to the World Bank (1990) report, the burden of poverty also weighs heavily on the people living in the regions of the developing world, among the countries of these regions, and among the localities of these countries. Almost half of the world's poor live in South Asia, which accounts for nearly 30% of the world's population. The people of Sub-Saharan Africa and those of South Asia are among the poorest in the world, both in terms of real income and access to social services. The same World Bank Report reveals that about 45% of the 590 million people of Sub-Saharan African (SSA) countries live under their national poverty lines.

In recent years, however, most SSA countries have achieved significant progress in the reduction of poverty. Estimates from country studies carried out in this region show that more than 40 million persons in these countries escaped poverty during the 1999-2003 period, most of this reduction being mainly due to the recovery of economic growth (World Bank, 2004).

As far as Cameroon is concerned, it can be noted that despite the sustained good performances that resulted in the achievement of an average annual real economic growth rate of 7% from independence in 1960 up to the mid-1980s, the country was witnessing high poverty rates especially in rural areas, marked inequalities in the distribution of income, and considerable regional disparities. In fact, according to World Bank (1995), a 1983 survey showed that in the early 1980s about 40% of the country's population was living below the poverty line; that poverty was overwhelmingly a rural phenomenon; and that per capita food consumption of poor households was about four times lower than that of other households.

By 1986, Cameroon had gone into a deep economic recession, which lasted for almost a decade until 1994. This period witnessed a rapid increase in unemployment and poverty especially in urban areas, where a survey carried out in 1993 estimated that a fourth of the urban population was living under the poverty line, while unemployment was particularly acute among women and youth, reaching a rate of about 25% in Yaoundé, the capital city, for instance. Poverty and unemployment also rose in rural areas due to a significant fall in agricultural output (World Bank, 1995). The fiscal crisis during this period naturally contributed to a serious deterioration in most social indicators in the areas of education, health, public administration and infrastructure, thus worsening the living conditions of the country's population (IMF, 2005).

However, the results of two comprehensive household surveys carried out in 1996 and 2001 show that the incidence of poverty decreased by 13.1 percentage points from 53.3% in 1996 to 40.2% in 2001, while the depth of poverty reduced from 19% in 1996 to 14% in 2001. As to the severity of poverty, it decreased from 9.0% in 1996 to 7.0% in 2001. These significant improvements in Cameroon's poverty indicators were brought about by the implementation of a vast programme of economic and structural reforms launched in 1988 by the Cameroon government with the support of the World Bank and the IMF, with a view to stemming the recession by shifting the economy back to a recovery path. These reforms succeeded in achieving an average annual GDP growth rate of about 4.8% between 1996 and 2001, thanks mainly to the CFA Franc devaluation relative to the French Franc, which took place in January 1994, and to a favourable international economic environment; these two were the most decisive factors in boosting the country's economy to the recovery of growth (Government of Cameroon, 2003).

However, these good performances at the aggregate level hide appreciable disparities between the poverty status of rural and urban areas. When disaggregated according to residence area, the statistical indicators of poverty show that the decline in poverty was particularly marked in urban areas, where the incidence of poverty fell almost by half from 41.4% to 22.1% between 1996 and 2001,¹ while it only dropped by 9.7 percentage points from 59.6% to 49.9% in rural areas during the same period.

In urban areas, the depth of poverty also fell by more than half from 14.7% to 6.5% between 1996 and 2001, while it only decreased slightly from 21.5% to 18.3% in rural areas during the same period. As to the severity of poverty, it decreased from 6.4% to 2.7% in urban areas, but only dropped by a tiny 0.8 percentage points from 10.1% to 9.3% in rural areas during the same period. In general, therefore, the poverty indicators of the rural areas where most of the poor live, both in 1996 and 2001, were not only higher than those of the urban areas, but their decline in 2001 was not substantial, such that poverty essentially remained a rural phenomenon.

Thus, these disaggregated statistics on Cameroon's poverty profile indicate that the economic recovery achieved during the study period did not significantly alter the living conditions of the population, after all. In effect, poverty still remains massive, and extremely intense and severe. Moreover, the indicators of access to basic social services and the level of income are still low. In addition, the prevailing situation

of endemic unemployment tends to become established in the labour market. The situation in the education and health sectors is equally worrying, while the HIV/AIDS pandemic is gaining ground (Government of Cameroon and UNDP, 2002). Cameroon has been downgraded from the 132nd to the 141st place among the 177 countries ranked according to the Human Development Index (HDI) of the United Nations Development Programme (UNDP). Therefore, as we enter the third millennium, poverty remains at the centre of development concerns in Cameroon, and it is becoming a very urgent problem that increasingly requires to be given a lot of attention.

In accordance with these complicated poverty-related issues, the United Nations decided to rank the eradication of poverty not only as the very first objective in the list of the Millennium Development Goals (MDGs),² but also as its first target whose goal is to reduce by half the proportion of persons living below the poverty threshold between 1990 and 2015. In this context, Cameroon, as all the other countries who are signatories to the 2000-United Nations Millennium Declaration, was required to carry out a rigorous analysis of its strategy for the reduction of poverty. One key element of this strategy is the need to identify the underlying causes of poverty in Cameroon.

During the preparation of Cameroon's poverty reduction strategy, the Government of Cameroon commissioned quantitative and qualitative studies to evaluate poverty and to identify its determinants. These studies thus highlighted some of the factors which affect poverty, such as the lack of resources to satisfy basic needs, the lack of support to agricultural production in rural areas and the low level of education, the lack of access to basic infrastructure services (e.g. water, electrical energy, roads), and the lack of social services such as education and health³⁷⁾

The quantitative analysis carried out in Cameroon in this context by the Direction de la Statistique et de la Comptabilité Nationale (DSCN) in 2002 uses two alternative methodologies (OLS and Multinomial Logit models) for estimation of standards of living. Unfortunately, these approaches do not make it possible to determine household living standards at the different points of the income distribution. Moreover, this analysis considers the determinants of poverty from an aggregate standpoint without taking into account the specificities that characterize target populations (for instance, rural population versus urban population). And yet, the specific features of Cameroon's economy, and in particular the dualism between rural and urban regions, prompts the researcher to identify the determinants of poverty by taking into consideration the clear distinction that must appear either in the analysis of poverty, or during the adoption of appropriate economic policies likely to reduce poverty. Finally, the said quantitative analysis does not enable us to identify the factors causing poverty differentials between two population groups such as, for instance, households residing in rural areas versus those residing in urban centres.

The limitations inherent in the study carried out by the DSCN (2002), therefore, underline the need to undertake an in-depth investigation of the determinants of poverty on a more disaggregated level, and to identify the factors that explain living standard differences between rural and urban areas. Any formulation of effective poverty reduction policies and their implementation requires the identification of the factors

strongly correlated with poverty (Glewwe and van der Gaag, 1988; World Bank, 1990; Rodriguez and Smith, 1994). In other words, a better understanding of the determinants of poverty, both as policy instruments useful in decision-making and as tools for the identification of the poor as a target group, is crucial in the design of effective poverty relief programmes. This study, therefore, is an attempt to fill the gap existing in the analysis of the determinants of poverty from a disaggregated level approach, with the hope of adding a building block to the poverty reduction effort which, nowadays, is a subject of great concern for the Government of Cameroon.

1.2 Objectives of the Study

The overall objective of this study is threefold:

- i) To identify and compare a few major welfare determinants, and hence of poverty, at the household level in the rural and urban areas of Cameroon with a view to capturing the significant factors to be considered in the design of poverty reduction policies for the relevant areas targeted;
- ii) To provide empirical evidence on the sources of welfare differences during the 2001-2007 period; and
- iii) To derive the policy implications of the study results for poverty relief in Cameroon.

To achieve these objectives, we will attempt to find answers to the following questions:

- i) What are the major determinants of rural and urban poverty in Cameroon? In other words, among the gamut of household characteristics and geographic factors, which ones preponderantly determine rural and urban poverty in the country?
- ii) How do living standards, and hence poverty, vary between rural and urban areas?
- iii) Are the differences in the performances of household characteristics or in the characteristics themselves the main determinants of the welfare differential between 2001 and 2007?

2. Review of the Literature on Poverty and its Determinants in Cameroon

The main research studies on poverty in Cameroon may be classified into three groups according to source and temporal dimension of the data used. The first group comprises studies based on the 1984-consumption-budget (*enquête budget Consommation (EBC)*) survey data. The second group uses both the 1984-EBC data and the 1996-household survey (ECAM1). The third group uses either ECAM1 data or the 2001-household survey (ECAM2) data gathered by the National Institute of Statistics (NIS), or combines both of these data sources.

Among the studies belonging to the first group, one may find the study by Lynch (1991), which constructs a poverty profile of Cameroon based on the 1984 EBC data by estimating a welfare level (per capita income) and defining a poverty line (78,000 CFA Franc per year), before measuring income inequalities in the country. The author concludes that poverty is essentially a rural phenomenon in Cameroon, and that poor households generally lack education.

Dubois and Amin (2000) describe the evolution of poverty and income inequality in Cameroon between 1978 and 1996. Using a relative poverty threshold in 1983 and an absolute poverty line in 1996 (based on consumption per adult equivalent), they find an aggravation of poverty between 1983 and 1996, and note that if poverty increased more significantly in rural areas than in urban areas during that period, it also appeared that the increase in urban poverty was larger in the city of Yaoundé, the political capital, than in the economic capital of Douala. In addition, they also find that poverty is essentially rural, but that it is distributed unequally according to regions.

Fambon (2006) also analyzes the change in poverty in Cameroon over the period 1983/84-1996 as above. In addition to the conclusions arrived at in the preceding study, the author decomposes poverty changes into sector effects, and finds that the within-sector effect totally explains the evolution of national poverty over the period of the study.

As in the two preceding studies, Baye (2006) decomposes the change in poverty in Cameroon over the period 1984-1996 into growth and redistribution components, but rather uses the Shapley-value approach. His findings are identical to those of the preceding studies, and they notably show a significant increase in poverty over the study period due mainly to the growth component both at the national level and the level of different geographic areas.

Fambon et al. (2001) study poverty and income distribution in Cameroon in 1996 using several poverty thresholds, and they analyze the sensitivity of poverty profiles to these thresholds. They show that poverty is basically a rural phenomenon, and that its main determinants are the following: household demographic structure (size, number of children, household type), socio-economic groups, occupational status of household head, educational level, and household residence area. As concerns income inequalities, they conclude that the latter are higher in urban than rural areas. One of the main shortcomings that may be addressed to this study is that it carries out an econometric analysis of poverty determinants by regressing the log of expenditure per adult equivalent on a set of household attributes without comparing the results to those of, for instance, a Probit model, which may serve as a test for the robustness of the results arrived at with an ordinary least squares (OLS) regression model. Moreover, this study does not analyze the determinants of differences in poverty incidence levels between urban and rural areas.

Fambon (2005) constructs a dynamic poverty profile for Cameroon between 1984 and 1996, captures the link between economic growth, poverty, and inequality using both the absolute poverty lines estimated with the cost of basic needs (CBN) method and the FGT-class of poverty indexes developed by Foster, Greer and Thorbecke (1984). Then he uses the static decomposition approach of Kakwani (1993), and the dynamic decomposition approaches proposed by Datt and Ravallion (1992) and by Kakwani (1997) to break down changes in poverty into growth and redistribution components. The author arrives at the conclusion that poverty in Cameroon between 1983/84 and 1996 is an important phenomenon that affects rural areas more severely than urban areas. Moreover, he finds that the increase in poverty during the period 1983/84-1996 was mainly due to contraction in economic growth that took place at that time, and whose adverse effect on poverty was stronger than the redistributive effect, which was rather favourable to the poor.

Finally, in the third group of works on poverty in Cameroon, we may note the study of the National Institute of Statistics (NIS, 2002), which carries out a dynamic poverty analysis between 1996 and 2001, and which finds an average per capita expenditure increase in addition to a fall in the monetary poverty rate from 53.3% to 40.2% over the study period due to economic recovery. This study also finds that the redistribution component of growth did not have any impact on the reduction of poverty in rural areas. Moreover, the NIS also analyzes poverty determinants in 2001 by means of both a linear model and a multinomial logit model. As in the preceding study, the NIS analysis suffers from the same limits, notably the failure to analyze the determinants of the differences in poverty incidence levels between urban and rural areas.

The National Institute of Statistics (NIS, 2008) also presents the monetary poverty profile of Cameroon in 2001 and 2007 by examining the extent of poverty across the geographic and socio-economic groups using data derived from the Cameroonian household surveys ECAM2 and ECAM3, which are representative at the national level. It emerges from the present study that incidence of national poverty remained almost the same over the period 2001-2007, slightly decreasing from 40.2% in 2001 to 39.9% in 2007. Urban poverty also fell from 17.9% to 12.2% between 2001 and 2007, while incidence of rural poverty increased from 52.1% in 2001 to 55% in 2007.

The study also reveals the large regional disparities in poverty rates both in 2001 and 2007. In 2007, for instance, it may be noted that apart from Yaoundé and Douala, the provinces of the Southwest, the West, the South, and of the Littoral had a poverty incidence oscillating around 30%, whereas this poverty rate amounted to 41% in the Centre Province. It fluctuated around 50% in the Northwest, the East and the Adamaoua provinces, while it hovered at more than 60% in the provinces of the North and Far-North. It should also be noted that in the case of Cameroon, incidence of poverty decreases with the schooling level of the household head, while it varies with household size, and the age as well as the gender of the household head.

Beyond this monetary poverty profile, this study also analyzes, among others, poverty and the basic social services, poverty and the living conditions, the subjective aspects of poverty, as well as poverty and governance. However, this study, like the previous one, only considers the extent of poverty and the relative changes this phenomenon witnessed during the period 2001-2007, without examining the determinants of urban and rural poverty in Cameroon.

The study by Foko et al. (2007) draws up non-monetary multidimensional poverty profile for Cameroon, and tests for its concordance with the monetary poverty profile available. Their results show that poverty in living conditions results in the exclusion of households from the consumption of certain basic commodities, owing to the fact that they are unavailable or of limited accessibility. Non-monetary multidimensional poverty is more pronounced than monetary poverty, is positively but imperfectly correlated with the latter, and tends to better convey the poverty status of households as they themselves perceive it. In addition, living conditions are more unequal in contexts where poverty levels are high, such as in the rural areas, whereas income distribution is very unequal in contexts where poverty levels are lower, such as in urban areas.

A conclusion shared by most of these studies is that poverty is essentially a rural phenomenon. Moreover, the literature review indicates that these studies mainly deal with the measurement of poverty, while studies on determinants or causes of poverty in Cameroon are rather scarce. And yet, it is precisely in this area that research can be very useful, since the major root causes of poverty should first be determined before any effective policy can be designed to reduce this phenomenon.

3. Conceptual Framework and Methodological Approaches

In this section, we sketch the methodology used to examine the factors determining poverty in the rural and urban areas of Cameroon. We start first by briefly presenting the measure used to represent the living standard of households and their members. Then, in order to highlight the determinants of household welfare in a broad sense, we adopt two strategies such that the first estimates an ordinary least squares (OLS) model, while the second estimates a continuous model at different quantiles of the conditional distribution of household expenditure. Finally, we summarize the Blinder-Oaxaca decomposition method, which helps to break down the evolution (growth) of the real consumption expenditure per adult equivalent over the period 2001-2007 into a component due to household endowments/characteristics, and a component due to changes in the performances of these endowments.

3.1. Welfare Indicator

The first key decision to be made in poverty analysis is the choice of a welfare indicator or measure. In accordance with several recent works, poverty analysis in the present study will be based on a monetary measure of utility and welfare (Deaton and Muellbauer, 1980). Total household expenditure will be used as an indicator of household welfare. Expenditure is preferred to income, because it is usually reported better in household consumption-budget surveys. Moreover, there exists a theoretical consideration according to which expenditure reflects permanent income better, since on the conceptual level, permanent income theory suggests that expenditure is a better proxy for long-term income, and hence of long-term living standards compared with the current income data reported in household surveys. Furthermore, in the present study, we will take account of the size and composition of different households and consequently use household expenditure per adult equivalent as a welfare measure (Deaton and Muellbauer, 1980).⁴

To carry out valid inter temporal comparisons, we have deflated household consumption expenditures per adult equivalent of 2007 to bring them back to the level of those of 2001. To do this, the consumption expenditures per adult equivalent of 2007 are divided by a deflator; that is, the ratio of the poverty line of 2007 to the poverty line

of 2001. The poverty lines of 2007 and 2001, amounting respectively to 269,443 CFAF per adult equivalent per year and 185,490 CFAF per year, this deflator is given by: deflator = $269,443/185,490 = 1.4526$.⁵ Finally, the nominal expenditures per adult equivalent of the household are deflated by the national poverty line of 2001; that is, 185,490 CFAF per adult equivalent per year.

3.2 Ordinary Least Squares (OLS) Model

In the present study, we model the determinants of poverty levels by taking the logarithm of real household consumption expenditure per adult equivalent divided by the poverty line (welfare ratio), which we regress on a certain number of explanatory variables characteristic of the household and the community in which households reside.⁶ This is a simple linear model similar to those used in other African countries such as Malawi (Mukherjee and Benson, 2003), and Mozambique (Simler et al., 2004 and Bruck, 2001).⁷ More specifically, this model may be written as follows:

$$\ln(y_i) = \alpha + \beta_i X_i + \varepsilon_i \quad (1)$$

where y_i is the annual total consumption expenditure per adult equivalent (food and non-food goods in real terms) of household i , α the intercept, X_i a vector of explanatory variables representing household and community attributes, and ε_i the random error term, where $\varepsilon_i \rightarrow N(0, \sigma^2)$. The estimates of β_i using OLS yield the *ceteris paribus* effects of their characteristics on the log of annual total consumption expenditure per adult equivalent of household i , $\ln(y_i)$.

Because of differences in the levels and nature of poverty in urban and rural areas, two distinct models corresponding to each of these areas will be estimated. This approach follows that of Glewwe (1991), who found that poverty determinants were significantly different in the rural and urban areas of Côte d'Ivoire.

3.3 Quantile Regression

In addition to estimating the continuous model of household expenditures, we initiate the search for the determinants of changes in the logarithm of the welfare ratio for specific quantiles of the welfare distribution using the quantile regression of the error terms⁸ proposed by Koenker and Basset (1978; 1982). The quantile regression of error terms is a method used to measure the effect of explanatory variables on a response variable at different points on the conditional distribution of household expenditures. This method is very effective when the data are known to be heteroscedastic, as is the case in the distribution of household consumption expenditure.

Compared with the ordinary least squares (OLS) method, the estimates derived from quantile regressions are more effective, and they yield more robust results when the errors do not display normal distribution behaviour. According to Deaton (1995) and Koenker (2000), the advantage of this method may be summarized as follows: (i) it captures changes in parameters along several quantiles;⁹ (ii) it can be evaluated with linear programming; (iii) monotonous transformations in the dependent variable may be

used; and (iv) it yields more robust results in the presence of outliers.

Quantile regressions of error terms use the procedure for the minimization of the absolute sum of errors, whereas OLS regressions minimize the sum of squared residuals. The estimator in quantile regressions is also known as the Least Absolute Deviations (LAD) estimator. The median of regression coefficients may be estimated by minimizing the following equation:

$$\Phi = \sum_{i=1}^n |\ln(y_i) - x_i' \beta| = \sum_{i=1}^n (\ln(y_i) - x_i' \beta) \operatorname{sgn}(\ln(y_i) - x_i' \beta) \quad (2)$$

where $\ln(y_i)$ is the natural logarithm of the expenditure per adult equivalent of the i^{th} household; $\operatorname{sgn}(a)$ is the sign of a , which takes on the value of 1 if a is positive and -1 if a is negative or equal to zero ($a \leq 0$), where a is the difference between the real value and the expected value of $\ln(y_i)$ for the i^{th} household; x_i represents a column vector of realizations on k explanatory variables; and β the corresponding column vector of k unknown parameters.

In the present study, we make use of quantile regressions rather than regressions at the median, and the former may be defined by minimizing the following equation:

$$\begin{aligned} \Phi_q &= -(1-q) \sum_{\ln y \leq x' \beta} (\ln(y_i) - x_i' \beta) + q \sum_{\ln y \geq x' \beta} (\ln(y_i) - x_i' \beta) \\ &= \sum_{i=1}^n \left[q - 1(\ln(y_i) \leq x_i' \beta) \right] (\ln(y_i) - x_i' \beta) \end{aligned} \quad (3)$$

where $0 < q < 1$ is the quantile of interest, and the value of function $1(z)$ is equal to 1 when the declaration z holds true, and 0 if it does not.

In the context of the model specified in Equation 3, quantile regressions enable us to estimate the parameters β at any quantile level. These evaluations make it possible to establish the magnitudes of the *ceteris paribus* effects of variables at different points of the conditional distribution of $\ln(y_i)$.

To obtain an estimate for quantile q , the values of $\ln(y_i) - x_i' \beta$ at the estimated value of β are weighted: if a residual is negative, it is weighted by factor of $-(1-q)$; and if a residual is positive, it is weighted by q . To illustrate, let us assume that the quantile regression is estimated for the 75th percentile. The weight of the negative residuals is equal to -0.25, while the weight of positive residuals is equal to 0.75. To minimize the sum of residuals using these weights is equivalent to using the absolute values of residuals whose weights are 0.25 and 0.75. Let us note that the weighting scheme with weights of -0.5 and + 0.5 minimizes one out of two (i.e. half) of the sum of the absolute values of residuals that estimate the median. The interpretation of estimated coefficients is the best linear approximation of the effect of explanatory variables at different quantiles of the dependent variable.

In this paper, we estimate the model at the median or at the 50th percentile, as well as at the 10th and the 90th percentiles of the distribution of consumption expenditure. We can then determine whether the position of quantiles in the distribution of consumption expenditure differently affects the manner in which household characteristics are linked

to consumption. This differentiation across households is important for the analysis and formulation of distributional policies, which may alter consumption models across households.

3.4 Decomposition of the Determinants of Poverty

3.4.1 Static decomposition of the welfare gap ratio

To investigate the static welfare gap between urban and rural areas, we use the classical decomposition method (Oaxaca, 1973 and Blinder, 1973), which breaks down the average welfare gap between two groups into two components at a point in time: the first component represents the differences in endowments between two groups, while the second component represents the differences in the results of these endowments. More formally, the estimated welfare ratio gap may be broken down as follows:

$$\overline{\ln y^{urban}} - \overline{\ln y^{rural}} = (\overline{X^{urban}} - \overline{X^{rural}}) \beta^{urban} + (\beta^{urban} - \beta^{rural}) \overline{X^{rural}} \quad (4)$$

where $\ln y$ is a measure of the welfare ratio of the household; X is the a vector of the characteristics of the i th household; and β is a vector of coefficients. The bars over the X vectors denote the mean of characteristics, while the bars over the $\ln y$'s represent the mean of the logarithm of the household's welfare ratio.

This equation implies that the differential in the average welfare ratios between urban and rural areas may be decomposed into two components: a component made up of the differences in the average characteristics summarized by the term $(\overline{X^{urban}} - \overline{X^{rural}})$, and another component which is due to the differences in the coefficients or results of the characteristics in the urban and rural areas, summarized by the term $(\beta^{urban} - \beta^{rural})$.

3.4.2 Changes in the determinants of poverty over time

To analyze the factors responsible for the changes in consumption expenditure over time, we use as before the Oaxaca (1973) and Blinder (1973) decomposition method. The latter is used to break down growth in real consumption expenditures per adult equivalent over the period 2001-2007 into two components: a component due to changes in household characteristics, and a component due to changes in the performances of these characteristics (Wodon, 1999).

More formally, let us consider the reduced-form function of the determinants of household consumption expenditure using the following simple linear econometric specification:

$$\log(y^t) = \beta^t X^t + \mu^t \quad (5)$$

In this equation, y^t is real consumption expenditure per adult equivalent, X^t is

the vector of independent variables, which influence consumption, and μ^t is a random disturbance term (with the usual properties), which serves to summarize the impact of all the other factors on the standard of living. The independent variables represent the individual, household, and community characteristics.¹⁰

By specifying Equation 5 above for the two time periods t and $t+1$, and then subtracting the last equation from the first, we obtain the difference in the means of living standards between t and $t+1$, which is given by the following equation:

$$\overline{\ln(y^{t+1})} - \overline{\ln(y^t)} = \overline{X^{t+1}} \hat{\beta}^{t+1} - \overline{X^t} \hat{\beta}^t \quad (6)$$

By adding and subtracting the term $\hat{\beta}^{t+1} \overline{X^t}$ from the above differences in equation 5, we can express the preceding difference as follows:

$$\overline{\ln(y^{t+1})} - \overline{\ln(y^t)} = (\overline{X^{t+1}} - \overline{X^t}) \hat{\beta}^{t+1} + \overline{X^t} (\hat{\beta}^{t+1} - \hat{\beta}^t) \quad (7a)$$

or,

$$\overline{\ln(y^{t+1})} - \overline{\ln(y^t)} = (\overline{X^{t+1}} - \overline{X^t}) \hat{\beta}^t + \overline{X^{t+1}} (\hat{\beta}^{t+1} - \hat{\beta}^t) \quad (7b)$$

Where $\overline{\ln(y^{t+1})}$ and $\overline{\ln(y^t)}$ are, respectively, the mean values of the logarithm of household consumption expenditures per adult equivalent at time $t+1$ and t ; $\overline{X^{t+1}}$ and $\overline{X^t}$ represent the means of household characteristics at time $t+1$ and t ; $\hat{\beta}^{t+1}$ and $\hat{\beta}^t$ are the parameter estimates at time $t+1$ and t . We have assumed that $E(\mu^t) = 0$ for $j \in \{t, t+1\}$.

In the majority of cases, both of these ways of decomposing $\overline{\ln(y^{t+1})} - \overline{\ln(y^t)}$ will lead to similar decomposition results.

In each of the equations 7a and 7b, the first term on the right hand side (RHS) of the equation represents the impact of changes in household characteristics between t and $t+1$, while the second component captures the impact of endowments on changes in household characteristics between t and $t+1$ ¹¹.

4. Data Source

The main data sources for this study are the Cameroonian household survey (ECAM 2) and the Cameroonian household survey (ECAM3), conceived and conducted by the National Institute of Statistics (NIS) in 2001 and 2007, respectively.

2001 Cameroonian Household Survey (ECAM2)

This survey covers the whole national territory and comprises a random sample of about 12,000 households.¹² It notably aimed to construct a poverty profile at the national and provincial levels, Douala and Yaoundé (respectively the economic and political capitals) being considered as separate strata, and each of the ten provinces of the country being divided into two strata, one rural and the other urban. The survey was therefore carried out in 22 strata, of which ten were rural and 12 urban. Data gathering lasted for three months in each of the urban, semi-urban, and rural areas (from September to December, 2001).

The survey basis was that of the second General Census of the Population and the Habitat (GCPH) of April 1987 updated to take account of its dated nature. Two types of draws were carried out according to residence area.

A two-degree draw was adopted in the main cities of Yaoundé and Douala. On the other hand, in the semi-urban and rural strata of the provinces, a three-degree draw was adopted with equal probability at each level. Thus, the cities (i.e. administrative centres of districts) were drawn at the first degree; the count zones (CZs) at the second degree; at the third degree households were drawn in each CZ drawn and counted.

This survey had gathered data intended for the study of different aspects of poverty in Cameroon. The survey questionnaire was organized into 15 sections. Section 01 was concerned with household composition and characteristics; section 02, household members health; section 03, household education; section 04, the activity status of household members; section 05, the fertility of women aged 15 to 49; section 06, anthropometrics and vaccine cover; section 07, housing and household equipment; section 08, household migration; section 09, access to basic infrastructures; section 10,

evaluation of living standards; section 11, non-agricultural family enterprises; section 12, material and financial wealth, savings and social capital; section 13, agriculture and rural activities; section 14, non-food expenditure; section 15, household daily expenditure.

Data gathering lasted for three months in each of the three survey areas (urban, semi-urban, and rural) from September to December 2001. Moreover, a particular section of the survey was concurrently gathering data on prices to evaluate home consumption and to make the household expenditure of the different regions comparable.

2007 Cameroonian Household Survey (ECAM3)

ECAM3 was designed to update the 2001 poverty profile, to evaluate the extent of progress achieved as far as poverty reduction and the Millennium Development Goals (MDGs) are concerned, and in order for it to serve as an input in the review of the Poverty Reduction Strategy Paper (PRSP) adopted by the Cameroon government in April 2003.

The sample of ECAM3, as that of ECAM2, comprises about 12,000 households. Its sampling basis is the list of count zones (CZs) defined during the General Census of the Population and the Habitat (GCPH) in April 1987.

As in the case of ECAM2, 12 survey regions are defined. They comprise the cities of Douala and Yaoundé, in addition to the ten administrative provinces of the country, the Centre Province being defined excluding the city of Yaoundé, and the Littoral Province also being defined excluding the city of Douala. Three strata are defined in each survey region: an urban stratum composed of large cities, a semi-urban stratum composed of medium-sized cities, and a rural stratum composed of villages. The regions of Douala and Yaoundé are considered as being wholly urban. The strata involved in the survey, therefore, add up to 32 strata of which 12 are urban, ten semi-urban and ten rural.

Data gathering lasted for three months from September to December 2007. The questionnaire of the survey was based on 13 modules, namely: 1) Household composition and characteristics; 2) Health; 3) Education; 4) Employment (including the labour of children aged 5 to 17 years) and the incomes derived from these activities; 5) Anthropometrics and vaccine cover; 6) Housing and equipment; 7) Migration of households; 8) Accessibility to basic infrastructures; 9) Perception of poverty; 10) Household capital; 11) Retrospective non-food household expenditures; 12) Daily household expenditures; and 13) The price constituent.

5. Empirical Results

In this section, we present in turn the determinants of poverty using the OLS and quantile regressions, the results of the Oaxaca-Blinder decomposition of the welfare gap between rural and urban areas, and the decomposition results of the change in household consumption expenditures between 2001 and 2007.

5.1 Determinants of Poverty: An OLS and Quantile Regressions Analysis

5.1.1 Description of the variables of the model

The dependent variable is the logarithm of the “welfare ratio”, which is a proxy for the standard of living. The welfare ratio is defined as consumption expenditure per adult equivalent deflated or divided by a national poverty line.¹³ This indicator reflects living standards as a multiple of the poverty line. A unitary value for the welfare ratio means that the household has its level of consumption expenditure per adult equivalent exactly at the level of the poverty line. A higher welfare ratio value means higher living standard.

Independent or explanatory variables are the attributes or characteristics of households. They are the factors likely to exert some influence on household consumption expenditure, and we have retained the following exogenous variables¹⁴ in specifying regression models: (a) household composition variables (household size), the age group of the household head, his gender and matrimonial status (married); (b) the schooling level of the household head; (c) the area of cultivated land and equity capital; (e) access to infrastructure, measured by the time spent to reach infrastructure (the time spent to reach a food market, the time spent to reach an asphalted road); (f) the region of residence of the household.

The other variables introduced in the model are: “a household member is a member of an association”; “the household head has a spouse”; “the household head obtained a business credit”; the activity sector of the household head; and the institutional sector of the household head.

It is generally accepted that poverty increases when advanced age comes by as the productivity of an individual decreases, and especially if the individual has a small amount of savings at his disposal to compensate for this loss of productivity and income. This position is maintained by some studies such as those of Gang, Sen and Yun (2004), Datt and Jolliffe (1999), and Rodriguez (2002). Three household-head age groups are included among the explanatory variables of the model, namely the 30-39 age group, the 50-59 age group, and the 60 or more age group.

Household size is another demographic variable used in this study. It represents the number of individuals living in the same household, and it is continuous. Based on studies carried out in many other developing countries, we expect to have a negative relationship between total household size and total consumption per adult equivalent (see for instance, Lanjouw and Ravallion (1995); Deaton and Paxson (1998); Cortes, (1997); Anyanwu (2005; 2010).

Gender is another factor that potentially affects income, and hence household consumption expenditure. It is generally accepted that women are subject to poverty due mainly to the fact that they usually have a low educational level, and lack opportunity to acquire (or to be an owner of) assets such as land. The feminization of poverty, which has become the subject of many research studies in recent years, is a phenomenon that exists when poverty is more widespread among female household heads than among their male counterparts. The feminization of poverty is explained notably either by the presence of discrimination against women in the labour market, or by the fact that women tend to have a lower level of education and hence receive lower salaries than men (Anyanwu, 2010). Gender is included among the regressors of the model as a variable called “the household head is a woman”.

Moreover, we have also included **Education** among the exogenous variables of the model of household consumption expenditure. It should be noted that education may affect economic welfare in different ways. For instance, it may influence both the results within economic activities and access to those activities. Education may also limit fertility and hence reduce the number of dependent children in the household. Furthermore, the literature shows that education increases the human capital stock, which in turn increases labour productivity and income. Since employment (work) is the most important asset for the poor, increasing their educational level will tend to increase their consumption expenditure, and hence reduce poverty.¹⁵

The variable “Education” is the level of education (or schooling) of the household head. In the ECAM2 and ECAM3 surveys, the interviewer asked the persons surveyed about the highest level of education each of them had achieved with success, and codes were used to represent the educational levels. The variable “education” is classified into five categories: 1. without level; 2. Primary; 3. Secondary first cycle; 4. Secondary second cycle; and 5. Higher education. The variable “Education” is also a dummy variable where each category takes on the value of 1 if the household head has that level of education. The sign of the coefficient of the schooling level may be positive since, on the average, higher schooling levels are associated with higher levels of income, and hence with higher expenditure per adult equivalent.

It is assumed that occupation is highly correlated with poverty, since occupations that require low amounts of capital, either human or physical, will be associated with low salaries and, consequently, with low consumption expenditure, and hence with higher poverty rates. The variables used to capture the occupation of the household head (the institutional sector of activity of the household head) are four in number, namely the household head is an “executive”; the household head is a “qualified employee”; the household head is an “unskilled worker”; and the household head is a “manager”. Similarly, the branches in which the household head works are also correlated with poverty. Four large sectors are included among the regressors, namely: the agricultural sector, the industrial sector, the trade sector and the services sector.

We have also included credit among the explanatory variables to test the assumption according to which households that have access to credit are less likely to be poor. In fact, increasing access to the credit market increases household welfare through the availability of investment credit, which not only boosts the income of the household (Adugna and Heidhues, 2000) but also smooths out household consumption (Zeller et al., 1994). This may significantly influence the income of the household by helping its members to take advantage of economic opportunities, thus making it possible for them to escape poverty (Binswinger and Khandker, 1995; Adugna and Heidhues, 2000).

Another explanatory variable is the physical asset “log land” defined as the area of land used by households either as property (real estate) mainly in the urban area, or as agricultural land in the rural area. Land is considered as the most valuable asset by farmers,¹⁶ and the area of land occupied and/or used by households may be used as an indicator of the welfare of the household. Richer households generally own large areas of agricultural land, and as a consequence they are able to produce and to consume more than households that are less well-off. Thus, we expect consumption expenditure per adult equivalent to be positively associated with the variable “log land”.

The best roads or access to markets are assumed to favour the production of high value products and non-agricultural activities, which will contribute to the achievement of higher income levels or to lower poverty levels (see for instance, Canagarajah and Pörtner, 2003). The variables of access to road infrastructure comprise the time span spent to reach a food market, and the time span spent to reach an asphalted road. A long time span spent to reach an asphalted road significantly increases the poverty level. The standard explanation here is that the larger the time span spent to reach a good road, the more difficult the access to market is, a situation which limits the options to earn a better livelihood.

In addition to variables of access to infrastructure, we have also created two other variables that are likely to affect the consumption expenditure of households: there is one variable to measure the matrimonial status of the household head, while the other variable captures the participation of the household head in an association.

The geographic location of the residences of households according to the ten regions of Cameroon (each household, either urban or rural lives in one of these regions) is also an important determinant of the consumption expenditure (or welfare)¹⁷ of the

household. The variable “Region” is a binary variable that represents the region where the household lives. It takes on the value of one if the household resides in the area considered and the value of zero if not. The regional dummies are the following: region 1 (Douala), region 2 (Yaoundé), region 3 (Adamaoua), region 4 (Centre), region 5 (East), region 6 (Extreme-North), region 7 (Littoral), region 8 (North), region 9 (North-West), region 10 (West), region 11 (South), and region 12 (South-West). The expected signs of the regional binary variables are ambiguous. However, we expect some of these regional binary variables to have positive signs in case some of the regions retained in the study have more economic activities likely to provide residents with employment.

Several of the variables mentioned above are category-specific (i.e. dummy variables). Consequently, in running our regressions, it is necessary to leave one category of variables as a group of reference. Such categories are: region 2 (Yaoundé), male household head, the household head has no spouse; the household head has no education; one household member is not a member of an association; and the household head has not obtained a credit, etc.

Table 1 lists the variables (dependent and exogenous) used to represent these household characteristics in the regression analyses in 2007. The descriptive statistics of the variables of the model in 2001 are found in the Appendix (Table A1).

Table 1: Descriptive statistics of the Model’s variables, 2007

Description of Variables	Urban			Rural		
	Obs	Mean	Std. Dev	Obs	Mean	Std. Dev
Log of welfare ratio	6,365	12.91	0.657	5,026	12.346	0.599
Douala	6,365	0.164	0.37	5,026	0	0
Adamaoua	6,365	0.048	0.215	5,026	0.053	0.225
Centre	6,365	0.040	0.197	5,026	0.107	0.309
East	6,365	0.042	0.201	5,026	0.063	0.243
Extreme-North	6,365	0.096	0.295	5,026	0.172	0.377
Littoral	6,365	0.056	0.230	5,026	0.055	0.228
North	6,365	0.058	0.234	5,026	0.079	0.271
North-West	6,365	0.099	0.299	5,026	0.168	0.374
West	6,365	0.096	0.295	5,026	0.135	0.342
South	6,365	0.040	0.196	5,026	0.055	0.229
South-West	6,365	0.095	0.293	5,026	0.108	0.311
Household size	6,365	4.430	3.035	5,026	4.574	3.108
Female	6,365	0.258	0.438	5,026	0.277	0.447
Household head has a spouse	6,365	0.493	0.499	5,026	0.484	0.499

Age of head of household: 30-39 years old	6,365	0.292	0.454	5,026	0.224	0.417
Age of head of household: 50-59 years old	6,365	0.227	0.419	5,026	0.199	0.399
Age of head of household: 60 years or older	6,365	0.126	0.332	5,026	0.163	0.370
Level of Head's education: primary	6,365	0.294	0.455	5,026	0.380	0.485
Level of Head's education: secondary 1st cycle	6,365	0.231	0.422	5,026	0.154	0.361
Level of Head's education: secondary 2nd cycle	6,365	0.205	0.403	5,026	0.086	0.280
Level of Head's education: higher	6,365	0.121	0.327	5,026	0.026	0.159
Industrial sector	5,594	0.174	0.379	4,725	0.080	0.271
Trade sector	5,594	0.197	0.398	4,725	0.060	0.238
Services sector	5,594	0.479	0.499	4,725	0.143	0.350
Executives	5,596	0.104	0.306	4,725	0.031	0.175
Skilled employees	5,596	0.236	0.424	4,725	0.069	0.253
Unskilled workers	5,596	0.071	0.257	4,725	0.037	0.190
Managers (bosses)	5,596	0.043	0.205	4,725	0.035	0.184
Is a member of an association	6,364	0.509	0.499	5,025	0.407	0.491
Travel time to market place	6,338	2.098	0.765	4,936	2.877	1.098
Travel time to reach an asphalted road	6,168	1.566	1.002	4,265	3.270	1.517
Area of land exploited	1,270	0.639	1.027	3,645	0.633	0.750
Head obtained a credit	6,365	0.047	0.212	5,026	0.035	0.185

Source: Calculations of the author using data of the Cameroonian Household Survey, ECAM3

5.1.2 Results of OLS Regressions

It is reasonable to expect the coefficients of the expenditures predicted for the rural area to be different from those predicted for the urban area.¹⁸ This implies that separate analyses should be carried out for the rural and urban samples. The results derived from the regression analyses¹⁹ of the rural and urban areas are presented in Table 2.

The first comment to be made here concerns the overall performance of the model. One of the models estimated yielded a coefficient of determination (R^2) of 0.43 based on a sample of 1,181 households. This result may be compared with those of similar

studies on the determinants of poverty in Egypt (Datt and Jolliffe, 1999), in Malawi (NEC, NSO and IFPRI, 2001), in Mozambique (Datt et al., 2000), and in Vietnam (Minot and Baulch, 2004). In Egypt, the (R^2) resulting from a rural model amounted to 0.41, based on a sample of 1,326 households, and with an explanatory power somewhat higher for urban households. In Malawi, an R^2 of 0.33 was obtained from a sample of 6,457 households. In the case of Mozambique, the R^2 was found to lie between 0.50 and 0.54. The result for Vietnam indicated an R^2 of about 0.55. The results of the present study should be considered as reasonable, for their coefficients of determination hover approximately around the range of the R^2 s found by the previous studies mentioned above.

Since the dependent variable is in log form, the coefficient estimates of the regression measure the percent changes in expenditures per adult equivalent induced by changes of one unit in the independent variables.

Table 2: Determinants of urban and rural consumption expenditure, 2007

Variable	Urban	Rural
Douala	-0.266 (-2.66)*	dropped)
Adamaoua	-0.090 (-0.82)	0.083 (1.37)
Centre	-0.347 (-4.10)***	-0.036 (-0.74)
East	-0.298 (-2.81)**	(dropped)
Extreme-North	-0.156 (-1.73)	-0.192 (-4.14)***
Littoral	-0.590 (-6.90)***	0.063 (1.06)
North	-0.14 (-1.62)	-0.182 (-3.50)***
North-West	-0.303 (-3.72)***	-0.115 (-2.44)
West	-0.340 (3.70)***	0.116 (2.39)
South	-0.346 (-3.72)***	0.278 (3.95)***
South-West	-0.088 (-1.05)	0.113 (2.19)
Household size	-0.074 (-9.92)***	-0.081 (-17.76)***
Female	-0.058 (-1.19)	-0.070 (-2.53)**
Household head has a spouse	-0.163 (-3.74)***	-0.146 (-6.52)***
Age of head of household: 30-39 years old	-0.066 (-1.55)	-0.065 (-2.96)**
Age of head of household: 50-59 years old	-0.108 (-2.57)	-0.128 (-5.48)*
Age of head of household: 60 years or older	0.070 (1.49)	-0.048 (-1.96)

Level of Head's education: Primary	0.063 (1.36)***	0.068 (3.18)**
Level of Head's education: Secondary 1 st cycle	0.207 (4.04)***	0.154 (5.25)***
Level of Head's education: Secondary 2 nd cycle	0.278 (4.76)***	0.188 (4.37)***
Level of Head's education: Higher	0.629 (8.01)***	0.348 (3.69)***
Industrial sector	0.019 (0.42)	0.074 (2.01)
Trade sector	0.261 (4.97)***	0.223 (4.41)***
Services sector	0.218 (4.72)***	0.068 (1.60)
Executives	0.33 (4.78)***	0.344 (4.47)***
Skilled employees	0.077 (1.49)	0.118 (2.43)
Unskilled workers	-0.089 (-1.49)	-0.029 (-0.56)
Managers (bosses)	0.244 (2.64)*	0.182 (3.84)***
Head is a member of an association	0.075 (2.34)	3.04 (3.04)**
Travel time to market place	-0.057 (-2.05)**	-0.024 (-2.74)*
Travel time to reach an asphalted road	-0.027 (-1.90)	-0.019 (-2.89)**
Area of land exploited	0.048 (3.18)**	0.065 (4.59)***
Head obtained a credit	0.201 (3.09)**	0.173 (3.56)***
intercept	13.287 (123.30)***	12.827 (212.46)***
	R² = 0.43	R² = 0.38
	F-statistic (33, 1147) = 21.77	F-statistic (31, 3004) = 47.91
	Prob. > F = 0.000	Prob. > F = 0.000
	1181	3036

Notes: Robust *t*-statistics are between parentheses

*** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level

Source: Calculations of the author using the data of the Cameroonian Household Survey, ECAM3

Household demographic characteristics are closely associated with consumption expenditure per adult equivalent.

The evidence derived from cross section data suggests that large-sized households are likely to be poor. Such is also the case in Cameroon as shown by the regression results presented in Table 2 above. In effect, household size is significant and negatively associated with consumption expenditure per adult equivalent both in the rural and

urban areas. This result implies that large-sized families usually have lower expenditure per adult equivalent, a situation that is likely to increase the probability of poverty.

Regression results show that in urban areas, households whose heads are women have, *ceteris paribus*, a consumption level that is 6% lower than that of households headed by men. In the rural areas, this is 7%. Thus, contrary to the results derived from the descriptive analysis of the preceding section, households headed by women tend to be more vulnerable when they are compared with those headed by men with similar characteristics. The fact that households headed by women have a lower poverty level may therefore be due to other factors such as the composition of the household, which is more favourable to households headed by women.²⁰

The age group of household heads exerts a significant and negative impact on consumption expenditures, and hence on poverty in the rural area. On the other hand, the welfare level in the urban area does not seem to be determined by household heads' age groups. Household heads aged 60 and more *ceteris paribus*, seem to enjoy a higher level of welfare than household heads belonging to the younger age groups of 30 to 39 and 50 to 59 years.

The results from the rural and urban regression equations indicate that education is an important determinant of expenditure per adult equivalent. The coefficients of most of the education variables are statistically significant and quite large in the urban and rural areas alike. In urban areas, having a primary level of education increases expenditure by about 6.3% relative to those of uneducated persons; this comes from the coefficient 0.063 and from the fact that the dependent variable is in the form of a logarithm. This effect amounts, respectively, to 20.7%, 27.8%, and 62.9% for households whose heads have a 1st cycle secondary, 2nd cycle secondary, and higher levels of education, respectively.²¹

The institutional sector where the individual exerts his activity and the branch in which he works are also correlated with poverty. The estimation results of the regression model show that there is a premium for a household whose head is a manager, a qualified employee or a director. In urban areas, and respectively in rural areas, a household whose head is a manager has a level of consumption per adult equivalent which is 33% (respectively 34.4% in rural areas) higher than that of a household whose head is self-employed, a mother's help or an apprentice. For a household whose head is a director, this gain amounts to 24% in the city and 18% in the countryside.

In addition, regarding the activity branch of the household head, the estimation results of the regression model also show that there is a premium (gain) for households whose heads work in industry, trade, and services as compared with households whose heads work in agriculture.

Actually, the fact of working in the trade sector in urban areas induces an increase in consumption per adult equivalent of 26% relative to a household whose head works in agriculture; in rural areas this amounts to 22.3%. Similarly, the fact of working in the services sector in urban areas leads to an increase in consumption per adult equivalent

of 22% relative to a household whose head works in agriculture; this percentage is equal to 7% in rural areas. The estimation results of the model confirm the fact that there is a fall in consumption if the household head works in agriculture, thus testifying to the vulnerability of the household concerned.

Access to credit by a household head who plans to engage in agriculture or business also plays an important role in the determination of household living standards. In effect, we note that access to credit by the household head positively and significantly affects living standards both in urban and rural areas. In rural areas, the coefficient associated with the variable “access to credit” is significant at the 1% significance level.²² In addition, the average welfare level of households that have obtained a credit in rural areas is 17.4% higher than that of households that did not have access to credit. This result is similar to that of the study by Geda et al. (2006) on Ethiopia, according to which credit is an important component in smoothing out household consumption and, as a consequence, it is pro-poor because it increases household welfare.

Production assets and issued capital are positively associated with household consumption and welfare. In effect, the ownership of land increases the level of household consumption per adult equivalent; the impact of this variable is, however, weak and this tends to suggest that other elements such as the means of production should be associated to land.

In addition, membership in any association improves the level of consumption per adult equivalent by 6% and 7.5%, respectively, in the rural and urban areas. Associations in effect play an important role in improving access to credit when it comes to financing income-generating activities, among others. Moreover, associations more often play the role of insurance (companies) for their members in case of illness, death, etc. However, it should be noted that there exists a double causality, since the level of consumption can incite a household to belong to an association.

The regressions also highlight the impact of access to infrastructures on the welfare ratio. The results derived from regression analysis suggest that absence of infrastructure contributes to the exclusion of some households from the market and from income-generating opportunities. The coefficient estimates of the average time span spent to reach an asphalted road or a food market are significant in rural areas. The negative signs of the coefficients show the absence of infrastructure and the enclosure of rural areas; a situation that may induce high transaction costs that are likely to reduce the welfare of populations.

Finally, regression results also show differences between the regions of the country. In urban areas and compared with Yaoundé, which is the region of reference for our model, all the other regions are disadvantaged relative to Yaoundé. Concerning the rural areas, all the regions (save for the Extreme-North, the North, and the North-West) have an advantage relative to Yaoundé.

5.1.3 Results of Quantile Regressions

On the whole, the results of quantile regressions actually confirm that the levels of expenditure per adult equivalent of the different quantile expenditure groups are affected by different factors. These different expenditure groups not only face different challenges, but the challenges of each group also depend on the particular type of households concerned, i.e. whether these households belong to urban or rural areas.

Table 3 shows that the pseudo- R_s^2 of quantile regressions lie between 0.24 and 0.36, thus indicating that the coefficient estimates derived from our model perform reasonably well.

In terms of geographic sites and by comparison with households residing in Yaoundé, the study results show that regional variables have negative effects on household consumption in urban areas, except for the consumption of households belonging to the 90th percentile of the Extreme-North region. On the other hand, in rural areas and compared with households residing in Yaoundé, the results show that regional variables (South-West, South, West and Littoral) have insignificant positive effects on consumption whichever quantile is considered, whereas the regional variables of the North-West, North, and Extreme-North rather have negative effects on household consumption.

As for the OLS regression results, household size is significant and negatively associated with consumption expenditure per adult equivalent across all the quantiles of the distribution of expenditure in urban and rural areas. This result not only indicates that large-sized families usually have lower expenditure per adult equivalent, but it is also similar to the results of other studies such as that of Lanjouw and Ravallion (1995), which finds that large-sized households are more likely to fall into poverty than small-sized ones.

As regards the gender of the household head, quantile regression results show that households whose heads are females have a negative relationship with welfare (except for the households of the 10th quantile of the urban area), and these results are very significant for the 50th and 90th percentiles in rural areas. A large number of studies have shown that households headed by men tend to fare better than those headed by women (Barros et al., 1997), because households headed by women not only have more limited access to resources than men, but they also tend to experience more discriminations (World Bank, 1991). This situation underlines the constant need to include gender-specific policies in the formulation of policies aimed at alleviating poverty.

Age has an insignificantly positive association with household living standards, except for the household head's age group of 60 and more, and for the 50th and 90th quantiles of the consumption distribution in the rural areas. In effect, the study results suggest that the variable "household heads belonging to the 50 to 59 age group" is significant for the 50th and 90th quantiles in rural areas. On the other hand, the variable "the household head belong to the 60-and-more age group" is positively related to welfare for the 50th and 90th quantiles of the distribution of consumption both in rural and urban areas. This result suggests that households headed by the oldest household heads

enjoy a higher level of welfare in the upper quantiles of the distribution of consumption expenditures, and they are less poor by inference. This result is different from the one derived from OLS regressions, according to which the older members of the household are negatively associated with consumption expenditure per adult equivalent.

The educational level of the household head is positively linked to household consumption expenditure at all the quantiles of the distribution of expenditure both in urban and rural areas. The first-cycle and second-cycle levels of secondary education significantly increase household consumption expenditure at the 10th quantile of the distribution of consumption expenditure, both in urban and rural areas. When higher education is considered, and when one moves from the 10th quantile to the 90th quantile of the consumption expenditure distribution, one notes that in the urban and rural areas, the coefficients increase and reach their highest levels at the 90th quantile, which means that education has a stronger effect on the welfare of rich households.

An examination of the sector in which the household head is employed reveals that household heads employed in trade have a positive relationship with welfare for all the three quantiles of the welfare distribution in both urban and rural areas. As for the results of the OLS regressions, they are significant for the 50th and 90th percentiles of the distribution of household expenditure in urban areas.

The household heads employed in the industrial sector have a positive relationship with welfare for the 50th and 90th percentiles of the distribution of household expenditures in urban areas, and for all the three quantiles of the distribution of household expenditure in rural areas. Contrary to the OLS regression results, household heads who work in industry have a negative relationship with consumption for the 10th quantile of the distribution of household expenditure in urban areas.

Household heads working in the services sector have a positive relationship with consumption for the three quantiles of the expenditure distribution in urban areas. This result is similar to the result obtained from OLS regressions. On the other hand, in rural areas, household heads working in the services sector have a positive relationship with consumption only for the 50th and 90th percentiles of the distribution of expenditure, whereas those belonging to the 10th quantile have a negative relationship with consumption, thus indicating the disadvantage associated with working in this sector.

Households whose heads are executives, skilled employees, and managers (bosses) tend to be more well-off for the three quantiles of the distribution of expenditure both in urban and rural areas. This result is similar to that obtained with OLS regressions. By contrast, households whose heads are unskilled workers tend to be poor for the three quantiles of the distribution of expenditure in urban areas, and for the 10th quantile in rural areas. Contrary to the results derived from OLS regressions, households whose heads are unskilled workers tend to be rich for the 50th and 90th percentiles of the distribution of expenditure in rural areas.

Quantile regressions provide the evidence of a higher positive impact in terms of access to land in the three quantiles of the distribution of consumption expenditure in rural areas, thus indicating the higher significance of the role played by agriculture for the households of this area.

In rural areas, the average time span spent to reach a market place or the time span spent to reach an asphalted road are positively correlated with the welfare of a household belonging to the 90th percentile of the distribution of household consumption expenditure. In particular, the average time period spent to reach an asphalted road has a stronger positive impact on the consumption of rural households belonging to the 90th percentile of the distribution of expenditure. These results are contrary to those derived from the OLS regressions, which rather show the existence of a negative relationship between the variables “time span” and household consumption.

The fact of being a member of an association has a positive but insignificant effect on the consumption of households belonging to the 10th, 50th and 90th quantiles of the distribution of consumption expenditure in urban areas. This result is similar to that obtained with the help of OLS regressions. In rural areas, on the contrary, to be a member of an association has a significant positive effect only on the consumption of the households belonging to the 10th quantile of the expenditure distribution.

As for the results derived with OLS regressions, the fact that a credit is obtained by a household head has a positive effect on the consumption of a household in the three quantiles of the distribution of consumption expenditure in both the urban and rural areas. This result is significant for the three quantiles of the distribution of consumption expenditure in rural areas.

Table 3: Quantile regression results, 2007

Variables	Urban				Rural			
	OLS	10 th	50 th	90 th	OLS	10 th	50 th	90 th
Douala	-0.266 (-2.66)*	-0.286 (-2.17)	-0.241 (-1.38)	-0.421 (-1.89)	dropped			
Adamaoua	-0.090 (-0.82)	-0.188 (-1.35)	-0.030 (-0.16)	-0.048 (-0.37)	0.083 (1.37)	-0.033 (-0.42)	0.160 (2.27)	0.186 (1.50)
Centre	-0.347 (-4.10)***	-0.333 (-3.00)*	-0.304 (-2.11)	-0.544 (1.54)**	-0.036 (-0.74)	0.033 (0.50)	-0.100 (-1.59)	-0.163 (-1.51)
East	-0.298 (-2.81)**	-0.350 (-2.55)	-0.164 (-0.93)	-0.376 (-1.73)	(dropped)			
Extreme-North	-0.156 (-1.73)	-0.413 (-3.75) ***	-0.091 (-0.66)	0.010 (0.06)	-0.192 (-4.14)***	-0.260 (-4.07)***	-0.176 (-3.03)**	-0.159 (-1.62)
Littoral	-0.590 (-6.90)***	-0.792 (-3.78)***	-0.518 (-2.99)	-0.659 (-3.79)***	0.063 (1.06)	0.043 (0.56)	0.138 (1.81)	0.183 (1.38)
North	-0.14 (-1.62)	-0.162 (-1.45)	-0.176 (-1.23)	-0.127 (-0.71)	-0.182 (-3.50)***	-0.245 (-3.53)***	-0.135 (-2.16)	-0.217 (-2.06)
North-West	-0.303 (-3.72)***	-0.390 (-3.87)***	-0.284 (-2.22)	-0.260 (-1.50)	-0.115 (-2.44)	-0.123 (-3.53)***	-0.127 (-2.14)	-0.116 (-1.14)
West	-0.340 (3.70)***	-0.403 (-3.84)***	-0.460 (-1.85)	-0.460 (-2.68)*	0.116 (2.39)	0.088 (1.35)	0.105 (1.70)	0.045 (0.43)
South	-0.346 (-3.72)***	-0.314 (-2.46)	-0.289 (-1.76)	-0.594 (-2.90)**	0.278 (3.95)***	0.214 (2.58)	0.111 (1.71)	0.182 (1.10)
South-West	-0.088 (-1.05)	-0.039 (-0.38)	-0.047 (-0.35)	-0.217 (-1.21)	0.113 (2.19)	0.058 (0.84)	0.138 (2.08)	0.139 (1.22)

Continued next page

Table 3 continued

Household size	-0.074 (-9.92)***	-0.087 (3.84)	-0.081 (-11.26)***	-0.083 (-6.04)***	-0.081 (-17.76)*	-0.071 (-24.04)* **	-0.048 (-1.32)	0.006 (0.10)
Female	-0.058 (-1.19)	0.014 (0.23)	-0.016 (-0.21)	-0.039 (-0.39)	-0.070 (-2.53)	-0.080 (-2.35)	-0.090 (-25.87)***	-0.002 (-9.20)***
household head has a spouse	-0.163 (-3.74)***	-0.032 (-0.61)	-0.164 (-2.50)	-0.221 (-2.52)	-0.146 (-6.52)***	-0.075 (-2.82) **	-0.001 (-0.80)	0.001 (0.32)
Age of head of household: 30-39 years old	-0.066 (-1.55)	-0.065 (-1.13)	-0.069 (-0.97)	-0.123 (1.37)	-0.021 (-2.96)	-0.021 (-0.73)	-0.082 (-2.26)	-0.036 (-0.56)
Age of head of household: 50-59 years old	-0.108 (-2.57)	-0.105 (-1.87)	-0.111 (-1.63)	-0.082 (-0.95)	-0.128 (-5.48) **	-0.088 (-2.99)	0.029 (1.12)	0.021 (0.45)
Age of head of household: 60 years or older	0.070 (1.49)	-0.003 (-0.06)	0.057 (0.78)	0.120 (1.36)	-0.048 (-1.96)	-0.075 (-2.54)	0.119 (3.14)**	0.069 (1.05)
Level of Head's education: Primary	0.063 (1.36)***	0.095 (1.68)	0.147 (2.54)	0.015 (0.17)	0.068 (3.18)**	0.039 (1.47)	0.153 (2.80)***	0.179 (1.85)

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Level of Head's education: Secondary 1 st cycle	4.04 (4.04)***	0.304 (4.52)***	0.216 (2.54)	0.148 (1.32)	0.154 (5.25)*	0.144 (3.77)***	0.210 (2.12)*	0.032 (0.20)
Level of Head's education: Secondary 2 nd cycle	0.278 (4.76)***	0.318 (4.14)***	3.55 (3.55)***	0.138 (1.13)	0.188 (4.37)*	0.141 (2.79)**	0.130 (1.92)	0.195 (1.71)
Level of Head's education: Higher	0.629 (8.01)***	0.647 (6.80)***	0.580 (4.55)***	0.830 (6.15)***	0.348 (3.69)***	0.135 (0.141)	0.179 (2.40)**	0.157 (1.29)
Industrial sector	0.019 (0.42)	-0.016 (-0.28)	0.051 (0.63)	0.078 (0.87)	0.074 (2.01)	0.050 (1.13)	0.104 (3.31)**	0.168 (3.16)**
Trade sector	0.261 (4.97)***	0.203 (3.27)**	0.276 (3.36)**	0.282 (2.73)*	0.223 (4.41)***	0.082 (0.76)	0.111 (1.21)	0.028 (0.16)
Services sector	0.218 (4.72)***	0.105 (1.93)	0.176 (2.51)	0.251 (2.69)*	0.068 (1.60)	-0.022 (-0.42)	0.105 (2.14)	0.241 (2.88)**
Executives	0.33 (4.78)***	0.363 (3.98)***	0.391 (3.34)**	0.340 (2.60)	0.344 (4.47)***	0.454 (4.75)***	0.127 (3.86)***	0.231 (3.93)
Skilled employees	0.077 (1.49)	0.147 (2.28)	0.154 (1.74)	0.039 (0.37)	0.118 (2.43)	0.095 (1.55)	0.096 (2.35)**	0.002 (0.04)***
Unskilled workers	-0.089 (-1.49)	-0.088 (-1.08)	-0.013 (-0.13)	-0.202 (-1.49)	-0.029 (-0.56)	-0.000 (-0.00)	0.051 (2.27)	0.033 (0.82)
Managers (bosses)	0.244 (2.64)*	0.067 (0.72)***	0.249 (2.03)	0.331 (2.25)	0.182 (3.84)***	0.150 (2.67)*	0.058 (3.90)***	0.136 (5.36)***

Continued next page

Table 3 continued

Head is a member of an association	0.075 (2.34)	0.058 (1.42)	0.079 (1.48)	0.091 (0.90)	3.04 (1.40)	0.078 (3.19)**	-0.236 (-2.56)**	-0.016 (-0.14)
Travel time to market place	-0.057 (-2.05)**	-0.035 (-1.63)	-0.068 (2.13)	-0.065 (-1.63)	-0.024 (-2.74)*	-2.49 (-2.49)	0.130 (0.94)	0.052 (0.27)
Travel time to reach an asphalted road	-0.027 (-1.90)	-0.041 (-2.71)*	-0.019 (-0.85)	-0.004 (-0.16)***	-0.019 (-2.89)**	-0.020 (-2.44)	0.036 (6.81)***	0.258 (3.87)***
Area of land exploited	0.048 (3.18)**	0.040 (2.16)***	0.045 (1.86)	0.036 (1.39)	0.065 (4.59)***	0.017 (1.06)	0.583 (3.86)***	0.817 (3.18)***
Head obtained a credit	0.201 (3.09)**	0.186 (2.88)***	0.147 (1.44)	0.267 (2.25)	0.173 (3.56)*	0.156 (2.98)**	0.108 (5.02)***	0.161 (4.32)***
Intercept	13.287 (123.30)***	12.775 (92.37) ***	13.226 (79.69) ***	13.991 (66.19)***	12.827 (212.46)***	0.078 (155.31) ***	-0.037 (-3.44)**	-0.026 (-1.36)
Number of observations		1,181	1,181	1,181	2,539	3,036	3,036	3,036
Pseudo-R ²		0.277	0.255	0.293		0.217	0.237	0.221

Notes: Robust *t*-statistics are between parentheses

*** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level

Source: Calculations of the author using the data of the Cameroonian Household Survey, ECAM3

5.2 Results of the Oaxaca-Blinder Decomposition Method

Table 4 below shows the results derived from the Oaxaca-Blinder decomposition method. The predicted yearly average consumption amounts to CFAF 12.632 6 for the urban area, and to CFAF 12.270 3 for the rural area. The overall difference in welfare between urban and rural areas is estimated at CFAF 0.3623905. The urban-rural welfare difference in Cameroon is decomposed into two components: an explained component of 0.1640441 representing 45% of the total welfare difference, and the unexplained component of 0.1983464 representing 55% of the total welfare difference. The explained difference is attributed to differences in household characteristics, while the unexplained difference is due to discrimination or pure bias.

The greatest contributor to the urban-rural welfare difference explained by endowments is the value of the employment sector (service sector) of the household head with a share of 13.57%. The latter is followed by the average time span spent to reach the market place, the average time span spent to reach an asphalted road, and by the characteristics of education (higher education) in the explanation of the urban-rural welfare difference. The characteristics of higher education explain 10.27% of the urban-rural welfare difference, and the characteristics of second-cycle secondary education explain only 6.71% of this welfare difference.

The results also show that the effects of the coefficients of second-cycle secondary education and higher education are quite small, while the effects of characteristics are substantial. This fact underlines the importance of obtaining higher educational levels for household members, for it is the gap in the level of education achieved by urban and rural households that turns out to be one of the major causes of welfare differences.

The results of the explained component indicate that variables such as the area of cultivated lands, being an unskilled worker, being a manager (or the boss), primary education, the 50-59 age group, the 60-and-more age group, having a spouse, and household size favour rural households, while the gap in the rest of the variables put rural households at a disadvantage. On the other hand, the constant term acts to increase the welfare gap, thus reflecting the underlying differences between the two groups that are not captured by the other explanatory variables.

The main factors creating the welfare bias against the rural areas are household size, followed by the 60-and-more age group, both of which, respectively, explain 9.06% and 6.29% of the discrimination.

The negative coefficient differentials of the regional dummy variables indicate that, on average, the marginal benefits of rural households that are located in regions different from the reference region tend to be higher than the marginal benefits of the urban households that are not located in the reference region, while controlling for other factors.

Table 4: Oaxaca-Blinder decomposition of the welfare gap results, 2007

	Estimate of amount attributable to characteristics (Amount explained)	Share (in %)	Estimate of amount attributable to coefficients (Amount unexplained)	Share (in %)
Douala	-0.008352	-2.31	0	0.00
Adamaoua	0.0016914	0.47	-0.00755	-2.08
Centre	0.0130303	3.60	-0.03486	-9.62
East	-0.000166	-0.05	-0.00945	-2.61
Extreme-North	0.0125014	3.45	0.007212	1.99
Littoral	-0.041907	-11.58	-0.02781	-7.67
North	0.0003008	0.08	0.003848	1.06
North-West	-0.005287	-1.46	-0.03705	-10.22
West	0.0119639	3.30	-0.06901	-19.04
South	-0.003465	-0.96	-0.01914	-5.28
South-West	0.0000148	0.00	-0.01823	-5.03
Household size	-0.066235	-18.30	0.032837	9.06
Female	0.0009726	0.27	0.003082	0.85
Household head has a spouse	-0.008279	-2.29	-0.00917	-2.53
Age of head of household: 30-39 years old	-0.000514	-0.14	-0.00014	-0.04
Age of head of household: 50-59 years old	-0.009302	-2.57	0.004274	1.18
Age of head of household: 60 years or older	0.0010597	0.29	0.022808	6.29
Level of Head's education: Primary	-0.002724	-0.75	-0.00213	-0.59
Level of Head's education: Secondary 1 st cycle	0.0102595	2.83	0.007368	2.03
Level of Head's education: Secondary 2 nd cycle	0.024297	6.71	0,005087	1.40

Continued next page

Table 4 continued

Level of Head's education: Higher	0.0371596	10.27	0.003892	1.07
Industrial sector	0.0013218	0.37	-0.00331	-0.91
Trade sector	0.0187858	5.19	0.001327	0.37
Services sector	0.0491227	13.57	0.012502	3.45
Executives	0.0236346	6.53	-0.00018	-0.05
Skilled employees	0.0057366	1.58	-0.00187	-0.52
Unskilled workers	-0.003331	-0.92	-0.00113	-0.31
Managers (bosses)	-0.000729	-0.20	0.002767	0.76
Is a member of an association	0.0157965	4.36	0.006973	1.92
Travel time to market place	0.0417189	11.52	-0.09864	-27.22
Travel time to reach an asphalted road	0.041718	11.52	-0.02646	-7.30
Area of land used	-0.00017	-0.05	-0.01056	-2.91
Head obtained a credit	0.0047081	1.30	0.001125	0.31
Intercept	0	0.00	0.459925	126.91
Total	0.1653328	45.67%	0.198346	54.73%

Source: Calculations of the author using the data of the Cameroonian Household Survey, ECAM3

NB: Share is a ratio of the contribution of each factor to the "predicted" overall difference in welfare in percentage terms

5.3 Decomposition Results of Changes in Household Expenditure between 2001 – 2007

The results derived from the Oaxaca decomposition technique using the specifications of models (7a) or (7b) for the urban and rural samples, respectively, are presented in Table A4 (Table 5a and Table 5b) in the Appendix and summarized in Table 6 below. Each column in this table shows the contribution of changes in endowments/characteristics and coefficients/performances to growth in real consumption per adult equivalent for specific categories of variables such as education, the branch of activity, the demographic characteristics of the household, regional binary variables, etc. Table A4 (Table 5a and Table 5b) in the Appendix present detailed results for the contribution of each explanatory variable to growth in real household consumption between 2001 and 2007. Decomposition results also show significant differences between rural and urban areas in real household consumption between 2001 and 2007.

Table 6: Oaxaca decomposition of the Increase in per adult equivalent real consumption expenditures between 2001 and 2007

	Rural		Urban	
	endowments	coefficients	endowments	coefficients
Douala	0.0000	0.0000	-0.0044	-0.0560
Adamaoua	0.0028	0.0017	0.0009	0.0072
Centre	-0.0039	0.0128	0.0000	-0.0147
East	-0.0041	-0.0056	-0.0011	-0.0182
Extreme-North	0.0180	-0.0674	-0.0013	0.0049
Littoral	0.0283	0.0210	-0.0012	-0.0185
North	0.0002	-0.0329	-0.0027	-0.0008
North-West	-0.0153	0.0276	0.0000	-0.0303
West	0.0051	-0.0026	-0.0042	-0.0051
South	-0.0004	0.0150	0.0041	-0.0011
South-West			0.0129	-0.0292
Household size	-0.3403	-0.0229	0.0527	0.0133
Female	0.4533	0.0064	-0.0013	0.0344
Household head has a spouse	-0.0390	0.0058	0.0072	0.0301
Age of head of household: 30-39 years old	0.0239	0.0034	-0.0007	0.0173
Age of head of household: 50-59 years old	-0.0002	-0.0272	0.0096	-0.0487
Age of head of household: 60 years or older	0.0000	-0.0100	0.0002	0.0070
Level of Head's education: Primary	0.0118	-0.0008	0.0035	-0.0268
Level of Head's education: Secondary 1 st cycle	-0.0363	-0.0046	-0.0026	0.8970
Level of Head's education: Secondary 2 nd cycle	-0.0213	-0.0046	0.0054	-0.0129
Level of Head's education: Higher	-0.0248	-0.0033	-0.0093	0.0106

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Table 6 continued

Industrial sector	0.0109	-0.0115	-0.0087	-0.0587
Trade sector	-0.0024	0.0000	-0.0994	-0.0235
Services sector	-0.0070	-0.0366	0.0414	0.0206
Executives	-0.0149	0.0037	-0.0123	0.0075
Skilled employees	-0.0147	0.0019	-0.0058	0.0383
Unskilled workers	0.0003	-0.0005	0.0499	0.0185
Managers (bosses)	-0.0046	0.0041	0.0002	-0.0052
Head is a member of an association	0.0457	1.1909	-0.0014	0.0316
Travel time to market place	-0.1229	0.0806	-0.0065	-0.2078
Travel time to reach an asphalted road	-0.0168	0.0818	-0.0042	0.0658
Area of land exploited	-0.2168	-0.0089	-0.0054	-0.0371
Head obtained a credit	-0.1406	-0.0011	0.0005	-0.0091

Source: Calculations of the author using the data of the Cameroonian Household Surveys, ECAM2 and ECAM3

Examination of household characteristics or endowments in rural and urban areas indicates that regional binary variables contribute positively to growth in household consumption (Table 6).

In urban areas, the change in the characteristics/endowments of household size also contributes positively but weakly to growth in consumption. In rural areas, by contrast, the change in the endowment of household size contributes rather negatively to growth in household consumption between 2001 and 2007.

As regards changes in the coefficients/performances, the variable household size is one of the main contributory factors in poverty reduction in urban areas. In this case, changes in the results (performances) of the “other demographic variables”, which include the matrimonial status, the age, and sex of the household head also contribute positively to growth in household consumption. These variables are added to the model mainly as control variables. The interpretation of changes in the coefficients of these variables is difficult and is not useful from a policy standpoint. Consequently, it is not envisaged in the present study.

The effect of an increase in educational endowments (primary and secondary school cycles) is positive for urban households, but performances are negative. On the other hand, the educational performances “secondary school 1st cycle” and “higher education” tend to contribute to poverty reduction. The overall performances of education are the main contributory factors in poverty reduction in urban areas. In rural areas, by contrast, the overall characteristics and performances of education variables

are negative, and hence unfavourable to growth in real consumption between 2001 and 2007.

Concerning another important dimension that affects household living standards, namely the activity sector, decomposition results generally suggest that the services sector contributes positively to growth in consumption in urban areas and negatively in rural areas.

As mentioned above, ownership of land is significantly associated with household consumption levels, particularly in rural areas. In 2001 and 2007, the coefficients of land are positive and significant, which goes in the direction of reducing poverty. By contrast, between 2001 and 2007, decomposition results show that the performances as well as the endowments of land ownership are negative both in rural and urban areas, which goes in the direction contrary to poverty reduction.

Decomposition results further indicate that for urban households, the effects of a change in the performance of the “member of an association” dominate those of a change in the characteristics of this variable. As to rural households, increases in the performance and the characteristic of a “member of an association” facilitate poverty reduction.

For rural and urban households, the effects of changes in the performances of activity branches dominate those of changes in the characteristics of these branches. For urban households, increases in the performances of managers, skilled workers, and unskilled workers are in accordance with the reduction of poverty.

For rural households, the performances of executives, skilled workers, and managers improved significantly, indicating that a rise in the income derived from work in these branches of activity in the urban areas contributed to the reduction of poverty.

6. Conclusion and Policy Implications

The objective of this study was to examine the key determinants of living standards, and hence of poverty in urban and rural areas as well as to identify the factors that explain differences in poverty between urban and rural households in Cameroon. Moreover, since the incidence of poverty is higher in rural than in urban areas, the study also aimed to find whether these differences are due to endowments of inferior quality in rural areas or to the low productivity of these endowments. On the methodological level, the study used both OLS regressions to analyze the general welfare status of households, and quantile regressions to analyze household welfare at different points on the consumption expenditure distribution, as well as to break down the differences between living standards using the Oaxaca-Blinder decomposition method (1973). The study used total household expenditure per adult equivalent as the welfare indicator, while the data used was derived from the ECAM2 and ECAM3 household surveys conducted, respectively, in 2001 and 2007 by Cameroon's National Institute of Statistics (NIS).

The results of the study show that the determinants of household welfare are numerous and complex, ranging from individual and household characteristics to the social characteristics of the community, but that the relative importance of these factors varies from one area to another and throughout the distribution of welfare. The use of OLS and quantile regressions indicates that human resources, social as well physical capital play a major role in improving household welfare. The study also reveals a certain number of demographic effects in the urban and rural areas, of which the most significant is caused by household size, which contributes to the reduction of household consumption expenditure. Moreover, the regions where the households reside also affect consumption expenditure and poverty. There are also significant differences in the occupations of household heads. Those who work in the services sector and trade are better-off than those working in the other sectors of the economy.

Unlike the results of OLS regressions, which show a negative relationship between the variable "female gender" and welfare, quantile regressions yield contrary results for

the household heads of the 10th quantile of the distribution of expenditures in the urban area, and for the household heads of the 90th quantile of the distribution of expenditures in rural areas.

OLS regressions results also show the presence of a negative relationship between the oldest household heads and welfare. This result is different from those derived from quantile regressions, which indicate that the oldest household heads enjoy a higher level of welfare in the upper quantiles of the distribution of consumption and, by inference, are less poor.

Contrary to the OLS regressions results, household heads who work in the industrial sector have a negative relationship with consumption for the 10th quantile of the distribution of household expenditure in urban areas.

In addition, contrary to the results obtained with OLS regressions, households whose heads are unskilled workers tend to be rich for the 50th and the 90th percentiles of the distribution of expenditure in rural areas.

In rural areas, the average time span spent to reach a marketplace, as well as to reach an asphalted road, is positively correlated to the welfare of households belonging to the 90th percentile of the distribution of household consumption expenditures. These results are opposed to those of OLS regressions, which rather show the existence of a negative relationship between these “time spans” variables and household consumption.

Finally, the variable “being a member of an association” has an insignificant positive effect on the consumption of households belonging to the three quantiles of the distribution of consumption in urban areas. This result is similar to that derived from using OLS regressions. On the other hand, the variable “being a member of an association” in rural areas has a significant positive impact only on the consumption of households belonging to the households of the 10th percentile of the distribution of expenditure.

The results derived from the Oaxaca-Blinder decomposition method indicate the existence of a welfare gap between urban and rural areas. This is largely explained by the differences in characteristics, particularly by physical assets and education to the tune of 59%. The remaining 41% of the welfare gap is attributable to discrimination.

These results suggest some poverty reduction policy recommendations. One of the main results of the study is the significant role that the education of the household head plays in reducing the poverty of urban and rural households. This finding suggests that widening access to education²³ will reduce poverty both by increasing individual productivity and by facilitating the movement of poor persons from the low-paying jobs of the agricultural sector, towards the well-paying jobs of the industrial and services sectors of the economy. What is even more important is that, if public spending on education is targeted at the poor, it can yield a double dividend by reducing poverty in the short term and by increasing the chances of poor children to have access to jobs in the formal sector of the economy, an opportunity that would help them bypass the intergenerational poverty trap. An increase in the levels and quality of education should be accompanied by a sound investment climate to make sure that productive jobs are

created for those who are newly educated.

Since the study has shown that poverty increases with household size both in rural and urban areas, one way to reduce household size, and hence poverty is to heighten the awareness of household heads about the possibility of reducing the number of children in the household through such techniques as contraception or abstinence, which are provided by family planning services. More specifically, it is urgent in the case of Cameroon to intensify the efforts and activities of family planning services. This will entail increasing family-planning financial expenditure, and also carrying out research on the determinants of fecundity as well as on the decentralization, provision, and supervision of family planning services in the country.

Since the occupation of household heads working in agriculture does not reduce poverty, there is consequently an urgent need to increase farm income through a rise in farm productivity by providing farmers with inputs such as fertilizer, pesticides, selected seeds, and appropriate mechanization, which can make it possible for them to increase agricultural output. This can be done through agricultural finance development by creating agricultural credit institutions, which can help farmers finance these production inputs. Moreover, farmers should also be provided with extension services in order for them to adopt sound advice in terms of cultural practices and information about market conditions, which may enable them to choose which crops to produce and to sell at advantageous prices. Furthermore, the government should endeavor to design and implement rural development programmes in the areas of physical infrastructure, energy, and social infrastructure such as roads, communications, telecommunications, schools, and hospitals, which can open up the countryside and facilitate exchange between rural and urban areas, which may in turn contribute to the modernization of rural areas and improvements in the well-being of rural dwellers.

In addition, the study's regression analysis results have highlighted the importance of infrastructure and of the other market variables such as access to good roads. These are areas in which Cameroon has made modest progress during the last two decades, and therefore more needs to be done.

A major source of welfare differences between urban and rural areas is in the endowments of saleable characteristics. Consequently, policies designed to reduce poverty and the urban-rural gap should include education and employment opportunities.²⁴

Finally, it is apparent that more jobs should be created for the poor. This requires that the government pursues growth promotion policies, most particularly in rural areas and in sectors that can provide the poor with job opportunities. This underscores the importance of private sector growth and development as a precondition for economic growth and job creation in Cameroon.

7. Notes

1. This reduction of poverty in urban areas is mainly concentrated in the two largest cities of Cameroon, namely Douala and Yaoundé.
2. Cameroon is a signatory to the Millennium Declaration of the United Nations as of September 2000.
3. Populations also perceive the poverty condition as a consequence of “social dysfunctions”, notably the depravation of mores, the loss of self-respect and family solidarity, and prejudices and discriminatory attitudes against certain ethnic and social groups. Lastly, they associate the poverty condition with insecurity, lack of protection against abuse, absence of rights, and inaccessibility to legal services.
4. Household aggregate consumption comprises food expenditure (including meals taken outside the household), non-monetary food consumption resulting from home consumption, and donations; the purchase value of non-durable goods and services; an estimate of the use value of durable goods; and the imputed value of housing for those households who own their accommodations or are housed for free by a third party.
5. The poverty lines of 2001 and 2007 are calculated by the NIS using the Costs of Basic Needs (CBNs) method, which consists in determining first, the food poverty threshold (ZF), and then adding to it the non-food poverty threshold (ZNF). In other words, the total poverty line (Z) is given by: $Z = ZA + ZNF$ (see, NIS (2008) for more details).
6. Numerous authors such as Glewwe (1991), Mukherjee and Benson(2003), Canagarajah et al. (2003), Banque (2003), and Audet et al. (2006) propose many theoretical arguments in favour of the continuous approach, to the detriment of the discrete approach as far as the modelling of poverty determinants is concerned.
7. To analyze the determinants of poverty, some authors such as Bardhan (1984), Grootaert (1997), Geda et al. (2001), Goaed and Ghazouani (2001), Fofack (2002), Roubaud and Razafindrakoto (2003) use the probit or logit-type models to model the probability that a household is poor or not, given its characteristics and other variables linked to its socio-economic environment. There is also an approach where some researchers use multinomial logit-type models ordered to estimate the probability of being extremely poor, poor, or non-poor (see for instance, Coulombe

- and McKay (1996) as well as Fissuh and Harris (2004)). Poverty functions such as the probit model are useful when the underlying dependent variable of interest is unobservable. However, they are often criticized because of the introduction of measurement errors stemming from the use of arbitrarily defined poverty lines. Moreover, to reduce a continuous variable such as household consumption expenditures to a binary qualitative variable (to be poor or not), is likely to create information loss in the distribution of the dependent variable (Deaton, 1997 and Appleton, 2001). In addition, even in the presence of robust poverty lines, the parameters estimated with the help of binary qualitative choice models may vary as a function of the chosen poverty line and may generate eventual discrepancies.
8. The paper by Koenker and Hallock (2001) has an excellent introduction to quantile regressions.
 9. Potentially, different solutions at distinct quantiles may be interpreted as differences in the dependent variable's response to changes in the regressors at different points in the conditional distribution of the dependent variable. The estimation of a set of conditional quantile functions enables us to depict a more detailed picture of the link between the conditional welfare distribution and selected co-variables. This helps us to focus on the performances of the characteristics of poor households at the level of lower quantiles, and on those of relatively rich households at the level of the highest quantiles of the conditional welfare distribution.
 10. The studies by Glewwe (1991) and Ravallion and Wodon (1997) provide examples of this type of analyse
 11. See Glewwe, Gragnolati and Zaman (2002) for a similar decomposition exercise, with household survey data from Vietnam.
 12. Excluding members of the diplomatic corps and their households.
 13. The welfare ratio and its theoretical properties are discussed in a study by Blackorby and Donaldson (1987). More practical applications of the welfare ratio may be found in Ravallion (1998), as well as Deaton and Zaidi (2002)
 14. There are at least two reasons for not including endogenous variables among the explanatory variables of the model. Firstly, since endogenous variables are likely to be correlated with the error term, the estimation results may be biased. This is not just the case for the variable in question; the introduction of an endogenous variable can potentially bias all the other parameter estimates. Secondly, even if there are no perceptible biases in the estimation results, the latter will depend on the endogenous variable. Under these conditions, we have not included the household housing characteristics among the explanatory variables, as the latter might be likely to be determined by household living standards. Similarly, we have excluded some regressors, variables including access to basic services such as electricity or potable water, because the endogeneity of these variables of access relative to income may lead to biases in the parameter estimates of the regression.
 15. In fact, it seems that a vicious circle of poverty exists, since low level of education leads to poverty while poverty itself leads to a low level of education (see, for instance, Bastos et al., 2009). The poor are unable to acquire the means to finance

their education, even if the latter is publicly supplied because of the higher opportunity costs the poor face. Usually, they cannot go to school because they must work to survive. In effect, Palmer-Jones and Sen (2003) as well as Anyanwu (2005; 2010) have found that rural households in India, whose principal salaried member has no formal education or has only attended primary school, are more likely to be poorer than households whose salaried members have reached the secondary level of education or more. However, Sadeghi et al. (2001) noted that higher levels of education were not seriously needed in rural areas, where only a few well-educated persons live.

16. This has important implications for poverty, since the ownership of land may serve as collateral on credit, in addition to its main function, which is to provide shelter.
17. Wodon (1999) analyzes the micro-determinants of consumption and poverty in Bangladesh by also including regional variables among the determinants of poverty.
18. Most poverty studies in developing countries have divided their samples into at least two categories. To a minimum, the households analyzed are divided into those of the urban area and those of the rural area. This division is chosen because the factors affecting poverty are likely to be significantly different in urban areas as compared with rural areas. Moreover, a household is considered as being urban if it resides in an area with population of more than 50,000 inhabitants; if the number of inhabitants is lower than that, the household is considered as rural. These definitions of rural and urban residency are the standard definitions used by the Cameroon National Institute of Statistics (NIS).
19. Regressions are run with the help of the STATA 10 program. Heteroscedasticity is the econometric problem frequently encountered when cross section data are being used in regression analysis. To overcome this problem, the ordinary least squares (OLS) are computed with the “robust” option. The “regress” command of the STATA 10 program includes a “robust” option for the estimation of the standard deviation using the Huber-White sandwich estimators. With this “robust” option, the coefficient estimates are exactly the same as those derived from OLS, but the standard deviations take account of the problems of heteroscedasticity and absence of normality.
20. The contradiction on women vs male headed household poverty may also be explained by the fact that the incomes of private transfers are likely to benefit vulnerable populations such as women alone. In addition, households headed by women alone often have fewer members, a situation which reduces poverty in a household.
21. Strictly speaking, to have a primary level of education in urban areas increases expenditure by about 7% (i.e., $\exp(0.063)-1$) relative to uneducated persons. Similarly, this effect amounts, respectively, to 23%, 32% and 88% for households whose heads have secondary education first cycle, secondary education second cycle, and higher education.

22. It is opportune to note that access to credit in urban areas is significant at the 5% level of significance.
23. Although ensuring good educational opportunities in urban areas may be the key poverty reduction policy, this does not imply that the government should make less efforts of this kind in the rural areas. In the presence of a significant rural-urban migration, many rural residents end up finding themselves in urban areas where they can earn a better livelihood if they are educated. Moreover, in combination with greater regional development efforts, rural families may have the chance of benefiting from employment opportunities that reward education. The literature on endogenous growth emphasizes the role of education in the economic development process (Lucas, 1988).
24. The creation of paid employment opportunities may be achieved by boosting the agricultural productivity of farmers, and by increasing self-employment opportunities. Microfinance is most particularly relevant for boosting the productivity of self-employment in the informal sector of the economy.

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Appendix

Table 1a: Descriptive statistics of the model's variables, 2001

	Description of the variables	Urbain			Rural		
		Obs	Mean	Std. Dev	Obs	Mean	Std. Dev
lny	log of welfare ratio	4,975	0.657	0.417	6,017	0.261	0.737
Region1	Douala	4,975	0.224	0.417	6,017		
Region3	Adamaoua	4,975	0.052	0.223	6,017	0.082	0.274
Region4	Centre	4,975	0.042	0.202	6,017	0.108	0.311
Region5	East	4,975	0.050	0.2193	6,017	0.082	0.274
Region6	Extreme-North	4,975	0.090	0.286	6,017	0.144	0.352
Region7	Littoral	4,975	0.051	0.221	6,017	0.079	0.269
Region8	North	4,975	0.036	0.188	6,017	0.113	0.317
Region9	Northwest	4,975	0.059	0.235	6,017	0.097	0.296
Region10	West	4,975	0.081	0.273	6,017	0.111	0.314
region11	South	4,975	0.053	0.224	6,017	0.082	0.275
region12	Southwest	4,975	0.036	0.187	6,017	0.097	0.296
tailm	household size	4,975	5.114	3.522	6,017	5.151	3.51
sex2	female	4,975	0.252	0.434	6,017	0.237	0.425
conjoint2	household head has a spouse	4,975	0.525	0.499	6,017	0.523	0.499
Headaged2	Age of head of household: 30-39 years old	4,975	0.286	0.452	6,017	0.229	0.420
Headaged3	Age of head of household: 50-59 years old	4,975	0.136	0.343	6,017	0.161	0.368
Headaged4	Age of head of household: 60 years or older	4,975	0.110	0.313	6,017	0.212	0.408

Education2	Level of Head's edu: primary	4,960	0.271	0.444	6,007	0.352	0.477
Education3	Level of Head's edu: secondary 1st cycle	4,960	0.246	0.431	6,007	0.174	0.379
Education4	Level of Head's edu: secondary 2nd cycle	4,960	0.189	0.391	6,007	0.078	0.268
Education5	Level of Head's edu: higher	4,960	0.138	0.345	6,007	0.030	0.170
secteur_ac~2	Industrial sector	4,033	0.198	0.399	5,467	0.071	0.257
secteur_ac~3	Trade sector	4,033	0.459	0.498	5,467	0.164	0.371
secteur_ac~4	Services sector	4,033	0.242	0.428	5,467	0.097	0.296
CATEGSIOP1	Executives	4,047	0.152	0.359	5,471	0.230	0.230
CATEGSIOP2	skilled employees	4,047	0.168	0.374	5,471	0.056	0.234
CATEGSIOP3	unskilled workers	4,047	0.214	0.410	5,471	0.105	0.306
CATEGSIOP4	managers (bosses)	4,047	0.043	0.203	5,471	0.020	0.140
association1	Head is a member of an association	4,975	0.614	0.486	6,016	0.513	0.499
tem8d	Travel time to market place	4,932	2.254	0.744	5,984	2.889	1.134
tem10d	Travel time to reach an asphalted road	4,816	1.504	0.907	5,984	3.377	1.472
logland	Area of land exploited	809	0.690	0.938	3,811	0.721	0.782
credit1	Head obtained a credit	4,975	0.046	0.210	6,017	0.048	0.215

Source: Calculations of the author using the data of the Cameroonian household survey ECAM2

Table 2a: Determinants of urban and rural consumption expenditures, 2001

Variable		Urban	Rural
Region1	Douala	0.074 (0.63)	(dropped)
Region3	Adamaoua	-0.238 (-1.47)	0.052 (0.79)
Region4	Centre	0.015 (0.14)	-0.156 (-2.49)
Region5	East	0.132 (1.21)	0.089 (1.51)
Region6	Extreme-North	-0.207 (-1.82)	0.199 (3.35)**
Region7	Littoral	-0.262 (-2.29)	-0.316 (-4.75)***
Region8	North	-0.126 (-0.89)	0.229 (3.90)*
Region9	Northwest	0.0008 (0.01)	-0.279 (-4.42)***
Region10	West	-0.287 (-2.91)**	0.135 (2.29)
Region11	South	-0.318 (-2.91)**	0.008 (0.14)
Region12	Southwest	0.218 (1.24)	(dropped)
tailm	household size	-0.077 (-10.80)***	-0.076 (-20.44)***
sex2	Female	-0.191 (-2.32)	-0.093 (-2.70)
conjoint2	Household head has a spouse	-0.224 (-3.47)**	-0.158 (-6.19)***

Headaged2	Age of head of household: 30-39 years old	-0.125 (-1.87)	-0.080 (-2.90)**
Headaged3	Age of head of household: 50-59 years old	0.106 (1.57)	0.008 (0.30)
Headaged4	Age of head of household: 60 years or older	0.015 (0.18)	0.013 (0.43)
Education2	Level of Head's education: primary	0.154 (1.78)	0.070 (2.43)
Education3	Level of Head's education: secondary 1st cycle	0.172 (1.80)	0.184 (4.85)***
Education4	Level of Head's education: secondary 2nd cycle	0.341 (3.34)**	0.241 (4.05)***
Education5	Level of Head's education: higher	0.542 (4.14)***	0.475 (4.70)***
secteur_ac~2	Industrial sector	0.356 (4.21)***	0.217 (3.76)***
secteur_ac~3	Trade sector	0.380 (4.25)***	0.223 (5.30)***
secteur_ac~4	Services sector	0.175 (2.19)	0.324 (1.60)***
CATEGSIOP1	Executives	0.258 (2.39)***	0.228 (2.48)
CATEGSIOP2	Skilled employees	-0.085 (-0.87)	0.091 (1.09)
CATEGSIOP3	Unskilled workers	-0.349 (-1.49)***	-0.016 (-0.26)
CATEGSIOP4	Managers (bosses)	0.363 (2.72)*	0.066 (0.85)
association1	Head is a member of an association	0.013 (0.21)	0.118 (5.09)***
tem8d	Travel time to market place	-0.042 (-1.16)	-0.052 (-5.16)***

tem10d	Travel time to reach an asphalted road	-0.069 (-2.28)	-0.044 (-4.96)***
logland	Area of land exploited	0.106 (3.52)***	0.079 (5.05)***
credit1	Head obtained a credit	0.392 (4.19)***	0.205 (4.39)***
_cons	intercept	0.982 (5.79)***	0.717 (9.56)***
		R ² = 0.4527	R ² = 0.2758
		F-statistic (33,632) = 12.75	F-statistic (31, 3154) = 31.86
		Prob. > F = 0.000	Prob. > F = 0.000
Number of observations		666	3,186

Notes: Robust t- statistics are between parentheses

**** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level*

Source: Calculations of the author using the data of the Cameroonian household survey ECAM2

Table 5a: Results of regression on log of per adult equivalent consumption and Oaxaca decomposition
Urban sample

	<i>Coefficient -</i>		<i>Coefficient</i>		<i>Oaxaca decomposition</i>	
	<i>2001</i>		<i>-2007</i>		endowments	coefficients
Douala	0.074		-0.266	*	-0.0044	-0.0560
Adamaoua	-0.238		-0.090		0.0009	0.0072
Centre	0.015		-0.347	***	0.0000	-0.0147
East	0.132		-0.298	**	-0.0011	-0.0182
Extreme-North	-0.207		-0.156		-0.0013	0.0049
Littoral	-0.262		-0.590	***	-0.0012	-0.0185
North	-0.126		-0.14		-0.0027	-0.0008
Northwest	0.0008		-0.303	***	0.0000	-0.0303
West	-0.287	**	-0.340	***	-0.0042	-0.0051
South	-0.318	**	-0.346	***	0.0041	-0.0011
Southwest	0.218		-0.088		0.0129	-0.0292
Household size	-0.077	***	-0.074	***	0.0527	0.0133
Female	-0.191		-0.058		-0.0013	0.0344
Household head has a spouse	-0.224	**	-0.163	***	0.0072	0.0301
Age of head of household: 30-39 years old	-0.125		-0.066		-0.0007	0.0173
Age of head of household: 50-59 years old	0.106		-0.108		0.0096	-0.0487
Age of head of household: 60 years or older	0.015		0.070		0.0002	0.0070
Level of Head's education: primary	0.154		0.063	***	0.0035	-0.0268
Level of Head's education: secondary 1st cycle	0.172		4.04	***	-0.0026	0.8970
Level of Head's education: secondary 2nd cycle	0.341	**	0.278	***	0.0054	-0.0129
Level of Head's education: higher	0.542	***	0.629	***	-0.0093	0.0106
Industrial sector	0.356	***	0.019		-0.0087	-0.0587
Trade sector	0.380	***	0.261	***	-0.0994	-0.0235
Services sector	0.175		0.218	***	0.0414	0.0206

Executives	0.258	***	0.33	***	-0.0123	0.0075
Skilled employees	-0.085		0.077		-0.0058	0.0383
Unskilled workers	-0.349	***	-0.089		0.0499	0.0185
Managers (bosses)	0.363	*	0.244	*	0.0002	-0.0052
Head is a member of an association	0.013		0.075		-0.0014	0.0316
Travel time to market place	-0.042		-0.057	**	-0.0065	-0.2078
Travel time to reach an asphalted road	-0.069		-0.027		-0.0042	0.0658
Area of land exploited	0.106	***	0.048	**	-0.0054	-0.0371
Head obtained a credit	0.392		0.201	**	0.0005	-0.0091
intercept	0.982	***	13.287	***	0.0000	
Total						

Source: Calculations of the author using the data of the Cameroonian household surveys ECAM2 and ECAM3

*** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level.

Table 5b: Results of regression on log of per adult equivalent consumption and Oaxaca decomposition**Rural sample**

	<i>Coefficient</i>		<i>Coefficient</i>		<i>Oaxaca decomposition</i>	
	<i>-2001</i>		<i>-2007</i>		<i>endowments</i>	<i>coefficients</i>
Douala	(dropped)		(dropped)		0.0000	0.0000
Adamaoua	0.052		0.083		0.0028	0.0017
Centre	-0.156		-0.036		-0.0039	0.0128
East	0.089		(dropped)		-0.0041	-0.0056
Extreme-North	0.199	**	-0.192	***	0.0180	-0.0674
Littoral	-0.316	***	0.063		0.0283	0.0210
North	0.229	***	-0.182	***	0.0002	-0.0329
Northwest	-0.279	***	-0.115		-0.0153	0.0276
West	0.135		0.116		0.0051	-0.0026
South	0.008		0.278	***	-0.0004	0.0150
Southwest	(dropped)		0.113			
Household size	-0.076	***	-0.081	***	-0.3403	-0.0229
Female	-0.093		-0.070		0.4533	0.0064
Household head has a spouse	-0.158	***	-0.146	***	-0.0390	0.0058
Age of head of household: 30-39 years old	-0.080	**	-0.065	**	0.0239	0.0034
Age of head of household: 50-59 years old	0.008		-0.128	***	-0.0002	-0.0272
Age of head of household: 60 years or older	0.013		-0.048		0.0000	-0.0100
Level of Head's education: Primary	0.070		0.068	**	0.0118	-0.0008
Level of Head's education: secondary 1st cycle	0.184	***	0.154	***	-0.0363	-0.0046
Level of Head's edu: Secondary 2 nd cycle	0.241	***	0.188	***	-0.0213	-0.0046
Level of Head's education: higher	0.475	***	0.348	***	-0.0248	-0.0033

Industrial sector	0.217	***	0.074		0.0109	-0.0115
Trade sector	0.223	***	0.223	***	-0.0024	0.0000
Services sector	0.324	***	0.068		-0.0070	-0.0366
Executives	0.228		0.344	***	-0.0149	0.0037
Skilled employees	0.091		0.118		-0.0147	0.0019
Unskilled workers	-0.016		-0.029		0.0003	-0.0005
Managers (bosses)	0.066		0.182	***	-0.0046	0.0041
Head is a member of an association	0.118	***	3.04	**	0.0457	1.1909
Travel time to market place	-0.052	***	-0.024	***	-0.1229	0.0806
Travel time to reach an asphalted road	-0.044	***	-0.019	**	-0.0168	0.0818
Area of land exploited	0.079	***	0.065	***	-0.2168	-0.0089
Head obtained a credit	0.205	***	0.173	***	-0.1406	-0.0011
Intercept	0.717	***	12.827	***	0.0000	
Total					-0.4262	1.2161

Source: Calculations of the author using the data of the Cameroonian household surveys ECAM2 and ECAM3

*** Significant at the 1% level; ** significant at the 5% level; * significant at the 10% level

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