

Determinants of Inequality and Polarization of Expenditure Huseholds in Cameroon

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Abstract. *This paper analyzes the determinants of inequalities and the polarization of household spending in Cameroon between 2007 and 2014. To achieve this, it uses data from Cameroonian household surveys (ECAM III and ECAM IV). The breakdown of Oaxaca-Blinder (1973) and that of Duclos-Estéban-Ray (2004) developed by Araar (2008) show that the level of education, the socio-professional category and the size of the household are the factors that determine the disparity in expenditure per consumption unit between households. However, the rural environment, the Far North and North West Cameroon regions contribute more to intra-group polarization. Hence the interest in further promoting and improving educational policies, access to decent employment in areas in crisis and continuous awareness-raising actions for responsible motherhood.*

Keywords: Cameroon, Household expenditure, Inequalities, Polarization

JEL Codes: D10, O12, E24

1. Introduction

The real problems that influence the relationships between people in a society are those linked to the phenomena of inequality and polarization. Questions related to the increase in inequalities and to resolution measures are among the priorities of international organizations, governments and civil societies around the world. In order to reduce inequalities, the concepts of equity and social justice are generally used. The fight against inequalities is also essential to reduce extreme poverty, promote transformations aimed at sustainability, promote social progress, end conflicts and violence and develop inclusive governance (WB, 2017). Inequalities can be social, but also economic. Economic inequalities arise from a disparity between individuals or social groups relating to economic advantages and disadvantages. For Sen (1997), inequality can be defined not only as a measure of the gap, but also as a measure of the difference between real income and necessities. Regarding social inequality, Piketty (2005) defines it as the measure of a relative difference in the situation between individuals with regard to either endowment of human or physical capital, either income, or access to certain services that can be allocated by the market or by the public sector.

On the theoretical level, it is known that certain forms of inequality can transform into polarization. The definition of the latter concept is based on the formation of two or more sub-groups in society. Polarization increases if inequality within subgroups decreases and increases with increasing intergroup inequality. It is related both to the feeling of alienation that individuals feel from others and from groups that are distinct from them, and to that of belonging to a particular group. In terms of economic policies, following the work

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of Estéban et al. (1999), it is known that polarization levels (income or expenditure) can generate conflicts between the subgroups that constitute a society. The search for a low level of polarization in society thus rests on several foundations similar to those which seek a kind of equality. The concepts of inequalities and polarization are therefore linked and close to each other, but highlight different aspects of the allocation of the variable measured on individuals. How these variables evolve determines the perception that the population has of the dynamism of a society. It is in fact, «very different to live in a society where living conditions converge over time or in a society in which the situations of different social layers diverge more and more» (Maurin, 2007). The persistence of inequalities and polarization fundamentally raises the question of the efficiency of the economic system.

Among the social imbalances, income / expenditure inequalities are seen as the most widespread. Piketty (2005, Op.it), before tackling the issue of inequality, breaks down income in terms of wages, the income of self-employed workers (farmers, traders, liberal professions, etc.), pensions, other transfer income (family allowances, unemployment benefits, social assistance, etc.), and income from assets (dividends, interest, rents, etc.). The expenses of individuals being linked to their income which is not only due to salary but also to their non-salary activities.

It must be said that several theories explain the income disparities that can exist in a society. The human capital theory developed by Mincer (1958), Schultz (1960, 1961) and Becker (1962, 1993), according to which income disparity is not a reflection of the hierarchy of skills. For this, work is considered as a heterogeneous factor of production and age, sex, level of education supposed to qualify the level income of individuals. According to this theory, the level of household income depends on their abilities.

On the other hand, polarization generally refers to the disparity or divergence between objects, attracted by the different forces towards the main masses or more narrowly towards the poles. Thus, when the interests of social groups made up of households sharing the same socio-economic characteristics are mutually different, they can act to defend their causes and can thus lead to social conflicts. According to Araar (2009), the more the groups have more opposing interests, the greater the intensity of the conflicts. Inequality and polarization are two different but analytically complementary concepts. They highlight distinct aspects of the same distribution. Their respective evolutions can sometimes diverge for the same population. Polarization is conceptually based on criteria distinct from those generally used to approach inequality. For example, the Pigou-Dalton transfer principle on which the inequality measures are based is far from being relevant for the development of the concept and the polarization measures. The resemblance and dissimilarity between these two concepts have been the subject of several studies. By way of example, mention may be made of those of Gradin et al. (1999), d'Ambrosio and Wolff (2001) and those of Estéban et al. (2006). This work on polarization has led to the construction of indicators that are more or less inspired by those of inequality. It is shown that under certain conditions, the Estéban and Ray polarization indicator can behave like an inequality indicator.

Analyzing inequalities and polarization supposes showing their determinants. The literature on development economics has focused in recent decades on explaining the problems of inequalities, more specifically income inequalities (Ngouwouo, 2019) and the disappearance of the middle-income class which has reinforced polarization. A highly unequal and polarized society is a potential hotbed of tension because when the number of people with a low standard of living increases, they feel excluded from national well-being in terms of redistribution (Duclos, 2006). It is in this context that this study seeks to know the determinants of inequalities and polarization of household spending in Cameroon.

This study contributes in the literature in that, it uses two databases (ECAM III and IV) simultaneously to analyze the evolution and identify the determinants of inequality and the polarization of household spending

in Cameroon. Then, it privileges the spatio-temporal dynamics and takes into account the polarization in the poverty study.

Away from this introductory section, the rest of this paper is organized as follows: section 2 examines the data and methodology, section 3 presents and discusses the results, while section 4 concludes.

2. Data and methodology

2.1. Geographic delineation, data source and study period

This study focuses specifically on Cameroon. The data used come from Cameroonian household surveys which gather information to quantify inequalities and the polarization of household income in Cameroon. These are precisely ECAMs 3 and 4 carried out in 2007 and 2014 respectively by the National Institute of Statistics (INS) of Cameroon. These data sources are the best suited and appropriate concerning the objectives of this research. They are felt and provide sufficient information on Cameroonian households and their income.

2.2. Analysis tools

In this study, a decision on the unit of analysis is required as well as measures of inequality and polarization that reflect the total distribution of expenditure. A good number of measures have been proposed in the literature to characterize polarization (Esteban and Ray, 1994; Wolfson, 1994; Tsui and Wang, 1998; Zhang and Kanbur, 2001) and inequality in the distribution of income (Kakwani, 1993; Glewwe, 1986; Fields, 1980; Theil, 1979; Sen, 1973; Shorrocks, 1984 and Litchfield, 1999).

However, we will proceed by a static decomposition by sub-group and the decomposition of inequalities developed by Oaxaca and Blinder (1973). Polarization measurements should be characterized by their local sensitivity to the interaction between alienation (intergroup heterogeneity) and identification (intra-group homogeneity). The polarization analysis will be done using the Duclos-Estéban-Ray (2004) class of measurements which addresses the problem of the Estéban-Ray (1994) measurement linked to the finite and discrete characters of the data uses and the Foster-Wolfson Index (1992). These measures are sensitive to the concentration of individuals around their respective expenses. This is what Duclos, Estéban and Ray (2004) called identification.

2.3. The decomposition of inequality measures

2.3.1. First decomposition of Oaxaca-Blinder

The decomposition of Oaxaca and Blinder (1973) developed below explains the average difference in the variable of interest between two groups (here, between the poor and the rich). This difference is broken down into a part linked to the differences in initial characteristics between the two groups and another part associated with the differences in the yields of these characteristics (here, by assumption, the parameters associated with the characteristics may be different for the two groups). Taking as our variable of interest, we have two groups: the poor and the rich. We assume that is explained by a vector of determinants, according to the following regression model:

$$Y_i = \begin{cases} \beta^p x_i + \varepsilon_i^p & \text{so poor} \\ \beta^r x_i + \varepsilon_i^r & \text{so rich} \end{cases} \quad (1)$$

Where the vector of parameters β includes the constant term. In the case of a single independent variable, the rich are supposed to have a more advantageous regression line than that of the poor because each value of x is associated with them a value of beta. Also, the rich are assumed to have an upper average of x . From the above, the poor have a lower average value of y than the rich.

The difference between the mean values of y^r and y^p is equal to:

$$y^r - y^p = \beta^r x^r - \beta^p x^p \quad (2)$$

Where x^r and x^p are vectors of explanatory variables evaluated on average for the rich and the poor respectively. If we have for example, x_1 , x_2 and x_3 , we can write the following:

$$X^R - X^P = (\beta_0^R - \beta_0^P) + (\beta_1^R X_1^R - \beta_1^P X_1^P) + (\beta_2^R X_2^R - \beta_2^P X_2^P) + (\beta_3^R X_3^R - \beta_3^P X_3^P) \quad (3)$$

$$G = G_0 + G_1 + G_2 + G_3$$

In this procedure, the gap in y between the poor and the rich is considered to be due to: (i) differences in the constants (G_0); (ii) the differences in x_1 and β_1 (G_1); (iii) the differences in x_2 and β_2 (G_2); (iv) the differences in x_3 and β_3 (G_3).

Therefore, G_1 could measure the share of the gap between the average expenditure (y) due to the differences in the sex of the heads of household (x_1) and the differences in the effects of sex (β_1). G_2 could measure the share of the gap due to household size (x_2) and the differences in side effects (β_2). And G_3 could measure the share of the education level of the head of household (x_3) and the differences in the effects of the education level.

In the results, estimates of the difference in the gap can be obtained by substituting the means of sample x and the estimates of the parameter β in the equation (2). This substitution will be carried out in everything else but without being explicitly mentioned.

2.3.2. Second Oaxaca-Blinder decomposition

The first decomposition is more than sufficient for us. But we ask ourselves how much of the overall inequality or specification deviation of G_1 or G_2 or G_3 is attributable for example to: (i) differences in x (sometimes called the explained component) rather than (ii) differences in β (sometimes called the unexplained component)?

The decomposition of Oaxaca-Blinder is an answer to this question.

Indeed, the difference between the two results could be expressed in one of two ways:

$$y^r - y^p = \Delta X \beta^p + \Delta \beta X^r \quad (4)$$

Where $\Delta X = X^r - X^p$ and $\Delta \beta = \beta^r - \beta^p$ or

$$y^r - y^p = \Delta X \beta^r + \Delta \beta X^p \quad (5)$$

We find that these decompositions are the same as the previous ones. In the first (4), the differences in the x 's are weighted by the coefficients of the poor group and the differences in the coefficients are weighted by the x 's of the rich group. While in the second (5), the differences in the x 's are weighted by the coefficients of the rich group and the differences in the coefficients are weighted by the x 's of the poor group. Either way, there is a way to compartmentalize the gap in outcomes between the poor and the rich in part due to the poor having low x - values compared to the rich, and part because, by assumption, they have worse values of β than the rich ones.

In equations 4 and 5, the decompositions can be seen as special cases of a more general decomposition:

$$y^r - y^p = \Delta X \beta^p + \Delta \beta X^p + \Delta X \Delta \beta \quad (6)$$

$$= E + C + CE$$

In this way, the average results could be as if coming from a difference in the endowments (E), a difference in the coefficient (C), and a difference resulting from the interaction of endowments and coefficients (CE).

Equations 4 and 5 are special cases in which:

$$y^r - y^p = \Delta X \beta^p + \Delta \beta X^r = E + (C + CE) \quad (7)$$

$$y^r - y^p = \Delta X \beta^r + \Delta \beta X^p = (E + CE) + C \quad (8)$$

In short, we find that the first decomposition places the interaction in the unexplained part, while the second places it in the explained part.

2.3.3. Linked decomposition

The Oaxaca-Blinder decomposition may also be a special case of another decomposition. For this we have:

$$y^r - y^p = \Delta X [\Delta \beta^r + (I - D) \beta^p] + \Delta \beta [X^r (I - D) + X^p D] \quad (9)$$

Where I and D represent the identity and weight matrix, respectively. When x is an expense and not a vector, $I = 1$ and D is a weight. However, $D = 0$ in decomposition (7), $D = 1$ in (5). If x is a vector, we have:

$$D = 0 \text{ (Oaxaca) (equation 4)} \quad (10)$$

$$D = 1 \text{ (Oaxaca) (equation 5)} \quad (11)$$

Moreover, Cotton (1988) proposed a formulation which suggests that the difference in the x s by the mean of the differences gives us:

$$\text{Diag} (D) = 0.5 \quad (12)$$

Where $\text{Diag} (D)$ is the diagonal of D . On the other hand, his counterpart Reimers (1983) suggested that one can weigh the coefficients of the vectors by the proportions in the two groups so that if f_r is the sample function in the rich group, we will have: $\text{Diag} (D) = f_r$ (12)

Finally, a fifth decomposition was proposed by Neumark (1988) which uses the coefficients obtained from the regression of the grouped data, β^p :

$$y^r - y^p = \Delta X \beta^p + [X^r(\beta^r - \beta^p) + X^p(\beta^p - \beta^r)] \quad (13)$$

2.4. The decomposition of the polarization measurements

2.4.1. The breakdown of the Duclos-Estéban-Ray measure

The objective here is to show how certain socio-demographic characteristics such as the place of residence, the sex of the head of household, the level of education of the head of household and certain sectors of activity (formal and informal sectors) contribute to the total polarization. We rely for this on the methodology proposed by Araar (2008), who, in agreement with Runciman (1966), perceives the magnitude of relative deprivation as the difference between the desired situation and the current situation of a person (Hey and Lambert, 1980).

Thus, local alienation ($a(x)$) can be decomposed into expected deprivation ($\delta(x)$) and expected surplus ($\sigma(x)$), and the DER measure according to Araar (2008) is then written:

$$p_\alpha(f) = \int f x^{1+\alpha} [\delta(x) + \sigma(x)] dx = D + S \quad (14)$$

Where $D = \int f x^{1+\alpha} [\delta(x)] dx$ is the overall deprivation in the distribution, and $S = \int f x^{1+\alpha} [\sigma(x)] dx$ is the overall surplus in the distribution. When the distribution is symmetric or when the parameter $\alpha = 0$, these two components are equal. But since the distribution of income is usually asymmetric, we can expect that $D > S$ (Arrar, 2008). If we denote by f_j the density function of group j and considering equation (14), the contribution of group j whose individuals have the level of well-being x to the DER index is as follows:

$$C_j(x) = \frac{\pi_j(x) a(x) f(x)^{1+\alpha}}{\mu^{1-\alpha}} = \pi_j(x) c(x)$$

With $\pi_j(x)$ the proportion of individuals belonging to group j and having income x and $C(x) = \frac{a(x) f(x)^{1+\alpha}}{\mu^{1-\alpha}}$ the contribution of individuals with the level of well-being x to the index $-1/\alpha$ DER. Based on these local contributions from groups, the DER index can then be written: $p_\alpha(f) = \sum_j \int c_j(x) dx$. Starting from the algebraic decomposition of the Gini index, Arrar (2008) also shows that the DER measure can be broken down into intragroup and intergroup components.

3. Results and Discussions

3.1 The decomposition of inequalities

The explained variable is the expenditure per unit of consumption. Using a model similar to the regression model of Wagstaff, van Doorslaer, and Watanabe (2003), we have the following variables: a dummy variable for the sex of the head of household (SEXECM), the places of residence of the households (MILIEU), the CSP of the head of household, the level of education of the head of household (NIVINSCM), the marital status of the head of household (STATMACM), household size (TAILM), type of dwelling (TYPLOG) and area of residence of the head of household (ZONE). After using the welfare variable (DEPUC), we create a variable distinguishing the level of poverty that we call POOR which takes 0 when the household is poor and 1 otherwise.

Table 1 : Coefficient homogeneity test between groups

Spend per unit of consumption	2007			2014		
	R-squared = 0.7135 Root MSE = 0.36821			R-squared = 0.7158 Root MSE = 0.42164		
	Coef	t_stat	p> t	Coef	t_stat	p> t
POOR	0.7740	11.49	0.000	0.8328	9.51	0.000
TAILM	-0.0343	-21.32	0.000	-0.0378	-18.79	0.000
_IpooXTAILM_1	-0.0196	-7.33	0.000	-0.0288	-8.57	0.000
MILIEU	-0.1735	-15.88	0.011	-0.2788	-19.45	0.000
_IpooXMILIE_1	0.0434	2.55	0.078	0.1618	7.71	0.000
ZONE	0.0031	1.76	0.000	0.0035	1.61	0.108
_IpooXZONE_1	-0.0082	-3.61	0.061	-0.0168	-5.91	0.000
SEXCM	0.0236	1.87	0.007	-0.0056	-0.36	0.715
_IpooXSEXCM_1	0.0486	2.72	0.000	0.0491	2.29	0.022
NIVINSCM	0.0669	11.64	0.000	0.1226	14.25	0.000
_IpooXNIVIN_1	0.0233	3.03	0.002	-0.0175	-1.47	0.143
STATMACM	0.0038	0.89	0.374	0.0169	3.25	0.001
_IpooXSTATM_1	-0.0101	-1.79	0.074	-0.0282	-4.22	0.000
TYPLOG	-0.0099	-3.29	0.001	-0.0302	-7.28	0.000
_IpooXTYPLO_1	0.0417	8.57	0.000	0.0768	10.72	0.000
CSPCM	-0.0162	-2.54	0.011	-0.0205	-2.67	0.008
_IpooXCSPCM_1	0.0242	2.94	0.003	0.0183	1.92	0.055
FORINCM	-0.0813	-3.42	0.001	-0.0701	-2.40	0.016
_IpooXFORIN_1	-0.0719	-2.42	0.016	-0.0701	-2.28	0.023
_cons	13.0245	256.70	0.000	13.3926	199.97	0.000
TEST	Testparm POOR_I* F(19, 10296)=1349.69 Prob > F = 0.0000			Testparm POOR_I*F(19, 8900) =1180.03 Prob > F = 0.0000		

Source: Authors based on data from ECAM 3 and 4

The FISHER F statistic for the ECAM 3 data, with 19 and 10296 degrees of freedom, is 1349.69 and its p-value is 0.00. Likewise, the FISHER F statistic for the data from ECAM4, with 19 and 8900 degrees of freedom is 1180.03 and its p-value is 0.00. This means that the Oaxaca-Blinder- type approach, which states that the coefficients of the regression are different, makes sense in this context since the null hypothesis of homogeneity of the parameters is rejected at the 1% threshold. And Prob> F = 0.0000 proves that the retained equations explain the model very well.

The next step will be to perform the Oaxaca Decomposition Test. We then obtain four tables. The first block (Table 2) shows the average values of expenditure per consumption unit of the two groups and the difference between the two. Table 2 shows the contributions attributable to the differences in the initial endowments (E), the coefficients (C), and the interactions (CE).

The second block of the decomposition (Table 3) shows how the explained and unexplained portions of the gap between the poor and the non-poor vary depending on the decomposition used. The Oaxaca decomposition is $D = 0$ and $D = 1$. At $D = 0.5$ and $f_r = 0.472$ we have the cotton and Reimers decomposition respectively. And "*" the decomposition of Neumark.

Contrary to the usual results where it is the average values of the variables which largely explain the differences in well-being between the poor and the non-poor, Table 3 provides us with contrasting results for Cameroon.

Table 2: First block of the decomposition

Poor = 0 Not poor = 1	2007	2014
High mean forecast (H):	13.598	13.952
Low average prediction (L):	12.499	12.701
Gross differential (R) {HL}:	1.099	1.251
- due to endowments (E):	0.223	0.324
- due to the coefficients (C):	0.830	0.930
- due to interaction (CE):	0.046	-0.003

Source: Authors based on data from ECAM 3 and 4

Table 3: Second block of the decomposition

D:	0		1		0.5		0.472		*	
	2007	2014	2007	2014	2007	2014	2007	2014	2007	2014
Unexplained (U) {C + (1-D) CE}:	0.876	0.927	0.830	0.930	0.853	0.929	0.854	0.929	0.586	0.606
Explained (V) {E + D * CE}:	0.223	0.324	0.269	0.320	0.246	0.322	0.245	0.322	0.513	0.644
% Unexplained {U / R}:	79.7	74.1	75.5	74.4	77.6	74.3	77.7	74.3	53.3	48.5
% Explained (V/R):	20.3	25.9	24.5	25.6	22.4	25.7	22.3	25.7	46.7	51.5

(Source: Authors based on data from ECAM 3 and 4)

The results from the rich-poor regression equations show that between 2007 and 2014, the level of education of the head of household, his gender and his socio-professional category are the factors that determine the expenditure per adult equivalent among the non-poor. While among the poor, after the factors are selected, the marital status of the head of the household is added. The education level of the head of household contributes significantly to the well-being of both the poor and the non-poor. Estimation of the level coefficients of education and the sex of the head of household is significantly positive at the significance level of 1%, confirming that they do indeed determine inequalities. The increase in the well-being of the poor between 2007 and 2014 is greater than that of the non-poor, thus probably consistent with the fact that the poor are more sensitive to price changes in the markets. Appendix 4 below shows us that the average annual consumption of the poor in 2007 amounts to 12,499 CFA francs and in 2014 to 12,701 CFA francs, while for the non-poor, it goes from 13,598 CFA francs to 13,952 CFA francs respectively in 2007 and 2014. The overall difference in well-being between the poor and the non-poor in Cameroon has broken down: an unexplained component which is 0.830 in 2007 and 0.930 in 2014 representing respectively 75.52% and 74.34% of the difference in good -total being and the explained component which is 0.223 in 2007 and 0.324 in 2014 representing 20.30% and 25.90% respectively of the difference in total well-being. The explained difference is attributed to differences in household characteristics, while the unexplained difference is due to discrimination or pure bias.

In terms of endowments, in 2007, the value of household size, with a share of 7.0%, largely explains the difference in well-being between the poor and the non-poor. Then come respectively the place of residence

of the head of household and his level of education. While in 2014, first the place of residence, with a share of 10.4% largely explains the difference in well-being between the poor and the non-poor, followed by the size of the household (9.6%) and the educational level (8.6%).

The results also show that the coefficient of the level of education is quite low while the effects of characteristics are important. This fact underscores the importance of achieving a higher level of education for household members, as it is the gap between the levels of education among poor households that turns out to be one of the main causes. Welfare gaps.

The main factors of bias linked to the well-being of the poor are the place of residence of the head of household, the size of the household and the level of education which respectively explain the discrimination for each factor of 6.3% and 10.4% in 2007 and in 2014, 7% and 9.6% in 2007 and 2014, 6.1% and 8.6% in 2007 and 2014 (Appendix 1).

3.2. Decomposition of the polarization of household spending in Cameroon

We highlight here the factors of the polarization of household expenditure in Cameroon according to the place of residence, the region of residence, the sex and the level of education of the head of household between 2007 and 2014. For this, we have by the decomposition of the DER measure ($\alpha = 0.5$) according to Araar (2008) used above.

3.2.1. Breakdown of polarization according to the environment and regions of residence of the head of household between 2007 and 2014

Let us first remember that, according to numerous studies, the rural environment is relatively poorer than the urban environment (Fambon, 2002; Chameni, 2010...).

The results reported in Table 5 allow us to show that even if the groups differ in the size of their population or their share of expenditure per unit of consumption, their level of polarization is relatively higher. Overall, between 2007 and 2014 the polarization index is between 12.7% and 14.0%. The intra-group component provides an absolute contribution to the polarization which is between 10.9% and 11.1% while the inter-group component goes from 14.2% to 15.22%. Rural areas have the highest level of deficit / surplus ratio and contribute the most to intra-urban polarization.

Table 5: DER decomposition ($\alpha = 0.5$) according to place of residence

Pure polarization index between groups: $\alpha=0.5$			2007	0.127				
			2014	0.140				
Component	Contribution absolute		Contribution relative					
	2007	2014	2007	2014				
Intra-group	0.109	0.111	0.435	0.423				
Intergroup	0.142	0.152	0.565	0.577				
Total	0.251	0.263	1.000	1.000				
Group	Population in %		By expenses in %		Index of polarization		Ratio R	
	2007	2014	2007	2014	2007	2014	2007	2014

Urban	.37.0	44.5	55.2	64.4	0.232	0.238	0.964	0.946		
Rural	63.0	55.5	44.8	35.6	0.228	0.255	0.940	0.918		
Polarization intra-group										
Group	Contribution absolute		Contribution relative		The component deficit D		Surplus S		Ratio D/S	
	2007	2014	2007	2014	2007	2014	2007	2014	2007	2014
Urban	0.037	0.054	0.149	0.051	0.039	0.051	0.042	0.052	0.923	0.989
Rural	0.072	0.058	0.286	0.134	0.138	0.134	0.032	0.027	4.327	4.902
Total	0.109	0.111	0.435	0.423	0.177	0.185	0.074	0.079	2.394	2.340

(Source: Authors based on data from ECAM 3 and 4)

The results in Appendix 2 show that between 2007 and 2014, regional polarization is higher in Adamaoua (located between 24.9% to 27.6%); the North (between 25.0% to 27.5%), the Far North (between 25.8% to 26.7%) and the North-West (between 24.8 and 26.2%) and that these regions are poorer in terms of expenditure per unit of consumption in relation to the proportions of the population. In addition, the northern regions have the highest deficit / excess ratio, in particular the Far North which contributes more to intra-region polarization (0.3%). This could justify the fact that following the phenomenon of Boko Haram, this region welcome more refugees who find themselves without a job or source of income.

3.2.2. Breakdown of polarization according to gender and the level of education of the head of household

Between 2007 and 2014, the polarization in the gender approach is almost similar. According to the DER measurement at $\alpha = 0.5$, the intergroup polarization is around 25.8% to 26.3%. But according to the deficit / excess ratio, it appears that men contribute the most to intra-group polarization (Appendix 3).

Finally, depending on the level of education of the head of household, the pure polarization between the groups is equal to 9.2% in 2007 and 11.4% in 2014. First, Table 6 below shows a decrease in the proportion of out-of-school populations and those with a primary level which leads to a drop in the share of expenditure per unit of consumption. But on the other hand, there is an increase in the proportion of heads of households with a secondary level, which goes from 32.1% to 34.4% and of those with a higher level (from 6.7% to 11.3%) for an increase in expenditure per year. consumption unit which goes from 39.1 to 40.3% and 15.6 to 23.7% respectively between 2007 and 2014. Then, the group of the out-of-school students records a higher level of polarization (26.6%) followed by those with a higher level (24.4%).

As a result, the intra-group component provides a rather low absolute contribution rate to the polarization which goes from 4.9 to 6.1% while the inter-group component has an absolute contribution to a polarization of around 20.2% depending on the level of education. The head of the household. The group of out-of-school students has the high deficit / excess ratio (6.61%) followed by the group of heads of household with a primary level (3.44%) which contributes the most to intra-group polarization. It can be said that the low level of pure polarization between the place of residence (8.0%) and the sex of the head of household (1.1%) results from the reduction of disparities and poverty as pointed out by Araar (2008).

Table 6: DER decomposition ($\alpha = 0.5$) according to the education level of the head of household

Pure polarization index between groups: α=0.5			2007	0.092						
			2014	0.114						
Component	Contribution absolute		Contribution relative							
	2007	2014	2007	2014						
Intra-group	0.049	0.061	0.197	0.233						
Inter-group	0.201	0.202	0.803	0.767						
Total	0.251	0.263	1.000	1.000						
Group	Population in %		Expenses in %		Index de polarization		Ratio R			
	2007	2014	2007	2014	2007	2014	2007	2014		
Unschoolé	27.6		17.5		0.235		0.896			
Primary	33.6	23.4	27.8	12.9	0.224	0.266	0.972	0.866		
Secondary 1 st cycle	19.2	30.9	21.0	23.2	0.228	0.237	0.984	0.955		
Secondary 2 nd cycle	12.9	34.4	18.1	40.3	0.226	0.234	0.957	0.986		
Superior	6.7	11.3	15.6	23.7	0.249	0.244	0.834	0.855		
Polarization intra-group										
Group	Contribution absolute		Contribution relative		the component deficit D		Surplus S		Ratio D/S	
	2007	2014	2007	2014	2007	2014	2007	2014	2007	2014
Unschoolé	0.013		0.051		0.066		0.011		5.720	
Primary	0.022	0.009	0.089	0.035	0.065	0.061	0.022	0.009	2.980	6.631
Secondary 1 st cycle	0.009	0.019	0.034	0.071	0.029	0.066	0.017	0.019	1.710	3.448
Secondary 2 nd cycle	0.004	0.030	0.017	0.112	0.014	0.050	0.014	0.034	0.990	1.464
Superior	0.001	0.004	0.006	0.015	0.004	0.008	0.010	0.016	0.388	0.474
Total	0.049	0.061	0.197	0.233	0.177	0.185	0.074	0.074	2.394	2.340

Source: Authors based on data from ECAM 3 and 4

4. Conclusions

In Cameroon, many factors determine inequalities and polarization. The results from the decomposition of Oaxaca-Blinder (1973) and the decomposition into sub-groups of the Duclos-Estéban-Ray measure (2004) as shown by Araar (2008) show the following factors: in general, for inequalities, the unexplained part of the model determines the disparities in household spending more than the unexplained part. This is explained by

the phenomena which undermine Cameroonian society, namely corruption and the misappropriation of public goods which increase the disparity within the group of populations of the upper part of the expenditure. However, the level of education of the head of household and his or her CSP largely determine the disparity in expenditure per adult equivalent. In addition, the DER decomposition at $\alpha = 0.5$ shows that in Cameroon, the rural environment, the regions of Adamaoua, the North, the Far North and the North West contribute the most to intra-group polarization.

Thus, the results presented in this study have several implications in terms of the definition of public policies for reducing poverty, inequalities and the polarization of well-being as rural-urban as in the regions of the country. The first implication concerns the promotion of human and physical capital to improve well-being Cameroonians. For this, a particular look should be turned towards education because it is an essential tool for the reduction of poverty, inequalities and polarization. Second, this study reveals the importance that smaller households have on securing higher levels of well-being. So, an urgent need to reduce the fertility rate in Cameroon for an effective reduction of dependency. Third, particular importance is needed for improving income redistribution in the northern part of Cameroon in order to create a class of populations with more improved income for more inclusive growth.

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Appendix 2 : Décomposition DER ($\alpha=0.5$) selon la région de résidence

Pure polarization index between groups: $\alpha=0.5$			2007	0.062						
			2014	0.080						
Component	Contribution absolute		Contribution relative							
	2007	2014	2007	2014						
Intra-group	0.021	0.022	0.083	0.085						
Intergroup	0.230	0.241	0.917	0.915						
Total	0.251	0.263	1.000	1.000						
Group	Population in%		Expenses in %		Index of polarization		Ratio R			
	2007	2014	2007	2014	2007	2014	2007	2014		
Douala	11.5	14.8	19.4	25.2	0.234	0.238	0.891	0.881		
Yaoundé	10.2	13.2	17.1	20.0	0.230	0.245	0.874	0.911		
Adamaoua	4.3	5.4	3.3	5.0	0.249	0.276	0.911	0.925		
Center	8.3	6.2	6.6	5.5	0.224	0.247	0.924	0.922		
East	4.2	3.6	3.3	3.1	0.243	0.236	0.920	0.936		
Far North	14.8	14.9	9.1	6.8	0.258	0.267	0.847	0.795		
Littoral	4.1	3.2	3.7	2.9	0.229	0.231	0.941	0.903		
North	8.1	8.4	5.4	4.6	0.250	0.273	0.881	0.833		
North-west	10.9	9.6	9.0	6.1	0.248	0.262	0.952	0.895		
west	10.6	8.9	9.5	8.1	0.219	0.238	0.955	0.906		
South	3.2	3.2	3.1	3.1	0.236	0.246	0.942	0.940		
south-west	9.8	8.8	10.5	9.8	0.229	0.232	0.971	0.947		
Polarization intra-group										
Group	Contribution absolute		Contribution relative		the component deficit D		Surplus S		Ratio D/S	
	2007	2014	2007	2014	2007	2014	2007	2014	2007	2014
Douala	0.006	0.002	0.014	0.023	0.010	0.013	0.015	0.020	0.666	0.665
Yaoundé	0.005	0.002	0.011	0.018	0.008	0.014	0.013	0.016	0.644	0.896
Adamaoua	0.001	0.000	0.001	0.003	0.009	0.010	0.002	0.004	3.776	2.503
Center	0.001	0.001	0.005	0.003	0.017	0.012	0.005	0.005	3.298	2.584
East	0.000	0.000	0.001	0.001	0.009	0.007	0.005	0.003	3.445	2.595
Far North	0.003	0.003	0.015	0.012	0.036	0.042	0.005	0.004	6.645	9.844
Littoral	0.000	0.000	0.001	0.001	0.007	0.006	0.003	0.002	2.624	2.320
North	0.001	0.001	0.005	0.004	0.019	0.022	0.003	0.003	5.653	7.170
North-west	0.002	0.002	0.010	0.007	0.023	0.023	0.006	0.005	3.562	5.012
west	0.002	0.002	0.009	0.006	0.019	0.016	0.008	0.007	2.507	2.437
South	0.000	0.000	0.001	0.001	0.005	0.006	0.002	0.003	2.062	2.188
south-west	0.002	0.002	0.009	0.007	0.015	0.013	0.008	0.008	1.767	1.562
Total	0.021	0.022	0.085	0.080	0.185	0.160	0.074	0.079	2.394	2.340

(Source: Authors based on data from ECAM 3 and 4)

Appendix 3: Breakdown of the DER measure ($\alpha = 0.5$) according to the sex of the head of household

Pure polarization index between groups: $\alpha=0.5$			2007	0.016						
			2014	0.011						
Component	Contribution absolute		Contribution relative							
	2007	2014	2007	2014						
Intra-group	0.153	0.156	0.608	0.591						
Intergroup	0.098	0.108	0.392	0.409						
Total	0.251	0.263	1.000	1.000						
Group	Population in%		Expenses in %		Index of polarization		Ratio R			
	2007	2014	2007	2014	2007	2014	2007	2014		
Male	74.4	71.9	72.0	70.4	0.250	0.263	0.993	0.997		
Feminine	25.6	28.1	28.0	29.6	0.258	0.268	0.998	0.995		
Polarization intra-group										
Group	Contribution absolute		Contribution relative		The Component deficit D		Surplus S		Ratio D/S	
	2007	2014	2007	2014	2007	2014	2007	2014	2007	2014
Male	0.135	0.134	0.538	0.509	0.134	0.134	0.053	0.056	2.507	2.407
Feminine	0.018	0.022	0.071	0.082	0.043	0.050	0.020	0.023	2.098	2.180
Total	0.153	0.156	0.608	0.591	0.177	0.185	0.074	0.079	2.394	2.340

(Source: Authors based on data from ECAM 3 and 4)

Appendix 4: Fourth decomposition block

VARIABLES	Top model				Bottom model				Put in common	
	Coef.		Avg..		Coef.		Avg..		Coef.	
	2007	2014	2007	2014	2007	2014	2007	2014	2007	2014
TAILM	-0.054	-0.067	3.485	3.310	-0.188	-0.221	-0.034	-0.040	5.521	5.730
MIDDLE	-0.130	-0.144	1.267	1.296	-0.165	-0.186	-0.173	-0.270	1.629	1.680
ZONED	-0.005	-0.098	6.295	1.140	-0.032	-0.111	0.003	-0.095	7.172	1.195
SEXCM	0.072	0.043	1.252	1.258	0.090	0.054	0.024	0.001	1.254	1.266
NIVINSCM	0.090	0.108	2.951	2.713	0.267	0.292	0.067	0.125	2.040	2.023
STATMATC	-0.006	-0.012	2.390	2.416	-0.015	-0.028	0.004	0.016	2.644	2.637
MTYPLOG	0.032	0.048	2.242	2.760	0.071	0.134	-0.010	-0.032	2.378	2.938
CSPCM	0.008	-0.003	3.661	3.728	0.029	-0.011	-0.016	-0.020	4.494	4.550
FORINCM	-0.153	-0.149	1.682	1.729	-0.258	-0.258	-0.081	-0.078	1.908	1.918
-cons	13.799	14.287	1.000	1.000	13.799	14.287	13.025	13.530	1.000	1.000
Total	13.598			13.952			12.499		12.701	

(Source: Authors based on data from ECAM 3 and 4)