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Dynamics of Monetary and Multidimensional Poverty in Cameroon

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Abstract
Cameroon has witnessed substantial economic growth in the new millennium, while poverty reduction has been limited and inequality has worsened. In this context, this paper investigates the different facets of poverty in Cameroon, the factors affecting them, and policy options to tackle poverty and achieve inclusive and sustainable development. We apply two prominent poverty measurement methods (Alkire–Foster and Foster–Greer–Thorbecke) to a series of household consumption and living standards (ECAM) surveys and Demographic and Health Surveys (DHS) collected between 2001 and 2018, and perform various empirical analyses to elucidate poverty dynamics and features. Our results indicate that both monetary and multidimensional poverty decreased in Cameroon between 2001 and 2018, albeit slowly and to varying degrees across the different demographic, socio-economic, and spatial groups of the population. We find that the proportion of multidimensional poor people was always higher than the proportion of the monetary poor. At the same time, multidimensional poverty has reduced much faster than monetary poverty at the national level. Lastly, we find that higher levels of poverty in Cameroon are strongly associated with rural livelihoods, large family size, less education, employment in agriculture, and the northern regions of the country. Our microeconomic analysis is complemented with a review of structural factors affecting poverty at the macro level. We point out the need to accelerate the structural transformation of the Cameroonian economy to reduce inequalities across the different regions and subgroups of the population and expand economic opportunities for the youth to achieve the demographic dividend.

Keywords: monetary poverty, multidimensional poverty, Alkire–Foster method, FGT measures, poverty dynamics, determinants of poverty, Cameroon

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1 Introduction

Since its independence in 1960, Cameroon has repeatedly faced severe economic shocks and crises resulting from fluctuations in international trade and exports revenue. Following an extended period of prosperity after independence with an average growth rate of 7%, the country's economy plunged into severe recession over the period 1985–95 resulting from the collapse of international commodity prices (IMF, 2003). The crisis lasted a decade before the economy regained a growth path in the mid-90s after the January 1994 devaluation of the CFA franc (CFAF). Between 2003 and 2019, the country successively implemented two major national development plans, namely the Poverty Reduction Strategy Paper from 2003 to 2009 and the Growth and Employment Strategy Paper from 2010 to 2019. While these development plans generated substantial economic growth, the impacts on job creation, poverty reduction, and human development have been limited.

Between 2001 and 2019, average annual GDP growth in Cameroon was 4.3%, while the consumption-based poverty rate stagnated at around 40% between 2001 and 2014, the multidimensional poverty rate decreased slightly from 54% to 43% between 2004 and 2018, and the Gini index of inequality worsened from 0.40 in 2001 to 0.44 in 2014. The country did not achieve most of the Millennium Development Goals (MDGs), and progress towards achieving the Sustainable Development Goals (SDGs) remains uncertain. Overall, economic growth in Cameroon has not been inclusive, and huge disparities persist across regions and subgroups of the population. In this context, this paper provides a comprehensive assessment of poverty in Cameroon using both monetary and multidimensional approaches, with emphasis on the dynamics and determinants of poverty. We also discuss policy implications for poverty reduction programmes and achieving the 2030 SDGs Agenda.

Poverty has traditionally been and is still widely considered as a lack of income and is measured via income- or consumption-based indices, predominantly using the FGT class of decomposable poverty measures developed by Foster, Greer and Thorbecke (1984). This approach has been operationalised and popularised by the World Bank and UN organisations and widely adopted by countries worldwide. In recent years, poverty has been increasingly viewed from a human development perspective, relying mainly on Amartya Sen's capabilities approach, which argues that income is only a 'means to an end' (Sen, 1985, 1992, 1999). Now widely understood as multidimensional (Atkinson, 2017; Alkire and Foster, 2011b; Ferreira, 2011), new measures of poverty go beyond income alone and focus more on 'the end', encompassing various aspects of wellbeing including, for example, quality of health, education,

and living standards.

This multidimensional notion of poverty is exemplified by the United Nations' adoption of the SDGs – 17 goals in itself – and the explicit targets of ending both monetary and multidimensional poverty as laid out in SDG targets 1.1[1] and 1.2[2]. In practice, the measurement of multidimensional poverty largely relies on the Alkire–Foster (AF) counting method as developed by Alkire and Foster (2011a) and prominently applied for the global Multidimensional Poverty Index (MPI) developed by the Oxford Poverty and Human Development Initiative (OPHI) at the University of Oxford. First applied by Alkire and Santos (2014), global MPI updates are published annually and jointly by OPHI and the United Nations Development Programme (UNDP). In this paper, we apply both the FGT class of poverty measures and the AF counting method, for the measurement of, respectively, monetary and multidimensional poverty in Cameroon.

Between 1990 and 2020, Cameroon produced a series of four household consumption surveys (ECAM 1996, 2001, 2007, and 2014) used for the measurement of monetary poverty and a series of five Demographic and Health Surveys (DHS 1991, 1998, 2004, 2011, and 2018) used for the analysis of non-monetary poverty. In addition to survey reports produced by the National Institute of Statistics (INS, 2002, 2008, 2014), several studies have used these datasets to measure and analyse poverty trends and determinants (see, for example, Fambon, 2005; Ningaye et al., 2011; Epo and Baye, 2012; Fambon et al., 2016; Kumase, 2018; Arrey, 2020). This literature essentially addresses three aspects of monetary poverty research: (i) estimation of poverty levels and trends, (ii) estimation of the determinants of wellbeing and poverty, and (iii) decomposition analysis of key factors affecting poverty and exclusion. Only two of the papers explored multidimensional poverty using a statistical approach – principal component analysis (Ningaye et al., 2011) and the dashboard approach (Fambon et al., 2016). Moreover, two OPHI country briefings showcase the global MPI results for Cameroon in 2018 and changes in the global MPI between 2011 and 2014 (OPHI, 2020a,b).

A few salient features emerge from this literature: (i) Cameroon has experienced a modest decrease of poverty between 1996 and 2014, with fluctuating patterns that are quite similar to that of economic growth during the same period; (ii) poverty in Cameroon, as is the case in most African countries, is predominantly a rural phenomenon, mostly affecting Northern regions (Adamawa, North and Far North) and households with less education, female heads

[1]By 2030, eradicate extreme poverty for all people everywhere, currently measured as people living on less than $1.25 a day.

[2]By 2030, reduce at least by half the proportion of men, women, and children of all ages living in poverty in all its dimensions according to national definitions.

of household, poor health conditions, large household size, low fraction of active members, and low proportion of members working in the formal sector; and (iii) the regression-based decomposition analysis reveals that poverty reduction can be largely attributed to economic growth between 1996 and 2014 rather than as an effect of redistribution. To the best of our knowledge, this paper is the first to analyse jointly the two types of poverty and to perform an in-depth analysis of multidimensional poverty over time for Cameroon.

In this paper, we delve deeper and provide a dual analysis of both monetary and multidimensional poverty between 2001 and 2018. We focus on diverging trajectories across Cameroon's regions and socio-economic subgroups of the population. Our approach includes both a microeconomic analysis of trends and features of poverty at the household level and a review of structural factors affecting poverty at the macro level. The contribution of the paper is thus twofold. First, the paper provides a comprehensive empirical analysis of monetary and multidimensional poverty in Cameroon, using the FGT method and the AF method respectively. Second, the paper explores determinants of poverty at both micro and macro levels and discusses options for poverty reduction policies. Overall, the paper offers a joint analysis of the two types of poverty and sheds light on similarities and differences between the two measures in terms of poverty levels, trends, and determinants, along with a macroeconomic outlook.

Our findings reveal that both monetary and multidimensional poverty declined between 2001 and 2018, albeit with pace and pattern varying across the different demographic, socio-economic, and spatial groups of the population. Our results show that multidimensional poverty was always higher than monetary poverty at the national, rural, and urban level. At the national level, we find that multidimensional poverty reduced much faster than monetary poverty, declining from 54% in 2004 to 43% in 2018. Monetary poverty remained almost stagnant at around 40%, resulting in a closing gap between the two measures. The pictures look very different at the rural and urban level. In rural areas, multidimensional poverty was much higher than monetary poverty (75% versus 52%) and it reduced over time, whereas monetary poverty increased. In urban areas, both multidimensional and monetary poverty declined over time, almost in parallel trends. The spatial decomposition shows diverging trajectories for the different regions, with poverty worsening for the poorest ones (the northern regions). We also find that the number of poor people increased over the studied period due to the rapid growth of population. Both the decomposition and regression analyses reveal that higher levels of poverty in Cameroon were strongly associated with rural livelihoods, larger family size, less education, employment in agriculture, and the northern

regions of the country. These results highlight four policy areas for poverty reduction in Cameroon revolving around the need to: (i) create conditions for the achievement of the demographic dividend, (ii) promote solutions to accelerate structural transformation and productivity gains in the agricultural sector, (iii) optimise the allocation of public spending across the different regions and subgroups of the populations, and (iv) address security crises and their impacts on society.

The rest of the paper is organised as follows. Section 2 presents the methodology and data used. Section 3 presents and discusses our empirical findings on levels, trends, and correlates of poverty, both monetary and multidimensional. In section 4, we discuss structural factors affecting poverty in Cameroon, and in section 5, we conclude with policy implications.

2 Methodology and data

2.1 Methods of poverty measurement for Cameroon

For the measurement of monetary poverty, we used the FGT class of indices of poverty and the poverty line estimated by Cameroon's National Institute of Statistics. Indicators of living standards used to analyse the evolution of poverty over the period 2001–14 include: food and non-food expenditures (clothing and footwear, household equipment, transport and communications, various services and housing services), use of durable goods, and auto-consumption and transfers in kind received. The poverty line – made of food and non-food poverty lines – was defined and computed by the National Institute of Statistics using the basic needs approach (INS, 2014). The food poverty line was calculated based on consumption costs of 2900 kilocalories per adult equivalent per day. The non-food poverty line was calculated from cost imputation. According to INS (2014), the poverty lines of 2001, 2007, and 2014 are, respectively, CFAF 232,547, CFAF 269,443, and CFAF 339,715.3 per adult equivalent per year. For inter-temporal comparisons we deflated the household consumption expenditures per adult equivalent of 2007 and 2014 to bring them back to the level of those of 2001. This deflation of aggregate consumption makes them directly comparable for the stochastic dominance tests conducted.

Three different poverty measures were used for our analysis: (i) the poverty ratio (P_0), (ii) the index of the depth of poverty (P_1), and (iii) the index of the severity of poverty (P_2). All three measures are members of the additive and decomposable class of poverty measures proposed by Foster et al. (1984), and the general formula to compute is as follows:

$$P_\alpha = \text{FGT}(\alpha) = \frac{1}{N}(\sum_{i=1}^{N} I(x_i < z)[1 - \frac{x_i}{z}]^\alpha, \quad \alpha > 0, \tag{1}$$

where α is a 'poverty aversion' parameter (larger α gives greater weight to larger poverty gaps, i.e. poorer people) and z is the poverty line.

To measure multidimensional poverty, we computed the global Multidimensional Poverty Index (MPI), which was first released in 2010 by the Oxford Poverty and Human Development Initiative (OPHI) at the University of Oxford and the United Nations Development Programme (UNDP) and is now widely used. It is a measure of acute poverty, reflecting three dimensions of health, education, and living standards. The methodology of computing the global MPI is based on the AF counting method (Alkire and Foster, 2011a). Spanning 10 indicators in total, each dimension is weighted by one-third, and equal weights are applied within each dimension. The indicators for health are nutrition and child mortality; for education they are school attendance and years of schooling; and for living standards they are drinking water, sanitation, electricity, cooking fuel, housing, and assets. In this paper, we use the most recent version of the global MPI, which is aligned explicitly to the SDGs following Alkire et al. (2021a, 2020a). For detailed indicator definitions and cutoffs see Alkire et al. (2020b).

The MPI is computed by multiplying its two components: the incidence and the intensity of poverty. The incidence or the proportion of multidimensionally poor people is referred to as the headcount ratio (H) of multidimensional poverty. With a poverty cutoff of one-third, any person that is deprived in at least one-third of the weighted indicators is identified as MPI-poor. In other words, if a person's counting vector, which sums up all weighted deprivations, is greater than one-third, a person is multidimensionally poor. In the robustness and dominance analyses, we made use of the counting vector and implicitly applied all possible poverty cutoffs to test for dominance in poverty trends.

The average intensity (A) of multidimensional poverty reflects the average deprivation share among the poor. The MPI is thus the product of H and A:

$$\text{MPI} = H \times A \tag{2}$$

Since for each indicator an indicator-specific cutoff is applied, the global MPI relies on a dual cutoff approach – the poverty cutoff and the indicator cutoffs (Alkire and Foster, 2011a).

We strictly followed OPHI's methodology, applying the indicator definitions of the most

recent global MPI 2020 as outlined in Alkire et al. (2020b), and replicated the most recent do-file for Cameroon as posted online.[3] We then replicated this with several rounds of available survey data and harmonized indicators where necessary. Overall, we found that the three rounds of DHS data used were very much comparable, requiring only very minor harmonisation steps in indicator specifications.

2.2 Data sources

For the measurement of the monetary poverty, we used three rounds of Cameroonian household living conditions surveys: ECAM2, ECAM3, and ECAM4, which were conducted in 2001, 2007, and 2014 respectively by the National Institute of Statistics (INS, 2014). The monetary value of household consumption expenditure was chosen as measure of welfare for the analysis of poverty. Consumption is a preferred welfare measure in developing countries for a number of reasons (Deaton, 1997; Atkinson, 2017). The three ECAM surveys (2001, 2007, and 2014) are representative at the national level and comparable in terms of sampling procedure, questionnaire, and data collection methodology (INS, 2002, 2008, 2014; Fambon et al., 2014, 2017).

For the analysis of multidimensional poverty, we used three rounds of the Demographic and Health Surveys (DHS) for the years 2004, 2011, and 2018. The DHS are unique for including questions that allow the calculation of anthropometric measures of underweight and stunting as well as various indicators of education and living standards. Standardised globally and largely available over time, the DHS allow for comparisons over time and across countries and across all subnational regions of Cameroon. We used region-level population shares from the DHS and year-wise national population totals from UNDESA (2020) to calculate regional population totals.

3 Empirical results: levels, trends and determinants of poverty

In this section, we present levels, trends, and determinants of monetary and multidimensional poverty. We begin by examining monetary poverty over time, followed by multidimensional poverty. We then juxtapose the two measures and compare levels and trends. In

[3] See https://ophi.org.uk/multidimensional-poverty-index/data-tables-do-files/.

Table 1: Monetary Poverty: 2001–14

	P0			Change			P1			Change			P2			Change		
	2001	2007	2014	Abs.	t	Rel.	2001	2007	2014	Abs.	t	Rel.	2001	2007	2014	Abs.	t	Rel.
National	0.402	0.399	0.375	-0.027	-6.6	-6.69	0.128	0.123	0.144	0.016	8.6	12.44	0.0555	0.050	0.072	0.017	14.7	30.16
Rural	0.521	0.550	0.568	0.047	8.6	9.04	0.173	0.175	0.229	0.056	20.7	32.05	0.077	0.072	0.117	0.040	23.6	52.72
Urban	0.179	0.122	0.090	-0.089	-25.9	-49.95	0.043	0.028	0.018	-0.025	-26.3	-57.84	0.016	0.010	0.006	-0.010	-23.0	-62.29
Adamawa	0.484	0.529	0.471	-0.012	0.4	-2.57	0.154	0.145	0.185	0.031	4.4	19.97	0.064	0.054	0.095	0.031	7.7	48.66
Centre	0.482	0.412	0.303	-0.179	-12.9	-37.11	0.150	0.095	0.075	-0.075	-14.3	-50.16	0.066	0.031	0.026	-0.041	-12.6	-61.38
Douala	0.109	0.055	0.042	-0.067	-12.2	-61.79	0.021	0.009	0.006	-0.015	-12.1	-73.09	0.007	0.002	0.001	-0.006	-10.4	-82.02
East	0.440	0.504	0.300	-0.140	-8.7	-31.87	0.154	0.157	0.093	-0.061	-8.4	-39.68	0.068	0.062	0.039	-0.029	-6.9	-42.58
Far-North	0.563	0.659	0.743	0.180	17.8	31.91	0.188	0.246	0.335	0.147	27.0	78.01	0.082	0.112	0.185	0.103	28.0	190.68
Littoral	0.355	0.308	0.195	-0.160	-13.0	-44.99	0.101	0.077	0.046	-0.055	-12.6	-54.14	0.042	0.027	0.017	-0.024	-10.5	-58.68
North	0.501	0.637	0.679	0.178	14.7	35.53	0.155	0.210	0.276	0.121	21.6	77.75	0.064	0.086	0.137	0.074	21.5	115.62
North-west	0.525	0.510	0.553	0.028	2.2	5.41	0.209	0.166	0.228	0.019	2.8	9.17	0.107	0.068	0.117	0.010	2.3	9.40
South	0.316	0.293	0.341	0.025	1.6	8.06	0.074	0.074	0.100	0.026	4.8	35.52	0.024	0.026	0.040	0.016	6.2	64.42
South-west	0.338	0.275	0.182	-0.156	-11.2	-46.15	0.105	0.069	0.050	-0.055	-10.4	-52.24	0.045	0.025	0.020	-0.025	-8.8	-56.19
West	0.403	0.289	0.217	-0.187	-15.3	-46.31	0.111	0.066	0.045	-0.066	-16.9	-59.51	0.042	0.023	0.014	-0.028	-16.2	-67.01
Yaounde	0.133	0.059	0.054	-0.080	-12.6	-59.74	0.027	0.010	0.011	-0.016	-10.5	-59.37	0.009	0.002	0.003	-0.005	-8.4	-60.19
Public sector	0.117	0.103	0.119	0.002	0.2	1.98	0.026	0.025	0.035	0.010	2.6	38.16	0.009	0.009	0.014	0.005	2.8	57.00
Public company	0.335	0.090	0.147	-0.188	-7.6	-56.22	0.124	0.027	0.054	-0.070	-6.0	-56.42	0.061	0.010	0.026	-0.034	-4.9	-56.70
Formal private enterprise	0.141	0.096	0.090	-0.051	-5.5	-36.45	0.036	0.020	0.026	-0.010	-2.6	-28.34	0.013	0.006	0.012	-0.002	-0.7	-11.78
Informal Non-agric.	0.569	0.230	0.216	-0.354	-60.4	-62.14	0.190	0.057	0.067	-0.124	-49.6	-65.00	0.085	0.021	0.029	-0.056	-37.9	-65.57
Informal agric.	0.317	0.596	0.628	0.311	43.3	98.09	0.089	0.194	0.261	0.173	52.7	194.77	0.035	0.081	0.137	0.102	49.6	296.77
Non-working	0.311	0.252	0.285	-0.027	-2.4	-8.62	0.094	0.071	0.097	0.003	0.7	3.32	0.040	0.028	0.045	0.005	2.0	13.39

Notes: Authors' calculations with data from Ecam 2001, 2007, 2014. The columns 'Abs.', 't', and 'Rel.' indicate the absolute change, the t-test of the change, and relative change, respectively.

a robustness and dominance analysis of the two measures, we implicitly apply all possible poverty cutoffs. We also estimate correlates of poverty using logistic regressions.

3.1 Monetary poverty: levels and trends

At the national level, our results show that monetary poverty remained stable between 2001 and 2007 and decreased slightly thereafter (Table 1). All three poverty indices, namely, $P0$, $P1$, and $P2$, indicate some rigidity of poverty. The proportion of Cameroonians who are poor declined from 40.2% in 2001 to 39.9% in 2007, reaching 37.5% in 2014. This downward rigidity in poverty at the national level not only concerns the rigidity of the poverty rate, but is also visible in the indices of depth and severity of poverty which assign a greater weight to the poorest of the poor. The index of the depth of poverty ($P1$) went from 12.8% in 2001 to 12.3% in 2007 and 14.4% in 2014. The severity of poverty ($P2$) rose from 5.0% in 2007 to 7.2% in 2014, reflecting an increase in inequality over this period or consumption gaps among the poor.

Trends in poverty by area of residence have moved in two opposite directions (Table 1). All three indices indicate a reduction of poverty in urban areas while showing poverty worsening in rural areas. The poverty rate went up in rural areas from 52.1% in 2001 to 56.8% in 2014. At the same time, the depth of poverty in rural areas increased from 17.3% in 2001 to 22.9% in 2014, while the severity of poverty rose from 17.3% in 2001 to 22.9% in 2014. However, the urban poverty rate was much lower and declined from 17.9% in 2001 to 9.0% in 2014. Indicators of the depth and severity of poverty in urban areas also show a clear reduction of

poverty during the studied period.

In 2014, households headed by farmers (informal agricultural enterprises) were by far the poorest group with a poverty rate of 62.8%, much poorer than the group of households headed by non-working people (with a rate of almost 28.4%). Over the period 2001–14, all the poverty measures deteriorated for farmer households. The poverty rate increased from 31.7% in 2001 to 62.8% in 2014 while the depth (respectively, the severity) of poverty rose from 8.9% in 2001 to 26.1% in 2014 (respectively, from 3.4% in 2001 to 13.7% in 2014).

An analysis by gender of the household head reveals that there were no significant disparities in the level and trend of poverty between male- and female-headed households at the national level. All the poverty measures indicate comparable levels and trends over the period 2001–14. However, gender disparities are observed within rural areas. In urban areas, there was no gender difference, while the poverty rate was relatively higher for women than for men in rural areas. This gender disparity observed in rural areas reflects inequalities between men and women in the agricultural sector (Pérez et al., 2002; Yengoh, 2012).

Regional decomposition of monetary poverty shows that the 12 regions of the analysis (see Table 1) can be divided into four groups according to the patterns of poverty observed in the periods 2001–7 and 2007–14:

- Group 1: regions with a continuous decrease in poverty over the whole period 2001–14: namely, Douala, Yaounde, Centre, Littoral, South-West, and West. Douala, Yaounde, Littoral, and South-West are regions whose incidence of poverty was already below the national average in 2001 and whose incidence fell further and remained lower than the national average in 2014. In Centre, the incidence of poverty was higher than the national average in 2001 and 2007, but dropped significantly by more than 10 percentage points to settle below the national average in 2014.

- Group 2: regions with an increase in poverty from 2001 to 2007 but a decrease in poverty from 2007 to 2014. This includes the regions of Adamawa and East, whose poverty rates were higher in 2001 and 2007 than the national average. Adamawa's poverty rate decreased in 2014, but not enough to prevent it from remaining well above the national average.

- Group 3: regions with a decrease in poverty from 2001 to 2007 but an increase from 2007 to 2014. This includes the regions North-West and South. The North-West had a relatively high poverty rate in 2007 and it rose to settle even further above the national

Table 2: Demographics and monetary poverty ratio in 2001, 2007, and 2014

	Population			P0			Number of Monetary-poor		
Area	2001	2007	2014	2001	2007	2014	2001	2007	2014
National	15,473	17,900	21,600	40.2	39.9	37.5	6,217	7,139	8,098
Rural	10,089	11,580	12,887	52.1	55.0	56.8	5,255	6,369	7,319
Urban	5,383	6,320	8,713	17.9	12.2	9.0	962	770	780
Adamawa	692	928	1,168	48.4	52.9	47.1	335	491	551
Centre	1,214	1,365	1,387	48.2	41.2	30.3	585	562	420
Douala	1,501	1,783	2,681	10.9	5.5	4.2	163	98	112
East	745	834	838	44.0	50.4	30.0	328	420	251
Far-North	2,745	3,241	3,903	56.3	65.9	74.3	1,545	2,135	2,898
Littoral	754	627	588	35.5	30.8	19.5	268	193	115
North	1,123	1,762	2,393	50.1	63.7	67.9	563	1,122	1,624
North-west	1,782	1,817	1,938	52.5	51.0	55.3	935	926	1,072
South	534	582	716	31.5	29.3	34.1	169	171	244
South-west	1,165	1,351	1,414	33.8	27.5	18.2	394	371	258
West	1,867	1,894	1,898	40.3	28.9	21.7	753	548	411
Yaounde	1,349	1,717	2,676	13.3	5.9	5.4	180	102	144

Notes: Authors' calculations with data from Ecam 2001, 2007, 2014. Population and number of poor are in thousands.

average in 2014. In the South, the poverty rate increased in 2014, but it remained below the national average in both 2014 and 2007.

- Group 4: the poorest regions, with a continuous increase of poverty over the whole period 2001–14: namely, the regions of Far North and North. All three poverty indices worsened in those regions over the whole period 2001–14. In the Far North, which had the highest poverty rates in 2001, the poverty rate increased to nearly 65.9% in 2007 and 74.3% in 2014. Likewise, the depth of poverty rose from 18.8% in 2001 to 24.6% in 2007, reaching 33.5% in 2014. The severity of poverty shows the same pattern; it increased from 8.2% in 2001 to 11.2% in 2007, reaching 18.5% in 2014.

The limited reduction in the poverty rate between 2001 and 2014 did not compensate for population growth. On the one hand, the proportion of poor people did decline at national level, but not everywhere at the same level or in the same pattern. On the other hand, Cameroon's population grew by nearly 40% between 2001 and 2014 (Table 2). As a result, the number of monetarily poor people increased from 6.2 million in 2001 to 8.1 million in 2014. This change is mainly due to the increase in the number of poor people in rural areas, which rose by the same rate, 40%, from 5.3 million to 7.3 million. The Far North and North regions experienced the largest increase in the number of monetarily poor people, with the North tripling its number of monetarily poor people in less than a decade (see Table 2).

3.2 Multidimensional poverty: levels and trends

As documented in Table 3, the value of the MPI at the national level decreased between 2004 and 2018 from 0.288 to 0.228, a statistically significant reduction of 21% in relative terms. Mostly, this was driven by an equally sizable reduction in the headcount ratio, which reduced from 54% in 2004 to 43% in 2018. Notably, however, the pace of multidimensional poverty reduced somewhat over time, while the average intensity of multidimensional poverty (A) stayed constant over time at 53%.

Table 3: Main results for changes in MPI, H, and A between 2004, 2011, and 2018

	MPI						H						A					
	Year			Change			Year			Change			Year			Change		
	2004	2011	2018	Abs.	t	Rel.	2004	2011	2018	Abs.	t	Rel.	2004	2011	2018	Abs.	t	Rel.
National	0.288	0.257	0.228	-0.061	5.1	-20.98	0.54	0.47	0.43	-0.11	5.86	-20.89	0.53	0.54	0.53	0.00	0.07	-0.12
Rural	0.419	0.403	0.382	-0.038	2.4	-8.97	0.76	0.72	0.70	-0.06	2.79	-8.23	0.55	0.56	0.54	0.00	0.44	-0.81
Urban	0.148	0.098	0.074	-0.074	5.7	-50.07	0.31	0.21	0.16	-0.15	6.33	-48.33	0.48	0.47	0.46	-0.02	1.05	-3.38
Adamawa	0.386	0.283	0.383	-0.003	0.1	-0.70	0.70	0.53	0.68	-0.02	0.41	-3.06	0.55	0.53	0.56	0.01	0.45	2.43
Centre	0.215	0.166	0.187	-0.029	1.0	-13.30	0.49	0.38	0.41	-0.08	1.15	-15.51	0.44	0.44	0.45	0.01	0.93	2.62
Douala	0.046	0.021	0.008	-0.037	3.2	-81.63	0.11	0.05	0.02	-0.09	3.15	-79.47	0.41	0.39	0.37	-0.04	2.32	-10.53
East	0.295	0.302	0.292	-0.003	0.1	-0.95	0.59	0.61	0.57	-0.02	0.28	-3.63	0.50	0.50	0.51	0.01	0.95	2.78
Far-North	0.544	0.543	0.432	-0.112	3.4	-20.59	0.90	0.87	0.76	-0.14	3.31	-15.76	0.60	0.62	0.57	-0.03	2.10	-5.74
Littoral	0.146	0.115	0.089	-0.057	2.4	-39.15	0.34	0.26	0.21	-0.13	2.41	-37.72	0.43	0.45	0.42	-0.01	0.58	-2.30
North	0.536	0.458	0.426	-0.110	3.2	-20.49	0.86	0.77	0.73	-0.13	3.07	-15.26	0.62	0.60	0.58	-0.04	1.86	-6.17
North-West	0.249	0.180	0.227	-0.022	0.5	-8.95	0.52	0.41	0.48	-0.04	0.49	-7.41	0.48	0.44	0.47	-0.01	0.33	-1.66
West	0.239	0.185	0.096	-0.143	6.0	-59.92	0.52	0.40	0.23	-0.29	5.98	-55.94	0.46	0.46	0.42	-0.04	2.80	-9.04
South	0.182	0.116	0.129	-0.053	2.6	-28.91	0.43	0.28	0.32	-0.11	2.25	-25.41	0.42	0.41	0.40	-0.02	1.69	-4.69
South-West	0.196	0.141	0.034	-0.161	6.0	-82.47	0.43	0.32	0.09	-0.34	5.51	-79.01	0.46	0.44	0.38	-0.08	4.66	-16.50
Yaounde	0.047	0.030	0.005	-0.042	4.7	-89.76	0.12	0.08	0.01	-0.11	5.12	-89.95	0.40	0.39	0.40	0.01	0.24	1.88

Notes: Authors' calculations based on DHS 2004, 2011, and 2018. The columns 'Abs.', 't', and 'Rel.' indicate the absolute change, the t-test of the change, and relative change, respectively.

The major reductions in multidimensional poverty took place in urban areas, where the MPI halved between 2004 and 2018 and the headcount ratio nearly halved, decreasing from 31% in 2004 to 16% in 2018. In rural areas, on the other hand, levels were much higher to begin with – the MPI for rural areas was 0.419 and almost three times higher than in urban areas. It also reduced, but at lower rates, in both absolute and relative terms. While the MPI for rural areas reduced by only 9%, and thus much slower than in urban areas, the headcount ratio barely decreased. It declined from 76% in 2004 to 72% in 2011 and to 70% in 2018.

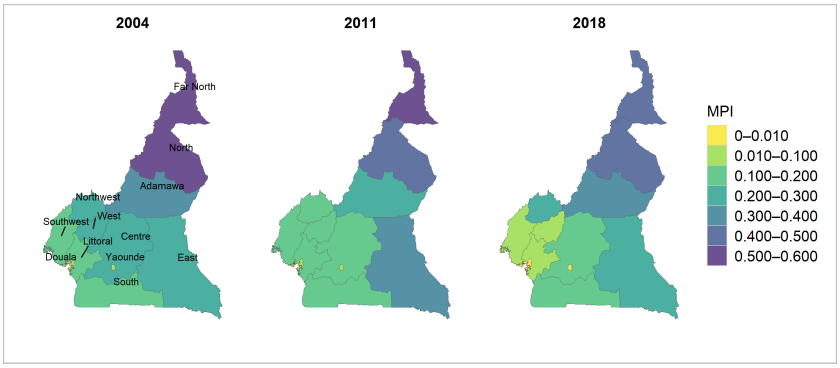
In combination with Figure 1a, it is evident that most of the improvements in multidimensional poverty occurred in urban centres and regions. In contrast, the northern regions of Far North, North, and Adamawa, as well as the East, fell further behind between 2004 and 2018.

As a result, and most worryingly, the number of MPI-poor people increased in many regions. This is evident from both Figure 1 and Table 4. On the one hand, headcount ratios did reduce over time, but not at the same pace and pattern everywhere. On the other hand, Cameroon's population grew by almost 50% between 2004 and 2018. In sum, the number of MPI-poor

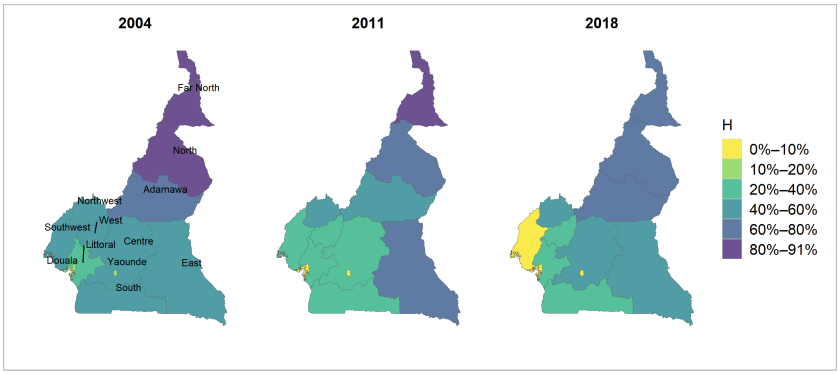
people increased from 9.4 million in 2004 to almost 10.8 million in 2018. This is driven solely by an increase in the number of poor people in rural areas, which increased by 30% from 6.8 million to 8.8 million. The Far North and North regions saw the highest increase in the number of MPI-poor people, with North doubling its number of MPI-poor people within less than a decade (see Table 4). Yet, at the same time, the headcount ratio declined over time, while the overall population almost doubled.

Figure 1: Change in the MPI, headcount ratio (H) and number of MPI-poor people at regional level in 2004, 2011, and 2018

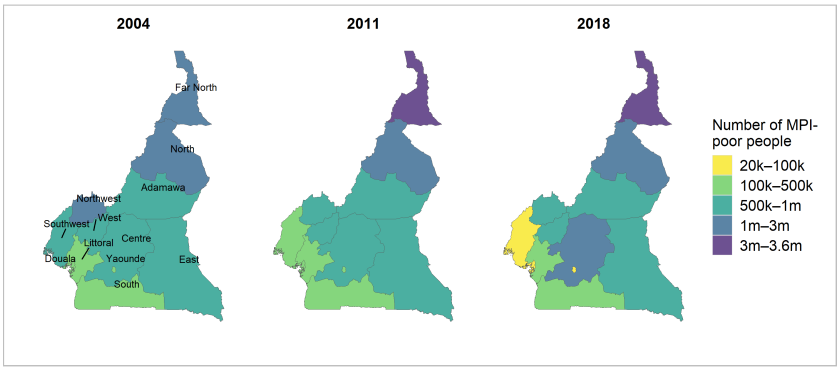
(a) MPI



(b) H



(c) Number of MPI-poor people



Notes: Authors' calculations based on DHS data of 2004, 2011, and 2018.

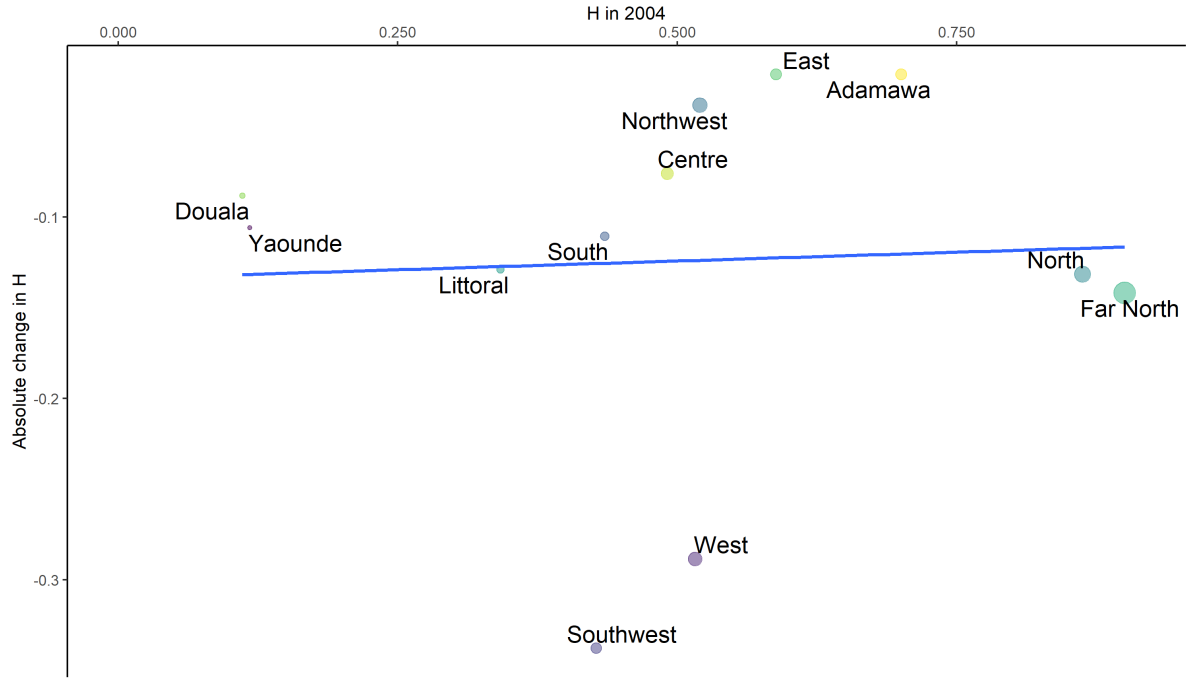
Table 4: Demographics and headcount ratio in 2004, 2011, and 2018

	Population			H			Number of MPI-poor		
Area	2004	2011	2018	2004	2011	2018	2004	2011	2018
National	17,259	20,906	25,216	54.3	47.4	43.0	9,379	9,906	10,841
Rural	8,943	10,926	12,626	76.3	71.7	70.1	6,826	7,834	8,844
Urban	8,316	9,980	12,590	30.7	20.8	15.9	2,553	2,072	1,997
Adamawa	763	998	1,270	70.0	53.0	67.9	534	529	862
Centre	1,479	1,505	2,496	49.1	37.8	41.5	726	569	1,036
Douala	1,533	1,883	2,639	11.1	5.3	2.3	170	100	60
East	903	896	1,567	58.8	60.8	56.7	532	545	888
Far-North	3,101	4,037	4,540	90.0	87.5	75.8	2,792	3,531	3,443
Littoral	749	870	967	34.2	25.7	21.3	256	224	206
North	1,615	2,456	3,461	86.2	76.6	73.1	1,393	1,882	2,530
North-West	2,040	1,856	1,620	52.0	40.9	48.2	1,062	759	781
West	1,790	2,407	2,627	51.6	40.0	22.7	924	962	597
South	746	604	1,135	43.5	28.2	32.4	324	170	368
South-West	1,183	1,505	461	42.8	32.3	9.0	506	487	41
Yaounde	1,356	1,889	2,434	11.8	7.8	1.2	160	148	29

Notes: Authors' calculations with data from DHS 2004, 2011, 2018. Population and number of poor are in thousands.

The absence of any pro-poor poverty reduction between 2004 and 2018 is illustrated in Figure 2. We plot every region's absolute change in the headcount ratio (H) over its respective starting level in 2004 and find that the poorest regions did not reduce faster than richer ones. In fact, there is no correlation at all, and some of the richer regions (South-West, West) saw faster poverty reduction than the poorer northern regions. This contrasts sharply with observations in other developing countries such as India, where the poorest regions moved fastest out of multidimensional poverty between 2005/6 and 2015/16 (Alkire et al., 2021b).

Figure 2: No pro-poor poverty reduction in the MPI headcount ratio (H) between 2004 and 2018



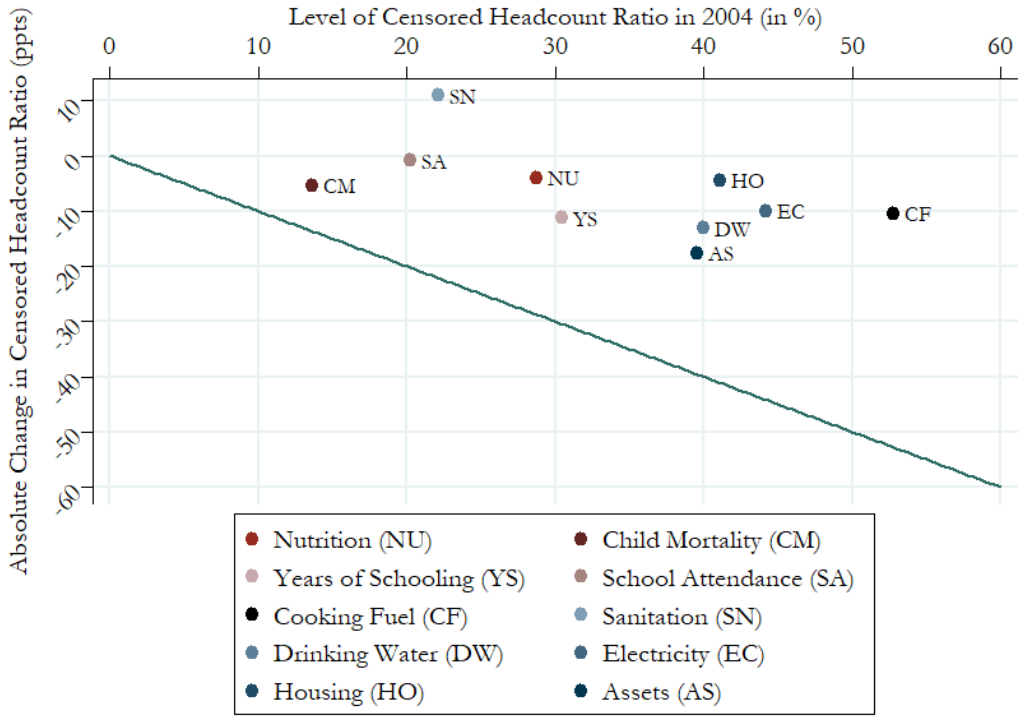
Notes: Authors' calculations based on DHS data of 2004 and 2018. Slope: 0.02; t-test: 0.14; correlation coefficient: 0.04. Size of bubble proportionate to number of poor people in 2004.

The MPI can also be decomposed into its components of 10 indicators, making it a unique tool for policy guidance. The MPI is the mean of all weighted and censored deprivations.[4] The censored headcount ratio of each indicator informs on the proportion of people who are MPI-poor and deprived in a given indicator. In our trend analysis, this provides useful information on how the many forms of poverty have changed over time among the poor. In Figure 3, we plot the 2004 level of each censored headcount ratio on the horizontal axis. This shows that 53% of all Cameroonians were MPI-poor and did not use SDG-standard cooking fuel, and around 40% were MPI-poor and deprived in housing, drinking water, and assets. Worryingly, close to 30% were MPI-poor and deprived in nutrition (i.e. they had a malnourished (stunted or underweight) family member). The censored headcount ratio in 2004 for child mortality stood at around 12%, with school attendance at 20% and sanitation at 22%. On the vertical axis of Figure 3, we plot the absolute change for each censored headcount ratio between 2004 and 2018. For eradication of poverty in an indicator (100% relative change), the indicator dots would need to align along the diagonal line through the

[4] 'Censored' in this context implies that the deprivations of only the MPI-poor people are counted, but the denominator includes the entire population.

origin (plotted in light blue). We notice, however, that the estimated change is far away from the diagonal line, implying that the censored headcount ratios did not change much in either absolute or relative terms. In the case of cooking fuel, the highest censored headcount ratio of 2004, there was a reduction of 10 percentage points from the starting level of 53%. The highest relative reduction in the censored headcount ratio was for assets, which reduced from 40% to 20%. In contrast, several other censored headcount ratios barely changed between 2004 and 2018 – see, for example, school attendance, nutrition, and housing near the zero on the y-axis. To make matters worse, censored headcount ratios in sanitation increased by 10 percentage points, implying that 30% of Cameroonians were MPI-poor and deprived in sanitation in 2018, compared with 20% in 2004.

Figure 3: Change in censored headcount ratios at national level, 2004–18



Notes: Authors' calculations based on DHS data for 2004, 2011, and 2018. The diagonal line goes through the origin and indicates how far away the absolute change in a headcount ratio is from complete eradication.

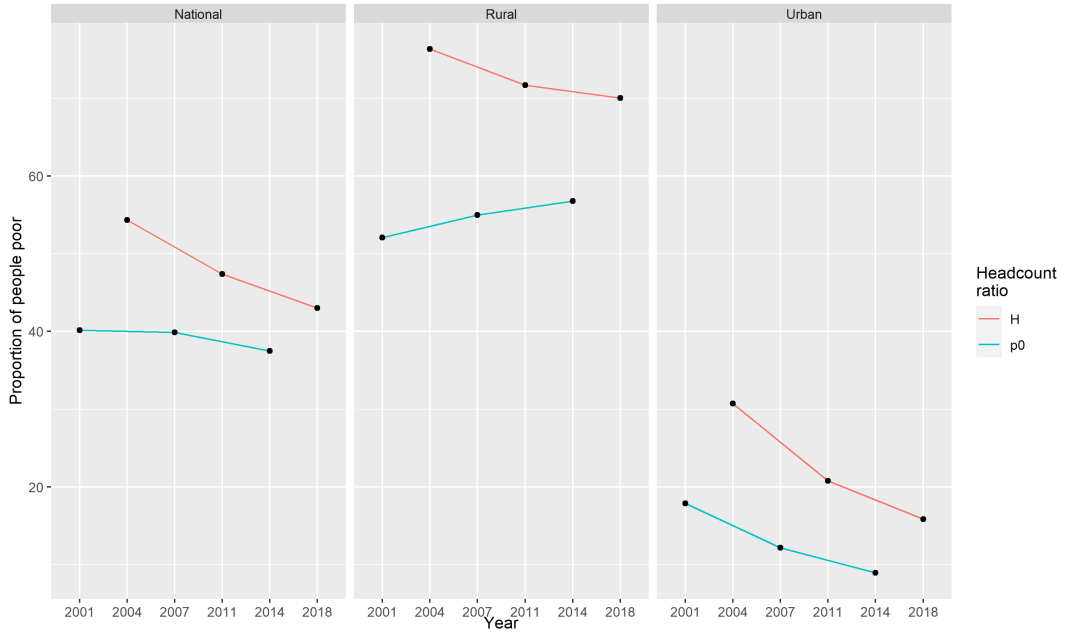
3.3 Two types of poverty: same levels and trends?

Up until this section, we have discussed levels and trends in both monetary and multidimensional poverty. Rightly, one may wonder whether they are just two sides of the same coin

and thus redundant. In Figure 4, we juxtapose trends in both headcount ratios – monetary ($P0$) and multidimensional (H) – for the two respective three-year time intervals.[5] It is clear that multidimensional poverty was always higher than monetary poverty at the national, rural, and urban levels. At the national level, it is evident that multidimensional poverty reduced much faster than monetary poverty, declining from 54% in 2004 to 43% in 2018. Monetary poverty, on the other hand, remained almost stagnant at about 40%, resulting in a closing gap between the two measures.

The pictures look very different at the rural and urban levels. In rural areas, multidimensional poverty was much higher than monetary poverty (75% versus 52%) and it reduced over time, whereas monetary poverty increased. In urban areas, both multidimensional and monetary poverty declined over time, almost in parallel trends.

Figure 4: Change in headcount ratios of monetary and multidimensional poverty at national, rural and urban levels



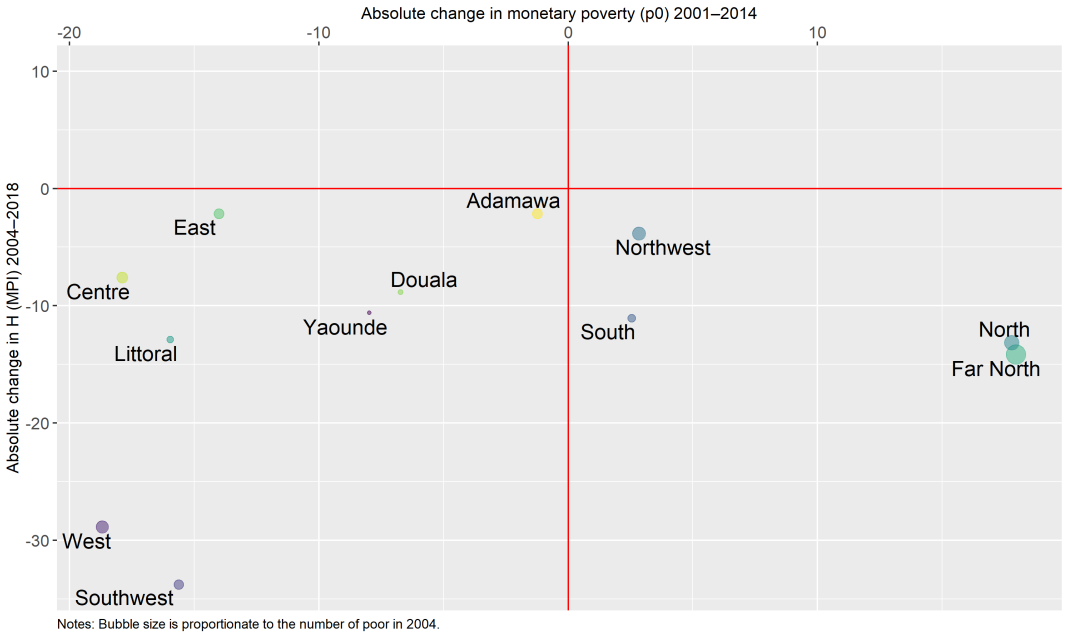
Notes: Authors' calculations based on DHS data for 2004, 2011, and 2018, and ECAM data for 2001, 2007, and 2014.

Zooming in to the regional level, changes in both measures were heterogeneous, as shown in Figure 5. On the one hand, most regions have seen reductions in both $P0$ (horizontal axis) and H (vertical axis). The lower left quadrant in Figure 5 captures regions that saw reduc-

[5]Recall that the ECAM data used for monetary poverty are available for the years 2001, 2007, and 2014, and the DHS data used for multidimensional poverty for 2004, 2011, and 2018.

tions in both measures. The magnitude of the absolute changes varies. The West, for example, reduced monetary poverty by 20 percentage points and multidimensional poverty by 30 percentage points. The East saw reductions in monetary poverty of almost 15 percentage points, but multidimensional poverty reduced by less than 5 percentage points. In Adamawa, neither of the two measures reduced significantly; they remained almost constant over time. In stark contrast, four regions (South, North-West, North, Far North) saw increases in monetary poverty while multidimensional poverty declined (lower right quadrant). This implies that while certain living conditions (e.g. assets, drinking water, years of schooling, see Figure 3) may have improved over time, consumption expenditure did not improve in real terms in these regions. Treating North and Far North as outliers, the broad pattern depicted in Figure 5 suggests a positive correlation between changes in both measures.

Figure 5: Change in multidimensional poverty headcount ratio (2004–18) over change in monetary poverty headcount ratio (2001–14)



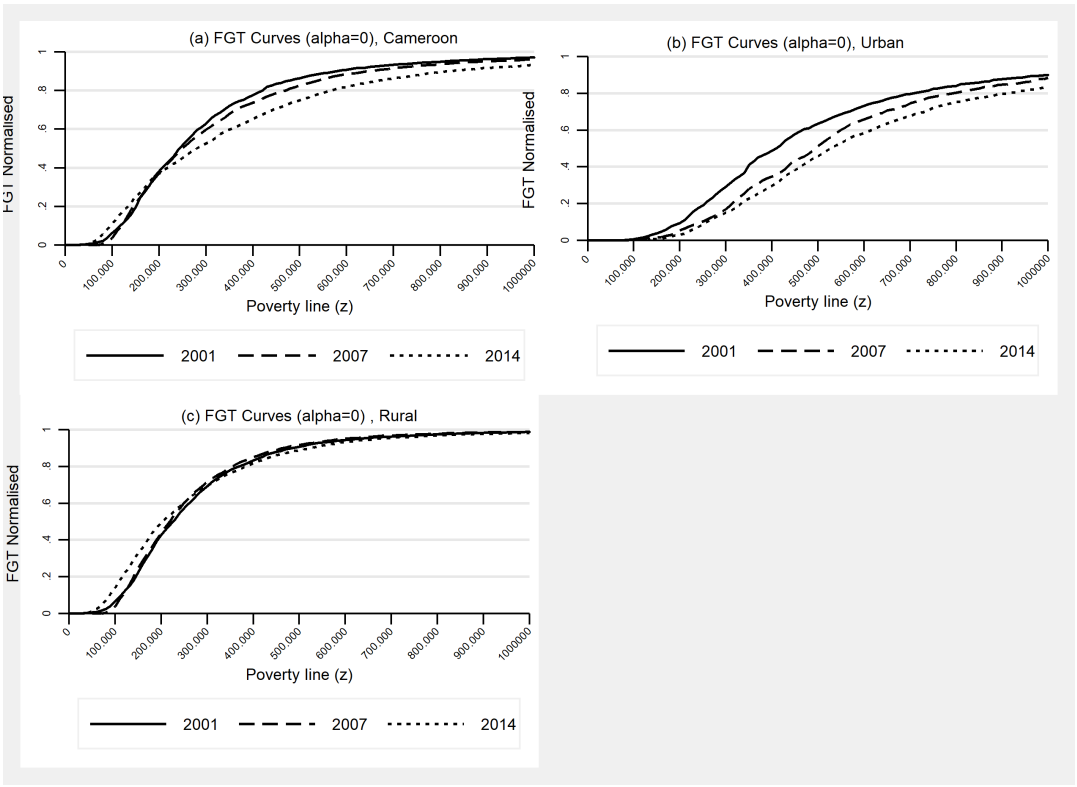
Notes: Authors' calculations based on DHS data for 2004 and 2018, and ECAM data for 2001 and 2014.

3.4 Robustness and dominance analysis

3.4.1 Monetary poverty

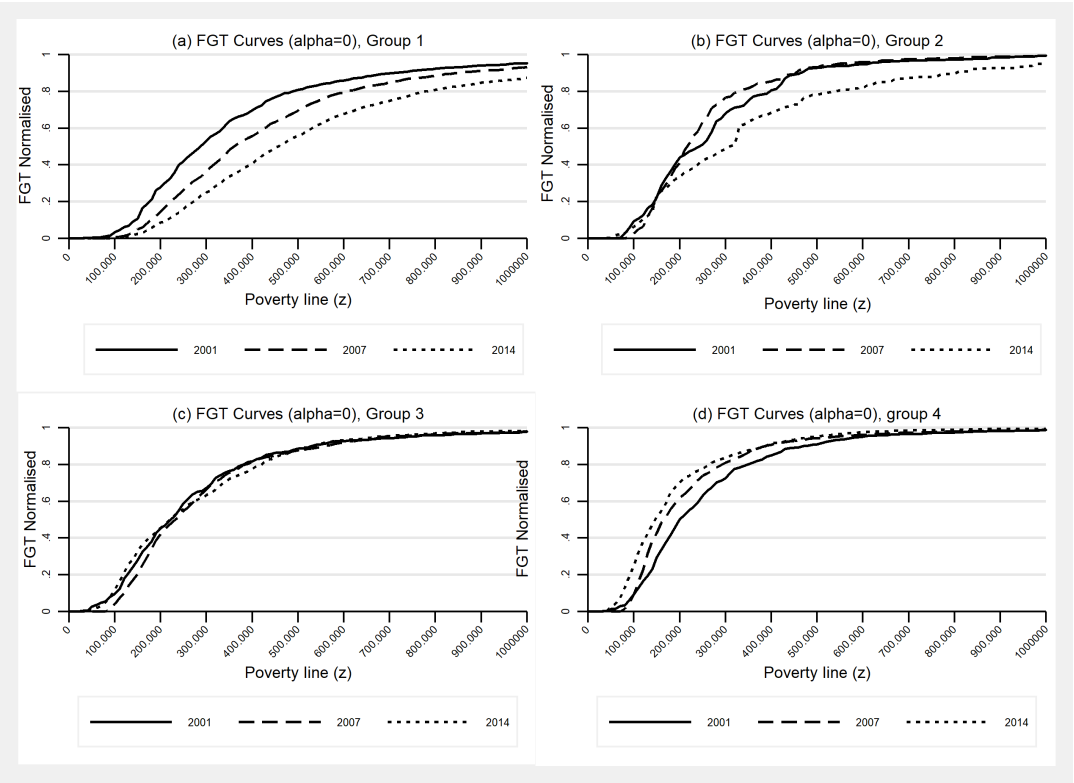
To probe our results and test whether the drawing of poverty lines has implications for the trends over time in monetary poverty, we undertake a first-order stochastic dominance analysis at the national, urban, and rural levels. Figure 6a compares the poverty incidence curves of Cameroon over the period 2001–07. It shows that for any poverty line starting from 200,000 CFAF per adult equivalent per year, the distribution of the expenditure of 2014 dominates that of 2007, which in turns dominates that of 2001. In other words, for any poverty line considered from this minimum level (200,000 CFAF), the level of poverty is lower in 2014 than in 2007. Figures 6b and 6c present the poverty incidence curves for the urban and rural areas respectively. These figures corroborate spatial patterns of poverty previously highlighted. Figure 6b shows that poverty decreased in urban areas, no matter what poverty line is used. For rural areas, Figure 6c indicates that poverty increased between 2001 and 2007 for any poverty line in the range of 200,000–250,000 CFAF per adult equivalent per year.

Figure 6: Poverty incidence curves 2001–14 at national, urban, and rural levels



Acknowledging the different poverty trends across regions, and building on the four groups of regions as developed above, Figure 7 presents a first-order stochastic dominance test. It corroborates the preceding conclusion on the spatial pattern of poverty over the period 2001–14. For a large range of poverty lines and with no additional hypothesis on the poverty threshold, it seems that poverty decreased unequivocally in regions of Group 1 whereas it increased in regions of Group 4 over the period 2001–14 (see Figures 7a and 7d). The results for regions of Group 3 are confirmed without additional assumptions (Figure 7c) while the conclusion for regions of Group 2 is consistent from a poverty line level of approximately 150,000 CFAF per adult equivalent per year (Figure 7b).

Figure 7: Monetary poverty incidence curves 2001–14 for four groups of regions

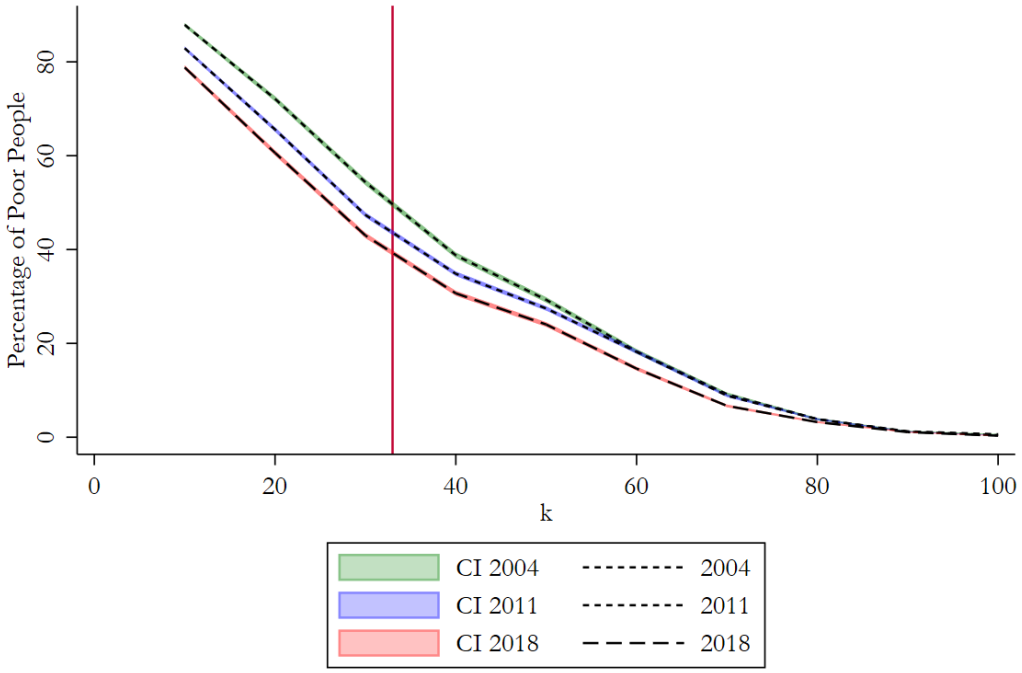


3.4.2 Multidimensional poverty

For the dominance analyses in multidimensional poverty, we follow techniques by Alkire et al. (2021b) as applied for their trend analysis of multidimensional poverty in India between 2005/6 and 2015/16. First, we plot the multidimensional poverty headcount (H) over all possible values of k, the poverty threshold (Figure 8). The 33% line, shown as a red vertical line, shows the applied poverty cutoff. Clearly, near the 33% line, any poverty cutoff would

yield a poverty reduction between 2004 and 2018, along with a slightly higher reduction between 2004 and 2011 than in the period 2001 to 2018. This holds up to a poverty threshold of 55%, where the two lines of 2004 and 2011 intersect, implying that there would be no reduction in multidimensional poverty between 2004 and 2011, given higher poverty lines starting from 55%. The 2018 line is always unequivocally lower than both the 2004 and 2011 line, indicating poverty reduction irrespective of the chosen cutoff.

Figure 8: Multidimensional poverty headcount ratio (H) over all levels of k

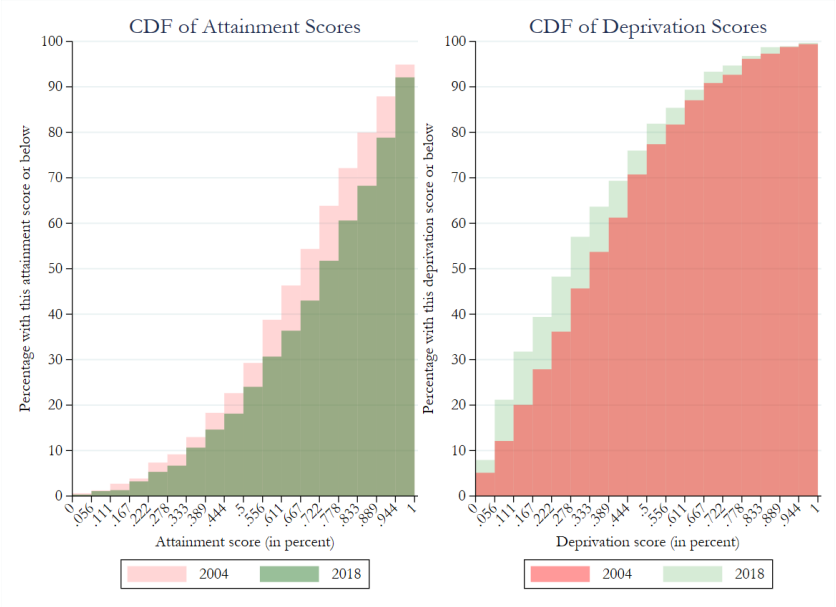


Based on authors' calculations with DHS data.
95% confidence intervals (CI) overlay the lines of point estimates.

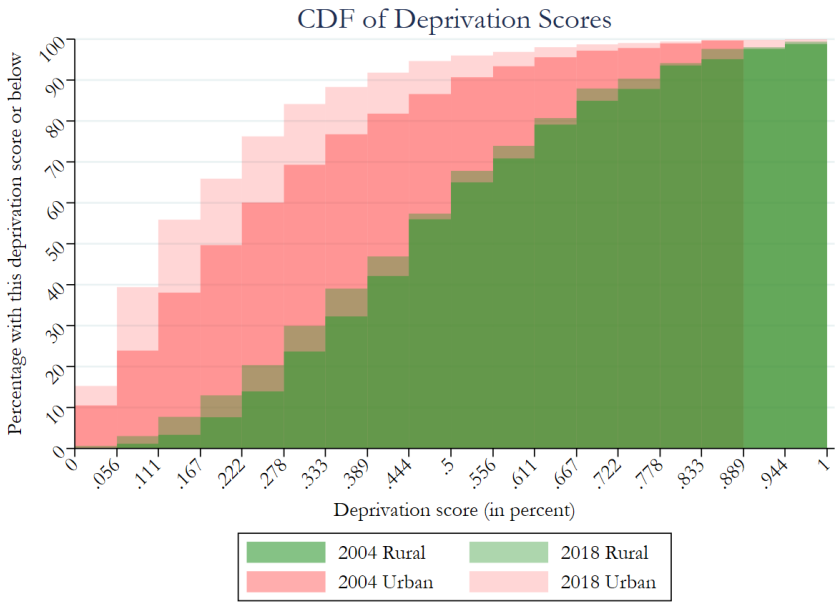
In Figure 9, we plot the cumulative distribution functions (CDFs) of the attainment and deprivation (counting) scores for 2004 and 2018 at the national level (Figure 9a), and deprivation scores at the urban and rural level (Figure 9b). They show that, irrespective of where we set the cutoff, there is an improvement in attainments and lessening of deprivations, albeit at small magnitudes. The CDFs for both rural and urban areas confirm the overall improvement in urban areas and the near stagnation in rural areas. Clearly, the gap between urban and rural areas widened between 2004 and 2018.

Figure 9: CDFs of attainment and deprivation scores, 2004–18

(a) National



(b) Rural and urban



Notes: Authors' calculations based on DHS data of 2004, 2011, and 2018.

3.5 Likelihood of being poor

To underscore our analysis of levels and trends, in this subsection we present findings of a simple regression analysis that aims to find correlates of the two forms of poverty. It com-

plements the trend analysis by estimating the probability of being poor due to several socio-economic factors available in the ECAM and DHS data.

In our logit regression framework of predictors of poverty, year-wise and pooled, we include demographic factors as available in both the DHS and ECAM datasets. The following explanatory variables are used: (i) sex, age, marital status, religion of household head, and household size, (ii) education, occupation, land ownership, and access to credit (as socio-economic factors), and (iii) area of residence – urban/rural and agro-ecological zones – defined by the administrative regions of the country (as spatial factors). Being one of the three MPI dimensions and thus directly correlated, the education variable is not included for the multidimensional poverty analysis. Also, being available only in the ECAM dataset (but not in DHS), the variable 'membership of an association', capturing the social capital of the household, is added only for the monetary poverty case. The final lists of explanatory variables included in the model are provided in Tables A.1 and A.2 presenting the results.

For each poverty status – monetary and multidimensional – for the dependent variable we estimate two year-wise and one pooled logit regression. To estimate the likelihood of monetary poverty we use ECAM 2007 and 2014, and for multidimensional poverty we use DHS 2011 and 2018, leaving out the earlier rounds of ECAM and DHS because of missing data.

Appendix Tables A.1 and A.2 display estimates of the correlates of poverty. The majority of estimated coefficients are robust, statistically significant, and have the expected signs. Coefficients for the variables age, sex, and marital status are not statistically significant in the monetary case and are sensitive to model specification and type of poverty. To highlight some of the emerging patterns, the odds of being in monetary poverty decrease by –36% for households headed by a primary-educated person, by –67% for those headed by a secondary-educated person and by –91% for those headed by someone who completed tertiary education, *ceteris paribus*. This shows a continuous poverty-reducing effect of education.

In terms of occupational factors, working in agriculture is the only status that leads to a greater probability of being poor than for unemployed people. All the other employment types are associated with a lower probability of being poor than for unemployed people. The odds of being monetarily poor (respectively multidimensionally poor) increase by 28% (respectively 75%) for households headed by someone working in the agriculture sector compared with those headed by unemployed individuals. This finding is also corroborated by the estimates obtained for both area of residence and land ownership. We find that households living in rural areas are more likely to be poor than their counterparts living in urban areas.

The odds of being monetarily (respectively multidimensionally) poor is four times (respectively five times) greater for households living in rural areas compared with their counterparts in urban areas. Similarly, land ownership increases the probability of being poor by 20% for the monetary case and by 42% for the multidimensional case, *ceteris paribus*. While land is considered as a productive asset, its use in a very low productivity rural farming sector significantly limits its impact on poverty.

We find that the odds of being poor for households headed by someone holding a bank account or someone who obtained credit in the 12 months preceding the survey decrease by –38% for monetary poverty and –77% for multidimensional poverty compared with their counterparts who do not have a bank account or did not obtain a credit. The effect of financial inclusion is more pronounced for the MPI estimate.

In order to account for climatic and ecological conditions, we group the 10 regions of Cameroon into five agro-ecological zones that combine both spatial (regions) and ecological factors: (i) the Humid Savannah zone made of the West and North-West regions, (ii) the Savannah zone that includes the Adamawa region, (iii) the Sahelien zone that includes the regions of Far North and North, (iv) the Forestry zone made of the regions of Centre, East, and South, and (v) the Mangrove zone made of the regions of Littoral and South-West. Our results indicate that the odds of being poor significantly increase for households living in the Sahelien zone (five times more for the multidimensional poverty and almost twice for the monetary poverty). Results for the Forestry zone differ, likely because of the presence of the East region, which is quite poor in both senses but is part of that zone along with the Centre and South regions which are among the least poor of the country. Overall, these findings are consistent with results from the bivariate analysis performed in the previous section as well as with previous findings from the literature, clearly highlighting that northern regions of Cameroon are significantly poorer than southern regions. The results also confirm that climate and ecological factors are key determinants of poverty.

For the monetary poverty case, we can test the importance of being a member of certain associations. We find that the odds of being poor decrease by –38% for households who have a member of an association, compared to households with none. This result is consistent with findings from the literature on informal institutions in Africa, such as informal saving groups, which are found to play a significant role in reducing poverty.

Turning to the demographic correlates of poverty such as age, sex, marital status, and religion of the households as well as household size, the results are heterogeneous. Household size is the only demographic variable significantly and robustly associated with both types of pov-

erty. An increase of household size by one person increases the odds of being monetary poor (multidimensional poor) by 21% (8%). Coefficients for other demographic variables, which are mostly socio-cultural variables (sex, age, marital status, and religion), are sensitive to the year of the survey or the type of poverty considered, and are therefore rather inconclusive. These results are, however, consistent with findings from the previous trend analysis. For instance, it was found in the previous decomposition analysis that the monetary poverty level for female-headed households was not significantly different to that of male-headed households. Overall, the results seem to indicate that the determinants of poverty in Cameroon are mainly socio-economic and spatial rather than demographic or socio-cultural.

4 Structural factors affecting poverty in Cameroon

To put our previous empirical results within a broader macroeconomic context, we discuss in this section the structural factors – inherent to demographic changes, structural transformation of the economy, policy effectiveness, and conflicts – that shape steadfast poverty. This discussion relies on lessons from the literature, mainly grey literature and policy documents produced by the government, civil society organisations (CSOs), and multilateral development agencies.

Demographic transition in Cameroon and poverty

The phenomenon of demographic transition is an important factor to consider in the analysis of poverty and wellbeing. Cameroon's population is estimated at 7.7 million in 1976, 10.5 million in 1987, 17.5 million in 2005 and 22 million in 2015 (MINEPAT, 2012). This evolution corresponds to an annual average growth rate of 2.9% over the period 1976—87 and 2.8% over the period 1987—2005. If the observed trend continues, the population of the country will reach almost 40 million in 2035. At the same time, fertility rates in Cameroon have been declining slowly following a steady decline of child mortality rates. The total fertility rate remained high with 4.8 births per woman in 2018 compared with 5.8 births per woman in 1991, while the child mortality rate decreased from 77 deaths per 1,000 live births in 1998 to 48 deaths per 1,000 live births in 2018), resulting in a very high youth dependency ratio for the population (INS, 2020).

Three salient facts are worth noting from these demographic dynamics. First, the trend of the sex ratio shows a progression towards a relative predominance of men. The sex ratio in-

creased from 96.1 men for every 100 women in 1976 to 97.7 in 2005, 98.0 in 2010, and 100 in 2019. Second, the Cameroonian population is essentially made up of young people. In 2010, the median age of the population was 17.7 years and the average age was 22.1 years. The population under 15 years of age represents 43.6% of the total population, while the population under 25 years of age represents 64.2%. Third, urbanisation in Cameroon has continued to grow over the years. In 1976, the urbanisation rate was 28.1%, rising to 37.9% in 1987 and 48.8% in 2005, and is estimated at 52.0% in 2010 and 57.0% in 2019. This galloping urbanisation is the result of a rural exodus marked by a strong concentration of populations in the metropolises of Douala, the economic capital, and Yaounde, the political capital (MINEPAT, 2012).

Slow structural transformation impedes substantial poverty reduction

Poverty reduction in Cameroon primarily depends on the ability of the economy to create sufficient formal and decent jobs to meet the needs of the growing and youthful population. Over the last few decades, employment response to growth has been weak. Alongside the slow rate of job creation is the dominance of vulnerable employment, notably in the informal sector. The two general enterprise surveys held in 2009 and 2016 show that on average only 38,072 new jobs per year were created, given an estimated total of 822,985 unemployed people in 2014 and a net job creation target of 495,000 per year set out in the first phase of 'Vision Cameroon 2035' (UNDP, 2019). Therefore, poverty reduction would require significant gains in productivity across all sectors, resulting in higher wages and more workers shifting to higher productivity jobs; this will only be achieved through greater and faster structural transformation of the economy.

Since 1980, Cameroon's GDP has experienced inter- and intra-sectoral changes. These were reflected in the gradual decline of agriculture, a marked reduction of manufacturing activities, and a significant increase in services. Before Cameroon became an oil-exporting country in 1978, cocoa and coffee were the main pillars of the economy, and agriculture accounted for an average of 30% of GDP. After a poor experience with liberalisation policies that lasted two decades, from 1980 to 2000, the share of agriculture in GDP fell from 27.0% to 14.8%, and the share of manufacturing in GDP fell from 30.2% in 1982 to 25.2% in 2015 (World Bank, 2020). The decrease in agriculture and the manufacturing industry in GDP was absorbed by an increase in services. While its share of total employment also decreased over time, agriculture remains the largest employer, with 47.1 percent of the labour force in 2015 (UNDP, 2019).

The concern, however, has been that these sectoral changes were not led by productivity

gains. Agriculture, mainly performed by smallholder farmers, still faces numerous challenges such as low agricultural productivity and underemployment (Molua, 2007; Yengoh, 2012; UNDP, 2019). The ratio of labour productivity in non-agricultural sectors to labour productivity in the agricultural sector between 1960 and 2001 is 6.8 (Kobou et al., 2008). These gaps in labour productivity have not reduced since 2001. In 2015, agriculture was still the sector with the lowest labour productivity. For instance, the added value per worker in agriculture is seven hundred times lower than in extractive activities. The construction sector and the service industry (commercial activities, catering, and hotels) have the highest levels of added value per worker (UNDP, 2019). Labour productivity is also relatively low in manufacturing industries. Diversification of the economy has not yet led to substantial export sophistication. The diversification remains horizontally concentrated on commodities with low technological intensity (Nations Unies, 2018).

Poor allocation of public spending and ineffectiveness of public policies

The observed spatial patterns of poverty and inequality in Cameroon relate to the poor allocation of public spending and the ineffectiveness of public policies across different regions and segments of the population. First, the persistence of spatial inequality, in both monetary and multidimensional achievements, suggests an ineffective allocation of resources and opportunities. Second, the increase in the number of poor people raises questions about the efficiency of public expenditure and poverty-targeting policies. Cameroon's total public spending has increased substantially from 13% of GDP in 2006 to 21% of GDP in 2016, but the country still spends little compared to its African peers. In 2015, Cameroon's public expenditure represented 19% of GDP, while the averages for sub-Saharan Africa (SSA), upper middle-income countries (UMIC), and lower middle-income countries (LMIC) were 28%, 25%, and 31.5%, respectively (World Bank, 2018).

This poor allocation of public expenditure manifests itself at two levels. First, productive public expenditure is limited. Cameroon spends more on general and administration costs than its non-oil-exporting peers. General and financial administration services and sovereignty expenditures absorbed roughly a quarter of the total budget between 2013 and 2015. If debt servicing is added, less than half of the budget was allocated to infrastructure, social sectors, production, commerce, and communication. Second, unsuitable regional allocation was noted. The public resources were not always directed towards the neediest regions or localities. For instance, the Far North, which has the lowest socio-economic indicators and is the poorest region, receives significantly less per capita budget transfer than the national

average (UNDP, 2019). In the education sector, unequal distribution of key educational inputs such as public expenditure, qualified teachers, and classrooms creates disparities between schools and regions. The analysis of the allocation of public expenditure reveals substantial variations in spending on education across the country, with the lowest levels of student spending observed in the areas with the greatest needs (World Bank, 2018). For example, students in the impoverished North region receive 2.2 times less than students in the wealthier Littoral region. Per-student spending on teacher salaries is systematically lower in designated Priority Education Zones (Zones d'Éducation Prioritaires, ZEPs) [6], which include the North, Far North, East, and Adamawa regions, than in other regions, particularly Centre, Littoral, and South. Public health spending is also unevenly allocated across the country. Health outcomes and the coverage of essential maternal and child health services vary substantially across regions.

Growing security concerns and worsening of poverty

Since 2013, Cameroon has been plagued by several conflicts and violent extremism challenges, posing a variety of threats to Central Africa's most resilient economy. These security concerns are fall-outs of the activities of the Boko Haram in the Far North as part of Lake Chad conflicts, the consequences of the influx of Central African refugees into the eastern regions, and the growing climate of insecurity resulting from socio-political unrest in the North-West and South-West regions. These three crises impose significant economic impacts on society and lead to not only direct human and physical capital damage but also long-term effects on the local economy and livelihoods of the population.

Conflict and violent extremism have affected poverty in several ways, exacerbating the already delicate economic situation. Indeed, the crises hurt the poorest part of the country, the Far North region, even before the outbreak of the conflict. The destruction of social infrastructure affects the education system and weakens the health of individuals and communities. Violent extremism acts as an asymmetric taxation on the local economy and has a negative effect on economic growth by diverting resources away from socially and economically productive sectors that promote development. The economic consequences in the mid and long terms can be devastating as conflict and violent extremism affect human capital.

[6] In 2000, the limited availability and poor quality of educational services in the North, Far North, East, and Adamawa regions have forced the authorities to consider these regions as ZEPs. The lack of teaching staff paid by the state in ZEPs has worsened because of the weakness of their institutional infrastructure, leading to a low yield in education.

Obvious costs include damage to and destruction of infrastructure, and stunted development due to insecurity and instability (Hoeffler and Reynal-Querol, 2003). Boko Haram's attacks in the Far North region have caused physical destruction of properties, houses, schools, markets, roads, and health centres. Between 2014 and 2017, destroyed or damaged facilities in the three border divisions of Mayo Tsanaga, Mayo Sava, and Logone et Chari included more than 40,000 houses, dozens of villages, hundreds of markets, 128 schools, and 30 health centres. The total damage is estimated at US$450m (International Crisis Group, 2017). Attacks in these villages force farmers to flee, leaving their fields abandoned. Nearly 70% of farmers have deserted their farms, and many more have missed out on key farming activities, such as timely planting. The insecurity has contributed to the reduction of about 15% of cereal-planted areas compared to the situation in normal years, and agricultural production has fallen by two–thirds. The damage and destruction of infrastructure can also have secondary effects such as an increase in transportation costs, which in turn raise wholesale prices and consumer prices. These price increases have likely had an impact on inflation given the importance of the illicit fuel market in the region. Conflict and violent extremism place enormous pressure on the state budget. In the national budget, budgetary allocation to the General Delegation for National Security (GDNS)[7] increased by 46% between 2011 and 2015. Likewise, the budgetary allocation to the ministry of defence amounted to 209,264 million FCFA in 2015; that is a 30% increase over 2011. An estimate by the IMF in 2016 suggested a budgetary impact of around 1 to 2% of GDP (IMF, 2016).

5 Concluding remarks

Inclusive and sustainable growth is linked to reduction in poverty in all its forms. Despite the multiple economic crises experienced in Cameroon over the past few decades, economic growth in Cameroon has been substantive, although not always inclusive and sustainable. Poverty rates have slightly decreased while the number of Cameroonian people living in poverty has been increasing. This paper provides a comprehensive assessment of poverty levels, trends, and determinants to better understand the different facets of poverty in the country, the distribution of poverty across different locations and socio-economic groups, and policy recommendations for poverty elimination. We apply two prominent methods of poverty measurement (the AF and FGT methods) to a series of household living standards (ECAM) and DHS surveys and perform various empirical analyses to elucidate poverty dynamics and

[7] GDNS is the government department in charge of peace and security.

features.

Three salient facts emerge from our results. First, poverty (both monetary and multidimensional) decreased at the national level between 2001 and 2018, at varying pace and pattern across the different demographic, socio-economic, and spatial groups of the population. However, this overall trend in the headcount ratio is mitigated by an observed increase in the number of people living in poverty (both monetary and multidimensional) due to rapid population growth. Second, multidimensional poverty was always higher than monetary poverty, and multidimensional poverty reduced much faster than monetary poverty at the national level. Third, higher levels of poverty in Cameroon were strongly associated with living in rural areas, large family size, less education, employment in agriculture, and living in the northern regions of the country. In our review of structural factors, we focus on four priority areas in poverty reduction policies for Cameroon. These include: (i) the need to create conditions for the achievement of the demographic dividend, (ii) the promotion of solutions to accelerate structural transformation and productivity gains in the agricultural sector, (iii) an optimal allocation of public spending across the different regions and subgroups of the population, and (iv) the need to address security crises and their impacts on the Cameroonian economy and population.

To reap a demographic dividend in the near term, there is a need for polices that accelerate the reduction in fertility rates and child mortality rates along with higher investments in human capital. A faster demographic transition will make the short-term benefits of the demographic dividend much larger (Bloom et al., 2012). Policies that allow families to make informed decisions and provide the means to implement these decisions are critical. These decisions relate to their family planning, investments in education, health, and support for the youth in transition to the labour market.

The slow pace of structural transformation of the Cameroonian economy limits its ability to generate enough decent jobs for the young and growing population. Its ability to reduce unemployment and underemployment therefore depends on the successful implementation of structural reforms to boost productivity, notably in the agriculture sector. Patterns of both monetary and multidimensional poverty show that most poor people not only live in rural areas but also depend on agriculture. Thus, improving agricultural productivity is essential both to improve the wellbeing of the population and to trigger structural transformation of the economy. Reinforcement of links with the secondary sector is essential to avoid the commodity trap. The notable absence of agro-industrial activities currently undermines this connection. This is even more alarming given that in the literature on structural transforma-

tion, the lack of inter-sectoral synergies between agriculture and industry is perceived as a vector of structural economic stagnation, likely to open a wider trap of agricultural underemployment (Gollin and Rogerson, 2014).

The connection between urbanisation and industrialisation is viewed traditionally as synonymous. The linkage is so strong that urbanisation rates are often used as a proxy for income per capita (Acemoglu et al., 2002, 2005). This expected relationship between urbanisation and the level of industrialisation is absent in Cameroon. Poverty is more prevalent in rural areas where agricultural activities occur and where nearly two-thirds of the country's population live. Poverty in rural areas has risen despite increasing urbanisation. The urbanisation that accompanied economic growth, combined with the embryonic nature of the secondary sector, confirms in Cameroon two major facts recently documented by the developing literature: (i) urbanisation in sub-Saharan Africa has no link to industrialisation (Gollin et al., 2016) and in Cameroon, it occurs without major industrialisation; (ii) urbanisation in sub-Saharan Africa is not accompanied by an increase in agricultural productivity (Gollin and Rogerson, 2014), which is also the case in Cameroon.

Persistent poverty and spatial inequalities are still among the main challenges that need to be addressed to create an inclusive society in Cameroon. Policy effectiveness can play a significant role in the expansion and distribution of both capabilities and incomes across individuals and regions. Additionally, there is a need for spatially informed analysis and policy-making capable of responding to the challenge of policy effectiveness. Such policies must address both region-specific characteristics and the population's needs to ensure that quality public goods and services are efficiently delivered to citizens. In practice, such policies operate in the middle ground between strictly universal and strictly targeted approaches. Universal policies can provide basic floors but may not be enough to eliminate spatial inequalities and pockets of poverty. The deepening of decentralisation as foreseen in the National Development Strategy (MINEPAT, 2020) can deliver effective solutions. It is of particular importance in terms of improving both regional equity and the effectiveness of public policies.

The precondition for the success of the different policies highlighted above is resolution of the different conflicts and security crises that Cameroon has experienced in the recent past. The different conflicts and insecurity situations (Boko Haram in the North, the Anglophone crisis in the North-West and South-West regions, political turmoil in neighbouring countries) come with huge economic and social costs and are all serious threats to the future of Cameroon's economy and its poverty eradication efforts. These need to be taken into account in future research on poverty in Cameroon.

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A Tables

Table A.1: Estimates of the determinants of monetary poverty using a logit model (dependent variable = monetary poverty status – being poor or not)

Independent variables	2007	2014	Both years together	
			Coefficient	Odds Ratio
Sex (Male = ref)				
Female	-0.2581***	0.1367**	-0.0462	0.955
Age	0.0173**	0.0037	0.0089*	1.009
Age squared	-0.0002***	0.0000	-0.0001**	1.000
Marital Status (Never married = ref)				
Currently married	-0.0456	-0.0618	-0.0816*	0.922
Other (divorced or widowed)	0.1213	-0.3946***	-0.1331**	0.875
Household size	0.1880***	0.1992***	0.1926***	1.212
Religion (Christian = ref)				
Muslim	-0.8108***	-0.8234***	-0.8098***	0.445
Other	0.4108***	0.0626	0.2032***	1.225
Education (Not educated = ref)				
Primary	-0.5372***	-0.4456***	-0.4524***	0.636
Secondary	-1.2040***	-1.1307***	-1.1190***	0.327
Tertiary	-2.4838***	-2.5533***	-2.4549***	0.086
Occupation (Not working = ref)				
Agriculture	0.1924**	0.2805***	0.2501***	1.284
Industry	-0.2152**	-0.1300*	-0.1524**	0.859
Sales	-0.3492***	-0.9280***	-0.6881***	0.503
Services	-0.5032***	-0.4999***	-0.4957***	0.609
Access to credit (No = ref)				
Yes	-0.7793***	-0.2388***	-0.4782***	0.620
Land ownership (No = ref)				
Yes	0.3179***	0.0457	0.1641***	1.178
Membership of an association				
Yes	-0.2485***	-0.7042***	-0.4837***	0.617
Area of residence (Urban = ref)				
Rural	1.2362***	1.4704***	1.3662***	3.920
Agro-ecological zones (Humid savannah = ref)				
Forestry	-0.2852***	-0.9411***	-0.6468***	0.524
Mangrove	-0.5694***	-1.1579***	-0.8711***	0.418
Savannah	0.1760*	-0.0383	0.0852	1.089
Sahelien	0.3973***	0.5538***	0.4981***	1.646
Year 2014			0.0098	1.010
Constant	-1.9142***	-1.5138***	-1.6927***	0.184
N	50448	45861	96309	
Pseudo-R2	0.295	0.397	0.343	

Significance levels: * p<0.05; ** p<0.01; *** p<0.001

Table A.2: Estimates of the determinants of multidimensional poverty using a logit model (dependent variable = multidimensional poverty status – being poor or not)

Independent variables	2011	2018	Both years together	
			Coefficient	Odds Ratio
Sex (Male = ref)				
Female	0.3884***	0.0058	0.2303***	1.259
Age	-0.0258***	-0.0674***	-0.0452***	0.956
Age squared	0.0001	0.0005***	0.0003***	1.000
Marital Status (Never married = ref)				
Currently married	0.2910**	0.5505***	0.4226***	1.526
Other (divorced or widowed)	-0.1493	0.8664***	0.3179***	1.374
Household size	0.0725***	0.0878***	0.0785***	1.082
Religion (Christian = ref)				
Muslim	0.7592***	0.6125***	0.6795***	1.973
Other	0.4869***	0.5160***	0.5251***	1.691
Occupation (Not working = ref)				
Prof., Tech., or Managerial	-1.4445***	-0.9827**	-1.3060***	0.271
Agriculture	0.5015***	0.6935***	0.5568***	1.745
Sales	-0.0945	0.0879	-0.0263	0.974
Services	-0.6347***	-0.6114***	-0.6356***	0.530
Others	-0.031	-0.3938***	-0.1703***	0.843
Land ownership (No = ref)				
Yes	0.4489***	0.2327***	0.3531***	1.423
Access to credit (No = ref)				
Yes	-1.2906***	-1.7969***	-1.4618***	0.232
Area of residence (Urban = ref)				
Rural	1.6661***	1.6303***	1.6525***	5.220
Agro-ecological zones (Humid savannah = ref)				
Forestry	0.1548**	0.2031***	0.2045***	1.227
Mangrove	-0.1608**	-0.4250***	-0.2535***	0.776
Savannah	0.7247***	1.5867***	1.1210***	3.068
Sahelien	1.8226***	1.4083***	1.6130***	5.018
Year 2018			-0.4083***	0.665
Constant	-1.8907***	-1.3275***	-1.4294***	0.239
N	29601	25539	55140	
Pseudo-R2	0.394	0.398	0.392	

Significance levels: * p<0.05; ** p<0.01; *** p<0.001