

Working Paper No. 194

# Declining poverty level in Ghana: Exploring the role of migrants' remittances

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## Abstract

Ghana has a long history of citizens migrating to other countries. Many of these migrants send remittances to relations and acquaintances back home, often to help recipients experiencing poverty and a lack of employment and economic opportunities. Empirical studies have established the poverty-alleviation impact of remittances in Africa, including Ghana. This study uses pooled Afrobarometer survey data collected between 2002 and 2017 to assess the relationship between migrants' remittances and lived poverty in Ghana. Multiple statistical approaches suggest that remittances have a negative and statistically significant impact on lived poverty. We therefore recommend that the government institute policy measures to encourage the use of formal channels for such transfers to enable the country to harness the full development potential, including the poverty-reduction benefits, of migrants' remittances.

## Introduction

A World Bank (2019) report on migration and remittances confirmed the important role that remittances have assumed in African economies. The report estimated that annual remittance inflows (mainly through formal channels) to low- and middle-income countries worldwide increased from \$342 billion in 2010 to \$529 billion in 2018. Inflows to sub-Saharan Africa (SSA) rose by 9.6% between 2017 and 2018, to \$46 billion. Nigeria was the largest recipient of migrants' remittances in SSA (\$24.3 billion), followed by Ghana (\$3.8 billion), Kenya (\$2.7 billion), Senegal (\$2.2 billion), and Zimbabwe (\$1.9 billion).

As Agarwal and Horowitz (2002) observed, foreign private remittances make up a significant portion of the disposable incomes of many households in developing countries. In Ghana, it is an open secret that most Ghanaians living in other countries send remittances to family members and acquaintances back home – a practice that De Bruin, van Dijk, and Foeken (2001) describe as an integral aspect of the experiences of most Africans living abroad. These remittances may be in the form of money, clothing, medicine, tools, and equipment, and may be provided through formal or informal channels. Remittance estimates might be much higher if we were to include non-monetary remittances as well as monetary ones received through informal channels.

The World Bank figures reveal how migrants' remittances have been gaining importance in Ghana, increasing both in absolute terms and as a percentage of GDP. At the same time, the incidence of poverty has been on a consistent decline, dropping from 60.6% recorded in the Ghana Living Standards Survey (GLSS 2) in 1989 to 23.4% in the 2016/2017 GLSS 7 (Ghana Statistical Service, 2007; 2018).

To understand the general context of the poverty-remittances nexus, we present a brief review of the literature in the next section.

### *The poverty-remittances nexus: What the literature says*

According to Chimhowu, Piesse, and Pinder (2005), the poverty-reduction impact of remittances can be understood from both micro and macro perspectives. They acknowledge, however, that while it is reasonable to assume that remittances have some poverty-reduction impact, there is no formal framework that captures this impact.

A number of studies have established a negative relationship between remittances and poverty. López-Córdova (2005), for example, reported a negative and statistically significant influence of remittances on poverty at the municipal level in Mexico. A similar study in rural Mexico found declines in poverty headcount and poverty gap incidence with a 10% rise in international remittance inflows (Taylor, Mora, Adams, & López-Feldman, 2005). Using household surveys from 71 developing countries, Adams and Page (2005) found that a 10% increase in the share of remittances in a country's GDP results in a 1.6% reduction in the number of citizens living in poverty.

Another study found a decline of 19.8% in Guatemala's squared poverty gap with the inclusion of international remittances in the measurement of total household income (Adams, 2004). Similarly, Lardé de Palomo and Rivera Campos (2002) found that remittances helped reduce the national poverty rate in El Salvador by 4.2%, while inequality as measured by the Gini coefficient also declined marginally, from 0.55 to 0.53. An earlier study by Gustafsson and Makonnen (1993) using survey data from 7,680 urban and rural households in Lesotho established that as much as 35% of household incomes came from remittances, and when remittances were set to zero, the poverty headcount index and poverty gap incidence on average increased by 26% and 52%, respectively.

With regard to Ghana, a number of studies have also established a negative association between remittances and poverty. These studies can be grouped into two categories – those that examine the relative impacts of both international and domestic remittances, and those that focus on the impacts of either international or domestic remittances.

In the first category are studies by Gyimah-Brempong and Asiedu (2011), Adams (2006), and Adams, Cueduecha, and Page (2008), which concluded that both domestic and international remittances reduce poverty in Ghana, with the reduction arising from international remittances being larger than that resulting from domestic remittances.

Studies by Litchfield and Waddington (2003), Quartey (2006), Adams and Cueduecha (2013), and Mintah and Nikoi (2015) fall in the second category and concluded that international or domestic remittances have poverty-reduction impacts, although the negative impact reported by Mintah and Nikoi was not statistically significant.

Building on the findings of earlier studies, we examine the relationship between migrants' remittances and lived poverty experiences in Ghana. We create a pooled data set of 10,797 cases from six waves (rounds) of Afrobarometer surveys conducted from 2002 to 2017. This data set contains all the variables Afrobarometer uses to gauge our first indicator of interest – lived poverty experiences – in all six waves, while our second indicator of interest – benefiting from migrants' remittances – runs through four survey waves (waves 2 (2002), 4 (2008), 6 (2014), and 7 (2017)).<sup>1</sup> Our empirical analysis using this data set shows that receiving migrants' remittances is negatively associated with lived poverty experiences among Ghanaians. The sections below detail our various analyses.

### **Different poverty measures, similar story**

In this section, we analyse Afrobarometer survey findings on levels of deprivation of basic life necessities suffered by citizens and their experiences (including the frequency of such experiences) with lived poverty. We then compare our findings to official data on the incidence and severity of poverty, and find that the data from these two sources tell similar stories.

#### *Deprivation of basic necessities*

As shown in Table 1 below, six in every 10 Ghanaians (60%) surveyed during the pooled-data period (2002-2017) went without a cash income at least once during the previous 12 months, and sizeable proportions lacked medicines or medical care (33%), clean water for household use (30%), enough food to eat (29%), and fuel for cooking (21%).

Over time (i.e. between 2002 and 2017), we found significant reductions in deprivation across the five basic necessities, including a 24-percentage-point drop in respondents reporting a lack of medical care/medicines, a 21-point decline when it comes to going without enough clean water, and a 16-point reduction in going without enough food.

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<sup>1</sup> Afrobarometer conducts nationally representative sample surveys of adult citizens, and its findings in a given country therefore reflect the opinions of the adult population at a given level of confidence and margin of sampling error. Waves 2-4 of the survey in Ghana had 1,200 respondents, while waves 5-7 had 2,400. In pooling the data, we observed that when we apply the pooled within-country weights, the regional, urban-rural, and gender distributions of the time-series data and the regional, urban-rural, and gender distributions of the pooled time-series data set did not vary significantly from the yearly distributions. The estimates from the pooled time-series data can therefore be generalised to the adult population of Ghana (see Appendix A, tables A.1, A.2, and A.3 for details).

**Table 1: Trends in deprivation of basic necessities** | Ghana | Afrobarometer pooled data | 2002-2017

	Pooled data	Yearly estimates						Change (pct. points)
		2002	2005	2008	2012	2014	2017	2002-2017
Lacked medical care	33%	54%	44%	38%	27%	26%	30%	-24
Lacked clean water	30%	42%	37%	36%	30%	25%	21%	-21
Lacked enough food	29%	40%	35%	30%	26%	28%	24%	-16
Lacked cooking fuel	21%	26%	29%	25%	21%	19%	15%	-11
Lacked cash income	60%	69%	73%	63%	50%	57%	62%	-7

**Respondents were asked:** Over the past year, how often, if ever, have you or anyone in your family gone without: Enough food to eat? Enough clean water for home use? Medicines or medical treatment? Enough fuel to cook your food? A cash income? (% who said "just once or twice," "several times," "many times," or "always") (Note: Question wording was the same in all waves.)

### Measuring poverty level: Lived Poverty Index vs. official poverty incidence

Using Afrobarometer's Lived Poverty Index (LPI), an experiential measure of poverty (Mattes, 2020), we averaged results on the five basic necessities to calculate scores on a scale of 0 (no deprivation) to 4 (constant deprivation). We conducted a factor analysis and reliability analysis to confirm the validity of pooling the scores on the five basic necessities and the reliability of the scale for measuring the concept of lived poverty.<sup>2</sup>

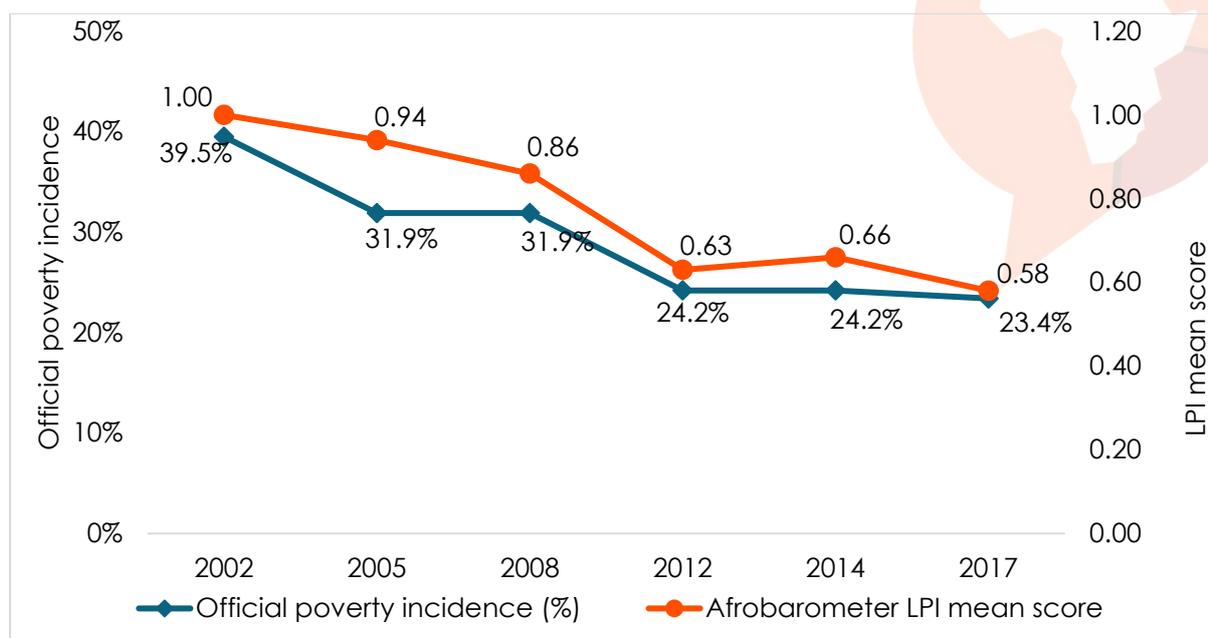
The trend path traced by the LPI mean scores across survey waves shows lived poverty on the decline. From a relatively high score of 1.00 in 2002, it decreased to 0.94 in 2005, 0.86 in 2008, and 0.63 in 2012, then increased marginally to 0.66 in 2014 before continuing the declining trend to 0.58 in 2017. Between 2002 and 2017, therefore, lived poverty experiences of Ghanaians declined by 0.42 (see Figure 1, orange trend line).

This declining trend largely mirrors the path traced by official poverty headcount (or poverty incidence) numbers from the Ghana Living Standards Survey (Ghana Statistical Service, 2007; 2008; 2014; 2018). Poverty incidence decreased consistently from 39.5% in 1998/1999 to 23.4% in 2016/2017, a 16.1-percentage-point drop (see Figure 1, blue trend line).<sup>3</sup>

<sup>2</sup> Analysis of the pooled data found an LPI mean score of 0.73 over the period 2002 to 2017. The factor analysis produced one factor with the following statistics: for all six waves, the extraction sums of the squared total is 2.617; the explained variance is 52.3%. The high factor loadings (from 0.691 for cooking fuel deprivation to 0.786 for medical care deprivation) show that the individual variables are strongly correlated with the single construct (Lived Poverty Index). The Cronbach's (reliability) alpha value of 0.763 shows that the index reliably measures experience with poverty. These statistics did not vary much when we use data sets for only the survey waves in which the remittance question was asked (2002, 2008, 2014, and 2017) (see Appendix A, Table A.4, panels A and B).

<sup>3</sup> See Appendix B, Figure B2 for analysis of lived poverty by socio-demographic groups.

**Figure 1: Trends in poverty: Official poverty incidence vs. Afrobarometer lived poverty | Ghana | 2002-2017**



**Respondents were asked:** Over the past year, how often, if ever, have you or anyone in your family: Gone without enough food to eat? Gone without enough clean water for home use? Gone without medicines or medical treatment? Gone without enough fuel to cook your food? Gone without a cash income?

**Official poverty incidence source:** Ghana Statistical Service, Ghana Living Standards Survey (GLSS) rounds 1-7

(Note: Afrobarometer data are for the years 2002, 2005, 2008, 2012, 2014, and 2017. The GLSS is conducted at specific intervals. We maintained the poverty incidence level of 1998/1999 for 2002, that of 2005/2006 for 2008, and that of 2012/2013 for 2014.)

## Receiving migrants' remittances

Afrobarometer does not ask respondents how much they receive from relatives or friends living in other countries. Rather, it asks respondents how much they depend on or how often they receive financial support from relatives or friends living in other countries. The question wording varies slightly across the four survey waves in which they were asked (see note beneath Figure 2). Further, the ordinal-scale response options varied across survey waves; we recoded them as "0=Not at all," "1=A little," and "2=A lot."<sup>4</sup>

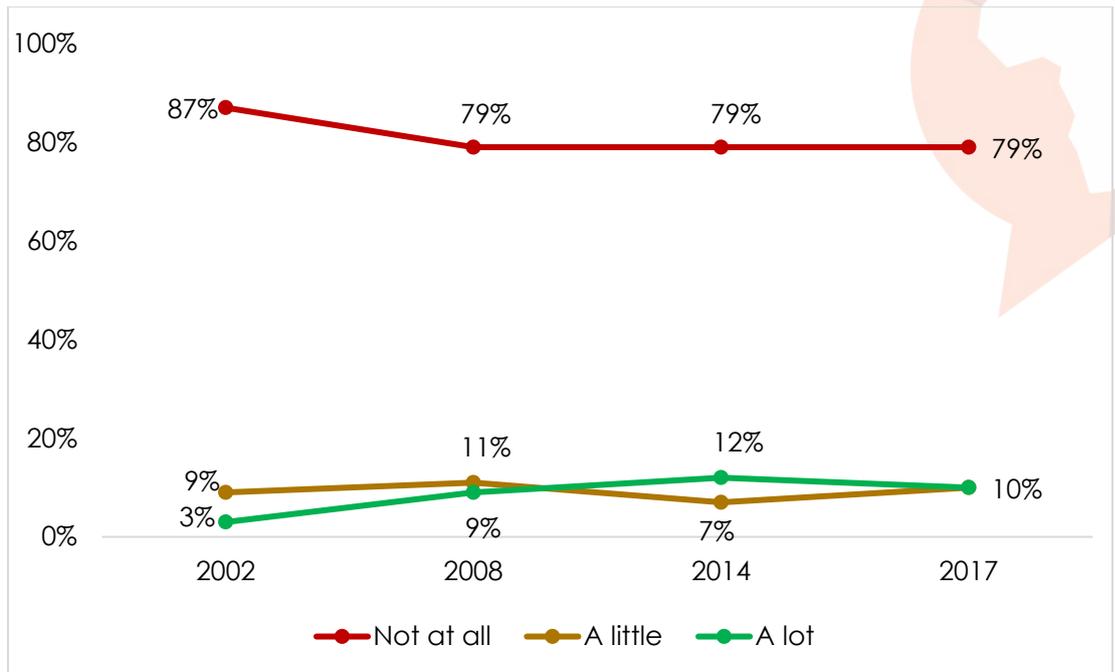
Analysing the pooled data on this variable, we found that about one-fifth (19%) of Ghanaians benefit "a lot" or "a little" from remittances sent by relations and acquaintances living in other countries, while 80% do not. Disaggregating this finding by year reveals a significant 7-percentage-point increase between 2002 and 2017 in the proportion of Ghanaians saying they depend "a lot" on remittances, while those who say they benefit from them "a little" increased by a marginal 1 percentage point. Thus, cumulatively, there is a significant 8-percentage-point rise in households benefiting from remittances (Figure 2).

Charting actual remittance inflow estimates obtained from the World Bank portal,<sup>5</sup> as shown in Figure 3, we observe that these have been rising since 2002, confirming the increasing dependence on migrants' remittances shown in the Afrobarometer data.

<sup>4</sup> See Appendix A, Table A.5 for details on recoding.

<sup>5</sup> Remittances received: <https://data.worldbank.org/indicator/BX.TRF.PWKR.CD.DT?locations=GH>. Remittances as a percentage of GDP: <https://data.worldbank.org/indicator/BX.TRF.PWKR.DT.GD.ZS?locations=GH>.

**Figure 2: Received migrants' remittances | Ghana | 2002-2017**

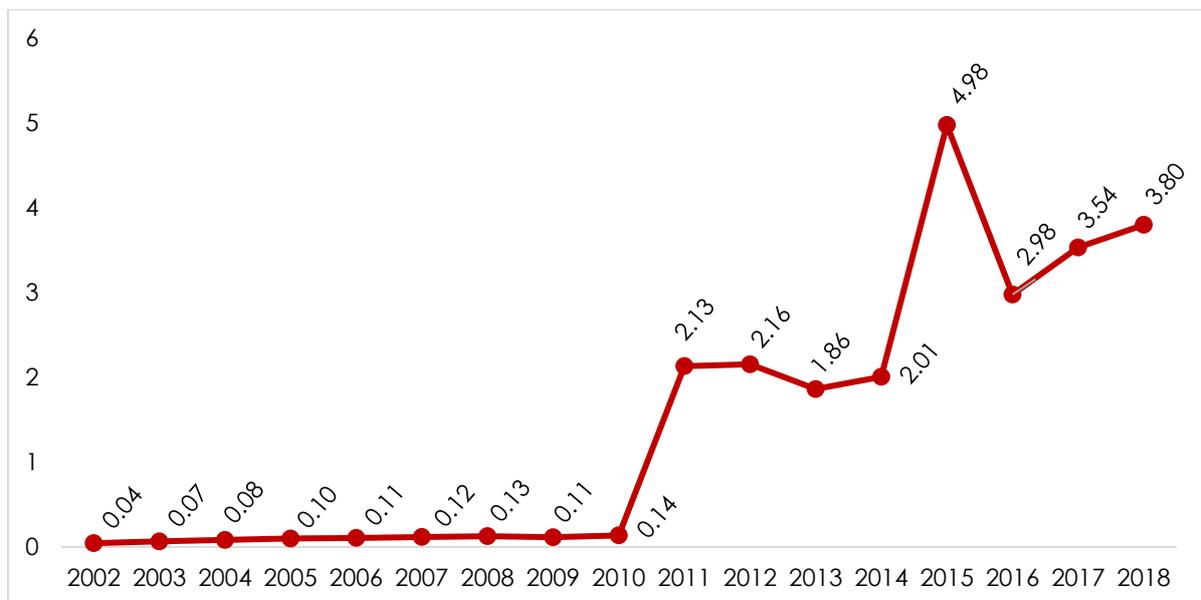


**In 2002 and 2017, respondents were asked:** Considering all the activities you engage in to secure a livelihood, how much do you depend on receiving money from family members working in other countries?

**In 2008, respondents were asked:** How often, if at all, do you receive money remittances from friends or relatives outside of the country?

**In 2014, respondents were asked:** How often, if at all, do you or anyone in your household receive money remittances from friends or relatives living outside of the country?

**Figure 3: International remittance inflows (billions of U.S. \$) | Ghana | 2002-2017**



**Source:** Computed from World Bank calculations based on data from IMF balance of payments statistics database and data releases from central banks, national statistical agencies, and World Bank country desks (in billions of U.S. dollars).

## Modelling poverty-remittances relationship for hypothesis test

Having established close similarities between the pooled Afrobarometer data and official statistics, we turn to the question of the association between migrants' remittances and lived poverty among Ghanaians. We expect the following:

*Hypothesis 1: Receiving migrants' remittances is negatively associated with the level of lived poverty experiences among Ghanaians.*

To test this hypothesis, we adopted regression analysis as the most appropriate method. This approach enables us to control for the effects of other factors while predicting the impact of migrants' remittances on lived poverty. We adapted the Ravallion (1997) growth-poverty model and the empirical frameworks posited by other researchers, such as Dollar and Kraay (2002), Berg and Krueger (2003), and Adams and Page (2005), to specify our poverty-remittance relationship for testing the primary hypothesis as follows:

$$LPI = \beta_0 + \beta_1(RMR) + \beta_2(Fgen) + \beta_3(Age) + \beta_4(Edu) + \beta_5(Emp) + \beta_6(RST) + \beta_7(WD_i) + e_t \quad \text{----- [1]}$$

where *LPI* is the Lived Poverty Index (the dependent variable), *RMR* is received migrants' remittances (the independent variable of interest), *Fgen* is female gender, *Age* is age of the respondent, *Edu* is level of education, *Emp* is employment status, *RST* is rural settlement type, *WD<sub>i</sub>* is survey wave dummies, and *e<sub>t</sub>* is error term of the model.  $\beta_0$  is the constant of the model, and  $\beta_1$  to  $\beta_7$  are the coefficients of the independent and control variables.

It has been argued that at the micro level, migrants' remittances alleviate poverty either directly by improving personal resources or incomes, smoothing consumption, and improving living conditions of households, or indirectly by providing households with opportunities to increase their incomes through savings and investment in education, physical capital, and business ventures that ensure an improved future income stream (Adams, 2002; Brown & Leevess, 2007; Ang, Sugiyarto, Jha, 2009). Empirically, studies on Ghana (see Quartey, 2006; Adams et. al., 2008) and elsewhere (see Adams, 2004; and International Monetary Fund, 2005) have confirmed the poverty-alleviation effect of migrants' remittances. We therefore expect benefiting from migrants' remittances to be negatively signed (i.e.  $\beta_1 < 0$ ).

Gender has been found to be a significant predictor of poverty levels, although scholars are not unanimous regarding its direction. While Alkire, Apablaza, & Jung (2012) and Meyer (2016) found that male-headed households have a lower probability of being poor than female-headed households, much other research has found the opposite. In Ghana, Acheampong and Wiafe's (2013) study on the link between poverty and social exclusion found that a household with a female economic head had a lower likelihood of being poor than one with a male economic head. Similarly, Xhafaj and Nurja (2014) observed that gender is one of the key variables that explain the economic status of families, and their logistic regression analysis indicated that female-headed households have a significantly lower probability of being poor compared to male-headed households. Over the years, the Ghana Living Standards Surveys have also found that male-headed households have comparatively higher poverty incidence than female-headed households.<sup>6</sup> Based on this work, we assumed that the female gender (*Fgen*) coefficient will be negative (i.e.  $\beta_2 < 0$ ).

Age has also been identified as a strong correlate of poverty. For instance, Ogg (2005) posited that individuals tend to be vulnerable to changes in their income as evident by the correlation between old age and poverty in Britain, and concluded that old-age pensioners

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<sup>6</sup> Gender-disaggregated data over various rounds of the GLSS show that male-headed households' poverty incidence was 34.9% in 2005/2006, 25.9% in 2012/2013, and 25.8% in 2016/2017 compared to 22.1%, 19.1%, and 17.6% for female-headed households.

are more prone to poverty than persons who are still in paid employment. Goldfield's (2005) analysis of the structure of the British population found that poverty and wealth correlate with a specific population structure defined by age. Goldfield found high proportions of middle-aged families in wealthy areas, while poor neighbourhoods were characterised by high proportions of children and older persons. Thus, from the literature, age appears to exhibit a non-linear relationship with poverty, with the young and elderly more prone to poverty compared to the middle-aged. However, given persistent high levels of unemployment in Ghana, particularly among the youth, we erred on the side of Hoff (2008), who concluded that "old age is not everywhere synonymous with poverty" because his study found varying levels of poverty among pensioners across the European continent. We therefore anticipate that the coefficient of this variable (*Age*) will carry a negative sign (i.e.  $\beta_3 < 0$ ).

Education places people in a better position to secure high-income jobs. For instance, Jamal (2005) concluded that education level reduces the probability of a household becoming poor. Using data from Pakistan's Household Integrated Economic Survey, Masood, Nouman, Haroon, and Muhammad (2011) showed not only that educational achievement correlates negatively with poverty incidence, but also that the likelihood of a person not being poor increases with improvements in the level of education. In Ghana, GLSS findings over the years have shown that poverty tended to be higher in households with uneducated heads.<sup>7</sup> We therefore expect the coefficient of the education variable (*Edu*) to be negative (i.e.  $\beta_4 < 0$ ).

As might be expected, researchers have identified employment status as important predictor of poverty level. Examining determinants of poverty in Bophelong, a South African township, Sekhampu (2013) found that employment status of the household head was the strongest predictor of poverty status. In Ghana, Acheampong and Wiafe (2013) showed that compared to someone who is unemployed, an individual who is employed is about 7.0% less likely to suffer poverty. Again, the GLSS findings over the years show that poverty incidence has always been very high among the unemployed and households headed by a self-employed person working in the agricultural sector.<sup>8</sup> We therefore anticipate that the employment variable (*Emp*) will be negatively signed (i.e.  $\beta_5 < 0$ ).

Exploring the determinants of poverty, Achia, Wangombe, and Khadioli (2010) found that residential location type significantly explains the distribution of poverty, with rural households more likely to be poor than their urban counterparts. Similarly, Spaho's (2014) logistic model found that urban residence significantly lowers the probability of being poor. These findings are consistent with those of the GLSS, which has established that poverty in Ghana is predominantly a rural phenomenon.<sup>9</sup> The rural settlement location type (*RSTL*) variable is therefore expected to carry a positive sign (i.e.  $\beta_6 > 0$ ).

The survey wave dummies (i.e. *WD<sub>i</sub>*) are included to account for possible external influences that may have differed from one survey wave to another. The coefficients of these factors are expected to take on any sign (i.e.  $\beta_7, \beta_8, \text{ and } \beta_9 > / < 0$ ).<sup>10</sup>

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<sup>7</sup> Poverty incidence of households headed by uneducated persons was 43.3% in 2005/2006, 37.6% in 2012/2013, and 37.0% in 2016/2017, compared to 0.3%, 3.0%, and 0.9%, respectively, for households headed by persons with tertiary education.

<sup>8</sup> Poverty incidence among the unemployed stood at 20.0% in 2005/2006, 28.1% in 2012/2013, and 29.4% in 2016/2017. Among household heads who were self-employed in the agricultural sector, poverty incidence was 45.1% in 2005/2006, 39.2% in 2012/2013, and 42.7% in 2016/2017.

<sup>9</sup> Poverty incidence among the rural population was 43.7% in 2005/2006, 37.9% in 2012/2013, and 39.5% in 2016/2017, compared to 12.4%, 10.6%, and 7.8% among the urban population.

<sup>10</sup> The Ghana Afrobarometer 2017 survey was considered the reference; hence its dummy was excluded from the main model for the hypothesis test.

Table 2 below summarises the signs of the anticipated relationships between the independent variables/control factors and the Lived Poverty Index score, our dependent or outcome variable.

**Table 2: Expected direction of the impacts of predictors in the main and robustness check models**

Variable	Expected sign
Receive remittances	Negative (-)
Age	Negative (-)
Level of education	Negative (-)
Employment status	Negative (-)
Female gender	Negative (-)
Settlement type	Positive (+)
Wave dummies	Negative/Positive (-/+)



## Data and measurement

Prior to data analysis, we operationalised the dependent, independent, and control variables in the conceptual models by developing scales or indexes and/or recoding. This section explains this process.

### *Dependent variable: Lived Poverty Index*

As explained earlier, we computed the Lived Poverty Index by taking the average of the pooled scores, ranging from "0=no deprivation" to "4=constant deprivation," on each of the five basic necessities. Pooling the scores to create the index was done after confirmatory factor analysis and reliability analysis.<sup>11</sup>

### *Independent variable: Receiving migrants' remittances*

This is a single variable derived from responses to the question about how much respondents depend on or how often they receive funds from family relations and acquaintances working in other countries. We explained in the section titled "Receiving migrants' remittances" that the question wording varied slightly across survey waves, although the intended purpose remained the same.

We also explained our recoding to ensure that response options, which also varied across survey waves, were aligned. Consequently, we measure this single variable on a scale of 0=no benefit at all, 1=benefit a little, and 2=benefit a lot.<sup>12</sup>

### *Control factors: Gender, age, education, employment, and settlement type*

Gender takes the value 1 if the respondent is female and 0 if male. Age is a continuous variable of the ages that respondents provided during the Afrobarometer survey.

Level of education is a single variable measured on a 10-point ranking order scale where 0=no formal education, 1=informal education, 2=some primary education, 3=completed primary education, 4=some secondary/high school education, 5=completed secondary/high school education, 6=post-secondary but not university education, 7=some

<sup>11</sup> See Appendix A, Table A.4, panels A and B

<sup>12</sup> See Appendix A, Table A.5 for an explanation of how recoding was carried out.

university/college education, 8=completed university/college education, and 9=post-graduate education.

Employment status is also a single variable drawn from the Afrobarometer question about whether respondents have a job that pays a cash income. We recoded this variable into a three-point scale where 0=not employed, 1=employed part time, and 2=employed full time. Settlement type is a dichotomous variable that takes the value 1 for rural and 0 for urban locations.

Each survey wave dummy is dichotomous and takes the value 1 for a particular wave and 0 for all other waves.

## Results

As noted earlier, the question on receiving international migrants' remittances – the key variable of interest – was asked in four survey waves (2002, 2008, 2014, and 2017). The data analysis and results are based on data from these four waves.

### *Descriptive statistics of variables in the model*

Table 3 provides descriptions of the data used in the regression analysis.

**Table 3: Descriptive statistics of variables in the main and robustness check models**

	N	Min.	Max.	Mean	Std. dev.
<b>Lived Poverty Index</b>	7197	0	4	0.723	0.772
<b>Received migrants' remittances</b>	7121	0	2	0.282	0.624
<b>Age</b>	7123	18	110	38.654	15.701
<b>Level of education</b>	7174	0	9	3.234	2.093
<b>Employment status</b>	7200	0	1	0.500	0.500
<b>Female gender</b>	7184	0	4	1.128	0.944
<b>Rural settlement</b>	7200	0	1	0.483	0.500
<b>Wave 2002 dummy</b>	7200	0	1	0.167	0.373
<b>Wave 2008 dummy</b>	7200	0	1	0.167	0.373
<b>Wave 2014 dummy</b>	7200	0	1	0.333	0.471
<b>Wave 2017 dummy</b>	7200	0	1	0.333	0.471

### *Correlations among variables in the lived poverty model*

To gain initial insight into the nature of the relationship between the dependent and the independent/control variables, we conducted a bivariate analysis by deriving the Pearson and point-biserial correlation coefficients.

We estimated the Pearson correlation coefficients where both factors are continuous variables or one is ordinal, as in the case of education and employment. Where one variable is categorical and the other continuous, we derived the point-biserial correlation coefficients.

As shown in Table 4, consistent with our expectations, the Pearson correlation analyses showed that lived poverty correlates negatively with receiving remittances ( $r=-0.107$ ), level of education ( $r=-0.267$ ), and employment status ( $r=-0.116$ ). Though the correlation between age and lived poverty is statistically significant, the positive sign ( $r=0.030$ ) is contrary to expectations. The point-biserial correlation analyses also established a positive correlation between lived poverty and female gender ( $r=0.006$ ), rural settlement type ( $r=0.195$ ), and waves 2002 and 2008 dummies ( $r=0.160$  and  $r=0.082$ ).

**Table 4: Correlations between dependent and independent/control variables of the main model for the hypothesis test**

	Pearson correlation	Point-biserial correlation
Received migrants' remittances	-0.107**	--
Age	0.030**	--
Level of education	-0.267**	--
Employment status	-0.116**	--
Female gender	--	0.006
Rural settlement	--	0.195**
Wave 2002 dummy	--	0.160**
Wave 2008 dummy	--	0.082**
Wave 2014 dummy	--	-0.061**
Wave 2017 dummy	--	-0.131**

\*\* Correlation is significant at the 0.01 level (1-tailed). \* Correlation is significant at the 0.05 level (1-tailed). See Appendix A, Table A.9 for full complement of correlation results.

### The hypothesis test

The OLS estimates of the main model for evaluating our hypothesis are presented in Table 5. The coefficient for receiving migrants' remittances is negative and statistically significant (coeff.=-0.056; p-value=0.000). The results also show that other independent/control variables in both models assumed their expected signs and were significant at the 99% confidence level.

**Table 5: Estimates of lived poverty-receiving migrants' remittance model**

| hypothesis test | Ghana Afrobarometer pooled data | 2002-2017

	B	Std. error	Beta	Sig.
Constant	0.929	0.039	--	0.000
Received remittances	-0.056	0.014	-0.046	0.000
Age	-0.001	0.001	-0.030	0.011
Level of education	-0.074	0.005	-0.200	0.000
Employment status	-0.058	0.009	-0.071	0.000
Female gender	-0.046	0.018	-0.030	0.009
Rural settlement location	0.174	0.018	0.113	0.000
Wave 2002 dummy	0.304	0.026	0.147	0.000
Wave 2008 dummy	0.196	0.026	0.095	0.000
Wave 2014 dummy	0.067	0.021	0.041	0.001

**Note:** Dependent variable is Afrobarometer Lived Poverty Index.  $R^2=0.113$ ; adj.  $R^2=0.112$ ; std. error of the estimate=0.723; F-statistic=99.462 (sig.=000); and n=7,003. There is no multicollinearity problem in the model, as the largest variance inflation factor is 1.321.

Quite interesting is the finding regarding the wave dummies. Considering the effects of all other independent or control factors are zero, and the 2017 dummy is the reference category, we observe that lived poverty declined consistently. This downward trajectory of

the lived poverty levels replicates the lived poverty over-time trend depicted earlier in Figure 1.<sup>13</sup>

### *The confirmatory hypothesis test*

The lived poverty construct is based on a battery of questions about the deprivation experiences of households, not just individual respondents, and as such the impacts of some independent or control factors are difficult to interpret. Cognizant of this fact, we estimated the main model with only wave 7 data of about 1,150 cases who are household heads to test the head-of-household factor as a form of confirmatory hypothesis test. Comparing the OLS estimates in Table 6 to those in Table 5, we find that the direction and statistical significance of the impacts on all the predictors did not change, giving us the assurance that our estimates in Table 5 do not suffer from hidden biases.

**Table 6: Estimates of lived poverty-receiving migrants' remittance model**

| hypothesis confirmatory test | Ghana Afrobarometer data on cases for household heads | 2017

	<b>B</b>	<b>Std. Error</b>	<b>Beta</b>	<b>Sig.</b>
<b>Constant</b>	1.060	0.075	--	0.000
<b>Received remittances</b>	-0.065	0.028	-0.065	0.021
<b>Age</b>	-0.003	0.001	-0.080	0.005
<b>Level of education</b>	-0.076	0.009	-0.250	0.000
<b>Employment status</b>	-0.089	0.019	-0.128	0.000
<b>Female gender</b>	-0.126	0.038	-0.093	0.001
<b>Rural settlement location</b>	0.182	0.037	0.144	0.000

**Note:** Dependent variable is Afrobarometer Lived Poverty Index.  $R^2=0.131$ ; adj.  $R^2=0.127$ ; std. error of the estimate=0.587; F-statistic=28.812 (sig.=000); and  $n=1,150$ . There is no multicollinearity problem in the model as the largest variance inflation factor is 1.151.

### *The robustness of the estimate of our variable of interest*

Researchers conducting regression analysis at times conduct robustness checks to examine how a regression coefficient estimate of a variable of interest behaves when the specification of their empirical model is modified by including or excluding some independent factors. Leamer (1983) advocated this type of check with an argument that a regression coefficient of a variable of interest that appears fragile with modifications to the model is indicative of model misspecification. However, when a coefficient estimate does not change much (i.e. by way of the sign it carries and its magnitude) even when the model is modified, then that coefficient is deemed "robust."<sup>14</sup> According to Lu and White (2014), a "robust" coefficient implies high predictive reliability of the associate factor in policy analysis. Lu and White further argued that a "robustness check" is not only a quality assurance of the predictive power of a variable, but also the test of the soundness of a model's specification for empirical analysis.

In this paper, we validated the "robustness" of the negative and statistically significant coefficient estimate of our variable of interest – receiving migrants' remittances – in our

<sup>13</sup> See Appendix B, Figure B.3.

<sup>14</sup> The term "robust" as used here is not akin to the concept of robustness in the statistics literature, which is concerned about the insensitivity of an estimator to adding or removing sample observations.

hypothesis test. To do this, we introduced region dummies, social assistance spending,<sup>15</sup> inflation rate, and gross domestic product per capita growth rate (and its lagged form)<sup>16</sup> in place of the wave dummies to create four different modified models for estimation.

The region dummies ( $D_{R_{Gi}}$ ) are intended to control for differences arising from inequities in poverty circumstances of regions. A dummy takes the value 1 for a given region and 0 for all other regions. The equation below is our modified model for the first “robustness” check.

$$LPI = \beta_0 + \beta_1(RMR) + \beta_2(Fgen) + \beta_3(Age) + \beta_4(Edu) + \beta_5(Emp) + \beta_6(RST) + \beta_7(D_{R_{Gi}}) + e_t \quad [2]$$

Social assistance spending (SAS) was computed from the government's expenditures on three key social intervention programmes targeting poverty alleviation: Livelihood Empowerment Against Poverty (LEAP), the Ghana School Feeding Programme (GSFP), and the Capitation Grant (CG) for basic school pupils. We were able to compute figures for 2008, 2014, and 2017 (i.e. waves 4, 6, and 7) but not for 2002 (wave 2) because the CG, GSFP, and LEAP had not yet commenced. Equation 3 below is the modified model for the “robustness” check with social assistance spending.

$$LPI = \beta_0 + \beta_1(RMR) + \beta_2(Fgen) + \beta_3(Age) + \beta_4(Edu) + \beta_5(Emp) + \beta_6(RST) + \beta_7(SAS) + e_t \quad [3]$$

Rising inflation (*Infla*) worsens the living conditions of citizens, making them poorer. We modified our main model for another “robustness” check by substituting inflation for the wave dummies.

$$LPI = \beta_0 + \beta_1(RMR) + \beta_2(Fgen) + \beta_3(Age) + \beta_4(Edu) + \beta_5(Emp) + \beta_6(RST) + \beta_7(Infla) + e_t \quad [4]$$

Improvements in a nation's gross domestic product per capita implies enhancement in citizens' well-being as at least some of them are able to get out of the poverty trap. For another “robustness” check, we modified our main model by replacing the wave dummies with per capita gross domestic product growth rate ( $GDP_{pcg}$ ) and its lagged form ( $LGDP_{pcg}$ ) as shown in Equation 5.

$$LPI = \beta_0 + \beta_1(RMR) + \beta_2(Fgen) + \beta_3(Age) + \beta_4(Edu) + \beta_5(Emp) + \beta_6(RST) + \beta_7(GDP_{pcg}) + \beta_8(LGDP_{pcg}) + e_t \quad [5]$$

The computed social assistance spending figure, inflation rate, and per capita GDP growth rate (and its lagged form) for any particular wave year was introduced into the data set as fixed values for all cases in that wave year.

On the direction of impacts and statistical significance of predictors in the main model, we do not expect them to change during the robustness checks. For the robustness check factors, we anticipate either positive or negative impacts from the region dummies ( $D_{R_{Gi}}$ ) (i.e.  $\beta_7 > / < 0$  in Equation 2), positive impact from inflation (i.e.  $\beta_7 > 0$  in Equation 4); negative impact

<sup>15</sup> Ghana's Livelihood Empowerment Against Poverty (LEAP) programme, piloted from March 2008 and fully implemented in 2009, provides cash and health insurance to extremely poor households to alleviate short-term poverty and encourage long-term human-capital development. The Ghana School Feeding Programme (GSFP) commenced in 2005 with the intermediate objectives of reducing hunger and malnutrition; increasing school enrollment, retention, and attendance; and boosting local food production. Ghana adopted a school fees abolition policy, the Capitation Grant (CG), in 2004 to spur the attainment of universal access to basic education. See Appendix A, Table A.6 for details on computing the value of social assistance spending.

<sup>16</sup> See Appendix A, Table A.7 for the real sector or macroeconomic data (i.e. inflation and per capita GDP growth rates) used in the robustness checks.

from social assistance spending (i.e.  $\beta_7 < 0$  in Equation 3); and negative impacts from GDP per capita growth and the lagged form (i.e.  $\beta_7$  and  $\beta_8 < 0$  in Equation 5).

The expected direction of the impacts of the robustness checks' variables and their descriptive statistics are presented in tables 7 and 8, respectively.

**Table 7: Expected direction of the impacts of variables for robustness check**

Variable	Expected sign
Region dummies	Negative/Positive (-/+)
Social assistance spending	Negative (-)
Inflation rate	Positive (+)
GDP per capita growth	Negative (-)
Lagged GDP per capita growth	Negative (-)

**Table 8: Descriptive statistics of variables for robustness checks**

	N	Min.	Max.	Mean	Std. dev.
Western Region dummy	7200	0	1	0.098	0.297
Central Region dummy	7200	0	1	0.086	0.280
Greater Accra Region dummy	7200	0	1	0.173	0.379
Volta Region dummy	7200	0	1	0.087	0.281
Eastern Region dummy	7200	0	1	0.109	0.312
Ashanti Region dummy	7200	0	1	0.193	0.395
Brong Ahafo Region dummy	7200	0	1	0.092	0.289
Northern Region dummy	7200	0	1	0.091	0.288
Upper East Region dummy	7200	0	1	0.042	0.201
Upper West Region dummy	7200	0	1	0.029	0.168
Social assistance spending	6000	51.52	394.01	255.976	128.442
Inflation rate	7200	12.40	16.50	14.517	1.576
GDP per capita growth	7200	0.57	6.37	3.503	2.519
Lagged GDP per capita growth	7200	1.15	4.85	2.528	1.652

The results of the correlation analysis between the robustness check variables and lived poverty as presented in Table 9 show that the latter correlates negatively with government social assistance spending ( $r=-0.131$ ), GDP per capita growth rate ( $r=-0.024$ ), lagged GDP per capita growth rate ( $r=-0.042$ ), and the region dummies for Greater Accra ( $r=-0.090$ ), Eastern ( $r=-0.074$ ), Ashanti ( $r=-0.099$ ), and Brong Ahafo ( $r=-0.012$ ) but correlates positively with inflation ( $r=0.114$ ) and the region dummies for Western ( $r=0.030$ ), Central ( $r=0.010$ ), Volta ( $r=0.039$ ), Northern ( $r=0.162$ ), Upper East ( $r=0.152$ ), and Upper West ( $r=0.047$ ), as anticipated in Table 7 above. Only the region dummies for Western, Central and Brong Ahafo failed to reach statistical significance; the rest were significant at either the 95% or 99% confidence level.

**Table 9: Correlations between dependent variable and those for robustness checks**

	Pearson correlation	Point-biserial correlation
Western Region dummy	--	0.003
Central Region dummy	--	0.010
Greater Accra Region dummy	--	-0.090**
Volta Region dummy	--	0.039**
Eastern Region dummy	--	-0.074**
Ashanti Region dummy	--	-0.099**
Brong Ahafo Region dummy	--	-0.012
Northern Region dummy	--	0.162**
Upper East Region dummy	--	0.152**
Upper West Region dummy	--	0.047**
Social assistance spending	-0.131**	--
Inflation rate	0.114**	--
GDP per capita growth	-0.024*	--
Lagged GDP per capita growth	-0.042**	--

\*\* Correlation is significant at the 0.01 level (1-tailed). \* Correlation is significant at the 0.05 level (1-tailed). See Appendix A, Table A.9 for full complement of correlation results.

### Robustness check with region dummies

In our first robustness check, we tested the effects of region dummies alongside our variable of interest (receiving migrants' remittances) and other independent/control factors. The OLS estimates of the modified model as presented in Table 10 show that benefiting from migrants' remittances still remained a negative predictor of lived poverty (coeff.=-0.052) and statistically significant at the 99% confidence level test. In general, the coefficient estimates of the other independent/control factors of the main model were quite similar, carried signs conforming with our expectations, and were statistically significant at the 99% confidence level except for age, which does not reach significance.

The direction of the impacts of the region dummies conformed with our expectation. Three of them – Eastern, Ashanti, and Brong Ahafo – had negative signs, while the rest were positively signed. Dummies for Volta, Eastern, Ashanti, Northern, Upper East, and Greater Accra (the reference region represented by the constant) were statistically significant at the 99% confidence level. The Central Region dummy was significant at the 90% confidence level, while the remaining three did not reach significance.

The computed effects of each region dummy, assuming the effects of all other predictors to be zero, ranked Central, Upper West, Volta, Northern, and Upper East regions high on the predicted lived poverty level, while Eastern, Ashanti, Brong Ahafo, Greater Accra, and Western regions ranked low.<sup>17</sup>

<sup>17</sup> The following are the predicted effects of the region dummies: Eastern, 0.85; Ashanti, 0.89; Brong Ahafo, 0.95; Greater Accra, 0.98; Western, 0.99; Central, 1.04; Upper West, 1.04; Volta, 1.08; Northern, 1.24; and Upper East, 1.44. See Appendix B, Figure B.4.

These rankings are about the same as those shown by the regional lived poverty score in Appendix B, Figure B.2 More importantly, they largely confirm official poverty incidence findings which shows high prevalence of poverty in the Northern, Upper East, Upper West, and Volta regions over the period 1991/92 to 2016/17 and low poverty incidence in the Greater Accra, Eastern, and Ashanti regions.<sup>18</sup>

**Table 10: Estimates of lived poverty–receiving migrants’ remittance model**  
| robustness check using region dummies

	B	Std. error	Beta	Sig.
<b>Constant</b>	0.978	0.042	--	0.000
<b>Received remittances</b>	-0.052	0.014	-0.043	0.000
<b>Age</b>	-0.001	0.001	-0.013	0.269
<b>Level of education</b>	-0.072	0.005	-0.195	0.000
<b>Employment status</b>	-0.053	0.009	-0.065	0.000
<b>Female gender</b>	-0.044	0.018	-0.029	0.013
<b>Rural settlement location</b>	0.141	0.019	0.092	0.000
<b>Western Region dummy</b>	0.015	0.036	0.006	0.664
<b>Central Region dummy</b>	0.061	0.037	0.022	0.097
<b>Volta Region dummy</b>	0.100	0.038	0.036	0.008
<b>Eastern Region dummy</b>	-0.128	0.034	-0.052	0.000
<b>Ashanti Region dummy</b>	-0.091	0.029	-0.047	0.002
<b>Brong Ahafo Region dummy</b>	-0.033	0.036	-0.012	0.360
<b>Northern Region dummy</b>	0.265	0.038	0.098	0.000
<b>Upper East Region dummy</b>	0.463	0.049	0.120	0.000
<b>Upper West Region dummy</b>	0.065	0.057	0.014	0.253

**Note:** Dependent variable is Afrobarometer Lived Poverty Index.  $R^2=0.124$ ; adj.  $R^2=0.122$ ; std. error of the estimate=0.719; F-statistic=66.068 (sig.=000); and  $n=7,003$ . There is no multicollinearity problem in the model as the largest variance inflation factor is 1.790.

### Robustness check with social assistance spending

In our second robustness check, we substituted social assistance spending for the wave dummies. The estimates as presented in Table 11 show that receiving migrants’ remittances maintained its negative and statistically significant impact (coeff.=−0.059, p-value=0.000) on lived poverty.

The estimated coefficients of the other independent variables/factors of the main model did not vary much from the findings of the main hypothesis test. Moreover, the direction of the impacts of these variables, together with the social assistance spending, conformed with our expectation, and were statistically significant at the 99% confidence level test.

<sup>18</sup> See Appendix A, Table A.8 for official poverty rates.

**Table 11: Estimates of lived poverty–receiving migrants’ remittance model**  
| robustness check using social assistance spending

	B	Std. error	Beta	Sig.
Constant	1.190	0.044	--	0.000
Received remittances	-0.059	0.015	-0.051	0.000
Age	-0.002	0.001	-0.038	0.004
Level of education	-0.076	0.005	-0.210	0.000
Employment status	-0.070	0.010	-0.087	0.000
Female gender	-0.055	0.019	-0.037	0.004
Rural settlement location	0.141	0.020	0.093	0.000
Social assistance spending	-0.001	0.000	-0.093	0.000

**Note:** Dependent variable is Afrobarometer Lived Poverty Index.  $R^2=0.093$ ; adj.  $R^2=0.092$ ; std. error of the estimate=0.715; F-statistic=85.944 (sig.=000); and n=5,852. There is no multicollinearity problem in the model as the largest variance inflation factor is 1.254.

### Robustness check with inflation rate

The third robustness check, with inflation rate as one of the predictors, again estimated the coefficient of receiving migrants’ remittances to be negative (coeff.=−0.065) and statistically significant at the 99% confidence level.

The magnitude and signs of the coefficients of other independent variables/factors of the main model did not deviate much from those of the hypothesis test. Similarly, these variables were highly significant (i.e. 99% level) except for age, which was significant at the 95% level. Inflation rate also carried a positive sign, as expected, and was significant at the 99% level (Table 12).

**Table 12: Estimates of lived poverty–receiving migrants’ remittance model**  
| robustness check using inflation rate

	B	Std. error	Beta	Sig.
Constant	0.482	0.090	--	0.000
Received remittances	-0.065	0.014	-0.053	0.000
Age	-0.001	0.001	-0.026	0.026
Level of education	-0.079	0.005	-0.215	0.000
Employment status	-0.066	0.009	-0.082	0.000
Female gender	-0.051	0.018	-0.033	0.004
Rural settlement location	0.173	0.018	0.112	0.000
Inflation rate	0.040	0.006	0.082	0.000

**Note:** Dependent variable is Afrobarometer Lived Poverty Index.  $R^2=0.100$ ; adj.  $R^2=0.100$ ; std. error of the estimate=0.728; F-statistic=111.645 (sig.=000); and n=7,003. There is no multicollinearity problem in the model as the largest variance inflation factor is 1.248.

### Robustness check with per capita GDP growth rate

The results of the robustness check with the GDP per capita growth rate and its lagged form followed the pattern found in previous checks. As presented in Table 13, the coefficient of receiving migrants’ remittances maintained its negative sign and statistical significance (coeff.=−0.053, p-value=0.001).

The coefficients of GDP (-0.042) and lagged GDP (-0.062) were negative and statistically significant at the 99% confidence level, as anticipated.

Moreover, the coefficients of all predictors of the main model had signs conforming with our expectations and were statistically significant. The magnitude of these coefficients did not deviate significantly from their estimates in the main model.

**Table 13: Estimates of lived poverty-receiving migrants' remittance model**  
| robustness check using per capita GDP growth

	B	Std. error	Beta	Sig.
<b>Constant</b>	1.367	0.056	--	0.000
<b>Received remittances</b>	-0.053	0.014	-0.044	0.000
<b>Age</b>	-0.001	0.001	-0.028	0.017
<b>Level of education</b>	-0.080	0.005	-0.216	0.000
<b>Employment status</b>	-0.068	0.009	-0.084	0.000
<b>Female gender</b>	-0.052	0.018	-0.034	0.003
<b>Rural settlement location</b>	0.178	0.018	0.116	0.000
<b>GDP per capita growth</b>	-0.042	0.006	-0.138	0.000
<b>Lag GDP per capita growth</b>	-0.062	0.010	-0.134	0.000

**Note:** Dependent variable is Afrobarometer Lived Poverty Index.  $R^2=0.100$ ; adj.  $R^2=0.099$ ; std. error of the estimate=0.728; F-statistic=97.185 (sig.=000); and  $n=7,003$ . There is no multicollinearity problem in the model as the largest variance inflation factor is 3.258.

### What the robustness checks imply

Table 14 shows summary information on receiving migrants' remittances from the estimates of the main model and its modified versions. We observe that the absolute size of the coefficient estimates in the first, second, and fourth robustness checks (0.052, 0.059, and 0.053) are very much comparable to that of the main model (0.056). However, estimates of the confirmatory hypothesis test and third robustness check (0.065 each) are marginally higher (by 0.009) than that of the main model. Moreover, the direction and statistical significance of the impact of our variable of interest remained consistent (i.e. negative and significant throughout). Thus, the Afrobarometer data provide us with convincing evidence to confidently conclude that:

1. The observed negative and statistically significant impact of receiving migrants' remittances on lived poverty is robust, is not a coincidence, and largely mirrors reality.
2. The regression model used in the hypothesis test (and subsequently modified for robustness checks) is sound and fits the data well.

**Table 14: Summary of receiving migrants' remittances coefficient estimates**

	Magnitude of coefficient	Direction of impact	Significance level
<b>Hypothesis test model</b>	0.056	Negative	99%
<b>Confirmatory test model</b>	0.065	Negative	95%
<b>Robustness check 1 model</b>	0.052	Negative	99%
<b>Robustness check 2 model</b>	0.059	Negative	99%
<b>Robustness check 3 model</b>	0.065	Negative	99%
<b>Robustness check 4 model</b>	0.053	Negative	99%



## Discussion and conclusion

This paper used data created by pooling Afrobarometer survey data from 2002 to 2017 to test the hypothesis that benefiting from migrants' remittances is associated with significantly lower levels of lived poverty among Ghanaians. Controlling for a number of covariates (mainly demographics) in a conceptual lived poverty multiple regression model, we found that receiving migrants' remittances has a negative and significant relationship with lived poverty experiences at the micro level.

Our findings confirm the work of other researchers who have developed empirical evidence of a negative relationship between receiving migrants' remittances and lived poverty (Lucas, 2004; Lucas & Stark, 1985) and have argued that international migration impacts poverty reduction positively through migrant remittances (Kothari, 2002; De Haas, 2005; Adams & Page, 2005; Adams, 2006).

Using more sophisticated statistical analyses, some studies have found a unidirectional causal relationship, i.e. that remittances reduce poverty (Adams, 2006; Adams & Cuecuecha, 2010; Banga & Sahu, 2010), while others have argued for a bi-directional causal relationship (Makram & Montassar, 2014; Hatemi-J & Uddin, 2014). Our survey data does not enable us to make causal inferences; further research, probably using data on poverty headcount or severity and remittance inflows, may shed light on possible causal relationships between remittances and poverty.

## Policy recommendations

The finding that lived poverty is inversely related to receiving migrants' remittances has important policy implications.

Researchers have confirmed the common knowledge that migrants' remittances often reach their recipients through informal channels, such as friends and relatives visiting home, self-carried when migrants visit home, or hidden in postal letters (Ahinful, Boateng, & Oppong-Boakye, 2013; Teye, 2016). The government should develop an efficient policy mechanism that encourages the use of formal channels for remittances. This will make it easier to have accurate data on the volume and value of remittance inflows and enable the country to reap the full development benefits (including poverty-reduction paybacks) of such remittances. For instance, though remittances are transfers between private parties, the government can derive economic growth benefits by creating a policy environment that encourages private savings and investment (e.g. in financial assets and stocks) with assured good return. Such a policy will raise the opportunity cost of consumption and make savings and investment more attractive to recipients of migrants' remittances.

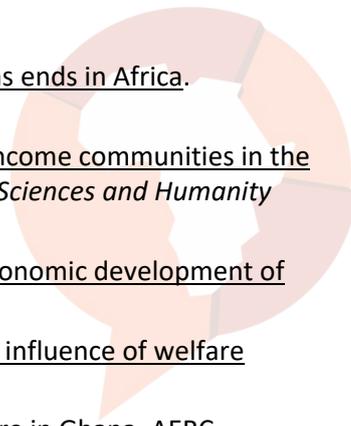
Any policy mechanism put in place with the intent of encouraging remittances through formal channels must ensure effective and efficient coordination of the sectoral policies of financial institutions, money-transfer companies, and agencies or ministries responsible for immigration, foreign affairs, and poverty alleviation. For this to be possible, the appropriate government regulatory body must examine the transaction cost (e.g. bank and other transfer charges) associated with receiving remittances and, where necessary, find a way of scaling them down to encourage more Ghanaian migrants to use the formal channels to support relations and friends back home.

Finally, the policy mechanism to be instituted should be able to reduce the cost to both senders and receivers of international financial transfers to Ghana. This is possible if the central bank of Ghana works with specific banks and money-transfer companies in countries where most remittances originate to regulate transfer charges at the points of sending and receiving.

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## Appendix A

**Table A.1: Regional distribution of Afrobarometer sample | Ghana pooled data**  
| 2002-2017

	<b>Pooled data</b>	<b>2002</b>	<b>2005</b>	<b>2008</b>	<b>2012</b>	<b>2014</b>	<b>2017</b>
<b>Western</b>	9.64	9.33	10.03	10.21	9.53	9.53	9.53
<b>Central</b>	8.64	8.67	8.69	8.41	8.66	8.66	8.66
<b>Greater Accra</b>	17.50	15.33	15.37	15.42	18.56	18.56	18.56
<b>Volta</b>	8.61	8.67	8.69	8.61	8.59	8.59	8.59
<b>Eastern</b>	10.84	11.33	11.28	11.11	10.65	10.65	10.65
<b>Ashanti</b>	19.44	19.33	19.21	19.12	19.54	19.54	19.54
<b>Brong Ahafo</b>	9.20	10.00	9.36	9.61	8.98	8.98	8.98
<b>Northern</b>	9.07	9.33	9.36	9.61	8.88	8.88	8.88
<b>Upper East</b>	4.23	4.67	4.68	4.91	3.96	3.96	3.96
<b>Upper West</b>	2.84	3.33	3.34	3.00	2.65	2.65	2.65
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

**Table A2: Urban-rural distribution of Afrobarometer sample | Ghana pooled data**  
| 2002-2017

	<b>Pooled data</b>	<b>2002</b>	<b>2005</b>	<b>2008</b>	<b>2012</b>	<b>2014</b>	<b>2017</b>
<b>Urban</b>	51.60	47.67	46.53	43.92	54.38	54.38	54.38
<b>Rural</b>	48.40	52.33	53.47	56.08	45.62	45.62	45.62
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

**Table A3: Gender distribution of Afrobarometer sample | Ghana pooled data**  
| 2002-2017

	<b>Pooled data</b>	<b>2002</b>	<b>2005</b>	<b>2008</b>	<b>2012</b>	<b>2014</b>	<b>2017</b>
<b>Men</b>	49.76	50.50	48.29	50.00	50.00	49.97	49.54
<b>Women</b>	50.24	49.50	51.71	50.00	50.00	50.03	50.46
<b>Total</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

**Table A.4: Lived Poverty Index factor and reliability analyses results** | Ghana pooled data | 2002-2017

	Communalities		Component matrix	Extraction sums of squared loadings		Reliability alpha
	Initial	Extraction	Factor loadings	Total	% of variance	Cronbach
<b>Panel A (based on surveys in 2002, 2005, 2008, 2012, 2014, and 2017)</b>						
<b>Lived Poverty Index</b>	--	--	--	<b>2.617</b>	<b>52.331</b>	<b>0.763</b>
<i>Gone without food</i>	1.000	0.510	0.714	--	--	--
<i>Gone without water</i>	1.000	0.526	0.725	--	--	--
<i>Gone without medical care</i>	1.000	0.618	0.786	--	--	--
<i>Gone without cooking fuel</i>	1.000	0.478	0.691	--	--	--
<i>Gone without cash income</i>	1.000	0.485	0.697	--	--	--
<b>Panel B (based on surveys in 2002, 2008, 2014, and 2017)</b>						
<b>Lived Poverty Index</b>	--	--	--	<b>2.625</b>	<b>52.494</b>	<b>0.764</b>
<i>Gone without food</i>	1.000	0.525	0.724			
<i>Gone without water</i>	1.000	0.511	0.715			
<i>Gone without medical care</i>	1.000	0.611	0.782			
<i>Gone without cooking fuel</i>	1.000	0.503	0.709			
<i>Gone without cash income</i>	1.000	0.475	0.689			

**Note:** (1) Panel A results in this table are based on full data set for surveys in 2002, 2005, 2008, 2012, 2014, and 2017. (2) Panel B results are based on data from survey waves in which the remittance question was asked (i.e. 2002, 2008, 2014, and 2017).

**Table A.5: Approach to recoding response options for receiving remittances questions in the various survey waves**

Waves	Original response option codes	Recoding of response option codes
<b>Wave 2 question wording:</b> <i>Considering all the activities you engage in to secure a livelihood, how much do you depend on receiving money from family members working in other countries?</i>	0=Not at all 1=A little 2=A lot	0=>0=Not at all 1=>1=A little 2=>2=A lot
<b>Wave 4 question wording:</b> <i>How often, if at all, do you receive money remittances from friends or relatives outside of the country?</i>	0=Never 1=Less than once a year 2=At least once a year 3=At least every 6 months 4=At least every 3 months 5=At least once a month	0=>0=Not at all 1=>1=A little 2=>1=A little 3=>2=A lot 4=>2=A lot 5=>2=A lot
<b>Wave 6 question wording:</b> <i>How often, if at all, do you or anyone in your household receive money remittances from friends or relatives living outside of the country?</i>	0=Never 1=Less than once a year 2=At least once a year 3=At least every 6 months 4=At least every 3 months 5=At least once a month	0=>0=Not at all 1=>1=A little 2=>1=A little 3=>2=A lot 4=>2=A lot 5=>2=A lot
<b>Wave 7 question wording:</b> <i>Considering all the activities you engage in to secure a livelihood, how much, if at all, do you depend on receiving remittances from relatives or friends living in other countries?</i>	0=Not at all 1=A little 2=Somewhat 3=A lot	0=>0=Not at all 1=>1=A little 2=>2=A lot 3=>2=A lot

**Table A.6: Social assistance spending data used in robustness check | Ghana official data | 2008-2017**

	School feeding (GHC)	Capitation grant (GHC)	LEAP (GHC)	Social assistance (GHC)
2002	--	--	--	--
2008	36,243,000	15,000,000	276,000	51,519,000
2014	164,687,000	16,720,000	38,761,000	220,168,000
2017	244,000,000	70,009,578	80,000,000	394,009,578

**Sources:**

(1) Figures for the Ghana School Feeding Programme (GSFP) and the Capitation Grant (CG) for 2008 and 2014 and for the Livelihood Empowerment Against Poverty (LEAP) programme for 2014 are from the World Bank report titled "[Ghana: Social Protection Assessment and Public Expenditure Review \(November 2016\)](#)."

(2) The LEAP figure for 2008 was estimated using figures from the [2009 budget statement](#) of the Ghana government. LEAP had 8,000 main beneficiary households and 15,000 emergency households in 2008. We assumed each household had three individual beneficiaries who were given GHC12.00 each [i.e. total spending: ((8,000+15,000) x 12.00)]. The LEAP figure for 2017 was from Ministry of Gender, Children and Social Protection programme-based [budget estimates](#) for 2019.

(3) The school feeding figure for 2017 was from Ministry of Gender, Children and Social Protection programme-based [budget estimates](#) for 2019.

(4) The CG figure for 2017 was estimated using figures on total enrollment and grant per pupil in Ministry of Education programme-based [budget estimates](#) for 2018.

**Note:** The GSFP and CG were introduced in 2005, while LEAP came on board in 2008, hence no estimates for government social assistance spending for 2002.

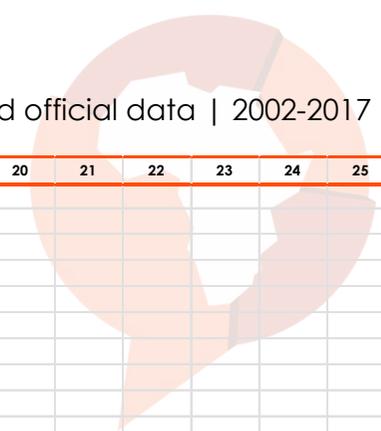
**Table A.7: Macroeconomic data used in robustness check** | Ghana official data | 2002-2017

	Inflation rate (%)	GDP per capita growth rate (%)	Lagged GDP per capita growth rate (%)
<b>2002</b>	14.80	1.97	1.48
<b>2008</b>	16.50	6.37	1.69
<b>2014</b>	15.50	0.57	4.85
<b>2017</b>	12.40	5.77	1.15

Source: World Bank

**Table A.8: Poverty incidence** | by region | 1991-2017

	1991/1992	1998/1999	2005/2006	2012/2013	2016/2017
Western	59.6%	27.3%	22.9%	20.9%	21.1%
Central	44.3%	48.4%	23.4%	18.8%	13.8%
Greater Accra	25.8%	5.2%	13.5%	5.6%	2.5%
Volta	57.0%	37.7%	37.3%	33.8%	37.3%
Eastern	48.0%	43.7%	17.8%	21.7%	12.6%
Ashanti	41.2%	27.7%	24.0%	14.8%	11.6%
Brong Ahafo	65.0%	35.8%	34.0%	27.9%	26.8%
Northern	63.4%	69.2%	55.7%	50.4%	61.1%
Upper East	66.9%	88.2%	72.9%	44.4%	54.8%
Upper West	88.4%	83.9%	89.1%	70.7%	70.9%
<b>National average</b>	<b>51.7%</b>	<b>39.5%</b>	<b>31.9%</b>	<b>24.2%</b>	<b>23.4%</b>



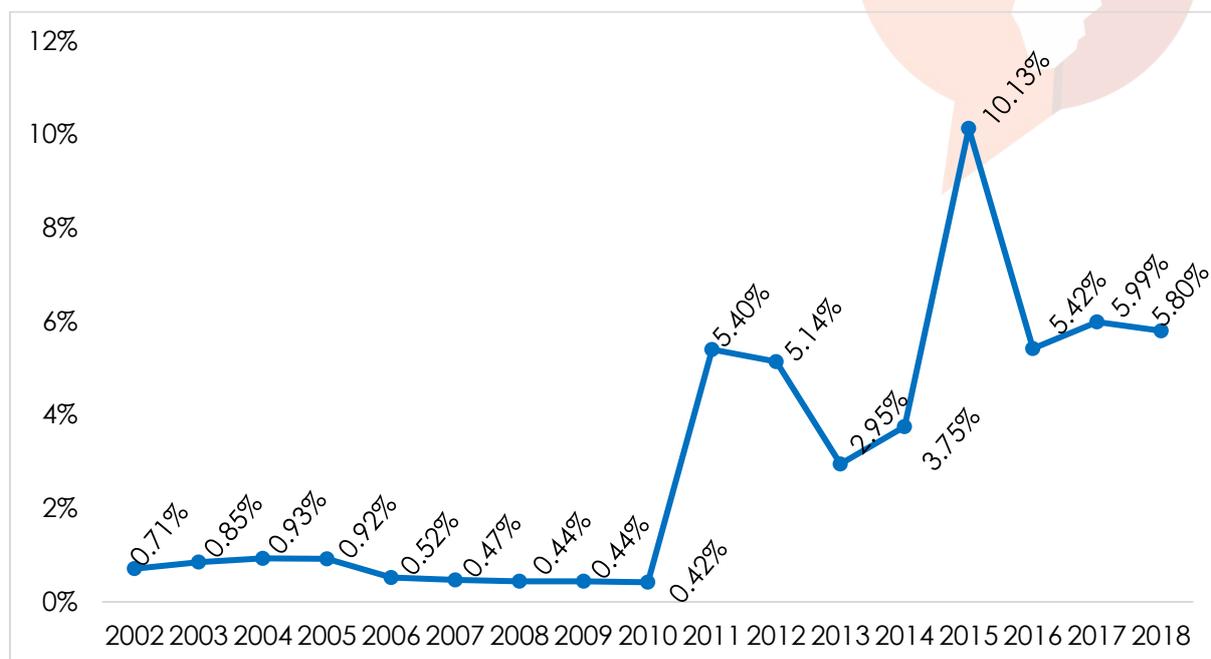
**Table A.9: Correlation among variables used in main and robustness test models | Ghana Afrobarometer pooled and official data | 2002-2017**

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
. Lived Poverty Index	1.000																									
. Depend on foreign private remittances	-0.107**	1.000																								
. Age of respondents	0.030**	0.022*	1.000																							
. Level of education	-0.267**	0.175**	-0.226**	1.000																						
. Employment status	-0.116**	0.004	0.038**	0.085**	1.000																					
. Female gender	0.006	-0.032**	-0.053**	-0.167**	-0.035**	1.000																				
. Rural settlement	0.195**	-0.150**	0.062**	-0.311**	-0.057**	-0.005	1.000																			
. Wave 2002 Dummy	0.160**	-0.087**	0.058**	-0.146**	-0.089**	-0.005	0.036**	1.000																		
. Wave 2008 Dummy	0.082**	0.032**	0.010	-0.079**	-0.070**	0.000	0.057**	-0.200**	1.000																	
1. Wave 2014 Dummy	-0.061**	0.043**	-0.015	0.071**	0.043**	0.001	-0.037**	-0.316**	-0.316**	1.000																
1. Wave 2017 Dummy	-0.131**	0.000	-0.038**	0.107**	0.082**	0.003	-0.037**	-0.316**	-0.316**	-0.500**	1.000															
2. Western Region dummy	0.003	-0.034**	-0.006	0.009	0.000	-0.003	0.071**	-0.007	0.003	-0.003	0.005	1.000														
3. Central Region dummy	0.010	-0.016	0.007	0.010	0.081**	-0.001	0.028**	0.002	0.002	0.003	-0.006	-0.101**	1.000													
4. Greater Accra Region dummy	-0.090**	0.075**	-0.058**	0.177**	0.061**	0.010	-0.348**	-0.024*	-0.024*	0.019	0.019	-0.151**	-0.140**	1.000												
5. Volta Region dummy	0.039**	-0.057**	0.026*	-0.002	0.018	0.001	0.119**	0.000	0.000	0.000	0.000	-0.101**	-0.094**	-0.141**	1.000											
5. Eastern Region dummy	-0.074**	0.002	0.045**	0.030**	0.032**	0.000	0.054**	0.006	0.006	-0.005	-0.005	-0.115**	-0.107**	-0.160**	-0.108**	1.000										
7. Ashanti Region dummy	-0.099**	0.059**	0.017	0.061**	0.045**	-0.002	-0.071**	0.000	0.000	0.000	0.000	-0.161**	-0.150**	-0.224**	-0.151**	-0.171**	1.000									
8. Brong Ahafo Region dummy	-0.012	0.027*	0.008	-0.051**	-0.030**	-0.001	0.031**	0.012	0.002	-0.005	-0.005	-0.105**	-0.097**	-0.146**	-0.098**	-0.111**	-0.156**	1.000								
9. Northern Region dummy	0.162**	-0.050**	-0.036**	-0.194**	-0.095**	-0.010	0.118**	0.003	0.003	-0.003	-0.003	-0.104**	-0.097**	-0.145**	-0.098**	-0.111**	-0.155**	-0.101**	1.000							
1. Upper East Region dummy	0.152**	-0.038**	-0.002	-0.087**	-0.126**	0.005	0.115**	0.010	0.010	-0.008	-0.008	-0.069**	-0.064**	-0.096**	-0.065**	-0.073**	-0.103**	-0.067**	-0.066**	1.000						
1. Upper West Region dummy	0.047**	-0.048**	0.015	-0.104**	-0.103**	0.000	0.086**	0.012	0.012	-0.009	-0.009	-0.057**	-0.053**	-0.079**	-0.053**	-0.060**	-0.084**	-0.055**	-0.055**	-0.036**	1.000					
2. Government social assistance spending	-0.131**	-0.028*	-0.028*	0.111**	0.093**	0.002	-0.057**	c	-0.796**	-0.228**	0.878**	0.001	-0.005	0.025*	0.000	-0.007	0.000	-0.004	-0.004	-0.011	-0.013	1.000				
3. Inflation rate	0.114**	0.022*	0.028**	-0.094**	-0.078**	-0.002	0.042**	0.080**	0.563**	0.441**	-0.950**	-0.003	0.005	-0.019	0.000	0.005	0.000	0.003	0.003	0.008	0.010	-0.959**	1.000			
4. GDP per capita growth rate	-0.024*	0.010	-0.016	0.005	0.001	0.002	0.021*	-0.272**	0.509**	-0.824**	0.636**	0.007	-0.004	-0.007	0.000	0.002	0.000	-0.001	0.001	0.003	0.004	0.146**	-0.425**	1.000		
5. Lagged GDP per capita growth rate	-0.042**	0.043**	-0.011	0.055**	0.031**	0.001	-0.029**	-0.284**	-0.227**	0.994**	-0.590**	-0.003	0.003	0.015	0.000	-0.004	0.000	-0.005	-0.002	-0.006	-0.008	-0.337**	0.540**	-0.828**	1.000	

\*\* . Correlation is significant at the 0.01 level (1-tailed). \* . Correlation is significant at the 0.05 level (1-tailed). c. Cannot be computed because at least one of the variables is constant.

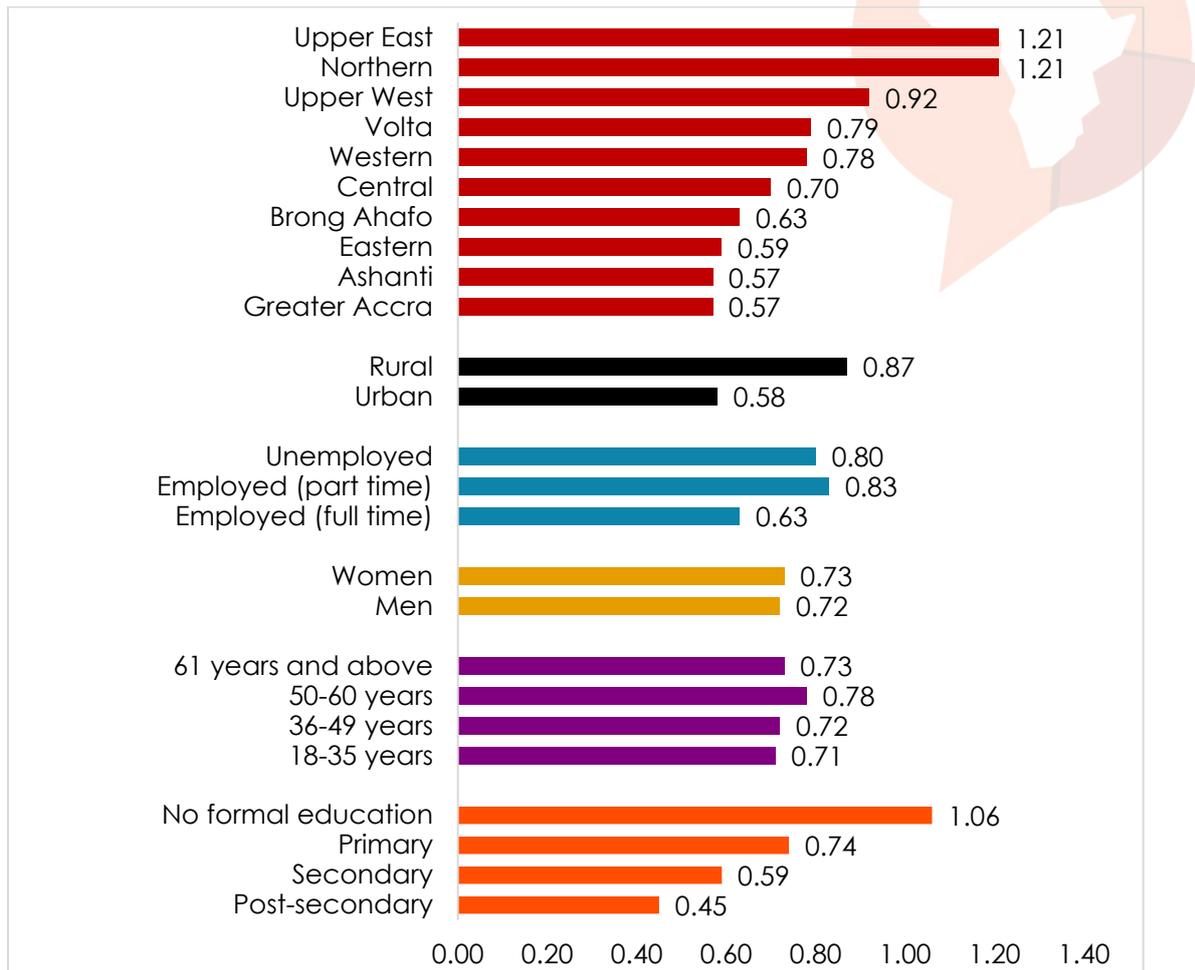
## Appendix B

**Figure B.1: International remittance inflows as a percentage of GDP | Ghana**  
| 2002-2018



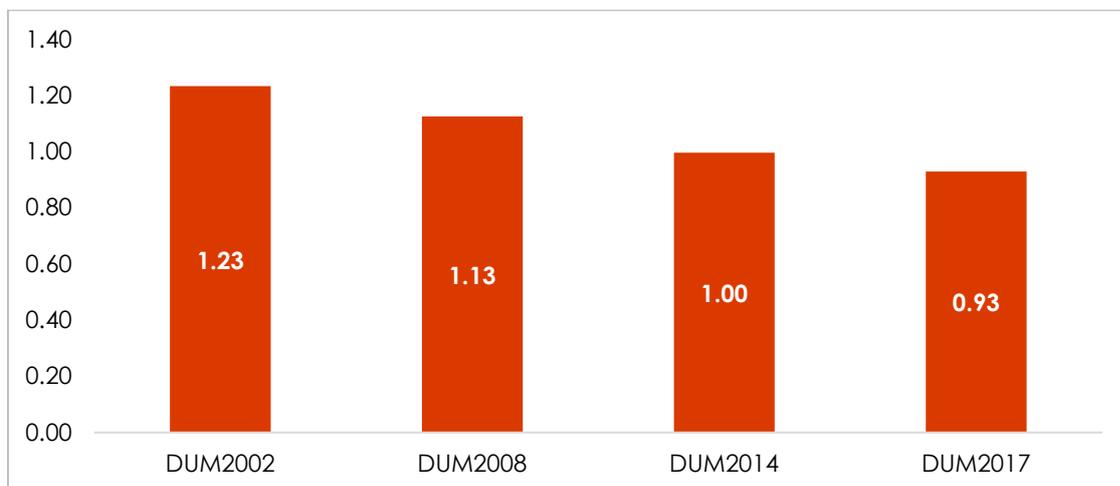
**Source:** Computed from World Bank calculations based on data from IMF balance of payments statistics database and data releases from central banks, national statistical agencies, and World Bank country desks.

**Figure B.2: Lived Poverty Index scores** | by demographic group | Ghana  
| Afrobarometer pooled data | 2002-2017

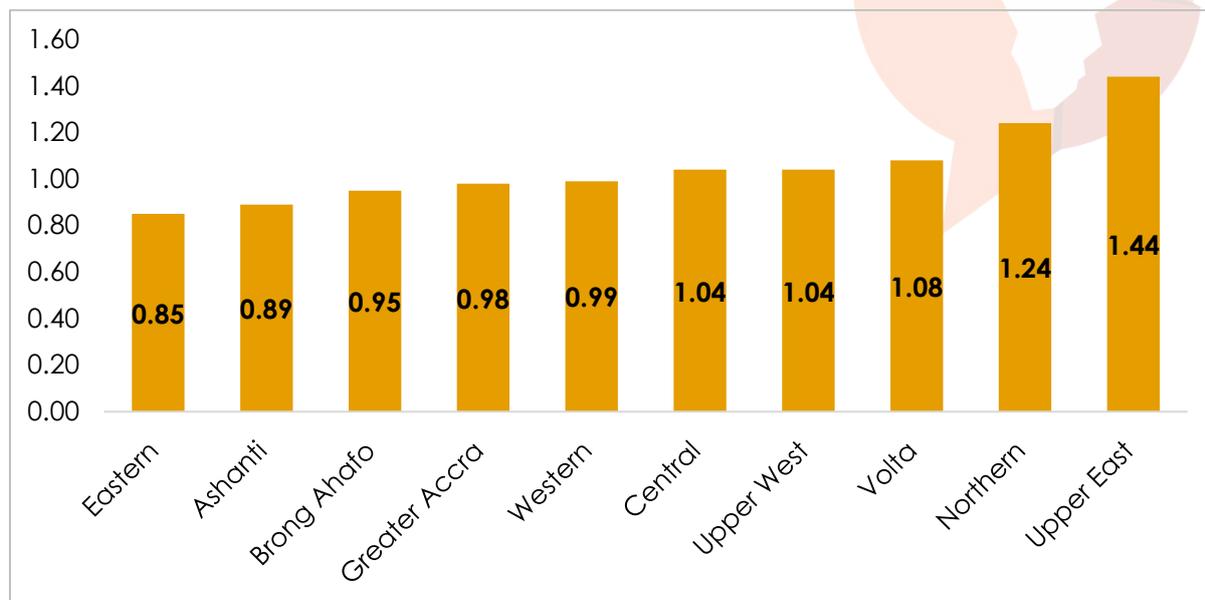


**Respondents were asked:** Over the past year, how often, if ever, have you or anyone in your family: Gone without enough food to eat? Gone without enough clean water for home use? Gone without medicines or medical treatment? Gone without enough fuel to cook your food? Gone without a cash income?

**Figure B.3: Predicted lived poverty level from the main regression model** | wave dummies effect | 2002-2017



**Figure B.4: Predicted lived poverty level from robustness check 1 regression model**  
| region dummies effects | 2002-2017



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