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The poverty and inequality nexus in Ghana

A decomposition analysis of household expenditure components

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Abstract

Purpose – Understanding the linkages between poverty and inequality is vital to any sustainable development and poverty reduction strategies. In Ghana, while poverty has reduced significantly over the years, inequality has increased. The purpose of this paper is to examine the linkages between inequality in household expenditure components and overall inequality and poverty in Ghana.

Design/methodology/approach – Using microdata from the sixth round of the Ghana Living Standards Survey (GLSS 6) conducted in 2012/2013, marginal effects and elasticities were computed for both within- and between-component analysis.

Findings – The results suggest that, in general, reducing within-component inequality significantly reduces overall poverty and inequality in Ghana, compared with between-component inequality. Specifically, inequality in education and health expenditure components were the largest contributors to overall poverty and inequality. The findings imply that policies directed toward reducing within-component inequality will be more effective. Specifically, the findings of the study corroborate recent policies on education and health in Ghana aimed at inequality within these components. Sustaining and scaling up these policies will be a step in the right direction.

Originality/value – The study contributes to existing studies in several ways: first, this study becomes the first attempt to examine inequality-poverty nexus using household expenditure components in Ghana. Second, the use of expenditure in place of income is an addition to the literature. Income is usually subject to reporting biases and is minimal in expenditure. Finally, the findings highlight the need for poverty reduction strategies to focus on specific household components including education and health. Blanket interventions may not be effective in reducing inequality and poverty.

Keywords Ghana, Poverty, Inequality, Household expenditure

Paper type Research paper

1. Introduction

The devastating impact of poverty has caused policy makers to propose various policies directed toward its reduction. The situation is most severe in developing regions, where a significant proportion of the population still live below the poverty line. The urgency in reducing poverty was evident in the now defunct millennium development goals (MDGs)

JEL Classification — D630, I32, I38

The authors dedicate this publication to Dr Richard Mussa who suddenly passed in January, 2017. Richard was exceptionally intelligent. He researched extensively on poverty, inequality and health economics in Malawi. He also mentored several young researchers (including the corresponding author of this paper).

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and the recently launched sustainable development goals. Both development goals have strong targets focused directly or indirectly on poverty reduction. While poverty reduction in itself is crucial, the concept is complex and requires a holistic approach. For instance, while economic growth is generally expected to translate into improved welfare and poverty reduction, this is not always the case. As noted by Araar and Duclos (2010), the impact of growth on poverty largely depends on whether the growth is pro-poor or a reduction in inequality that favors the rich. This implies that an effective assessment of the impact of growth on poverty requires an assessment of the link between growth and inequality and how this inequality consequently feeds into poverty.

Ghana's economic prospects have experienced inconsistent trends over the years. Consistent economic growth performance between 2006 and 2013 resulted in the country moving from low-income to lower-middle income status. Available statistics suggest that Ghana's gross domestic product grew by an average of 8.1 percent annually between 2006 and 2013 (World Bank, 2013). However, as already mentioned, the extent to which this growth impacts on poverty significantly depends on how the wealth is distributed across the population. It is important to find out whether the poorest households in the population also benefit from this growth (Ghana Statistical Service, 2014b).

Like many developing countries, efforts toward improving economic growth and poverty reduction in Ghana date back to 1957, when the country gained independence. However, the most notable strategies, aside the structural adjustment programs, were pursued after the country returned to constitutional rule. Ghana: Vision 2020 was the first coordinated program of economic and social development to be pursued by the then government in 1995. An offshoot of this program was the first medium-term development plan introduced between 1997 and 2000. This program's priority areas included economic growth and human development, as well as rural, urban and infrastructural development. Following the implementation of the Vision 2020 program, the Ghana Poverty Reduction Strategy Paper I (GPRS I) was formulated and implemented over the period 2003-2005. Key objectives of the strategy included stabilizing the macroeconomy, achieving sustained economic growth and reducing the high incidence of poverty in the country, while its successes included creating the necessary fiscal space to increase expenditure in agriculture, health and education. To address challenges remaining after the GPRS I, the GPRS II was launched and implemented between 2006 and 2009. This time, the focus was on accelerating economic growth and poverty reduction by supporting the private sector to create wealth. More recently, the Ghana shared growth and development agenda was implemented over the period 2010-2013.

In spite of the progress made by the various strategies in terms of economic growth and poverty reduction, there remain structural challenges that limit the capacity of the economy to achieve sustainable improvement in the population's livelihood. These include the inability of the increased growth rate to be accompanied by a reduction in inequality.

For instance, Table I shows a brief trend in economic growth, poverty and inequality in Ghana between 1991 and 2013. The table shows that the rate of economic growth steadily increased throughout the period, from 4 percent in 1991/1992 to 8.5 percent in 2012/2013. Similarly, poverty reduced from 51.7 percent in 1991/1992 to 24.2 percent in 2012/2013.

Year	Inequality (Gini)	Poverty (%)	Economic growth rate (%)
1991/1992	0.37	51.7	4
1998/1999	0.39	39.5	4.5
2005/2006	0.42	28.5	6
2012/2013	0.42	24.2	8.5

Sources: Ghana Statistical Service (2014b, 2007), Osei-Assibey (2014) and the World Bank (2013)

Table I.
Trends in inequality, poverty and economic growth in Ghana

On the contrary, the Gini coefficients show that inequality increased from 0.37 to 0.42 over the same period. This suggests that while economic growth and poverty have improved over the period, the same observation cannot be made for inequality, raising the question as to whether the achievements in economic growth have been pro-poor.

Against this backdrop, the current study sought to estimate the linkages between inequality and poverty in Ghana. We adopt a "bottom-up" approach that examines how inequalities at the household level feed into overall poverty and inequality at the national level. Household expenditure was classified into specific components and inequalities within and between these components were assessed.

2. Literature review

The theoretical foundation of the nexus between poverty, inequality and economic growth (also known as the Triple challenge) is largely attributed to the seminal work by Kuznets (1957). The author proposed an inverted U-shape relationship between economic growth and income inequality. The theory suggests that every country goes through phases of development and this has implication for the nature of inequality at every stage of development. Most countries commence their development transition from agrarian societies, where agriculture is the main driver of economic growth. At this stage, income levels are generally uniform and there in minimal inequality in the distribution of income. However, as the economy develops, industries emerge, the economy opens up and productivity grows. Eventually, this creates increased inequality as some individuals engage in more productive activities that generate higher income. In later stages of development, the introduction of technology reduces the disparities in productivity and income. This leads to reducing the distribution of income and hence reduces inequality.

However, Araar and Timothy (2006) argue that inequality is more responsive to productivity in economic sectors rather than economic growth as a whole. This implies that inequality is related to economic shocks which make some sectors relatively more productive. In this case, economic growth may not give an indication of inequality. Other conceptual frameworks have posited that while economic growth may be relevant for poverty reduction a more pertinent question is "on the impact of growth on inequality and on how much this impact on inequality feeds into poverty" (Araar and Duclos, 2010). Several authors have joined the debate on the exact conceptual linkage between economic growth, poverty and inequality. The question of whether economic growth impacts poverty or inequality is yet to be answered. However, as noted by Araar and Duclos (2010), both poverty and inequality are important for the purposes of effective poverty reduction strategies. In this regard, we focus on understanding the linkages between poverty and inequality in Ghana.

The empirical literature on the economic growth, poverty and inequality nexus has emerged in recent years. The findings from the literature are mixed with some studies contradicting the Kuznets hypothesis especially in developing countries. For instance, Ravallion (1997, 2001) and Kanbur (2005) have shown that the inequality-growth elasticity is very low. This suggests that the Kuznets hypothesis is weak in practice. Ravallion and Chen (1997) used data from more than 100 household surveys from over 40 countries. The authors showed that while there was evidence of small decline in poverty due to economic growth, there was no tendency for inequality to increase with growth. Similar evidence of bleak relationship between inequality and growth has been confirmed by other researchers (Squire, 1993; Fields, 1989).

Other studies have also suggested that economic growth alone is not enough to reduce poverty unless it also reduces inequality (Ravallion, 2001; Fosu, 2009; Odedokun and Round, 2004). For instance, Dollar and Kraay (2002) provided evidence from 92 countries, spanning four decades, to show that growth does not necessarily reduce inequality. The results of the

study show that the determinants of growth have little systematic effect on the income of households in the bottom quintile and that the poorest fifth of society benefits from these factors along with everyone else. In a similar study, Bourguignon (2004) found that there exists a negative relationship between inequality and economic growth. However, the author argued that this relationship applies to redistribution of wealth rather than mere redistribution of income and is likely to favorably affect economic efficiency and growth. Such wealth redistribution can be achieved through correcting credit market imperfections that would otherwise limit productive investments, by lowering taxes or freeing other distortionary income redistribution mechanisms. Other empirical works on the inequality-growth nexus include Bruno *et al.* (1996) and Eastwood and Lipton (2001).

The literature on poverty and inequality decomposition has mostly focused on household income components. For instance, Araar and Duclos (2010) provided evidence from Nigeria to show that changes in within-component inequality generally had a higher impact on poverty compared with between-component inequality. Based on this finding, they concluded that policies directed toward reducing within-component inequality may be more effective at reducing poverty than policies directed toward reducing between-component inequality. Essama-Nssah and Lambert (2009), using data for the period 1993-2002 from Indonesia, showed that the amount of poverty reduction achieved over the period was much lower than what distributionally neutral growth would have produced. The decomposition for household expenditure components suggested that expenditure on food (particularly rice) was the main contributor to this pattern of poverty and inequality. It should be mentioned that these findings were derived from an elasticity-based methodology developed by the same authors. Applying the methodology proposed by Araar and Duclos (2010) to household expenditure components, Mussa (2014) found that increase in both within-component and between-component inequality raised overall poverty in Malawi. Specifically, inequality in food and health had relatively higher poverty-reducing effects.

3. Methodology

To estimate the marginal impact of inequality within household expenditure components on overall inequality and poverty, we borrow from the methodology developed by Araar and Duclos (2010) and applied by Mussa (2014)[1]. The starting point is to assume a household's total expenditure has K components. The expected amount of expenditure component k at the *pth* percentile can be denoted by $s(p; k)$. The overall mean of expenditure component k is given as $\mu(k) = \int s(p; k)dp$. It is worth noting that $s(p; k)$ can be increasing or decreasing in p or even negative.

3.1 Within-component inequality

Increasing the bipolarization of expenditure component k is equal to an increase in the distance between the total mean component and the individual value of all expenditure components. This can be derived by adding $(\eta(k)-1)(\mu(k)-s(p; k))$ to $s(p; k)$ (Araar and Duclos, 2010).

The overall single-parameter Gini coefficient (S-Gini) after bipolarization, with parameter $\eta(k)$, reduces to the ordinary Gini coefficient if the parameter of inequality aversion, ρ, is set to 2 (i.e. $\rho = 2$). This implies that the impact of a change in $\eta(k)$ on inequality can be derived as:

$$\frac{\partial(\rho : \eta(k))}{\partial \eta(k)}\Big|_{\eta(k-1)} = \frac{\mu(k)}{\mu} IC(\rho; k) \tag{1}$$

where $(\mu(k))/(\mu)$ represents the share of expenditure component k in total expenditure and $IC(p;k)$ is the coefficient of concentration of component k. Thus, the impact on total inequality

of an increase in inequality within a particular component (component inequality) depends both on the expenditure share and on the concentration index of that component. The impact of component inequality on overall inequality is presented in Equation (1). In order to capture the joint impact of inequality in all the components on total inequality, we simply apply the same $\eta(k)$ to all components.

Given a poverty line (z) and poverty aversion parameter (α), the Foster-Greer-Thorbecke (Foster *et al.*, 1984) class of poverty indices, after applying the bipolarization factor, $\eta(k)$, can be used to estimate the marginal impact of within-component inequality on total poverty as follows:

$$\frac{\partial p(z;\alpha;\eta(k))}{\partial \eta(k)} = \begin{cases} \alpha z^{-1}\mu(k)\left[p(z;\alpha-1) - \overline{CD}(z;\alpha;k)\right] if\, \alpha > 0 \\ -f(z)(s(F(z));k) - \mu(k)) if\ \alpha = 0 \end{cases} \tag{2}$$

where $f(z)$ and $F(z)$ represent the probability and cumulative density functions, respectively, *at* z (Araar and Duclos, 2010). $CD(z;\ \alpha;\ k)$ is normalized consumption dominance curve for component k as developed by Makdissi and Wodon (2002).

The sign of the marginal impact of within-component inequality on poverty (Equation 2) depends on z, α, $\mu(k)$ and the distribution of $s(p;\ k)$. For instance, the sign of the poverty headcount ($\alpha = 0$) depends on the difference between the expected level of expenditure component k at the poverty line and the overall mean value of the component. If $s(F(z);\ k)$ exceeds $\mu(k)$, the headcount will fall following an increase in the inequality of component k. Equation (2) measures the individual impact of inequality in each component on overall poverty. The joint impact of inequality in all the components on overall poverty is measured by applying the same $\eta(k)$ to all components.

To measure the elasticity of total poverty with respect to within-component inequality, we combine the impact of within-component inequality on total inequality (Equation 1) and on total poverty (Equation 2) as follows:

$$\varepsilon_{\eta(k)}(z;\alpha;\rho) = \frac{\partial P(z;\alpha;\eta(k))/\partial\eta(k)}{\partial I(\rho;\eta(k))/\partial\eta(k)} \frac{I((\rho;\eta(k))}{P(z;\alpha;\eta(k))}\Big|_{\eta(k-1)} \tag{3}$$

Equation (3) captures individual expenditure component elasticities. A joint impact of within-component inequality on total poverty can be measured by applying $\eta(k)$ to all components (Araar and Duclos, 2010).

3.2 Between-component inequality

The basic idea here is to measure how changes in the bipolarization of average expenditure components' impact on overall poverty and inequality without changing within-component inequality. Mussa (2014) provides a typical example of such a relationship, whereby an increase in food prices benefits producers of food items by raising their expenditure on other goods while buyers of food items redirect their spending to food items. The impact of such between-component inequality on overall inequality and poverty can be measured by defining a component-specific factor of change $\tau(k)$ in the average of component k while holding within-component as well as overall mean expenditure constant.

The marginal impact of a change in τ on the S-Gini coefficient is then given by:

$$\frac{\partial I(\rho;\tau)}{\partial \tau}\Big|_{\tau=1} = \left[I - \sum_{k=1}^{K} \frac{IC(\rho;k)}{K}\right] \tag{4}$$

Equation (4) shows the impact of between-component inequality on overall inequality. On the other hand, the marginal impact of between-component inequality on overall poverty can be written as follows:

$$\frac{\partial P(Z;\alpha;\tau)}{\partial \tau}\Big|_{\tau=1} = \begin{cases} \alpha\left[P(z;\alpha)-P(z;\alpha-1)+\frac{\mu}{z}\sum_{k=1}^{K}\frac{\overline{CD}(Z;\alpha;k)}{K}\right] if\,\alpha>0 \\ -f(z)\sum_{k=1}^{K}s(F(z);k)\left(1-\frac{\mu/K}{\mu(k)}\right) if\,\alpha=0 \end{cases} \quad (5)$$

The elasticity of total poverty with respect to between-component inequality can be derived by putting Equations (4) and (5) together as follows (Araar and Duclos, 2010):

$$\varepsilon_{\tau}(z;\alpha;\rho) = \frac{\partial P(z;\alpha;\tau)/\partial\tau}{\partial I(\rho;\tau)/\partial\tau}\frac{I(\rho;\tau)}{P(z;\alpha;\tau)}\Big|_{\tau-1} \quad (6)$$

where the direction of the poverty impact of between-component inequality is not pre-determined as the sign depends on $(\mu/K)/(\mu(k))$ and $p(z;\alpha-1)$.

3.3 Data and variable definition

The study used cross-sectional data from the sixth round of the Ghana Living Standards Survey (GLSS) conducted by the Ghana Statistical Service. The GLSS is a series of data collected on various socio-economic indicators. The first five surveys were conducted in 1997, 1988, 1991/1992, 1998/1999 and 2005/2006. The sixth and most recent round (GLSS 6) was conducted between October 2012 and October 2013[2]. The data is nationally and regionally representative, with comprehensive information on household income and expenditure. In total 16,772 households were interviewed, with 7,445 (44.4 percent) urban and 9,327 (55.6 percent) rural households (Ghana Statistical Service, 2014a). Following Mussa (2014), household expenditure was disaggregated into four mutually exclusive and exhaustive components as follows: food: this includes expenditure on all food items as well as beverages; non-food non-human capital: this comprises all spending on non-food items apart from spending on human capital development such as education and health; health: this include expenditure on health care such as consultation, medication and hospitalization; and education: this expenditure component covers school fees, books, uniforms and other education-related spending.

4. Estimation results

Table II shows some descriptive statistics on the share and mean of expenditure components included in the analysis. The statistics are presented at the national level and

National			Rural		Urban	
Source	Mean	Share	Mean	Share	Mean	Share
Food	1340.04	0.48	1083.85	0.56	1660.99	0.43
Non-human	1188.28	0.42	709.66	0.36	1787.89	0.46
Health	25.07	0.01	20.97	0.01	30.22	0.01
Education	169.56	0.09	91.43	0.07	267.44	0.10
Total	2722.95	1.00	1905.91	1.00	3746.54	1.00

Notes: All amounts are presented in per capita Ghana Cedis (GH¢) and annualized. Expenditure component shares are computed by dividing mean of component by mean of total expenditure ($\mu(k)/\mu$)
Source: Authors' computation

Table II.
Descriptive statistics

further disaggregated across rural and urban households. At the national level, the statistics suggest an average household expenditure of GH¢2722.95. However, average urban household expenditure (GH¢3746.54) was higher than average rural household expenditure (GH¢1905.91).

Statistics on the expenditure components show that, at the national level, expenditure on food items made the highest contribution (48 percent) to total expenditure.

While a similar situation prevailed at the rural level, with food expenditure making up about 56 percent of total expenditure, non-human capital household spending was highest in urban areas, at about 46 percent of total expenditure. A comparison of spending on human capital shows that, at all levels, education expenditure was significantly higher than health expenditure. It is also worth mentioning that in all the expenditure components, average spending was higher in urban areas than in rural areas.

Table III presents the impact and elasticities of changing within-component and between-component inequality across household expenditure components and poverty indices (α) at the national level. In general, the results show that broad changes in within-component inequality have a higher impact on poverty than broad changes in between-component inequality. This pattern is reflected in the elasticities, except for the case of poverty headcount ($\alpha = 0$) where the magnitude of the elasticity of poverty is greater for between-component inequality.

It can also be observed that, irrespective of the poverty index used, the signs of the marginal impact and elasticity of within-component inequality on total poverty were all positive. On the contrary, the signs of the marginal impact and elasticities of between-component inequality on overall poverty were only positive for poverty headcount. This suggests that both within- and between-component inequality impact overall poverty headcount in the same direction. However, in the case of poverty gap and poverty severity, within- and between-component inequality impact poverty in opposite ways. This implies that an increase in within- and between-component inequality will decrease headcount poverty, while only an increase in within-component inequality will decrease poverty severity and poverty gap. Given its relatively higher magnitude of impact, the findings suggest that policies directed toward reducing within-component inequality will be more effective at reducing overall poverty than policies intended to reduce between-component inequality.

Consequently, the results further show that a decrease in inequality in any of the expenditure components will lead to a reduction in poverty headcount, poverty gap and poverty severity. Specifically, education expenditure recorded the largest elasticity, irrespective of the poverty index used. A 1 percent reduction in inequality in education expenditure, all things being equal, will lead to a 1.14, 3.46 and 2.82 percent reduction in overall poverty headcount, poverty gap and poverty severity, respectively. Reduction in inequality in health produced the second most important reduction in the overall poverty gap (3.38 percent)

			$\alpha = 0$		$\alpha = 1$		$\alpha = 2$	
Source	Share	MII	MIP	Elasticity	MIP	Elasticity	MIP	Elasticity
Food	0.48	0.001702	0.001559	1.066107	0.001736	3.372722	0.000697	2.820635
Non-human	0.42	0.002096	0.002012	1.118052	0.001953	3.083788	0.000747	2.45872
Health	0.01	0.000035	0.000029	0.985102	0.000036	3.382998	0.000014	2.833292
Education	0.09	0.00039	0.000383	1.142501	0.000408	3.462728	0.00016	2.818522
Within		0.004223	0.00395	1.088998	0.004133	3.237746	0.003236	5.281906
Between		0.000064	0.000116	2.115344	−0.000032	−1.65018	−0.000041	−4.46068

Table III.
Elasticity of poverty with respect to within- and between-component inequality ($\rho = 2$), national

Notes: MII is the marginal impact on inequality; MIP is the marginal impact on poverty; Elasticity is elasticity of poverty with respect to inequality. An upper poverty line of GH¢1314.00 was used
Source: Authors' computation

and poverty severity (2.83 percent), while non-food non-human expenditure had the second highest impact on overall poverty headcount (1.12 percent).

A further decomposition analysis was performed across rural and urban areas. Table IV shows results on the marginal impact of inequality in within- and between- household expenditure components on inequality and poverty, as well as the elasticities of the impact on overall poverty at the rural level. In general, the results show that the marginal impact of within-component inequality on poverty is higher than that of between-component inequality. However, the corresponding elasticities are higher for between-component than within-component inequality. The signs of the elasticities of changes in component inequality with respect to poverty vary across poverty indices: the elasticities for within- and between-component inequality were both positive for poverty severity and poverty gap, whereas only within-component elasticity was positive for headcount poverty. Also, while the marginal impacts on overall poverty of a change in within-component inequality were all positive, the marginal impact for between-component was only positive for headcount poverty. It is worth noting that the marginal impact of a change in within-component inequality on overall inequality was positive while that of between-component was negative.

The results suggest that, in rural Ghana, reductions in within-component inequality are more effective in reducing overall poverty and inequality, irrespective of poverty index used. However, with regards to the elasticity of impact, a reduction in between-component inequality is only effective in reducing poverty gap and poverty severity. Specifically, a 1 percent reduction in within-component inequality leads to a 0.26, 1.63 and 2.96 percent reduction in poverty headcount, poverty gap and poverty severity, respectively. On the other hand, a 1 percent reduction in between-component inequality, all things being equal, leads to a 4.29 and 11.29 percent reduction in poverty gap and poverty severity, respectively.

A look at the various expenditure components shows that the marginal impacts with respect to poverty and inequality were all positive, irrespective of poverty index. Similarly, the elasticities of impact were all also positive for all expenditure components and indices. Contrary to the findings at the national level, changes in inequality in food and non-food non-human expenditure impacted highest on overall poverty headcount. On the other hand, inequality in education and health were the highest contributors to poverty gap and poverty severity. For instance, in terms of poverty gap and severity, a 1 percent reduction in inequality in education and health led to a 1.69 and 1.67 percent reduction in poverty gap, respectively, while poverty severity reduced by 1.58 and 1.54 percent, respectively.

Table V shows the marginal impact of inequality in within- and between-expenditure components on poverty and inequality for urban areas. The table also shows the elasticities of impact on overall poverty. The results show that the magnitude of impact was higher for within-component inequality than for between-component inequality. The direction of impact was also the same for both within- and between-component inequality, irrespective of poverty

			$\alpha = 0$		$\alpha = 1$		$\alpha = 2$	
Source	Share	MII	MIP	Elasticity	MIP	Elasticity	MIP	Elasticity
Food	0.56	0.002032	0.000663	0.240782	0.001743	1.650722	0.000813	1.525851
Non-human	0.36	0.00161	0.00071	0.32519	0.00134	1.602247	0.000595	1.409104
Health	0.01	0.000043	0.000012	0.214624	0.000037	1.667642	0.000017	1.54366
Education	0.07	0.000254	0.000067	0.193696	0.000224	1.693923	0.000105	1.575925
Within		0.003938	0.00141	0.264184	0.003344	1.63388	0.003061	2.963117
Between		−0.000027	0.000126	−3.494083	−0.000059	4.29142	−0.000079	11.28622

Notes: MII is the marginal impact on inequality; MIP is the marginal impact on poverty; Elasticity is elasticity of poverty with respect to inequality. An upper poverty line of GH¢1314.00 was used
Source: Authors' computation

Table IV. Elasticity of poverty with respect to within- and between-component inequality ($\rho = 2$), rural

index used. The elasticities of poverty with respect to within- and between-component inequality were all positive across the three poverty indices. This implies that a reduction in both within- and between-component inequality leads to a reduction in overall poverty. The signs of the marginal impact on inequality with regard to within- and between-component inequality were all positive, but were relatively higher for within-component inequality.

Specifically, the results suggest that a 1 percent reduction in within-component inequality leads to a 2.81, 6.02 and 8.98 percent reduction in poverty headcount, poverty gap and poverty severity, respectively. On the other hand, a 1 percent reduction in between-component inequality leads to a 2.16, 0.69 and 0.60 percent reduction in poverty headcount, poverty gap and poverty severity, respectively. It is worth mentioning that the magnitude and direction of marginal impact and elasticities are more consistent at the urban level than at the rural level. Furthermore, the magnitude of elasticities of poverty with regards to within-component inequality was greater in urban areas than in rural areas. The reverse was true for between-component inequality.

The individual component analysis shows that, irrespective of the poverty index, the marginal impact on poverty and inequality as well as elasticities were all positive. This implies that, all things being equal, a reduction in inequality in any one of the expenditure components will lead to a reduction in overall poverty and inequality. Education had the highest reducing effect on poverty and inequality, followed by food. For instance, a 1 percent reduction in education inequality or food inequality leads to 3.05 or 2.89 percent reduction in headcount poverty, respectively. This was slightly different from rural areas, where inequality in education and health were the leading contributors to total inequality and poverty.

5. Discussions

The findings of the study suggest that food expenditure was the highest contributor to total household expenditure at the national and rural levels. This is not surprising, as food consumption usually takes a significant part of household expenditure in developing areas, particularly in rural communities. On the contrary, non-food non-human capital expenditure contributed the most to total household expenditure at the urban level. Health expenditure constituted the lowest to household expenditure, with similar findings at the national level as well as in rural and urban areas. This is explicable by the fact that heath expenditure does not occur frequently compared to food expenditure or other non-human capital spending. Moreover, the proportion of population that spend on health in a given year is relatively few. Ghana's national health insurance scheme (NHIS) may also reduce the proportion of household expenditure directed to health care (NHIA, 2012).

The findings also provide some insightful exposition on the nexus between inequality and poverty in Ghana. We found evidence that consistently show that a reduction in

			$\alpha=0$		$\alpha=1$		$\alpha=2$	
Source	Share	MII	MIP	Elasticity	MIP	Elasticity	MIP	Elasticity
Food	0.43	0.001449	0.00208	2.890367	0.001212	6.353346	0.000348	4.791254
Non-human	0.46	0.002045	0.002688	2.647174	0.00151	5.609726	0.000425	4.144609
Health	0.01	0.00003	0.00004	2.677472	0.000025	6.262691	0.000007	4.692585
Education	0.10	0.000349	0.000529	3.05467	0.00032	6.981007	0.000092	5.230152
Within		0.003872	0.005404	2.810124	0.003066	6.016532	0.001744	8.977162
Between		0.000162	0.000174	2.157658	0.000015	0.690399	0.000005	0.597107

Notes: MII is the marginal impact on inequality; MIP is the marginal impact on poverty; Elasticity is elasticity of poverty with respect to inequality. An upper poverty line of GH¢1314.00 was used
Source: Authors' computation

Table V.
Elasticity of poverty with respect to within- and between-component inequality ($\rho=2$), urban

within-component inequality leads to a reduction in overall poverty and inequality. The relationship was consistent at the national level as well as in rural and urban areas. Changes in the poverty line did not also change the relationship[3]. However, the relationship for between-component inequality and poverty was not consistent. These results show a significant linkage between the level of inequality and poverty in Ghana. This linkage works through specific components of household expenditure. Inequalities in household human capital-related expenditure were more important for overall poverty. This implies that it is relevant for poverty reduction strategies to target reducing inequalities in these components of household expenditure. Mussa (2014) noted that designing policies that reduce the disparities between the rich and poor in health and educational expenditure may be crucial. This could be achieved through taxes and subsidies that seek to improve welfare distribution across households. Progressive tax systems that target the rich could be designed to raise revenue to subsidize the poor. This will likely reduce inequality within the specific expenditure component and hence reduce poverty.

In the context of our findings, the marginal impact of inequality within the various components on overall inequality and poverty was all positive. This suggests that a subsidy program that seeks to reduce inequality in access to education and health care will eventually lead to reducing overall poverty and inequality in Ghana. Similarly, a progressive tax system levied on the rich in their spending on these components will likely reduce inequality in these components and hence reduce overall poverty. Moreover, resources accumulated from such progressive taxes could be used to finance subsidy programs designed to improve inequality.

Currently, there are a few policies in Ghana that conform, to some extent, with the findings of this study. One of these policies is the Livelihood Empowerment Against Poverty intervention which gives cash transfers as well as health insurance coverage to the poor and vulnerable. The intervention focuses on reducing inequality in health care access as well as food expenditure. A more recent intervention is the free senior high education program. Effective implementation of this intervention, with specific focus on the poor, will reduce inequality within this component and eventually reduce overall poverty. Furthermore, the government has also made a critical policy effort in an attempt to reduce inequality in health expenditure through the introduction of the NHIS and its exemption of poor and vulnerable groups from paying premiums. The policy's primary aim is to make health care accessible to all Ghanaians and to reduce inequality in health care access. This implies that implementing this policy effectively will have poverty-reducing effects through reduced inequality within household health expenditure.

In general, the findings highlight the need for policies directed toward reducing poverty in developing countries to focus on reducing within-component inequality. Blanket poverty reduction strategies that directly target national-level poverty may be elusive. It is important for poverty reduction strategies to be "bottom-up" where inequality within specific components at the household level is addressed. This will eventually translate to overall poverty and inequality reduction at the national level. The relatively higher marginal impact of the human capital expenditure components (education and health) despite their lower household expenditure share shows the need to make human capital central to poverty reduction strategies, especially in developing countries. There exists a large body of empirical literature that confirms that human capital has significant inequality- and poverty-reducing effect (Minh, 2008; Santos, 2011; Winters and Chiodi, 2011). For instance, Santos (2011) demonstrated that improving education quality has the potential to reduce inequalities in the long run.

6. Conclusion

This paper sought to investigate the link between inequality in specific household expenditure components and overall inequality and poverty in Ghana. The analysis focused

on computing inequality within and between the components using data from GLSS 6 conducted between October 2012 and 2013. Household expenditure was disaggregated into four components: food; non-food, non-human capital; health; and education expenditure.

The results showed that, in general, the largest part of Ghanaian household expenditure is on food and the smallest part on health items. The results also showed that an increase in within-component inequality increases overall poverty levels. It was also observed that the marginal impact of within-component inequality on poverty was higher than that of between-component inequality. A similar pattern was observed for elasticity of poverty with respect to changes in within- and between-component inequality. The elasticity of poverty with respect to inequality in all the expenditure components was positive, irrespective of poverty index used. However, the elasticity of poverty with respect to changes in inequality in education expenditure was relatively higher at the national level as well as in rural and urban areas.

The findings suggest that appropriate government policies directed toward reducing inequality within specific household expenditure components could be effective in reducing national poverty in Ghana. Specifically, interventions directed toward bridging the gap between the rich and poor in accessing health and education will be a step in the right direction. Recent policy efforts on education and health in Ghana with particular focus on the poor are laudable and should be scaled up and sustained.

Notes

1. For the purposes of simplicity, only a reduced version of the methodology is reported in this section. However, detailed derivations are available in Araar and Duclos (2010) as well as Mussa (2014).
2. See GLSS 6 report for further details on the sampling procedure.
3. Results from the lower poverty line are reported in Appendix.

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Appendix. Estimation results using the lower poverty line (GH¢792.05)

Source	Share	MII	$\alpha=0$ MIP	Elasticity	$\alpha=1$ MIP	Elasticity	$\alpha=2$ MIP	Elasticity
Food	0.47624	0.001702	0.002507	4.186097	0.001455	8.676893	0.000439	6.258797
Non-human	0.423958	0.002096	0.002806	3.806163	0.001522	7.377051	0.000445	5.153704
Health	0.009131	0.000035	0.00005	4.095234	0.00003	8.778557	0.000009	6.431319
Education	0.090671	0.00039	0.000586	4.267377	0.000329	8.550129	0.000098	6.06462
Within		0.004223	0.006037	4.063863	0.003336	8.021007	0.001983	11.38781
Between		0.000064	−1.1E-05	−0.51117	−0.000056	−8.99195	−0.000048	−18.1513

Notes: MII is the marginal impact on inequality; MIP is the marginal impact on poverty; Elasticity is elasticity of poverty with respect to inequality. An upper poverty line of GH¢792.05 was used
Source: Authors' computation

Table AI. Elasticity of poverty with respect to within- and between-component inequality ($\rho=2$), national

Table AII.
Elasticity of poverty with respect to within- and between-component inequality ($\rho = 2$), rural

Source	Share	MII	$\alpha = 0$ MIP	Elasticity	$\alpha = 1$ MIP	Elasticity	$\alpha = 2$ MIP	Elasticity
Food	0.562706	0.002032	0.002618	2.022404	0.001821	4.732092	0.000601	3.615265
Non-human	0.360344	0.00161	0.001988	1.938139	0.001316	4.317349	0.000422	3.202667
Health	0.010882	0.000043	0.000052	1.901408	0.000039	4.832394	0.000013	3.736992
Education	0.066068	0.000254	0.000326	2.016929	0.000235	4.878066	0.000079	3.779258
Within		0.003938	0.005007	1.995569	0.003411	4.573087	0.002229	6.917063
Between		−0.000027	0.000014	−0.840112	−0.0001	19.820807	−0.000087	39.79895

Notes: MII is the marginal impact on inequality; MIP is the marginal impact on poverty; Elasticity is elasticity of poverty with respect to inequality. An upper poverty line of GH¢792.05 was used
Source: Authors' computation

Table AIII.
Elasticity of poverty with respect to within- and between-component inequality ($\rho = 2$), urban

Source	Share	MII	$\alpha = 0$ MIP	Elasticity	$\alpha = 1$ MIP	Elasticity	$\alpha = 2$ MIP	Elasticity
Food	0.430317	0.001449	0.001645	9.427244	0.000578	17.67595	0.000113	11.3344
Non-human	0.457744	0.002045	0.002041	8.286491	0.000682	14.78877	0.000132	9.338386
Health	0.008201	0.00003	0.000033	9.130382	0.000012	17.2742	0.000002	11.44064
Education	0.103738	0.000349	0.000433	10.30021	0.000152	19.35293	0.00003	12.29236
Within		0.003872	0.004384	9.398059	0.001424	16.2994	0.000554	20.73513
Between		0.000162	0.000037	1.869361	−0.000006	−1.73733	−0.000008	−7.12318

Notes: MII is the marginal impact on inequality; MIP is the marginal impact on poverty; Elasticity is elasticity of poverty with respect to inequality. An upper poverty line of GH¢792.05 was used
Source: Authors' computation

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