The poverty and inequality nexus in Ghana: a decomposition analysis of household expenditure components

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Abstract

The study examined the linkages between inequality in household expenditure components and total inequality and poverty in Ghana. Using micro data from the sixth round of the Ghana Living Standards Survey conducted in 2012/2013, marginal effects and elasticities were computed for both within-and between-component analysis. The results suggest that, in general, reducing within-component inequality significantly reduces overall poverty and inequality in Ghana, compared to 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 towards reducing within-component inequality will be more effective than those directed towards between-component inequality. Specifically, the findings of the study corroborates with tax policies (such as Value Added Tax and National Health Insurance Levy in the case of Ghana) that provide exemptions for educational, health and agricultural inputs. This will lead to reduction in overall poverty and inequality by reducing inequality within these expenditure components. The results were robust to the choice of poverty line and consistent for both rural and urban locations.

Keywords: Household expenditure, inequality, poverty, Ghana

JEL: D630, I32, I38

1. Introduction

The devastating impact of poverty has caused policy makers to propose various policies directed towards the reduction of poverty. The situation is profound in developing regions where significant proportions of the population still live below the poverty line. The urgency in reducing poverty is evident in the Millennium development Goals which 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 reduction in inequality that favours 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.

In recent times, Ghana's economic prospects had seen major boost with the country moving from low income to lower-middle income status. The country has also discovered and started extraction crude oil in commercial quantities. Available statistics suggest that Ghana's Gross Domestic Product grew by an average of 8.1% between 2006 and 2013 (World Bank, 2013). However, as mentioned earlier, the extent to which this growth impacts on poverty significantly depends on how the wealth is distributed across the population. The basic idea is to find out if the poorest households in the population also benefit from this growth (Ghana Statistical Service, 2014a).

The literature on whether or not economic growth and development is pro-poor has been growing with some authors suggesting that economic growth alone is not enough to reduce poverty unless to also reduces inequality (Ravallion, 2001, Fosu, 2009, Odedokum 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 income of households in the bottom quintile and that the poorest fifth of society benefit from these factors as everyone else. In a similar study, Bourguignon (2004) found that there exist a negative relationship between inequality and economic growth. However, the author argued that this relationship applies to redistribution of wealth than mere redistribution of income and is likely to favourably 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 been done for household income components. For instance Araar and Duclos (2010) provided evidence from Nigeria to show that changes in within-component inequality generally had higher impact on poverty relative to between-component inequality. Based on this finding, they concluded that policies directed towards reducing within-component inequality may be more effective at reducing poverty than policies directed towards 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 contributors to this pattern of poverty and inequality. It should be mentioned that this findings were derived from elasticity-based methodology developed by the same authors. In applying the methodology proposed by Araar and Duclos (2010) to household expenditure component, 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.

The current study examined the link between poverty and inequality in Ghana. Within-and between-household expenditure components inequality analysis was performed using micro data from the fifth and sixth Ghana Living Standards Survey. Specifically, the paper explores the impact of marginal changes in inequality in the various components of expenditure on total inequality and poverty. The analysis was also conducted along rural and urban lines to further appreciate the direction and magnitude on impact.

The rest of the paper proceeds as follows; section two presents methods including data used in the analysis while section three presents the results. In section four, the results are discussed with various policy implications. The summary and conclusions are presented in section five.

1.1 Brief country profile

Economic growth and poverty reduction strategies in Ghana dates back to 1957 when the country gained independence. However the most notable strategies were pursued after the country returned to constitutional rule. The Ghana: Vision 2020 was the first coordinated programme of economic and social development to be pursued by the then government in 1995. An offshoot of this programme was the first Medium-Term Development Plan which was introduced between 1997 and 2000. This programme had priority areas including economic growth, human development as well as rural, urban and infrastructural development. Following the implementation on the Vision 2020 programme, the Ghana Poverty Reduction Strategy Paper I (GPRS I) was formulated and implemented over the period 2003-2005. Key objectives of the strategy include to stabilize the macro economy, to achieve sustained economic growth and to reduce the high incidence of poverty in the country. The strategy was successful, among others, in creating the necessary fiscal space to increase expenditure in agriculture, health and education. To address challenges that remain after the GPRS I, the GPRS II was launched and implemented between 2006 and 2009. This time, the focus was to accelerate economic growth and poverty reduction by supporting the private sector to create wealth. More recently, the Ghana Shared Growth and Development Agenda 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 still remain structural challenges that limit the capacity of the economy to achieve sustainable improvement in livelihood of the population. These include, among others, inability of the increased growth rate to be accompanied by reduction in inequality.

For instance, Table 1 shows a brief trend in economic growth, poverty and inequality in Ghana between 1991 and 2013. The table show that the rate of economic growth has steadily increased over the period from 4% in 1991/92 to 8.5% in 2021/13. Similarly, poverty reduced from 51.7% in 1991/92 to 24.2% in 2012/13. On the contrary, inequality has been increasing over the same period. The Gini coefficients show that inequality increased from 0.37 in 1991/92 to 0.42 in 2012/13. This suggest that while economic growth and poverty have improved over the period, same observation cannot be made for inequality. This raises question about whether the achievements in economic growth has been pro-poor.

Table 1: Trends in inequality, poverty and economic growth in Ghana

Year	Inequality (Gini)	Poverty (%)	Economic growth rate (%)
1991/92	0.37	51.7	4
1998/99	0.39	39.5	4.5
2005/06	0.42	28.5	6
2012/13	0.42	24.2	8.5

Source: GSS (2014a, 2007), Osei-Assibey (2014) and World Bank (2013)

2. Methodology

To estimate the marginal impact of changes in the inequality of household expenditure components on overall inequality and poverty, the current study borrows from the methodology[1] developed by Araar and Duclos (2010) and also used in Mussa (2014). The starting point is to consider total expenditure with *K* components where 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.

2.1 Within-component inequality

Increasing the bipolarisation of expenditure component *k* is equal to an increase in the distance between total mean component and the individual value of all expenditure components. This can be derived by adding (η(k)-1)(μ(k)-s(p; k)) to *s(p; k)* (Arrar and Duclos, 2010).

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

$$\frac{\partial I(\rho;\eta(k))}{\partial \eta(k)}\Big|_{\eta(k)=1} = \frac{\mu(k)}{\mu} IC(\rho;k) \qquad (1)$$

[1] For the purposes of simplicity, only a reduced version of the methodology is reported in this section. However, detailed derivations are available in Arrar and Duclos (2010) as well as Mussa (2014).

where $\frac{\mu/K}{\mu(k)}$ 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 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 *η(k)* to all components.

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

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

f(z) and *F(z)* represent the probability and cumulative density functions, respectively, at *z* (Arrar and Duclos, 2010). $\overline{CD}(z;\alpha;k)$ is a 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*, *μ(k)* and the distribution of *s(p; k)*. For instance, the sign of the poverty headcount (α = 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 *μ(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 on overall poverty of inequality in all the components is measured by applying the same *η(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

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

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

2.2 Between-Component Inequality

The basic idea here is to measure how changes in the bipolarisation of average expenditure components impact on overall poverty and inequality without changing within-component inequality. A typical example of such relationship is provided by Musa (2014) where an increase in food price benefits producers of food items by raising their expenditure on other goods while buyers of food items redirect their spending to food items. Measuring the impact of such between-component inequality on overall inequality and poverty can be done by defining a component-specific factor of change *τ(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

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

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

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

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

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

The direction of the poverty impact of between-component inequality is not pre-determined as the sign depends on $\frac{\mu/K}{\mu(k)}$ and *p(z; α-1)*.

2.3 Data and variable definition

The study was based on cross section 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 to fifth were conducted in 1997, 1988, 1929/92, 1998/99 and 2005/06. The sixth and most recent round was conducted between October 2012 and October 2013[2]. The data is nationally and regionally representative with comprehensive information on household income and expenditure. A total sample of 16,772 households were interviewed with 7445 (44.4%) urban and 9327 (55.6%) rural households (Ghana Statistical Service, 2014b). Following Mussa (2014), household expenditure was disaggregated into four mutually exclusive and exhaustive components as follows; (1) Food: this includes expenditure on all food items as well as beverages (2) non-food non-human capital: this comprises all spending on non-food items except spending on human capital development such as education and health (3) health: this include expenditure on health care such as consultation, medication and hospitalization (4) education: this expenditure component covers school fees, books, uniforms and other education related spending.

3. Estimation results

Table 2 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 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 households expenditure (GH¢1905.91). Statistics

[2] see sixth GLSS report for further details about sampling procedure

on the expenditure components show that, at the national level, expenditure on food items contributed the highest (48%) to total expenditure.

While similar situation prevailed at the rural level with food expenditure making up about 56% of total expenditure, non-human capital household spending was the highest in urban areas with about 46% of total expenditure. Comparing spending on human capital (health and education) show that, at all levels, education expenditure was higher than health expenditure. It can also be observed that average spending on health is significantly lower than that of education at all levels. It is also worth mentioning that in all the expenditure components, average spending was higher in urban areas than rural areas.

Table 2: Descriptive statistics

	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

Source: Authors' computation
Note: 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 [$\mu(k)/\mu$].

Table 3 shows the incidence of poverty and inequality in Ghana at the national as well as the rural and urban levels. The poverty analysis was based on the Foster, Greer and Thorbecke (FGT) poverty analysis with three different indices, namely; poverty headcount ($\alpha = 0$); poverty gap ($\alpha = 1$) and poverty severity ($\alpha = 2$). As mentioned earlier, the inequality measure was based on the ordinary Gini coefficient (which is the S-Gini coefficient with $\rho = 2$). A critical part of the analysis was to select an acceptable poverty line (z). In this regard two different values of z, computed by the Ghana Statistical Service based on the sixth GLSS, were employed in the analysis. These are the upper poverty line (z = GHC1314.00) and the lower or food poverty line (z = GHC792.05).

The results show that, for headcount poverty at the national level, about 36% of households were living below the upper poverty line while 14.9% were living below the lower poverty line. significantly higher proportions of the poor were also based in rural areas irrespective of the

poverty line used. For the upper poverty line, 53% of the rural population were poor, relative to 19% of urban population. On the other hand, for the lower poverty line, rural poverty was estimated to be 25%, relative to 5% in urban areas. Similar pattern prevailed in the poverty gap index and poverty severity index. The Gini coefficient (which is independent of poverty line) suggest an inequality level of 0.42. Again the Gini coefficient is slightly higher for rural areas than urban areas, suggesting that rural areas are more unequal than urban areas in Ghana

Table 3: Poverty and inequality incidence in Ghana

	Poverty line= GHC 1314.00			Poverty line= GHC 792.05		
FGT index/Gini coefficient	National	Rural	Urban	National	Rural	Urban
Poverty Headcount (α= 0)	36.3	53.4	19.2	14.9	25.1	4.7
Poverty Gap (α= 1)	0.128	0.205	0.051	0.04	0.075	0.009
Poverty Severity (α= 2)	0.061	0.103	0.019	0.02	0.032	0.003
Gini coefficient	0.422	0.394	0.387	0.422	0.394	0.387

Source: Authors' computation
Note: Poverty health count has been multiplied by 100

Table 4 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 impact higher on poverty than broad changes in between-component inequality. This pattern is reflected in the elasticities except for the case of poverty headcount (α = 0) where the magnitude of the elasticity of poverty is higher 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 was 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 gab 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. Coupled with the relatively higher magnitude of impact, the findings suggest that policies directed towards

reducing within-component inequality will be more effective at reducing overall poverty compared to 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 reduction in poverty headcount, poverty gap and poverty severity. Specifically, education expenditure recorded the largest elasticity, irrespective of the poverty index used. A 1% reduction in inequality in education expenditure, all things equal, will lead to a 1.14%, 3.46% and 2.82% reduction in overall poverty headcount, poverty gap and poverty severity, respectively. Reduction in inequality in health had the second most important reduction in overall poverty gap (3.38%) and poverty severity (2.83%) while non-food non-human expenditure had the second highest impact on overall poverty headcount (1.12%).

Table 4: Elasticity of poverty with respect to within-and between-component inequality (ρ = 2), National

			α = 0		α = 1		α = 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

Source: Authors' computation

Note: 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.

A further decomposition analysis was performed across rural and urban areas. Table 5 shows results for the marginal impact of inequality in within-and between- household expenditure component 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 gab while 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 suggests 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 gab and poverty severity. Specifically, a 1% reduction in within-component inequality leads to a 0.26%, 1.63% and 2.96% reduction in poverty headcount, poverty gab and poverty severity, respectively. On the other hand, a 1% reduction in between-component inequality, all things equal, leads to a 4.29% and 11.29% reduction in poverty gap and poverty severity, respectively.

A look at the various expenditure components show that the marginal impacts with respect to poverty and inequality are 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% reduction in inequality in education and health lead to a 1.69 and 1.67% reduction in poverty gap, respectively, while poverty severity reduced by 1.58% and 1.54%, respectively.

Table 5: Elasticity of poverty with respect to within-and between-component inequality (ρ = 2), Rural

			α = 0		α = 1		α = 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

Source: Authors' computation

Note: 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.

Table 6 shows results of marginal impact of inequality in within-and between-expenditure components on poverty and inequality for urban areas. The table also show the elasticities of impact on overall poverty. The results show that the magnitude of impact was higher for within-component inequality relative to between-component inequality. The direction of impact was also the same for both within- and between-component inequality, irrespective of poverty 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 relatively higher for within-component inequality.

Specifically, the results suggest that a 1% reduction in within-component inequality leads to a 2.81%, 6.02% and 8.98% reduction in poverty headcount, poverty gap and poverty severity, respectively. On the other hand, a 1% reduction in between-component inequality leads to a 2.16%, 0.69% and 0.60% 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 rural level. Also the magnitude of elasticities of poverty with regards to within-component inequality were higher in urban areas compared to rural areas. A reverse situation was established for between-component inequality.

The individual component analysis show 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 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% reduction in education and food inequality leads to 3.05% and 2.89% 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.

Table 6: Elasticity of poverty with respect to within-and between-component inequality (ρ = 2), Urban

			α = 0		α = 1		α = 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

Source: Authors' computation

Note: 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.

4. Discussions

The findings of the study suggest that food expenditure was the highest contributor to total household expenditure at the national and rural levels. On the contrary, non-food non-human capital expenditure contributed highest to total household expenditure at the urban level. This was not surprising as food consumption usually take up a significant part of household in developing areas with particular emphasis on rural communities. Health expenditure was the least contributor to household expenditure with similar findings at the national level as well as rural and urban areas. This may be justified by the fact that Ghana operates a National Health Insurance Scheme than covers about 35% of the population (NHIA, 2012). Individuals are expected to pay an annual premium to enable them receive health care at no cost. The scheme also exempts older population above age 70 and children under age 18 as well as pregnant women from paying premium (Gajate-Garrido and Owusua, 2013). This may explain the low average household spending on health in the country.

The findings consistently showed that a reduction in within component inequality leads to a reduction in overall poverty and inequality. The relationship was consistent at the national level as well as 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. The findings generally has significant implications for government fiscal policies in the form of taxes or subsidies and expenditure. For instance Mussa (2014) noted that when the marginal impact of inequality in a particular commodity on overall poverty is positive, a tax increase (decrease) on the commodity is likely to increase (decrease) inequality which in turn, increases (reduces) total poverty. In this regard an effective poverty reduction strategy would be to decrease tax on the commodity or exempt the commodity completely from tax.

With regards to the current findings, the signs of the marginal impact of within-component inequality on inequality and poverty were all positive, suggesting that a tax cut or exemption would likely reduce poverty through reduction in inequality. Considering the magnitude of the elasticities of poverty with respect to within-component inequality, education had the highest effect on poverty. This implies that a reduction in taxes or increase in government subsidies on

[3] Results from the lower poverty line is reported in the appendix

educational commodities will significantly reduce inequality in educational expenditure and hence reducing overall poverty. Apart from inequality in education expenditure, a tax cut, exemptions or increased subsidies in health and food items will lead to reduction in poverty in rural and urban, areas respectively.

A good example of the implications of the findings for tax policy is the sales tax in Ghana. The sales tax encompasses the Value Added Tax (VAT) and National Health Insurance Levy (NHIL)[4]. While these taxes are charged on all goods and services sold in the country, there are exemptions for items including health, educational as well as agricultural and fishing inputs. Our findings corroborate these exemptions as they are likely to reduce inequality in theses essential items and hence reduce overall inequality and poverty in Ghana. This is because, as discussed earlier, inequality in educational, health and food expenditure are the largest contributors to overall inequality and poverty. In this regard, it is important to ensure that these exemptions are expanded and sustained to achieve general reduction in inequality and poverty in Ghana.

The findings of the study are also relevant for policy in terms of increasing government expenditure towards within-component focused poverty reduction strategies. This include specific policies directed towards reducing inequality in sensitive household expenditure components. The signs and elasticities of poverty suggest that poverty reduction policies directed at reducing inequality in human capital development (such as education and health) will be critical in the case of Ghana. It is worth mentioning that Ghana has made significant efforts in terms of policies directed towards reducing inequality in the education and health sector. With regards to education, relevant policies include the school feeding and capitation programmes meant to increase primary school enrolment and attendance among the poor. In recent times, a new policy to make secondary education free has been proposed by the government. If these policies are implemented effectively, they are likely to reduce inequality in education and hence reduce overall poverty in Ghana.

Inequality in health was the other component of human capital development found in this study to have important role in poverty reduction in Ghana. As reported earlier, reducing inequality in this component of household expenditure will reduce overall poverty. A critical policy effort

[4] The rate of VAT currently stands at 17.5% which includes a 2.5% NHIL. The NHIL was introduced to raise funds to support the National Health Insurance Scheme.

made by government in this direction was to introduce the NHIS and to exempt poor and vulnerable groups from paying premiums. The primary target of the policy 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. In addition to the above the findings also suggest that reducing tax or increasing subsidies on food items will also have significant poverty reducing effects.

5. Conclusion

The paper sought to investigate the link between inequality in household expenditure components and overall inequality and poverty in Ghana. Analysis was conducted with focus on within-and between-component inequalities using data from the sixth GLSS conducted between October, 2012 and October, 2013. Household expenditure were disaggregated in four components, namely, food, non-food non-human capital, health and education expenditure. The results showed that, in general, Ghanaian households spend highest on food and lowest 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. Similar pattern was also 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 were 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 as well as rural and urban areas.

The findings suggest that appropriate government fiscal policies could be effective in reducing poverty. Specifically, reducing taxes and increasing government subsidies in human capital development will be critical in reducing inequality and poverty. Similarly, increased government commitments to pro-poor policies directed towards reducing inequality in education and health will be a step in the right direction.

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

Table 1: Elasticity of poverty with respect to within-and between-component inequality (ρ = 2), National

		α = 0			α = 1		α = 2	
Source	Share	MII	MIP	Elasticity	MIP	Elasticity	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

Source: Authors' computation

Note: 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.

Table 2: Elasticity of poverty with respect to within-and between-component inequality (ρ = 2), Rural

		α = 0			α = 1		α = 2	
Source	Share	MII	MIP	Elasticity	MIP	Elasticity	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

Source: Authors' computation

Note: 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.

Table 3: Elasticity of poverty with respect to within-and between-component inequality (ρ = 2), Urban

		α = 0			α = 1		α = 2	
Source	Share	MII	MIP	Elasticity	MIP	Elasticity	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

Source: Authors' computation

Note: 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.