

## Regional Income Differences in Ghana: The Importance of Socio-Demographic and Ethnicity

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### Abstract

Income differences have gained increased attention among policy makers and economists in Ghana and around the world. Several factors affect income differences in and across different geographical levels in the Country. The Paper therefore presents a comparative analysis of regional income differences in Ghana with regional panel data for 1960, 1970, 1984 and 2000. The results show a relationship between socio-demographic factors and regional income differences. It was identified that ethnicity and religion have different impacts on regional income; Christians have positive effect on regional income but not Muslims and Akans. Again, high population density in a region reduces the mean regional income; similarly, high concentration of population over 60 years reduces the average regional income. Evidence from the results empirically emphasize that, regions with high share of aged population, Akans, Muslims and high population density have low regional income compared with regions with high share of Christians and low share of Akans.

**Keywords:** ethnicity, Ghana, income differences, religion, socio-demographic,

### 1. Introduction

Income is equitably distributed in an economy that is linguistically homogeneous Lazear (1995). There is substantial evidence that ethnicity is a possible determinant of income differences. Regions with relatively greater ethnic diversity experience greater ethnic income differences Robinson (2002). Studies by Malan (2000) revealed the effects of high ethnic diversity on income inequality in South Africa between mid-1970 to mid-1990's. Alesina & La Ferrara (2005) posit that irrespective of the economic importance of ethnic diversity in terms of experience and expertise, income may not be equally distributed across Ghana due to the ethnic and religious heterogeneity. Although many factors account for income differences, income inequality based on ethnicity and religion is predominant in most countries, especially in Africa.

Also, educational attainment affects income differences. Literature suggests that people with higher level of education usually earn higher income (Chevan & Stokes, 2000; Cornia & Kiiski, 2001). Although the government of Ghana is committed to providing Free Compulsory Universal Basic Education (FCUBE), education at higher levels is self-sponsored which affects the less privilege or the disadvantage. Studies have also shown that population with different age structures have different influences on income (Deaton & Paxson, 1997; Kaasa, 2005). Deaton & Paxson (1997) suggest that older population have large income dispersion, hence higher income inequality.

Literature on income inequality in Ghana had mainly centered on the differences between the southern and northern regions. Therefore, there are relatively fewer studies on likable socio-economic and demographic factors that affect income differences/inequality in these regions. On the other hand, exploration of income inequality at the regional level is relatively unattended to in research literature and a novelty. It is against this background that the Study seeks to ascertain the role of demographic and socio-economic factors in explaining regional variations in income in Ghana. Specifically, the Paper seeks to find the link between socio-demographic factors and income differences in regions of Ghana and as well analyze how they affect income difference across regions. This paper will contribute to the bulk of empirical literature on income differences in Ghana with much emphasis on how socio-demographic factors affect income. The Paper adds to literature by providing an empirical linkage between socio-demographic factors and income differences at the regional level in Ghana. On a broader note, the Paper puts forward the impacts of ethnic and religious diversity on income differences in Ghana in facilitating future socio-economic and infrastructural developments. This is because income differences have the propensity to increase or decrease over time as countries develop both in socio-economic and demographic terms.

## **2. Conceptual Considerations for the Study**

### *2.1 Socio-demographic Factors and Income Differences*

#### *2.1.1 Demographic Factors*

Income Inequality is influenced by couples of demographic factors such as age structure, household size, density, population, educational level etc. (Kaasa, 2005). There are opposing schools of thought on the effect of high population density on income differences. Crenshaw (1993) argues that high population density lowers income inequality through better social organization, whereas Litwin (1998) asserts that high population density and urbanization increase inequality. Taking a reflection of the two arguments, Glaeser (1999) suggests that density may influence the wages of different workers in different ways through learning. Assuming individuals learn by observing and high urban population density increases the rate of interaction; Low-skilled workers may have the opportunity to learn from high-skilled workers (Wheeler, 2004). In such scenarios, the effects on learning can have both negative and positive impacts on income levels. Also, household sizes affect income differences. According to Kaasa (2005), households of different individuals with different skills have different income levels hence affects the average income of such household. Again, age structure within a population can also have effect on income. Older people have larger dispersion of income (Deaton & Paxson, 1997); therefore higher share of older people in a household or population increases income differences.

Theoretically and empirically, most studies have found a negative relationship between income inequality and countries' average education attainment (Park, 1996; De Gregorio & Lee, 2002). Higher educational inequality is associated with higher income differences; highly educated individuals duly ensure higher income (Cornia & Kiiski, 2001). Population with a higher share of higher and lower educational levels are usually associated with higher income differences (Chevan & Stokes, 2000). According to Barro (1999), income inequality has a negative relationship with primary education attainment but a positive relationship with higher levels of education, Globalization through Structural Adjustment Programmes (SAP) in developing countries (e.g. Ghana) affected educational systems through the implementation of fiscal austerity measures which included decreased public spending on education etc. (Stromquist, 1999). This creates the platform for only those who can afford education to attain educational levels that ensure them better wages.

#### *2.1.2 Cultural and Environmental Factors*

According to Gupta et al. (2002), the abundance of natural resources is often associated with higher concentration of ownership and rent; hence higher land concentration among individuals and regions increases regional and individual income disparities (Lundberg & Squire, 2003). Notwithstanding the impact, the influence of land and other natural resources on income differences diminishes over time. Mushinski & Pickering (2000) also believe that religious and ethnic/tribal variations have significant influence on income differences. A study by Clarke et al. (2003) revealed that societies with larger ethnic and religious diversity are less interested in redistribution of resources, therefore ensures higher income differences. Ethnic diversity is seen by Alesina & La Ferrara (2005) in reference to language/group and membership in different clans and tribes; interestingly, people in Africa identify themselves more strongly with their kinships, ethnicity and religion than with their nations (Collier et al., 2001). Diversity in ethnicity brings about varieties in ability, experience and culture that may be harnessed to improve innovation and creativity. At the same time, fragmented society based ethnicity and religion is often prone to infightings that may pose major politico-economic challenges which can further aggravate the extent of inequality (Alesina & La Ferrara, 2005). Alesina et al. (1999) argue that the interests of some ethnic minorities are suppressed in countries where there is ethnic and religious polarization. This is often the case when politicians and public workers associate themselves with ethnic or religious constituencies and spending on public goods is reduced to favour the interest of the affiliated ethnic or religious constituencies (Alesina et al., 1999). It can therefore be concluded that both ethnic and religious minorities tend to have a negative relation to average regional household income.

#### *2.1.3 Socio-economic and Political Factors*

Socio-economic development in terms of increase in country's wealth is likely to increase income differences. Chang & Ram (2000) believe that increase in country's wealth is likely to widen the gap between the rich and the poor. Labour mobility between different sectors of the economy as a result of changes or development in socio-economic structures due to technological development influences income levels (Cornia & Kiiski 2001; Kaasa, 2005). According to Kaasa (2005), in cases of intensive technological changes, skilled workers tend to contribute immensely to socio-economic development and as such ensure higher wages than less skilled workers; in some extreme cases, the skilled workers take over jobs for less skilled workers. Income differences are widened tremendously by some political decisions. Privatization for instance increases income differences. In such scenarios, poorer households have less chance to benefit from privatized state-assets. Ferreira (1999) argues that there are higher earning inequalities within privatized or private institutions, therefore income inequality is assumed to be higher in capitalist states. Governments' investment in education rather than privatization can

minimize income differences when/if poor families or regions can have access to subsidized public education. An empirical analysis of 50 countries by Sylvester (2002) shows that countries with larger government expenditure on education have lower income differences. Also, according to Gradstein & Milanovic (2002) and Lundberg & Squire (2003), income inequality in democratic societies is comparatively lower than in non-democratic societies. Gradstein & Milanovic (2002) further emphasized that the current state of democracy does not matter in reducing income differences but rather the length of democratic experience. This proves that political decisions can in differentiated ways affect incomes.

### *2.2 Income Differences and Space*

There is a growing recognition of the importance of space to many socio-economic processes (Goodchild, 2000) on the analysis of regional income distribution and spatial income differences. This is more evident in the spatial patterns of inequality and dynamics of geographical income differences (Rey & Janikas, 2005). The need then arises concerning levels of spatial income differences and their persistence over time. Income inequality results in income polarization; which is a dispersion of distribution from a central value towards extreme points (Chakravarty, 2009). This does not foster equal spatial development and vice versa. Income inequality has often been dismissed as too insignificant worth serious attention (Atkinson, 1997), but current developments prove such assertions wrong considering its effect on economic development. There have now been numerous researches on factors affecting income differences within and among geographical locations. Income inequality is highly pronounced in urban areas and relatively affects human capital and skills return (Wheeler, 2005). Moreover, market imperfection in regions limits low income families to invest in education leaving the productivity gains of such people unexploited (Galor & Zeira, 1993; Aghion & Bolton, 1997). According to Becker (1994), Human Capital Theory (HCT) suggests that education/training raises workers' productivity by imparting useful knowledge and skills, thereby raising workers' future income. Effective education has been hindered by income inequality since investment in education takes national, parental and individual commitment. The correlation between education and economic performance is influenced by income.

It is an established phenomenon that high level education correlates better job prospects, relative high performance and higher wages across space. People are therefore denied attaining such heights of education due to the large income differences. This gives an important implication for labour market inequalities and performance (Machin, 2009). Education to some extent provides the route out of difficulty by enabling people from poorer families to break away from poverty. However in some cases, education reinforces or aggravates the already existing inequality. Education has now become an important element in the current labor market; where those with low level education are rewarded with low wages (ibid). In spite of the extensive welfare state and the modern societies, income inequality is still extreme in some countries. Esping-Andersen (2002) argues that the relationship between income and health mainly rely on the uniqueness of a welfare regime and the path of governance. Through redistribution and subsidized welfare services (i.e. education and health-care), regional income differences can be reduced (ibid). On the contrary, Clarke et al., (2003) argue that redistribution is the least expected policy in heterogeneous ethnic societies. Income and health gap is therefore always likely to widen. It is however obvious that economic performance is affected by the negative relationship between income, health-care and education. Skewed spatial distribution of society's total wealth affects personal development. Mayer (2001) has estimated the effects of income inequality on educational attainment between rich and poor children. Her findings include the fact that income differences can affect educational attainment through the incentives provided by higher returns to schooling, the declining utility of family income etc. However, growth in income differences is a credible factor to increase inequality in educational attainment. Spatial differences in income can degenerate into political uprising (Glaeser, 2009). Also in polarized countries, there is a strong connection between income inequality and crime (Fajnzylber, 2002).

### **3. Data and Variables**

The data used for the Study were gathered from different official reports from the Ghana Statistical Service (GSS) on Population and Housing Censuses (4 consecutive censal years). However, these official reports included the Ghana Living Standard Surveys 3 and 5 (GLSS 3 and 5) in March 1995 (Ghana Statistical Service, 1995) and September 2008 (Ghana Statistical Service, 2008) respectively; Population Data analysis Reports on the 2000 Population and Housing Census (Vol. 1 and 2) in August 2005, CICRED series (World Population Year) in 1976 by Gaisie and De Graft-Johnson (1976). Due to the unavailability of districts data (which would have been more finer geographical level), the analyses were delimited to the 10 administrative regions in Ghana and analyzed across four censal years. Most of the variables were categorized based on the research focus to represent the stock of people and effect as provided in the statistical reports. The variables used in the analysis were carefully chosen socio-economic and demographic variables based on the developed line of argument and data availability in the data sources.

### 3.1 Dependent Variable: Average Regional Household Income

For the purposes of the Paper, average income is used as the dependent variable in the analysis. In line with this, average annual income per household in every region was used. The mean annual income per household was used purposefully to ascertain the influence of the factors at household level. Treating income differences at household level will clearly show the effects and decisions that affect household and individual's development (i.e. especially on education and health) base on socio-economic and demographic factors. Measuring and determining the accurate influence of the variables on the mean income, the disposable mean annual income per households were used. The income is expressed in Ghana Cedi (US\$1 = GH¢1.699) at the conduct of the research. Due to the unavailability of some panel income values, income values for 1960 and 1970 were proxy based on possible causative variables i.e. income for 1960 and 1970 for the regions were based on the average highest levels of education (post basic and tertiary education) (Note 1). Therefore, income values and highest levels of education for 1984 in every region were used to determine the probable incomes for 1960 and 1970, believing higher education ensures higher income and vice versa. For accurate estimation of the differences in the panel, the average income of households in 1960, 1970 and 1984 were estimated to their worth in 2000 (Note 2) and log of the values were used in the model to control for skewness.

### 3.2 Independent Variable

#### 3.2.1 Main and Control Variables

The independent variables used are mainly demographic and socio-economic factors. The main variables are share of Akans, share of Christians and share of Muslims representing the socio-demographic factors and population density and educational characteristics representing demographic factors with share of employment in industrial classifications representing the control variables. Ghana is a multi-ethnic and religious country; therefore their impact on income distribution is necessary for regional planning. The four main ethno-cultural groups (Akan, Ewe, Ga and Mole-Dagbani) constitute about 86% of the population in Ghana. The Akans are the largest ethnic group of about 49% and comprise other 20 smaller sub-ethnic groups, with the Ashantis being the largest of about 15%. They are very predominant in five out of the ten regions in the Country (i.e. Ashanti, Brong Ahafo, Eastern, Western and Central regions). An important characteristic of the Akan group is their matrilineal line of inheritance which distinguishes it from the other ethnic groups which practice patrilineal inheritance (Langer, 2007). Mole-Dagbani is the second largest ethnic group of about 17% and comprises 10 smaller sub-ethnic groups. They are predominant in the three northern regions (i.e. Northern, Upper East and Upper West regions). Ghana is also largely a Christian country with about 70% of the population being Christians (i.e. Catholics, Protestants etc.) with 16% being Muslims. Muslims form important part of the population in the northern regions. About 42% of the population in the 3 northern regions is Muslims (Ghana Statistical Service, 2005a). Since information on ethnicity and religion in 1960 and 1970 were unavailable, survey in 1984 on ethnicity and religion were used as determinant on the total population to ascertain their shares in 1960 and 1970 across the regions (Note 3). These together with other provided census and survey data were employed in the estimation of the effects of the socio-economic and demographic variables on regional income differences across space and time.

## 4. Empirical Model and Descriptive

Panel data was used for the Study as it gives information on the time-ordering of event and also allows control for individual and here regional unobserved heterogeneity. In the analysis, a comparison is made between the estimates from pooled OLS regression and fixed effects modeling. Considering the problems associated with the regression approaches, year and region fixed effects were introduced in the OLS model to control for both year and regional unobserved heterogeneities which the fixed effects regression is capable of addressing. These models almost produce the same estimates. However, in Model 2, where unobserved heterogeneities i.e. within regional characteristics were not controlled for, produced less significant estimates. The models are specified as follow:

$$\ln Y_{it} = \beta X_{it} + \alpha_i + \varepsilon_{it} \quad (1)$$

$$\ln Y_{it} = \beta_0 + \sum_{i=1}^{n=10} MV + \sum_{i=1}^{n=10} CV + \varepsilon_{it} \quad (2)$$

Where  $\ln Y_{it}$  denotes the average annual household income at  $i$  region and  $t$  time. From equation (1) or FE and equation (2) or OLS  $\beta$  represent the coefficients of the independent variables.  $X_{it}$  from FE also represent the independent variables in  $i$  region and  $t$  time.  $\varepsilon_{it}$  in FE and OLS is the sampling error in the Study. The error is assumed to be normally distributed with a mean of zero and a known variance.  $\alpha_i$  in FE is the unknown intercept for each region. Also, from OLS  $\sum_{i=1}^{n=10} MV$  is the sum of the main variables and  $\sum_{i=1}^{n=10} CV$  is the sum of the control variables. The models are weighted by regional population size. The motivation for this weight is to control the allocation of total explained variance in the model.



Table 1: Summary of Panel Identifier and Descriptive

Variable	Description	Mean	Overall (SD)	Between (SD)	Within (SD)	Observations	
Average income	Average regional household income (log)	5,19	1,13	0,13	1,12	40	
Under 15years	Population age under 15years	44,87	3,19	2,34	2,26	40	
Over 60years	Population age 60years and over	5,93	1,46	1,06	1,05	40	
Population density	Population density per square kilometer	96,33	152,03	126,48	91,36	40	
Akan	Share of Akans	39,33	34,72	35,94	3,62	40	
Christians	Share of Christians	57,01	26,46	27,24	3,86	40	
Muslim	Share of Muslims	17,25	16,21	16,77	1,80	40	
Low Education	Share of population with junior high school education	30,48	12,90	3,20	12,53	40	
Employment in Primary Sector	Share of employment in primary sector	47,30	22,10	9,38	20,18	40	
Unemployment	Employment rate	6,03	4,35	2,13	3,83	40	
Year	Year	1978,	5	15,25	0,00	15,25	40
Region	Region	5,5	2,91	3,03	0,00	40	

Table 2: Pairwise Correlation Matrix

Variables	1	2	3	4	5	6	7	8	9	10
1 Average income	1,00									
2 Under 15years	-0,52***	1,00								
3 Over 60years	0,57***	-0,14	1,00							
4 Population density	0,35*	-0,74***	-0,10	1,00						
5 Akan	0,12	-0,08	-0,16	0,08	1,00					
6 Christian	0,17	-0,36*	-0,06	0,32*	0,77***	1,00				
7 Muslim	0,01	0,33*	-0,14	-0,22	-0,48**	-0,71***	1,00			
8 Low Education	0,77***	-0,48**	0,50**	0,33*	0,22	0,29	-0,19	1,00		
9 Employment in Primary Sector	-0,83***	0,66***	-0,35*	-0,54	-0,05	-0,25	0,05	-0,60***	1,00	
10 Unemployment	0,53***	-0,61***	0,25	0,40*	0,07	0,17	-0,09	0,11	-0,67***	1,00

Note: \* p<0,05, \*\* p<0,01, \*\*\* p<0,001

Table 1 presents the descriptive statistics and summary of the variables. It shows the measure of central location in terms of mean and the measure of spread from the mean in terms of standard deviation (i.e. within, between and overall). It again shows the level at which the variables were identified “within” and “between” the regions and also the level of variations between and within the regions. By the illustration, the panel identifier “Region” does not vary “within” the panel i.e. it is time-invariant. This is evident from the “within” standard deviation of “Region” which is zero. The descriptive also suggests that, the regional differences in income are related to the variations in inter-regional differences in income. Table 2 also shows the pairwise correlation estimates.

### 5. Empirical Results and Discussions

Table 3 presents the estimates from the models. From the FE and OLS Models, both the main and the control variables showed some level of association with regional income differences across Ghana. From the FE model, increase in the share of Christians in a region increases the regions average household income. It presents a robust association with regional household income. On the other hand, increase in the share of Muslims in a region has a negative effect on regional income. Putting this in perspective, Christians in Ghana are over 60% in most of the regions and can be indirectly related to regional employment shares. Also from the FE, increased in the share of Akans in a region is associated with negative effect on average regional household income. Practically, Akans being the most dominant ethnic group in five regions and also fairly represented in other regions, an increase in their share in a region account for less average regional household income compared to other regions with lower share. The negative influence is attributable to the level of average increase in unemployment in these regions over the years. This result was highly unexpected from a more causal perspective. However, from Model 6, it is understandable that with both year and region fixed effects and also weighted regional population size, the negative effect of Akans on regional household income is reduced even in regions with high share of Akans. Juxtaposing the rate of unemployment and the share of Akans in the regions, it is understandable that it has a minimal negative impact on regional household income and also considering regional specific effects, the influence of Akans on regional income is bound to change.

Ethnic and religious differences are embedded in different spaces, therefore, confirming the argument by Clarke et al., (2003) and Mushinski & Pickering (2000), ethnic and religion heterogeneity have a great influence on regional household income differences. Considering the fact that Christians constitute a high share of people in almost all the regions, it is economically wise and acceptable to conclude that a higher share of the employed are/or will be Christians and all other things being equal, will ensure some level of income irrespective of the employment type. On the other hand also, the same group of regions and group of people will also be subjected to minimal or even no income if unemployment increases or there are lay-offs. On the contrary, Muslims negative correlation to regional household income correlation is likely to differ from regions due to their relatively smaller size. Most religious institutions have greater number of jobs in the formal sectors in Ghana, therefore, one can conclude on the effect of self-selection in these institutions. Complementarily, studies

by Malan (2000) in South Africa also revealed that high ethnic diversity influences income differences with high negative impact on the minority.

The FE also indicate that, increase in the share of aged population has a negative association with regional income. Relating to Deaton & Paxson (1997) assertion, higher share of aged population increases the degree of income differences within and between regions, the Models produce significant and negative association with regional income except model 2. This means that, increase in the share of aged population in a region have negative effect on average regional income due to higher income dispersion among the aged population. Considering the poor structure and the non-existence of welfare schemes and adequate pension systems in Ghana for the retired and also the rate of increase in the share of aged population and unemployment, increase in the share of aged population with meager welfare or pension schemes will negatively affect the average income within that region. Harnessing the fact that, most of these aged population never had any form of formal education and are often engaged in informal private sectors, they often retire without appropriate financial plan. This situation can be heavily predominant in the three northern regions which are gradually becoming 'aged regions' due to high migration of the youthful population to the southern regions for better lives. Increase in unemployment and employment in the primary sector in regions negatively affects regional income.

Table 3: Estimated Impacts of Socio-demographic Factors on Regional Income Differences

	FE (1)	OLS (2)	OLS (3)	OLS (4)	OLS (5)	OLS (6)
Under 15years	- 0,014 (0,010)	0,018 (0,048)	- 0,014 (0,010)	- 0,014 (0,016)	0,070 (0,050)	- 0,009 (0,010)
Over 60years	- 0,104** (0,034)	0,180* (0,077)	- 0,104** (0,034)	- 0,082* (0,030)	0,175 (0,163)	- 0,091* (0,034)
Population density	- 0,000 (0,000)	0,000 (0,001)	- 0,000 (0,000)	0,000 (0,000)	0,000 (0,001)	- 0,000 (0,000)
Akan	- 0,014** (0,004)	0,005 (0,004)	- 0,014** (0,004)	0,002 (0,001)	0,001 (0,022)	- 0,012** (0,004)
Christians	0,054*** (0,011)	- 0,001 (0,006)	0,054*** (0,011)	- 0,001 (0,002)	0,092 (0,054)	0,034* (0,014)
Muslim	- 0,092*** (0,014)	0,014 (0,007)	- 0,092*** (0,014)	- 0,002 (0,002)	- 0,176* (0,067)	- 0,072*** (0,015)
Low Education	- 0,001 (0,003)	0,038** (0,012)	- 0,001 (0,003)	- 0,004 (0,005)	0,039* (0,014)	- 0,004 (0,003)
Employment in Primary Sector	0,001 (0,002)	- 0,020** (0,007)	0,001 (0,002)	- 0,001 (0,003)	- 0,011 (0,007)	0,002 (0,002)
Unemployment	- 0,027* (0,010)	0,050 (0,034)	- 0,027* (0,010)	- 0,034** (0,011)	0,082 (0,046)	- 0,027* (0,010)
_cons	4,358*** (0,657)	2,446 (2,468)	3,687*** (0,830)	5,276*** (0,804)	- 4,881 (4,104)	4,409*** (0,895)
Year Fixed Effects	Yes	No	Yes	Yes	No	Yes
Region Fixed Effects	No	No	Yes	No	Yes	Yes
Weighted by Population Size	No	No	No	No	No	Yes
N	40	40	40	40	40	40
adj, R-sq	0,996	0,859	0,996	0,988	0,892	0,997

Standard errors in parentheses

\* p<0,05, \*\* p<0,01, \*\*\* p<0,001

Although population density is not significant in any of the models, however, it is negatively related to regional household income in FE. In other words, increase in regions population density negatively affects income differences. Both in theory and practice, urbanisation facilitate easy and fast learning among individuals. The least effect is therefore understandable. Going by Litwin (1998) assertion, population density or urbanization increases income differences in both models. This implies regions with higher population density are likely to experience higher income differences within and also between regions with smaller population density. Considering that unemployment and high population density are common in large regions, there are probable income differences within and between large and small size regions. The negative effect of population density also explains that, there is always some level of selection and networking on urban relations than mere association as argued by Crenshaw (1993) that, increased population density lowers income differences through various forms of socialization.

## 5. Conclusion

The Paper focused on understanding how socio-demographic factors affect regional income distribution in

Ghana by comparing the fixed-effects model and pooled OLS regression. The two models revealed that ‘within regional characteristics’ are important determinants of regional income differences. Both demographic and ethnicity factors positively and negatively correlate with regional income. The estimates have deepened the understanding and also contributed to existing literature on the effects of socio-demographic factors on income distribution. The relationship between increased human capital and income is corroborated from the regressions. Taking cognizance of the model, though, ‘within regions’ accounted for greater part of the income differences; income differences between the northern and southern regions still remain significant in Ghana. Income differences between urban and rural regions in Ghana are high but more serious among rural areas in the northern regions due to the less urbanized and substantial differences in education and job prospects. Shepherd et al. (2004) have suggested that income differences within regions in the south of Ghana may be partly explained by the relocation of people from the north with no skills and at the same time linked with their class, religion and ethnic influences. It can however be said that the spatial location of people in Ghana roughly concurs with ethnicity and religion but can sometimes be mere coincidence and irrelevant.

The research analysis has shown a direct linkage between socio-demographic factors and regional income differences. This association from the two models cannot be attributed as mere statistical correlation but rather as causality effect. The estimated influence of socio-demographic factors on regional income difference requires a swift policy intervention. To be able to salvage these possible negative relation requires conscious synchronization of all informal employment into institutionalized pension schemes. This will create a source of safety net from which the aged population can resort to when they retire from active services. Also, attempts should be made to spread development across all ten regions of the Country to curtail the north-south migration of active labor force. This will in the medium to long term ensure even distribution of both young and aged populations across all regions in Ghana and its associated effects on regional income differences.

Conclusively, the Paper presented range of ideas and empirical findings on socio-demographic factors and their influence on regional income differences in Ghana. The results inform that economic performance of regions with their varied population structures and compositions are important determinant of regions’ average household income. Due to data unavailability issues for micro and longitudinal panel analysis, the research was based on aggregated and short panel. Future researches are therefore recommended to focus on more micro and longitudinal panel for finer estimates on the effects of socio-demographic factors on regional household income.

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## Notes

Note 1. If education (tertiary + post basic) 1984 = Income (1984)



- Therefore education <sub>(tertiary + post basic)</sub> 1970 or 1960 = (proxy income for 1970 and 1960)
- Note 2. The conversion was based on the average annual Consumer Price Indexes i.e. 35734, 40141, 45681 and 140141 for 1960, 1970, 1984 and 2000 respectively. The index in 2000 was used as the base to assume the values in 1960, 1970 and 1984 in 2000.
- $$140141_{(2000)} = 14_{(1960)}$$
- $$35734_{(1960)} = \text{(Inflation free Income for the years)}$$
- Note 3. If population <sub>(1984)</sub> = Ethnicity/Religion <sub>(1984)</sub>
- $$\text{Therefore population}_{(1970 \text{ or } 1960)} = \text{(Proxy ethnicity/religion for 1970 and 1960)}$$

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