

TITLE

**DECOMPOSITION ANALYSIS OF INEQUALITIES IN HOUSEHOLD CONSUMPTION
EXPENDITURE IN NIGERIA**

CERTIFICATION

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APPROVAL

This research work, “*DECOMPOSITION ANALYSIS OF INEQUALITIES IN HOUSEHOLD CONSUMPTION EXPENDITURE IN NIGERIA*”, has been studied through and approved to have met the minimum requirement for the award of the Master of Science (M.Sc) in the Department of Economics, Faculty of the Social Sciences, University of Nigeria, Nsukka.

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DEDICATION

This work is dedicated to the Almighty God who has given me the strength to have this work accomplished. I also wish to dedicate this work to my beloved wife, Peace, and my children Walter, Mitchel and Benita.

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ABSTRACT

Income inequality is one of the major underdevelopment problems facing developing countries including Nigeria. Despite serious attention given to inequality in both theoretical and empirical literature, it is still understudied in the case of Nigeria because most empirical studies overaggregate analysis. This study departs from existing studies in two ways. First, the study disaggregates household consumption expenditure into food and nonfood and thus decomposes inequality into within-groups and between-groups components using generalised Entropy (GE) measures. The purpose is to ascertain where inequality in household consumption expenditure is coming from. Second, the study employs regression-based inequality decomposition to ascertain the determinants of inequality in food and nonfood expenditure using household demographic and socioeconomic characteristics as covariates. The data used in the analyses is the 2010 Harmonised Household Living Standards Survey for Nigeria. The results show that nonfood expenditure is the major source of inequality in household consumption expenditure in both urban and rural areas with inequality coefficients of above 0.6 compared to about 0.4 for food expenditure. The decompositions also show that within-group inequalities for nonfood and food expenditure are respectively 0.97 and 0.365 using the Theil index, while between-group inequalities for nonfood and food are respectively 0.016 and 0.035. Furthermore, the regression based inequality decompositions show that variables such as living in rural areas, household size, household dwelling and household dwelling characteristics account for the significant proportion of inequality in food and nonfood expenditure. The policy recommendation of this study, among others, is that policies should focus on addressing inequality within rural and urban areas especially with respect to nonfood expenditure than in inequality existing between urban and rural areas. Some of the nonfood expenditures that need to be paid attention to are expenditure in education, health, energy, accommodation, water and sanitation.

CHAPTER ONE

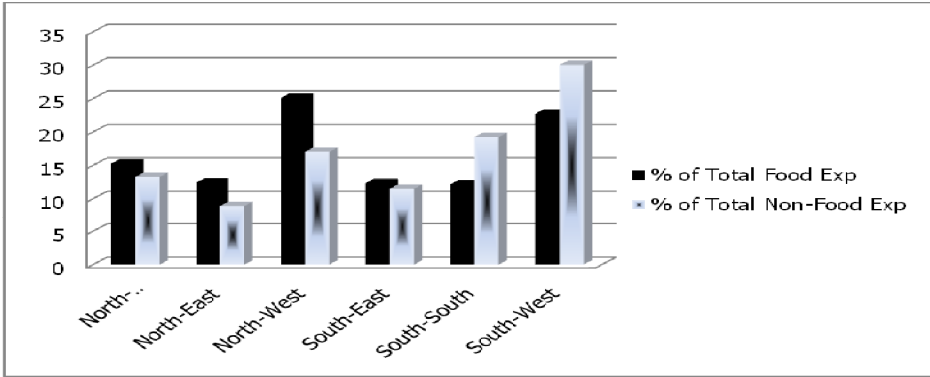
INTRODUCTION

1.1. Background of the Study

Household consumption expenditure is one of the important components of gross domestic product (GDP). On the average, consumption expenditure accounts for over 60 percent of the gross domestic product in all countries. When developing countries are singled out, consumption expenditure could account for as high as 68 percent to 70 percent of the GDP (Yakubu and Abbas, 2012).

Consumption expenditure is defined as the market prices of all goods and services purchased by households to satisfy their needs and wants. It includes all food and non-food expenditure. For a typical developing country such as Nigeria, households spend more than 60 percent on food items and about 40 percent on non-food items (which include education expenditure and medical expenditure) (Yakubu and Abbas, 2012).

Research by International Fund for Agricultural Development (IFAD) showed that inequality in household consumption expenditure is widespread and rising in both urban and rural areas in Nigeria (IFAD, 2007). Similarly, a report published by the National Bureau of Statistics (NBS) in 2012, revealed that inequality in household consumption expenditure varies greatly in the six geo-political zones of Nigeria. The report further showed that these variations are greatly influenced by the heterogeneity of zones in terms of prices, income, population, tastes and cultural factors. Bamidele, Abayomi, and Esther (2010) argue that demand pressure in different geo-political zones also helps to explain inequality differential. Figure 1 shows the average consumption expenditure in percentage terms for the six geo-political zones in Nigeria.



Source: NBS, 2012

Fig 1: Food and Non-food expenditure among Nigerian Geo-political Zones

The chart shows that household consumption expenditure for south-west zone has the highest proportion (29 percent) for non-food items, while the North-West zone has the highest (25 percent) for food items. The South-South and South-West zones consume more of non-food items while the rest of the zones have high dependence on food items. In general, South-South and South-West zones spend more of their income on non-food than food items, while the North-Central, North-East, North-West and South-East spend more on food than non-food items.

Awoniyi, Amos, and Omole (2011) also established that inequality in household consumption expenditure profile exists among the six zones in Nigeria. They showed that the mean index inequality in household consumption expenditure among zones in Nigeria is 0.4093. The highest is in the North-West zone with an index of 0.4305. Then the least is in the South-South zone with an index of 0.2233. Therefore, about 40 percent inequality in household consumption expenditure in Nigerian households is evident. This is even higher in the North-West zone with 43 percent inequality, and least in the South-South zone with approximately 22 percent inequality.

Often, this inequality in household consumption expenditure has been traced to the level of educational attainment since this characteristics of household heads has a way of improving living standard of individuals and households (Olaniyan and Awoyemi, 2006). However, considering the economic implication of income inequality and low per capita income in developing countries, the poverty consequences of changes in income distribution are likely to be significant (Fofack and Zeufak, 1999). This implies that if household consumption

expenditures are more on capital investments, it will go a long way to boost output. The outputs will create employment as well as boost economic activities that might stimulate investments such that the effect can reduce the widespread of inequality in household consumption expenditure.

However, Nigeria, as a typical developing country, exhibits several characteristics of other developing countries one of which is large household size. Other characteristics include: low wages, low employment rate, high dependency ratio, prevalence of subsistent agriculture, and high dependence on food consumption (FAO, 2013). This has reflected greater deprivation among different strata of consumers, which also accounts for the existing inequality in consumption expenditures among Nigerian households (Adekunle, Adegbite, & Fakayode, 2012). The focus of this study is to provide further evidence on inequality in Nigeria.

1.2. Statement of the Problem

High income inequality is one of the critical problems of development especially in developing countries such as Nigeria with high level of poverty and fluctuating economic growth. High inequality reduces the ability of economic growth to trickle down to substantial reduction in poverty (Bourguignon, 1979). Inequality appears to be widening in Nigeria over the past one and half decades following the rise of the political class and stagnant real sector that could help to share the benefits of growth to all population groups.

National Bureau of Statistics (NBS, 2012) reported that there exists huge inequality in household consumption expenditure in Nigeria. The report revealed some factors that contributed to inequality in household consumption expenditure in Nigeria. The factors: include inequalities in income, security and social amenities. The Nigerian economy is fraught with severe inequalities in household consumption expenditure. Consumption inequality has affected different characteristics of households especially in the areas of health, education and finance (Obaro and Vincent-Osaghae, 2006). Further evidence (Obaro and Vincent-Osaghae, 2006) shows that the 21st century growth in household consumption expenditure, unprecedented in its scale and diversity, is skewed in its distribution, leaving a backlog of shortfall and gaping inequalities while

expenditure per capita has increased steadily in industrial countries over the past 25 years. Some developing regions are far from catching-up, implying that consumption growth has been slow or even stagnant in such countries. It has been observed that the average African household today consumes 20 percent less than it did 25 years ago (Pradhan, 2011).

However, in a bid to militate the state of inequality in household consumption expenditure in Nigeria, some researchers like Ejieh (2009) and Suleiman (2009) suggest free compulsory education for the poor households as a basis for reducing inequality, extreme poverty, and hunger in Nigeria. They also suggest that government should devote greater assistance to households, particularly in the rural areas in terms of free acquisition of skills and training for self-entrepreneurship, subsidized prices on social amenities, and cost for acquisition of formal education. The study of personal consumption expenditure carried out by Nwabueze (2009) shows that government's efforts overtime to alleviate poverty have been slow and almost ineffective in improving the living conditions of the households irrespective of the ideas that justified those schemes. Nwabueze stated that there exists a wide economic inequality in food expenditure and non-food expenditure of households. The findings from Nwabueze show that the high level inequality is due to very few economic opportunities available to certain household groups to benefit from government established schemes. Nwabueze also stated that such scenario gave rise to greater percentage of households indulging in menial occupations like road-side automobile repairing, motor cycle taxing, and petty trading.

Several Economists have argued that inequality in household consumption expenditure is a huge burden on economic growth in Nigeria. Various political administrations in Nigeria have made efforts to reduce inequality by introducing different poverty alleviation schemes, targeted at reducing both poverty and inequality. The schemes include the Universal Basic Education (UBE), National Health Insurance Scheme (NHIS), Structural Adjustment Programme (SAP), National Poverty Eradication Programme (NAPEP) and recently, the establishment in 2012 of the subsidy Re-Investment and Empowerment Programme (SURE-P), Youwin, and so on. In spite of all these efforts by the Government to bridge the inequality in household consumption

expenditure, there are yet no appreciable positive impacts in the living conditions of the households in Nigeria (National Bureau of Statistics, 2012).

This study departs from previous studies that have been carried out on inequality in Nigeria. Many of such previous studies (Olaniyan and Awoyemi, (2006), Obaro and Vincent-Osaghae (2006), Ejieh (2009), Awoniyi, Amos, and Omole (2011), Eregha, Sede, Oziegbe, and Onotanigohwo 2012), among others) focused mainly on inequality distribution (especially on the components of inequalities among households). A few like Olaniyan and Awoyemi (2006) and Eregha *et al.*, (2012) had looked at inequality in households based on the aggregate consumption expenditure in Nigeria. This study is of the view that a study of inequalities in household consumption on the aggregate without looking at inequality from various components of consumption expenditure can not decisively reveal the specific situation and sources of inequality in Nigeria. Hence, this study contributes to literature by unraveling the extent of inequality in household consumption expenditure decomposition and the sources of inequality in consumption expenditure in Nigeria.

1.3 Research Questions

The study seeks to address the following questions:

- i How large is inequality in food expenditure of household groups in Nigeria?
- ii How large is inequality in non-food expenditure of household groups in Nigeria?
- iii What are the sources of inequality in food expenditure of household groups?
- iv What are the sources of inequality in non-food expenditure of household groups in Nigeria?

1.4 Objectives of the study

The broad objective of the study is to carry out a decomposition analysis of inequalities in household consumption expenditure in Nigeria. Specifically the study seeks to:

- i. Ascertain the extent of inequality in food expenditure among household groups in Nigeria;
- ii. Ascertain the extent of inequality in non-food expenditures among household groups in Nigeria;

- iii. Ascertain contributing sources of inequalities in food expenditures among household groups in Nigeria; and
- iv. Ascertain contributing sources of inequalities in non-food expenditures among household groups in Nigeria.

1.5 Research Hypotheses

In line with the objectives of this study, this study is guided by the following:

H₀₁: There is no significant difference in food expenditure inequality among household groups in Nigeria.

H₀₂: There is no significant difference in non-food expenditure inequality among household groups in Nigeria.

H₀₃: Household socio-economic and demographic factors do not significantly explain inequality in household food expenditure in Nigeria.

H₀₄: Household socio-economic and demographic factors do not significantly explain inequality in household non-food expenditure in Nigeria.

1.6 Significance of the study

It is obvious that certain policies could be drafted as a result of inequalities in household consumption expenditure in Nigeria economy. Such policies and the process of drafting them can benefit from this study for the purpose of enhancing economic growth. Therefore, the findings from this study would be very informative to specific policies that are meant to address inequality. The findings of this study would be resourceful for policy formulation towards alleviating poverty among household groups in Nigeria.

The results of this research would also be useful for policy makers working towards sustainable development in Nigeria in the process of trying to identify the variables affecting household consumption expenditure. One of the government policies in that regard is equal right of citizens

for education in Nigeria. To achieve and sustain such policy, government should subsidize the cost of education in order to make it affordable for an average Nigerian.

Apart from this study being useful to government, the following are other possible beneficiaries from the findings of this study: Non-Governmental Organizations (NGO) can use the findings of this study as the basis for conducting advocacy on the promotion of good health of the poor and the needy through the provision of health care for household. Some of the NGOs that may find the outcomes of this study to be of much direct relevance are Lift Above Poverty (LAPO), Grassroots Empowerment Network (GEN), and Total Health Organization (THO).

Researchers would also use the outcome of this study as the basis for conducting further research on inequality either in Nigeria or other countries outside Nigeria. Finally, business managers would find the outcome of this study useful in executing their social responsibilities.

1.7 Scope of the study

This study focuses on inequalities in household consumption expenditure mainly on expenditure inequalities on disaggregation into food and non-food expenditure. The data for the study which is cross sectional data survey was generated specifically from the 2008/2009 Harmonized Nigeria Living Standard Survey (HNLSS) conducted in 2010. The survey covers all 36 States of the Federation and the Federal Capital Territory (FCT). The units of interest to this study include sectors (urban and rural) and geo-political zones (South-South, South-West, South-East, North-Central, North-East and North-West). The core variables of interest for the conducting of investigation is household per capita expenditure in food and non-food, regionally harmonized both spatially and inter-temporally.

CHAPTER TWO

LITERATURE REVIEW

This chapter discusses the conceptual framework, reviews of different relevant theoretical and empirical literature. It also identified the limitations of previous studies with respect to inequalities in household consumption expenditure.

2.1 Review of Conceptual Literature

The Review of Conceptual Literature of this study focused on the following:

- Household Consumption Expenditure and
- Household Consumption Expenditure Inequality.

Household consumption expenditure can be described as the act of paying for use either food or non-food items by a household through money or in kind. It could also refer to the total monetary value of expenditure incurred by a household on domestic consumption which includes food and non-food items, (National Sample Survey Organisation, 2004). It is a measure of the total outlay of a household on its own consumption expenditure and on compulsory payments (International Labour Organization, 2003). It could also be conceptualised as the value of consumption goods and services used or paid for by a household to directly meet its needs. The goods and services meant can be obtained: through the purchase of goods and services in the market as in-kind income from employers, from self-employment (through the barter of goods and services produced by the household), or from property or other investments from the household's own production of goods and services; or as transfers in kind from other households, or from businesses (Organisation for Economic Co-operation and Development, 2013). Oldfield and Goodman (2004) defined household consumption expenditure as total household expenditure, including expenditure on durables and housing, but excluding any consumption in-kind such as home-grown food.

Pradhan (2011) described household consumption expenditure as dynamic in character both in food and non-food, and always subjected to change per time. Personal Consumption

Expenditures (PCE) as different from household consumption expenditure has to do with household final consumption expenditure. It is also the primary measure of consumer spending on goods and services in the Nigerian economy. It accounts for about two-thirds of domestic final spending, and thus it is the primary engine that drives future economic growth (Ellis, 2007). PCE shows how much of the income earned by households is being spent on current consumption as opposed to how much is being saved for future consumption. Sekhampu and Vaal (2013) assumed that individual household consumption expenditures are significantly influenced by certain variables such as household income, household size, the number of people employed and educational attainment by household heads. Such variables were found to exert a positive impact on household consumption expenditure.

This study adapts the conception of household consumption expenditure by Pradhan (2012) as something dynamic and always subject to changes. This is because the consumption expenditure of every household depends on the various factors that define household. The variations in consumption expenditure are therefore visible in different households as there exist difference in environmental, social, economic and cultural contexts (Ilmo, 2011). Hence, households get transformed as the society grows leading to substantial changes in the outlook of the people towards consumption expenditure on commodities.

Household consumption expenditure inequality has to do with the lack of equal consumption of goods and services among households. It can also be described as differences in households spending based on income, geographical location and household size. Olaniyan and Awoyemi (2005) defined household consumption expenditure inequality as deprivation of equal privilege of households to have or participate in certain social and economic rights such as education, security, infrastructure and many others. This implies that expenditure inequality tends to vary between households depending on the level of educational attainment, quantity, size, degree and social standing.

Household consumption expenditure inequality can be classified into three categories: the total consumption expenditures, current consumption expenditures, and total outlays (Johnson, 2004). The current consumption expenditures refers to the transaction costs, including excise and sales

taxes of goods and services. The total outlays, depicts the out-of-pocket expenditure outlays of consumers. It is the same to total expenditures with some modifications such as exclusion of purchase price of financed vehicles, inclusion of payments on principal loan amounts on all financed vehicles; payments to reduce the borrowed principal on home mortgages are also among. Household consumption expenditures also consist of the market prices of all goods and services purchased by households to satisfy their needs and wants which include all durable and nondurable goods. The durable goods include: cars, household washing machines, television. The nondurable goods include: vegetables, beans, rice, yam, etc. (Papsin and Hepsag, 2014).

By the definitions of household consumption expenditure from different scholars mentioned on the above, this study chooses to adapt the definition by Olaniyan and Awoyemi (2005) which holds that household consumption expenditure inequality is a deprivation of equal privilege of households to have or participate in certain social and economic rights. The definition by these scholars best captures the issues to be addressed in this study.

2.2. Theoretical Literature

This study looks at several theories to explain sources of inequality. This section of the study considered some of the theories and approaches that can be employed in any study on sources of inequality. The approaches include decomposable and non-decomposable approach. However, many theories have been developed to establish the complex and multi-dimensional nature of the problem of inequality among household consumption expenditure. The theories presented below explain some of the sources of inequalities in household consumption expenditure.

2.2.1 Social Segregation Theory

The social segregation theory as described by Koch and Valdes (2008) argues that inequality is a result of sociological features characterized as a form of social differentiation within households. The social differentiation expresses the distribution of the social structure in households. Koch and Valdes (2008) state that determinants of social segregation stem from three levels: (a) The collective level of social interaction; (b) and (c) The psychological processes that shape individual behavior.

The theory, as proposed by Koch and Valdes (2008), considers that it is necessary to reinforce social policies for different target groups and social classes according to their characteristics, needs and specific demands. Thus, policies should not only be directed to the poor, but to other segments of the population, considering the importance of the middle classes and processes of socio-economic fragmentation. The theory by Koch and Valdes (2008) established that social segregation and differentiation structured in household contributes immensely for inequality in household consumption expenditure. The theory targeted that needs and specific demands of household are directly influenced by established lifestyle and it is the contributor for inequality in household consumption expenditure.

2.2.2 Political Theory

Political regime has been found as a possible source of inequality in some analyses. The political theory as proposed by Hsu (2008) states that the nature of political regimes has been investigated as a source of inequality. The theory states that regular changes in political regimes and policies are some of the sources of inequality. In addition, there can be short-term shifts in the levels of inequality in a democratic regime with changing governments and policies. The theory by Hsu (2008) was trying to show that changes in political reforms in government takes a negative dimension in household consumption patterns. The theory established that political stability in government closes the gap between household consumption expenditure for the poor and non-poor. However, the theory as proposed by Hsu (2008) shows that when there is political instability, the inequality in household consumption expenditure will intend to increase. Therefore, government policies and reforms have a way to contribute to inequality in household consumption expenditure.

2.2.3 Globalization Theory

Benar (2007) has advanced a theory called globalization theoretical approach for determining the sources of inequality. According to the theory, global integration can be a source of inequality when it alters the trends in income distribution through trade, structural adjustment and opening to external influences. This theoretical approach adopted Gini coefficients as measures of

inequality and applied two indicators for globalization, namely the ratio of trade interrelations (total exports and imports) to GDP, and the foreign direct investment (FDI) as a percentage of GDP. The theory view inequality in household consumption expenditure as function of interruption from trade interrelations and foreign direct investment. According to Benar (2007) trade interrelations is defined as market exchange earnings from total exports and imports. According to the theory, the loss or interruption of foreign direct investment (FDI) from developed countries increase inequality in household consumption expenditure.

2.2.4 Human Capital Theory

Human capital theory was propounded by Becker (1962).The theory focused on the source of inequality on the bases of knowledge and skills of household. The theory analyses the process of skill formation from two different perspectives: (a) individual's educational choices and (b) individual backgrounds and characteristics. With regard to the first, the theory takes into account the individual educational choices, based on a constrained maximization process. According to the theory, individuals invest in years of education for as many years so that the return to this investment is greater than the one of any alternative financial investments. This is based on the idea that the earning profile of a worker depends on the amount of this investment, whose level is substantially affected by two factors: the individual ability, and background characteristics such as gender, parental background and income. With regard to the second perspective, the theory takes into account that inequality depends on both background and individual characteristics. In the analysis of training activity in firms, inequality results from the decisions taken both by employers and employees. The theory as propounded by Becker believe that human capital enhances growth process through abilities, skills and knowledge. Developing countries like Nigeria have not come to terms with the necessity of human capital and are likely to have shortage of stock of human capital. The returns on shortage of human capital include low income, low level of output and poor maximization and utilization of resources. These returns contribute to inequality in household consumption expenditure.

2.3 Empirical Literature

This section is a review of empirical studies that are related to inequality in household consumption expenditures from both Nigeria and outside Nigeria.

2.3.1 Studies from outside Nigeria

Pavithra, Basavaraja, Kiresur, Mahajansbetty and Mageri (2009) carried out a study on inequality in household consumption expenditure with focus to analyze the changes in the pattern of food consumption in 1993-94 and 2004-05 in India using percentage calculation. The study was decomposed into urban and rural sector. The findings of Pavithra *et al.* (2009) revealed as follows: decline in the monthly per capita expenditure (MPCE) for food consumption in rural and urban areas but more in the rural areas. The monthly per capita consumption of pulses was almost stable over the periods in rural and urban areas. The monthly per capita expenditure (MPCE) on food was less during 1993-94 in rural areas while it increased during 2004-05. The expenditure elasticity for all food groups were less than unity in urban areas with the highest value. The study by Pavithra *et al.* was similar to the current study because both of them conducted a study on food consumption and its decomposition into urban and rural areas. However, while Pavithra *et al.* study was limited to food consumption pattern of urban and rural areas in India, the current study is broader with its focus on food and non-food consumption expenditure in Nigeria.

In London, Fernandez *et al.* (2007) carried out a study on inequality in household consumption expenditure for the purpose of investigating the factors linked to the inequalities in local provision both consumption expenditure on food and non-food. The study plotted life cycle profiles of total expenditure for food and non-food consumption expenditure, controlling for group and time effects. The study also provided special emphasis on the comparison of different approaches to control for changes in demographics over the life cycle. They posit that there exists negative relationship between rural and urban areas in terms of household consumption expenditure. Another findings of their study showed that there exist significant changes over the life cycle for total non-durable, and durable expenditure. The findings of their study revealed similar results with the study by Pavithra *et al.* (2009) in respect of decline in consumption in

both urban and rural areas. The above study by Fernandez *et al.* is similar to the current study because both of them paid special attention on food and non-food consumption expenditure. However, while Fernandez *et al.* study on food and non-food consumption expenditure were carried out in London, the current study on food and non-food consumption expenditure were conducted in Nigeria.

Another country specific study was carried out by Kumar and Agawam (2003) for India. The study was conducted in 2001 on household expenditure inequality with focus to determine its extent in India. The study was on the basis of the National Sample Survey (NSS), Market Information Survey of Households (MISH), and the National Accounts Statistics (NAS). The interesting feature of these studies is that they include every item of population with an equal chance to avoid personal bias using a simple random sampling techniques. The findings of study revealed as follows: low level of education of the migrants, gender disparity in economic status, significant number of households below the poverty line. The households in India made an average expenditure on food from their income due to high inequality. The above study by Kumar Agawam (2003) is similar to the current study because both of them conducted a study on household expenditure inequality. However, while Kumar and Agawam were limited to household expenditure inequality in aggregation, the current study focuses the household expenditure inequality in disaggregation.

Gangopadhyay and Wadhwa (2004) carried out a study on inequality in household consumption expenditure in India. The study focuses on household behavioural consumption survey to investigate the empirical distribution of per capita total consumption expenditure (PCTE) in food and non-food expenditure for each of the four years 1983, 1987-88, 1993-94 and 1999-2000 in India with the use of secondary data sourced from the National Sample Survey (NSS). The study employed the proportion of per capita expenditure on major items of expenditure, by sector and state for each of the years to examine the changing pattern of household consumption expenditure in India. The findings of the study revealed as follows: That the general growth in household expenditure is sufficient to reduce poverty which implies that poverty incidence has been improving over time. That inadequate supply of social services contributes to inequality in

household consumption expenditure. They concluded that the general growth in expenditure is sufficient to rid societies of poverty. The study by Gangopadhyay and Wadhwa (2004) is similar to this current study because the two studies conducted a research on household consumption expenditure in both food and non-food. The current study deviated from the above study on the location of the study which is London while the current study is in Nigeria.

Jacoby and Skoufia (1998) carried out a study on inequality in household consumption with its focus on behavior in the rural areas of India using information on aggregate shock to reflect households with respect to anticipated and unanticipated seasonal income fluctuations from 1975 to 1984. The study employed a stratified random sample of 40 households for the analysis. The study did not capture any evidence against the households' smooth idiosyncratic fluctuations in their income. Their approach uncovered several interesting features of rural credit and insurance markets. The findings revealed that households are largely vulnerable to aggregate risk, in that the magnitude of their seasonal consumption changes varies significantly from year to year. The above study has no similarity to the current study. The above study is limited to household consumption expenditure and employed stratified random sample for the analysis. The current study carried out the broader study with its focus household consumption expenditure on disaggregation using Theil Index model.

Celinkutty and Joseph (2003) carried out a study on inequality in household consumption expenditure with its focus to analyze the variations in expenditure of households total expenditure in India. The study employed a multi-stage sampling procedure for selecting the sample units. A sample size of 100 households were selected from a total population of 200 households. The study introduced some factors to examine the consumption patterns such as monthly per capita consumption expenditure, consumption expenditure elasticity of items, variations in expenditure of households on food, non-food and total expenditure, among households. Other factors considered were the consumption expenditure and their variables such as income, education, occupation and area of residence. The study revealed that the various levels of living in India are far below expectations and that a very large percentage of the Indians belong to the lower income groups as a result of their very low economic status. The above study

by Celinkutty and Joseph (2003) employed non decomposable approach to which is multi-stage sampling procedure to analyse the effect of inequality in household consumption expenditure in India. The current study employed decomposable approach called Theil index to analyse the inequality in household consumption expenditure into within-group and between-group components.

Jones and Martin (1997) conducted a study on inequality in household consumption expenditure with focus to analyse the Family Expenditure Survey (FES) and patterns of consumption that are affected by changes in economic status and domestic responsibility, as young people become independent of their parents and set up homes of their own. The study selected 16-25 year-olds which took a wider perspective on spending and placed it in the domestic context of young people's lives based on the household expenditure survey annual data for over 2000 young people aged 16 to 25 years for three years data set from 1992, 1987 and 1982 to examine the ways in which patterns of spending have changed over the decade. The findings of the study revealed that young males spent more outside their household on food consumption expenditure while females also spent as well but not as much as males. The above study by Jones and Martin (1997) is similar to the current study because both undertook study on household expenditure. The above study focuses on non decomposable survey analysis to determine the food consumption expenditure status of young people. But the current study is specifically on food and non-food consumption expenditure for entire households.

Subramanian and Deaton (1991) carried out a study on inequality in household consumption expenditure with focus to examine the role of gender in explaining consumption expenditure patterns for food and non-food items using the household expenditure data from the National Sample Survey (NSS) in India. The study employed Ordinary Least Squares, a set of Engel curves containing a range of household demographic variables to test for the effects of gender pattern of household consumption expenditure. The results of the study revealed an increase of food consumption expenditure for adult men and women. They further found evidence to support the claim that the poor levels of living of the Indians were for low per capita consumption expenditure while high proportion of persons below poverty line and expenses like medicals and

education are regarded as luxury goods. Looking at the study by Subramanian and Deaton (1991) is similar to the current study because the two studies carried out paid attention on household consumption expenditure for food and non-food. However, while Subramanian and Deaton study employed Ordinary Least Squares to test the effects of gender pattern of household consumption expenditure in india, the current study employed regression-based analysis to determine the sources of inequality in household consumption expenditure.

Ravallion (1990) carried out a study on inequality in consumption expenditure of household in Bangladesh to determine the effect on prices of food when it increases or shifts the budget constraints with, particular focus on rural welfare using estimation from 1978-1979 household income-expenditure survey. The study revealed that increase in the budget constraints with respect to rural welfare is more contagious and mean share of wages in income for the poorest of rural households varies and it depends according to the household income. The above study by Ravallion (1990) is related to the current study because both of them conducted a study on food consumption expenditure. However, while Ravallion study was limited to food consumption expenditure using household income as a measure of welfare, the current study is broader with its focus on food and non-food consumption expenditure using household expenditure as a measure of welfare.

Jackson (1988) also carried out a study on inequality in household consumption expenditure with its focus to find the elasticity of food consumption expenditure pattern of children aged from 0 to 36 months among the urban and rural households at Notting Hill Carnival in London. The study adopted double log model to estimate the elasticity as well as stratified random sampling technique to select 301 households. The findings showed that expenditure elasticity for food were more in the urban areas than the rural areas. The study also revealed that the food consumption expenditures in urban areas had the highest elasticity in the bottom income quartile, while the consumption expenditure for animal products had the highest elasticity in the bottom income quartile. However, for the rural areas, self-provisioning was most elastic among the highest elasticity in the top quartile. The above study by Jackson is similar to the current study because both of them paid considerable attention on food consumption expenditure. However,

while Jackson's study was limited to food consumption expenditure pattern of children, the current study is detailed with its focus on food consumption, non-food consumption, and entire households.

Greeley (1994) carried out a study on inequality in household consumption expenditure for the purpose of examining poverty based on house budget shares for four groups of commodities and household demographic attributes in South Africa. Inequality in household expenditure on consumption per adult was considered in the study as a measure of individual welfare. The study employed poverty indices to examine poverty gap and social ability in order to eliminate poverty by income transfers and inequality among the poor. The study employed headcount ratio to ascertain if poverty was a major factor affecting human development. The findings revealed that poor human development causes persistent poverty as well as a contributor to inequality in household consumption expenditure. The study by Greeley (1994) is similar to this study because both of them conducted a study concerning inequality in household consumption expenditure. However, while Greeley's study was to determine the effect of poor human development to inequality in household consumption expenditure, the current study is focusing on decomposition analysis of inequality in household consumption expenditure.

Kakwani and Pernia (2000) conducted a study on inequality in household consumption expenditure for the purpose of cross-country on growth, inequality and poverty in Thailand, Korea and Lao PDR. The poverty incidence was decomposed into two components with respect to inequalities in household consumption expenditure. The decompositions are changes explained by changes in household mean consumption expenditure levels of households and changes arising from changing household consumption expenditure distribution with mean consumption kept constant in 1992-1993 to 1997-1998. The study employed Gini index and Lorenz curve for the analysis. The findings reveal that changes in poverty incidence are predominantly due to changes in mean expenditure of households. Their study also reveal that economic growth, both mean and redistribution effects combined together will go a long way to reduce poverty. However, the mean effect dominated the redistribution effect. The above study by Kakwani and Pernia (2000) is the same with this study because both of them concentrated

their attention on decomposition analysis of inequality in household consumption expenditure using Gini index and Lorenz curve for the analysis. However, while study of Kakwani and Pernia specific objective was on growth, inequality and poverty, the current study focuses on food consumption expenditure, non-food consumption expenditure, and entire households.

Elsenburg (2003) carried out a research on inequality in household consumption expenditure with its focus to determine the categories of household that are fully dependent on non-food expenditure. The study categories in question are poor and non-poor household for the purpose of reducing inequality among the poor and non-poor. The study is in line with Engel's law as propounded by Malan (1998). The study found that the expenditure pattern of household for the non-poor is greater on non-consumable goods. Households for the non-poor spend a smaller proportion of their budgets on necessities such as food and a larger proportion on luxuries such as recreational goods. The study also revealed that a given household becomes better off, if it spends a smaller proportion of its budget on necessities such as food and a larger proportion on luxuries such as recreational goods. The above study conducted by Elsenburg (2003) is similar to this current study because both of them paid full attention on non-food consumption expenditure. However, while Elsenburg's study was on non-food expenditure with respect to poor and non-poor household, this current study is broader with focus on food and non-food consumption expenditure with respect to households in aggregation.

Ortiz *et al.* (2011) carried out a study on inequality in household consumption expenditure for the purpose of determining the behavioural consumption expenditure for poor and non-poor in New York. The study employed Lorenz Curve for comparing the three periods of 2005-2007 (pre-crisis), 2008-2009 (crisis phase I: fiscal expansion) and 2010-2012 (crisis phase II: fiscal contraction). The findings reveal that the consumption expenditure of a household tends to become diversified in such a way that expenditure tends to be more evenly distributed across different expenditure categories, and that there exists a convergence in the level of diversity in the expenditure patterns of non-poor household and poor households. The findings also showed that the level of diversity of expenditure in poor households has increased over time and approached the same level observed in non-poor households. The study conducted by Ortiz *et*

al.(2011) is synonymous with the current study. This is because the study by Ortiz *et al.* both of them conducted a study on household consumption expenditure and also adopted Lorenz curve to explain the inequality across different quintiles. However, while Ortiz *et al.* study was disintegrated into poor and non-poor in New York, the current study focuses on aggregation of poor and non-poor which is the entire households.

Fambon (2009) carried out a study on inequality in household consumption expenditure with its focus to investigate the effect of educational level and gender on average consumption expenditure of household heads for the poor and non-poor in Cameroun. The study employed the Lorenz curves, the Gini coefficient and two entropy measures of inequality to verify the average expenditure of household heads with different levels of education. The findings reveal that the household average expenditure for the non-poor as well as non-educated is approximately four times higher than the poor household. The findings of the study strongly suggest that the educational systems of developing countries may be among the causes of the increase in the level of inequality since the opportunity costs of elementary education are usually higher for pupils of poor household than for the non-poor household. The study by Fambon (2009) which was conducted in cameroun is similar to this current study because both of them carried out a study on household consumption expenditure, employed the Lorenz curves, Gini coefficient, and entropy measures of inequality. However, while Fambon's study was on the impact of educational level and gender on average consumption expenditure of house heads with respect to poor and non-poor, this study is not specific on categories of households to determine the inequality in household consumption expenditure.

Gregg, Waldfogel, and Washbrook (2005) conducted a research on inequality in household consumption expenditure specifically to determine the relationship between consumption expenditure for poor households and non-poor households with respect to their children. The study indicated that poor households increased their spending on children's items during the period. The study also revealed that poor households with youngest children aged from zero to ten years are spending a greater average of their income on non-food items such as clothing and footwear and least of their income on books, magazines and newspapers. These results suggest

that as incomes were increasing for poor households with children, these gains were being spent on items for children, in particular, clothing, footwear, holidays, and books. The above study which was conducted by Gregg, Waldfogel, and Washbrook in 2005 shows an evidence of similarity to the current study. Both study paid considerable attention on household consumption expenditure. However, while the study of Gregg, Waldfogel, and Washbrook was on disaggregation of household consumption expenditure into poor and non-poor, the current study is on disaggregation of household consumption expenditure into food and non-food.

Kakwani (1990) carried out a study on inequality in household consumption expenditure with its focus to examine the relationship between economic growth and poverty. The study also focused on the impact of changes in average household expenditure and expenditure inequality on poverty. A decomposition analysis called axiomatic approach was used to conduct analysis between macro-economic adjustment policies and poverty, which was discussed in the context of the adjustment experience. The findings reveal that poverty has a negative relationship with economic growth. This implies among other things, that increase in poverty affects economic growth negatively. The study by Kakwani in 1990 is similar to the current study because both of them conducted a decomposition analysis. However, while Kakwani's study was to determine the impact of changes of economic growth and poverty in household expenditure using axiomatic approach, the current study focuses on analysis of household consumption expenditure using Theil index approach to conduct the analysis.

Baye (2005) carried out a study on inequality in household consumption expenditure with its focus to investigate contributory factors to changes in poverty level in Cameroun and concomitant effects on aggregate household consumption expenditure. The study was to decompose the changes to mobility and sector-specific effects between 1984-1996. The study employed Shapley Value for assigning entitlements in distributive analysis to assess within and between sector contributions to changes in poverty levels. The investigation was carried out for the period of twelve years between 1984 and 1996. The findings revealed that within sector effects disproportionately accounted for increase in poverty, but the between-sector-contributions in both rural and semi-urban areas increased poverty. The above study in cameroun by Baye

(2005) is the same with this study because both of them employed decomposable approach to analyse household consumption expenditure. However, Baye's study was concisely on aggregate household consumption expenditure with the use of Shapley Value method. The area of interest in the current study is to disaggregate household consumption expenditure.

Kalwij and Verschoor (2005) carried out a study on inequality in household consumption expenditure for the purpose of determining the impact of globalization on poverty by quantifying explicitly the responsiveness of poverty to aggregate changes in household expenditure patterns in six developing regions between the period from 1980 to 98. The Shapley method was used for the study. The findings revealed that differential household expenditure accounts for most of the diversity in poverty trends, both across regions and over time, but leaves a substantial amount of variation unexplained. Besides, the impact of changes such as income, household sizes inequality is relatively small. The study Kalwij and Verschoor is similar to the current study because both of them selected income and household size as a factor that is militating inequality. However, the above study concentrated on aggregate changes in household expenditure. The current study is on disaggregation of household expenditure into food and non-food.

Celestin and Clovis (2012) carried out a study on inequality in household consumption expenditure with focus to explain the evolution of inequality of consumption expenditures of households in Malaysia which focused on expenditure on food and source of income inequality. They used the Shapley-Shorrocks decomposition of inequality by subgroups and sources of income and expenses. The findings of the study showed that the expenditure on food and housing explains inequality by sources, while the expenditure distribution is much more unequal in households headed by a man in urban areas whose ages are between 31 and 50 regarding the decomposition subgroup. The above study which was conducted in Malaysia by Celestin and Clovis is similar to the current study specifically on household expenditure on food and source of inequality. However, while the above study by Celestin and Clovis was limited to income as a measure of welfare, the current study make use of per capita expenditure of households.

Pieters (2012) carried out a study on inequality in household consumption expenditure specifically to examine the relationship between education and household inequality dynamics

from 1993-2004. A micro-econometric decomposition of inequality was used for the analysis. The study revealed that there exist some distributive effects of changes in return to education, changes in educational attainment and the indirect effect of the latter on fertility. The findings also revealed that changes in the return to education of household heads reduced rural and urban household expenditure inequality. The above study by Pieters that was conducted in 2012 is similar to the current study because both of them paid especial attention on decomposition analysis of inequality in household consumption expenditure. However, while Pieters's study was limited to one variable, education to determine its impact in household consumption expenditure, the current study is broader with its focus on many variables of non-food consumption expenditure.

Akita, Lukman, and Yamada (1999) carried out a study on inequality in household consumption expenditure for the purpose of providing an update on household expenditure inequality and to investigate its determining factors and forces. The study employed Theil decomposition technique using household expenditure cross sectional data of 1987, 1990, and 1993. One of the results revealed that inter provincial inequality has not been a major factor in overall national inequality as it contributed 17.618 per cent to total inequality. Another important result also revealed that education is an important determinant of expenditure inequality as the between-education component accounted for 30.633 percent of total inequality. A further analysis still revealed that mean expenditure for households with university education is 5 and 3.5 times larger than those with no formal education and those with elementary education, respectively. The above study conducted by Akita, Lukman, and Yamada is similar to the current study because both of them paid considerable interest on Theil decomposition technique using household expenditure approach. However, while the study by Akita, Lukman, and Yamada was to investigate the determining factors of inequality in household expenditure, the current study is looking at the sources of inequality in household consumption expenditure.

Ofwona (2013) carried out a study on inequality in household consumption expenditure with its focus to investigate the consumption function for households in Kenya, from the period 1992 to 2011, using Keynes's Absolute Income Hypothesis (AIH). In the study, the relation between

total household consumption expenditure and total income were analyzed. The study revealed that with the method of ordinary least square, consumption is determined by income in Kenya in accordance with AIH. The above study by Ofwona in Kenya is similar to this study because both of them conducted a general study on consumption with respect to households. However, while Ofwona's study of household consumption is a function of income, the current study is paid considerable attention on household expenditure as measure for consumption expenditure.

Mishra (2011) carried out a study on inequality in household consumption expenditure to investigate the relationship between real consumption expenditure and economic growth in India for the years of 1950-51 to 2008-09. The co-integration test and the vector error correction regression were used to analyse the data. Results indicated that there is a long-run equilibrium relationship among the variables, the real consumption expenditure and economic growth. According to the results of causality test in the error correction model, there is a unidirectional causal relationship from real private consumption expenditure to economic growth in the long-run. The study in the short-run applied Granger causality test, and the findings indicated that there exists no causality between real consumption expenditure and economic growth. The above study by Mishra is similar to the current study on the basis of consumption expenditure. However, while Mishra's study was limited to specific models such as co-integration test and Granger causality test for the analysis, the current study is focusing on Gini coefficient and Theil index as approach for the analysis.

Andrew and Sarmistha, (2015) conducted a study on inequality in household consumption expenditure for the purpose of examining the relationship between average household living standard and inequality in Cameroun by using annual time series data. The study employed also causality test to investigate the relationship between household consumption and subsequent inequality on the one hand and initial inequality and subsequent consumption on the other. The findings of the study revealed that the lower inequality has generally been associated with higher future consumption levels, but urban sectors of some state's consumption are positively correlated with subsequent inequality. The study by Andrew and Sarmistha conducted in Cameroun is similar to this study. Both of them emphasize on consumption expenditure

inequality with respect to household. However, while the study by Andrew and Sarmistha was making use of time series data, the current study has its focus on panel data.

Sakib (2011) carried out a study on inequality in household consumption expenditure with its focus to investigate the causal relationship between household consumption expenditure and economic growth in Bangladesh using annual data from 1976-2009. The method used in the study was Johansen and ARDL co-integration test. The results revealed forth that there is co-integration between consumption expenditure and economic growth in the long-run. Granger causality test used in the study revealed a long-run unidirectional causal relationship running from economic growth to consumption expenditure. The above study by Sakib in 2011 is similar to the current study because both has a especial interest on household consumption expenditure. However, while Sakib's study was limited on non-decomposable approach, the current study adopted a decomposable approach into within-group and between-group components for the analysis of household consumption expenditure.

Tapsin and Hepsag (2014) carried out a study on inequality in household consumption expenditure for the purpose of examining income with special attention on EA-18 regional countries. The countries include: Austria, Belgium, Cyprus, Estonia, French, Finland, Germany, Latvia, Luxemburg, Portuguese, Malta, Holland, Slovakia, Ireland, Greece, Netherland, Italy and Spain. The study employed panel data for both the section and time series. The study also added the unit variety to the model that consists of income variable of annual observation for the period of 2000-2001. The result revealed that one unit increase in GDP will also increase the household consumption expenditure by approximately more than half. The above study by Tapsin and Hepsag is similar to the current study because both of them employed panel data. However, while this current study is limited to panel data for the analysis of household consumption expenditure, the study by Tapsin and Hepsag was specifically with its focus on time series data for the analysis of household consumption expenditure.

2.3.2 Studies on Nigeria

Below are some empirical studies on inequalities in household consumption expenditure in Nigeria.

Babatunde (2008) thematically conducted a study on inequality in household consumption expenditure to analyze the income with respect to the farmers in rural Nigeria using Gini coefficient. The farmers involved were classified into agricultural wage, non-agricultural wage, self-employed, remittances and other income such as pension and capital income components. The results of study revealed that there are differences in income inequality among households. Some of the components showed decrease income inequality such as remittances, pension and capital income while agricultural wage, non-agricultural wage and self-employed components showed income increase inequality. The other findings of the study also revealed that income which is not from farming contributes the highest total income inequality in household consumption expenditure. The above study by Babatunde conducted in Nigeria which is inequality with its focus on households as well as the use of Gini coefficient is similar to the current study. However, while Babatunde's study in 2008 was on income inequality in household consumption in rural Nigeria, the current study is broader with its focus on inequality in household consumption expenditure both in rural and urban areas.

Osahon and Osarobo (2011) carried out a study on inequality in household consumption expenditure for the purpose of investigating relationship between poverty, income distribution and the growth of the Nigerian economy. The study employed co-integration technique to test for the unit root and the error correction mechanism (ECM). The Real Gross Domestic Product (RGDP) was used as dependent variable while the Private Consumption Expenditure, Per Capita Income, Registered Unemployment, and Government Expenditure on Health and Education were used as independent variables. The findings showed a negative relationship of poor sustainable improvements in the economy as a result of deprivation on non-food consumption such as education, health, transportation and financial services. The above study by Osahon and Osarobo is similar to the current study. Both studies investigated household consumption on non-food. However, while study of Osahon and Osarobo adopted regression

analysis to explore the impact of non-food in Real Gross Domestic Product, the current study adopted a decomposition technique to analyse the study of inequality in household consumption expenditure.

A study carried out by Adigun, Awoyemi, and Omonona (2011) focused on inequality in household expenditure with emphasis on the dimensions for the reduction of poverty. The study projected that for the achievement of poverty reduction, both economic growth and equity should be considered as basic to combat poverty. This background motivated them to analyze income growth and inequality elasticities of poverty in Nigeria. They employed secondary data generated in the National Consumer Survey of 1996 and 2003/2004 on Nigeria Living Standard Survey. The study employed mean per capita expenditure to measure the economic growth, ratio estimates of Economic Growth and Inequality elasticities of poverty. The findings of the study revealed that the growth elasticity of poverty is inversely proportional to the income growth. This implies that poverty reduction is mainly accelerated by economic growth, redistribution and reductions in inequality. The above study by Adigun, Awoyemi, and Omonona is the same with current study. Both studies emphasized on inequality in household expenditure and application of mean per capita expenditure to measure the inequality. However, while the study by Adigun, Awoyemi, and Omonona was limited to inequality elasticities of poverty, the current study is different with its focus on sources of inequality in the entire households.

Alimi (2013) carried out a study on inequality in household consumption expenditure with its focus to investigate the relationship between consumption expenditure and income in Nigeria using to Keynes's Absolute Income Hypothesis (AIH). The model was tested by ordinary least squares for the period of 1970-2011. In the study, marginal propensity to consume (MPC) and average propensity to consume (APC) were estimated both in the short and long run. Results showed that as income increased, the average propensity to consume is reduced as Keynes indicated. But in the long-run, although MPC is less than one, it is not stable. The study by Alimi in 2013 is similar to the current study because both of them investigated consumption expenditure. However, while Alimi's study was purely on regression analysis, the current study is narrow with its focus on decomposition technique.

Oluwatayo (2008) had carried out a study on inequalities in household consumption expenditure with its focus on welfare status in rural and urban areas. The study focused on analyzing inequality and welfare status for rural households. Data for the study were generated from a random sample of two hundred and twenty (240) households. The analytical techniques employed for the study were descriptive statistics, regression analysis, Lorenz curve and Gini coefficient. The Lorenz curve and Gini coefficient were used to explain household distribution income as well as estimate the level of inequality in household expenditure in Nigeria. The study employed regression analysis to examine the determinants of households expenditure on food and non-food items (proxy for welfare). The findings of the regression analysis revealed that income and household size were positively related to the welfare status of the household expenditure. The study carried out by Oluwatayo in 2008 is similar to this current study in the sense that both studies analysed inequalities in household consumption with respect to rural area. Another similarity to the current study by Oluwatayo was the use of Gini coefficient and Lorenz curve to explain the inequality of household consumption expenditure. However, while Oluwatayo's study was limited to regression analysis with its focus on determinants of households expenditure, the current study is specific in decomposition analysis of inequality in household consumption expenditure into within-group and between-group components.

Oyekale, Adeoti, and Ogunnupe (2004) conducted a study on inequality in household consumption expenditure to determine household source of income with focus on rural and urban areas. This study was meant to estimate the level of income inequality in household using the data from National Integrated Households Survey collected by the Federal Office of Statistics (FOS) in 2003. The study employed mean, standard deviation, and coefficient of variation to describe the household income distributions. The measure of income inequality adopted in this study was Gini coefficient. The income sources were decomposed into agricultural, livestock, rental, transfer, and non-farm incomes, using the Coefficient of variation and Gini coefficient. The measure of welfare which was per capita income was derived through an Ordinary Least Squares (OLS) regression. The study showed that income inequality is detrimental both in economic growth and development. The above study by Oyekale, Adeoti, and Ogunnupe carried out in 2004 is similar to the current study because both of them paid considerable attention on

causes of inequality with respect to urban and rural areas. However, while the study by Oyekale, Adeoti, and Ogunnupe employed the following model techniques: Coefficient of variation, Gini coefficient, mean, standard deviation, and coefficient of variation, the current study is different by employing Theil index, Regression-Based analysis, and Shorrocks model for the analysis.

Agwu, Ellah, and Iwuchukwu (2009) carried out a study on inequality in household consumption expenditure to determine consumption patterns and intra-household with its focus on the Northern Agricultural Zone of Benue State, Nigeria. The study used a structured interview schedule to collect data from a sample of 80 randomly selected respondents from ten extension blocks. The study revealed that one of the most serious factors that lead to inequalities in household consumption expenditure was lack of finance. The above study as presented by Agwu, Ellah, and Iwuchukwu is similar to the current study because both of them carried out a study on inequality in household consumption expenditure. However, while the study of Agwu, Ellah, and Iwuchukwu was centred to inequality in household consumption expenditure Northern Agricultural Zone of Benue State, the current study is specific with focus on inequality in household consumption in the entire Nigeria.

Olaniyan, Olenrewaju, and Bankole, (2005) studied the inequalities in household consumption expenditure in Nigeria. More specifically, the study paid attention on the role of household endowments in determining poverty in Nigeria. Merged data from the 1996 General Household Survey (GHS) and the National Consumer Survey (NCS) were used to study the effect of human capital and capabilities on rural poverty in Nigeria. The study employed a two-stage stratified sample design plus probit model to determine the probability of being poor as a result of a unit change in a variable. The findings of the study indicated that education reduces the probability of being poor in a household. Coming from the marginal effects, the largest impact was for those who have up to a post-secondary education, which is followed by those with primary education. Human capital was revealed to have a decreasing effect on the probability of being poor among all rural households. The marginal effects indicated that the coefficients were significant both in magnitude and sign (positive or negative). However, while study by Olaniyan, Olenrewaju, and Bankole paid attention on the role of household endowments in determining poverty in Nigeria

wit its focus on human capital, the current study is on the source of inequality in household consumption expenditure.

Olaniyan (2000) examined inequalities in household consumption expenditure with special focus on how household endowments determine poverty in Nigeria. The National Consumer Survey data sets of 1985, 1992, and 1996 of the Federal Office of Statistics (now National Bureau of Statistics) were used for the study. The surveys served as representative samples of Nigerian households, with both 1985 and 1992 surveys having a sample of about 10,000 households each and the 1996 survey having an increased sample of 14,600 households from all the Nigerian states. The findings of the study revealed that human capital endowments were significant determinants of the probability of a rural household being poor. The above study by Olaniyan conducted a study to examine inequality in household consumption expenditure with a special focus on data sets from National Consumer Survey while the current study has a specific focus on data sets from Nigeria Living Standard Survey.

Oni and Yusuf (2007) studied inequality in household consumption expenditure for the purpose of ascertaining the determinants of expected poverty among rural households in Nigeria using three stage Feasible Generalized Least Squares (FGLS). Data for the study were from the merged General Household Survey (GHS) and the National Consumer Survey (NCS) of 1996. They adopted augmented co-integration with certain covariate factors using cross-sectional data. The study found out that both idiosyncratic and covariate factors affected the expected log per-capita consumption of rural Nigerians. The study further revealed that poor households have lower mean per capita consumption compared with non-poor households. The above study conducted by Oni and Yusuf is the same with current study. Both studies employed cross-sectional data. The study by Oni and Yusuf merged two data survey, GHS and NCS while the current study adopted one data set, Nigeria Living Standard Survey (NLSS)

Omonona (2009) carried out a study on inequality in household consumption expenditure with focus on quantitative analysis of rural poverty in Nigeria. The study employed simple Ordinary Least Squares (OLS) as against the dependent variable models (probit, logit and Tobit). The study revealed that poverty levels were inversely related to the level of formal education. Using

analytical measurement, Omonona (2009) indicated that the higher the household size, the worse the poverty becomes because inequality among households depends on household size. The above study is similar to the current study because both of them focus attention on inequality in household consumption expenditures in Nigeria. However, the current study has a specific focus on decomposition technique of inequality in household consumption expenditure. The study by Omonona was on non decomposable technique.

Alayande and Alayande (2004) conducted a study on inequalities in household consumption expenditure in Nigeria with focus on empirical assessment of vulnerability in rural and urban areas. They found that most cases of poverty and vulnerability arise as a result of chronic rather than transient conditions in Nigeria. The results also revealed that about 68 percent of the Nigerian population is poor, the majority of these (about 61 percent) are chronically poor (41.2 percent of the population) which implies that vulnerability is dominated by low expected mean consumption (LM vulnerability). The above study by Alayande and Alayande has similarity with the current study on inequality in household consumption expenditure in Nigeria. The study by Alayande and Alayande was limited to poor household while the current study is broader with its focus on food and non-food consumption expenditure.

Okojie (2002) carried out a study on inequality in household consumption expenditure with its focus on gender and education as determinants. Data for the study were obtained from four national consumer expenditure surveys conducted in Nigeria in 1980, 1985, 1992 and 1996 by the Federal Office of Statistics. The study employed per capita expenditure as the indicator of poverty, while the unit of analysis was the household. Trends in inequality were analyzed using Gini coefficients and the Theil's index. The findings of the study showed that education decreased the likelihood of being poor while larger households were more likely to be poor. The above study by Okojie is similar to the current study because both of them employed per capita expenditure as indicator for the analysis. However, while Okojie's study was limited to two variables, gender and education to determine inequality in household consumption expenditure, the current study is broader with its focus on more than two variables to determine inequality in household consumption expenditure.

Oyekale and Oyekale (2007) did a comparative analysis of inequalities in household expenditures among rural and urban in Nigeria using a data from 2004 Nigeria Living Standard Survey. This study employed three stage Feasible Generalized Least Squares (FGLS) to capture expected poverty in Nigeria. In the study, some of the variables included as determinants of consumption expenditures showed that average household consumption expenditure in Nigeria was less than one dollar in a day. Besides, there is a very low standard of living in Nigeria but the case is more prevalent in rural areas than in urban areas. The above study by Oyekale and Oyekale is similar to the current study because both of them used data set from Nigeria Living Standard Survey. However, while the study by Oyekale and Oyekale was using data sets from 2004 Nigeria Living Standard Survey (NLSS), the current study was different with its focus on data set from 2009 Nigeria Living Standard Survey (NLSS).

Akinlo (2009) investigated the causal relationship between household consumption expenditure inequality for non-food and economic growth in Nigeria during the period 1980-2006. The model of Granger causality tests was used. He found that real gross domestic product (rGDP) and household consumption expenditure for non-food are co-integrated and there is only unidirectional Granger causality running from consumption of non-food to real gross domestic product. The above study by Akinlo is similar to the current study because both study paid attention on household consumption expenditure for non-food. However, while Akinlo's study was narrow to non-food consumption expenditure, the current study is broader with its focus on food and non-food consumption expenditure.

Okojie, Anyanwu, Ogwumike, and Alayande, (2001) carried out a study on inequality in household consumption expenditure to investigate its trend in Nigeria. The study used poverty of relative lines based on some percentage of average per capita expenditure to discover inequality among household consumption expenditure in Nigeria. The findings of their study affirmed that between 1992 and 1996, inequality in Nigeria increased from 43 percent to 69 percent. This implies that in a short period between 1992 and 1996, Nigeria experienced rapid increase in poverty (26 percent). By this implication, there was rise of inequality in Nigeria during the period. The above study by Okojie, Anyanwu, Ogwumike, and Alayande is similar to the current

study. The study is similar because both of them adopted in their study per capita expenditure as a measure of welfare. However, while the study by Okojie, Anyanwu, Ogwumike, and Alayande adopted per capita expenditure to investigate trend of inequality, the current study uses the per capita expenditure to investigate the sources of inequality in household consumption expenditure.

However, Ichoku, Fonta, and Araar, (2009) conducted a study on inequality in household consumption expenditure for the purpose of experimenting its effect in Nigeria using a random sampling technique. The experiment focused on total expenditure incurred for the poor and non-poor as out-of-pocket. The findings reveal that 38 percent of poor households incurred out-of-pocket expenditure while 30 percent of the non-poor households reported out-of-pocket which implies that the percentage of total household expenditure spent as out-of-pocket expenditure by different income quintiles of households financing by the poor household and non-poor household differed widely. The study on the above by Ichoku, Fonta, and Araar on household expenditure focused poor and non-poor. The current study focused on food and non-food expenditure.

Awoniyi, Amos and Omole (2011) conducted a research on inequality in household consumption expenditure to ascertain its level of disparity in access to non-food with focus on rural areas of Nigeria. The study employed shapley decomposition model. They found that inequality is more in the rural area as a result of differences within the various socio-economic groups rather than dynamics between the various socio-economic groups. They also found that there exists inequality and it is prevalent in the Northern Nigeria and the result targeted that it might be due to the fact that households in the North have the highest incidence of poverty. The above study by Awoniyi *et al.* on non-food consumption among household is similar to the current study. However, while the study by Awoniyi *et al.* was limited to non-food with its focus in the rural areas, the current study is broader to tackle household expenditure in both food and non-food.

Olaniyan and Awoyemi (2005) conducted a research to examine the analysis of inequality in household consumption expenditure among rural households in Nigeria. The study employed the generalized entropy measures and the Gini coefficient Index. The findings of the analysis

indicated that some factors such as age, gender, and education level of the household head are important factors in explaining inequality profile in the country. The study also revealed that most of the inequality exists within-group and not much of differences in between-groups explain appreciable levels of inequality. The above study by Olaniyan and Awoyemi is similar to the current study because both of them paid considerable attention on inequality in household consumption expenditure with the use of generalized entropy measures and Gini coefficient index. However, while the study of Olaniyan and Awoyemi was limited to identify the component (within-group and between-group) inequality is coming from, the current study is different with its focus to identify the source of inequality in household consumption expenditure (food and non-food).

Akekere and Yousuo (2012) investigated a study on inequality in household consumption expenditure with its focus to verify the effect of income changes on household consumption expenditure in Nigeria by using the Ordinary Least Squares in a simple regression analysis for the years of 1981-2010. Their result concluded that there exists positive impact of gross domestic product on household consumption expenditure. The above study by Akekere and Yousuo is similar to the current study because both of them conducted a study on household consumption expenditure in Nigeria. However, while study by Akekere and Yousuo was for the use of Ordinary Least Squares simple regression analysis, the current study is different with its focus to use decomposition analysis for the study.

Terano and Mohamed (2012) carried out a study on inequality in household consumption expenditure to examine its patterns in relations to income. They went ahead to identify actual expenses and detailed consumption items for basic subsistence at the household level. The food expenditure and non-food expenditure were two main expenditure items. They found that on average the household expenditure in east coast is lower compare to the west coast. The household consumption expenditure function indicates that income and number of family members are the major determinants influencing the expenditure level. The above study by Terano and Mohamed is similar to the current study because both of them paid attention on food and non-food consumption expenditure for household. However, while the study by Terano and

Mohamed was to compare average household consumption expenditure forecast coast and west coast, the current study is different with its focus on entire households.

Adewuyi, Mafimisebi, and Awe (2009) carried out a study on inequality in household consumption expenditure with focus to examine food expenditure patterns among urban areas in Ibadan South West Local Government Area of Oyo State. The primary data used for the study were obtained through structured questionnaire using random sampling technique. Descriptive statistics and least squares regression model were used to analyze the data collected from respondents. The result of the least square regression model showed that the age of respondents, level of education and occupation (salary-earner or self-employed) of the household head, as well as the household income were significantly influenced by household's monthly food expenditure in Ibadan. The above study carried out by Adewuyi, Mafimisebi, and Awe is same with the current study. Both conducted a study on food expenditure among urban households. However, while the study by Adewuyi, Mafimisebi, and Awe was to examine food expenditure among urban household with the use of primary data, the current study is different with its focus on secondary data.

Oduh, Oduh, and Ekeocha (2012) carried out a study on inequality in household private consumption expenditure with focus on entire household in Nigeria. They employed fixed effect panel model which was used to underscore the importance of consumer confidence and expectations in household spending, using data from the CBN survey of consumer expectation across the six geopolitical zones from 2009-2011. The result shows that expected change in the prices of food, durable goods, and exchange rate are the determinants of consumption in Nigeria. The above study by Oduh, Oduh, and Ekeocha which is consumption expenditure in Nigeria is similar to the current study. However, while the study by Oduh, Oduh, and Ekeocha was on private consumption, the current study is different. The current study focused on household consumption.

Ekine, Albert, and Peregba (2012) carried out a study on inequality in household consumption expenditure to analyze the backdrop of increasing protein deficiency. The study was designed to estimate and evaluate the monthly household expenditure that is influencing the household

income and household size as well as determine other factors which influence the monthly consumption of food by households in southern Nigeria. The study was carried out in Obio/Akpor local government area of Rivers State, Nigeria Ten (10) households were randomly selected from each of the selected six communities to get a total of sixty (60) households using the simple random sampling technique. Data collected were analyzed using descriptive statistics, and multiple regression and analysis of variance (ANOVA). They found that household size and income were the major determinants of household expenditure on food. The above study by Ekine, Albert, and Peregba which is on household food consumption in Nigeria is similar to the current study. However, while the study by Ekine, Albert, and Peregba was limited to a local government area in Rivers State, the current study is broader with its focus on household food expenditure for the entire Nigeria.

2.4 Limitations of Previous Studies and Motivations

Inequality in household consumption expenditure have been a critical issue in developing countries, thereby inviting publications on the subject from all around the world. There exist innumerable studies on public spending impact on economic growth and its burden on inequality in household consumption patterns. Many studies have also focused on the issue of unequal expenditure by households on such needs as education, infrastructure, security and many others. From the various review of empirical literature so far on household consumption expenditure in Nigeria, it is evident that the issue of inequality in household consumption expenditure is an economic problem which have drawn the interest of several researchers and policy makers from various parts of the country. However, it is also evident that the question of inequality in household consumption expenditure in disaggregation such as food and non-food expenditure in Nigeria has not been studied using expenditure per capita as measure of welfare. Besides, most researchers used, households income to capture the inequalities in household consumption in aggregation. Few or none known to the researcher has investigated if the variables chosen really capture several of the unobserved variables. Yet, few of the studies on expenditure inequality in Nigeria anchored their findings on microeconomic analysis using multipurpose demographic survey data. Such empirical works based on multipurpose

demographic survey data have been carried out only in such places as India, Malaysia, Europe, Israel, Mexico and many other better developed countries of the world.

Still on the studies on Nigeria, Olaniyan and Awoyemi (2005), Obaro and Osaghae, (2006), Ejieh, (2009), Awoniyi, Amos, and Omole (2011), and Ereghaet *al.* (2012) were very close to addressing the issues of concern in about the same manner as the present study, but their studies focused on inequality in household consumption expenditure on aggregation where as the present study will do so by disaggregating the expenditures into two: food and non-food expenditures.

Another motivation for this study stems from the fact that most studies carried out to examine inequalities in household consumption expenditure in Nigeria often did not provide a framework that could be useful for decomposition analysis of inequalities as they affect household consumption expenditure. Some other studies (Ichoku, *et al.*, 2009, and Akekere and Yousuo, 2012) employed random sampling technique and ordinary least squares method to examine inequality in household consumption expenditure on aggregation which often did not capture the household expenditure in disaggregation (food and non-food expenditure).

The above issues are the reasons that made it imperative for a study as this to provide an alternative analytical approach meant to study household expenditure in disaggregation (food and non-food expenditure).

CHAPTER THREE

THEORETICAL FRAMEWORK AND METHODOLOGY

3.1 Theoretical Framework

The theoretical properties of various measures of inequality from a decomposition perspective are well developed in the literature especially the issue of relating sub-group inequality levels to overall inequality (Cowell, 1980; Cowell and Kuga, 1981; Bourguignon, 1979; Shorrocks, 1980 and 1984; Mukherjee and Shorrocks, 1982; Blackorby et al., 1981, among others). The general conclusion from existing theories is that if the total inequality can be expressed as a function of sub-group inequality values, when the sub-groups are mutually exclusive and exhaustive, then there exists a variety of ways to decompose the total inequality. Hence, the particular method of decomposition depends on the nature of the inequality index and the way in which it is decomposed since the decomposability of the indices differ from measure to measure (Mishra and Parikh, 1992).

Additive decomposability has been found very attractive by most researchers studying income distribution. According to Mishra and Parikh (1992), an index is additively decomposable if it can be neatly expressed as the sum of a "between-group" term and a "within-group" term. According to them, this implies conceptually that the between-group component can be defined as the value of the inequality index when all the within-group inequalities are assumed to be non-existent by a hypothetical assignment of the group average income to each member of the same group. So it quantifies only the inequality between the group means.

The within-group component, on the other hand, can be defined as the value of the inequality index when all the between-group inequalities are suppressed by an hypothetical equalisation of group mean incomes to the overall mean which can be achieved by an equi-proportionate change in the income of every unit within each of the groups (Mishra and Parikh, 1992). Shorrocks (1980) and Cowell and Kuga (1980) simplified the analysis by showing that there is one parameter family of Generalised Entropy (GE) indices which are additively decomposable in the manner described above. On the basis of the independence of between-group and within-group

terms, an additively decomposable index can be called strongly or weakly additive. This is because sometimes the decomposition coefficients in the within-group term can be affected by the change in the group means. This happens when the income shares are the coefficients in the within-group term. In such a case, if the between-group inequality is eliminated by equalising all the group means, the reduction in total inequality will not necessarily be the amount of between-group inequality (Mishra and Parikh, 1992).

The general consensus, however, is that when the weights or coefficients of the within-group indices are population shares instead of income shares, the total reduction in the inequality will be exactly by the amount of between-group inequality (because the population shares are not affected by the change in group means) and such indices are called strongly additively decomposable. One example in this context is Theil's second measure. As all the additively decomposable indices do not possess this property they can be divided into strongly additively and weakly additively decomposable indices (Shorrocks, 1980; Anand, 1983). Only for the strongly additively decomposable measures equalisation of group means or in other words, elimination of between group inequalities, will reduce total inequality exactly by the same amount.

As additive decomposability is considered to be a superb quality of the indices, these measures are largely used for decomposing inequality for population sub-groups, especially the Theil's entropy index. Shorrocks (1984) suggests that when decomposability is desired and scale and replication invariance are accepted, there is nothing substantially lost by concentrating on GE class measures. This view is stated more clearly and forcefully in Shorrocks (1988). It is fortunate that we can get a set of "Generally decomposable or aggregative" indices where there always exists a suitable transformation to move to an additively decomposable index belonging to the GE family. According to Shorrocks (1984), a "generally decomposable or aggregative" index is defined as that index where the overall inequality level can be expressed simply as some general function of the sub-group means, population sizes and inequality levels. These frameworks provide the basis for our inequality decompositions of household food and non-food expenditure using both the generalised entropy and regression based decompositions.

3.2. Model Specification

3.2.1. Nonparametric Specifications

This segment is built to analyze inequalities in household consumption expenditure (food and non-food) among household socio-economic groups. Literature reviewed showed many approaches of inequality measures for the analysis of inequality, but this study adopts the most widely used measures due to the nature of the objectives of the study. There are a number of measures of inequality that satisfy all criteria. Among the most widely used are: the Theil indexes and the mean log deviation measure. Both belong to the family of generalized entropy (GE) inequality measures.

According to Justino (2004), the use of GE class of measure permits the examination of the stability of the welfare ranking for different weightings. The general formula is given as:

$$GE(\theta) = \frac{1}{\theta^2 - \theta} \left[\frac{1}{n} \sum_{i=1}^n \left(\frac{y_i}{\mu} \right)^\theta - 1 \right] \dots\dots\dots(1)$$

Where μ is the mean income per individual (or expenditure per capita). The values of GE measures vary between zero and infinity, with zero representing an equal distribution and higher values representing higher levels of inequality. The parameter θ in the GE class represents the weight given to distances between incomes at different parts of the income distribution, and can take any real value. For lower values of θ , GE is more sensitive to changes in the lower tail of the distribution, and for higher values, GE is more sensitive to changes that affect the upper tail (Litchfield, 1999). The most common values of θ used are 0, 1, and 2. GE (1) is Theil's T index, which may be written as:

$$GE(1) = \frac{1}{n} \sum_{i=1}^n \frac{y_i}{\mu} \log \frac{y_i}{\mu} \dots\dots\dots(2)$$

$GE(0)$, also known as Theil's L, and sometimes referred to as the mean log deviation measure, is given as:

$$GE(0) = \frac{1}{n} \sum_{i=1}^n \log \frac{\mu}{y_i} \dots\dots\dots(3)$$

The generalized entropy measure employed has the appealing property of being additively decomposable. The degree of measured inequality of the distribution of an income variable can be decomposed into between-group and within-group components. The decomposition by population subgroups of the GE class is defined as:

$$\text{Inequality} = \text{within-group inequality} + \text{between-group inequality}$$

These decompositions are done according to the six geo-political zones, as well as according to urban and rural areas.

$GE(2)$ = Coefficient of Variation, CV:

$$CV = \frac{1}{\mu} \left[\frac{1}{n} \sum_{i=1}^n (y_i - \mu)^2 \right]^{1/2} \dots\dots\dots(4)$$

Where n is the number of individual households in the sample, y_i is the per capita expenditure of household i . The parameter θ is the generalized entropy (GE) class of measures ranging from 0 to θ with 0 representing an equal distribution, and higher figures representing higher levels of inequality. This study adopts only two values (1 and 2) for θ .

3.2.2 Decomposition of Income Inequality: Regression-Based Inequality

In order to address objectives three and four of this study, the study adopts regression based inequality decomposition. Morduch and Sicular (2002) and Fields (2003) extended the decomposition of inequality to regression-based inequality decomposition by determinants of income. They suggested, following Pandey (2013), expressing household income (or log-income) as:

$$y = X + \dots\dots\dots(5)$$

Where, X is an $n \times k$ matrix of explanatory variables (including a constant), β is a $(k \times 1)$ vector of coefficients, and ϵ is a $(n \times 1)$ vector of random error terms. Given a vector of consistently

estimated coefficients b , income can be expressed as a sum of predicted income and a prediction error as:

$$y = x\hat{b} + \epsilon \dots\dots\dots(6)$$

Following and modifying the work by Cowell and Fiorio(2006) household per capita expenditure can be expressed as:

$$y_i = \sum_{m=1}^M \hat{b}_m x_i^m + \epsilon_i \dots\dots\dots(7)$$

Shorrocks (1982) suggested that inequality measures can be written as a weighted sum of incomes i.e.

$$I(y) = \sum_{i=1}^n a_i(y)y_i \dots\dots\dots(8)$$

Where, a_i represent the weights, y_i is the income of household i , and y is the vector of household incomes (Pandey, 2013).

Substituting (5) into (8) and dividing by $I(y)$, the share of inequality attributed to explanatory variable m , is obtained as:

$$s_m = b_m \sum_{i=1}^n x_i^m / \sum_{i=1}^n a_i(y)y_i \dots\dots\dots(9)$$

The coefficients of the regression can be used to compute income shares of the household characteristics used as the explanatory variables as follows:

$$\alpha_m = b_m \sum_{i=1}^n x_i^m / \sum_{i=1}^n y_i \dots\dots\dots(10)$$

and also used to calculate the marginal effects on the Gini index of inequality of a uniform increase in an explanatory variable m , as in Lerman and Yitzhaki (1985) and Pandey (2013) by

computing $s_m - \alpha_m G(Y)$.

The household characteristics used to decompose the regression based-inequality in this study are: sector which takes the value 1 if rural, and zero otherwise, household size (hhsiz), sex of head (hhsex_female) which takes the value 1 if female and 0 otherwise, age of head (hhagey), marital status (hhmarsta), number of spouses (spouses), whether or not the household receives remittances (remittance), education level of the head (educ_level), and household dependency ratio (depratio). Others are the characteristics of the household living conditions such as: dwelling characteristics (dwelling), materials used in the outside wall of the house (outside_wall), flooring material of the dwelling (flooring_dwelling), roofing material of the house (roofing_mat), cooking fuel (cooking_fuel), lighting and water source (water_source).

In order to estimate the model we applied the stata module ineqrbd developed by Fiorio and Jenkins (2007) for regression-based inequality decomposition for STATA, by using Fields (2003) and Shorrocks (1982) decomposition formula. According to the model, the Y_i and X_i variables based on n observations estimates following specification represented in equation (11) as:

$$y_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_k X_k + \mu \dots \dots \dots (11)$$

Equation (11) can be rewritten as:

$$Y_i = \beta_0 + Z_1 + Z_2 + Z_3 + \dots + Z_k + \mu_1 \dots \dots \dots (12)$$

Z_1, Z_2, Z_3, \dots and Z_k are composite variable, product of regression coefficient and variables. For inequality decomposition calculations, the value of β_0 is irrelevant as it is constant for every observation. The predicted value \hat{Y}

$$\hat{Y}_i = \beta_0 + Z_1 + Z_2 + Z_3 + \dots + Z_k \dots \dots \dots (13)$$

Equations (8) and (9) are of exactly the same form as the Shorrocks, (1982) used equation for deriving inequality decomposition by factor components. In this study, this is modified to represent total household expenditure as the sum of various expenditure components.

Alternatively, one may apply the decomposition rule to the inequality of \hat{Y} itself, in which case there is also a decomposition term corresponding to the residual (Cowell and Fiorio, 2006).

As shown by Pandey (2013), based on Fiorio and Jenkins (2008), the `ineqrbd` command in `stata` provides a regression-based Shorrocks-type decomposition of a variable labelled "Total", where Total is defined as \hat{Y} , unless `fields` option is used in which case Total refers to predicted \hat{Y} . In either case, the contribution to inequality in Total of each term is labelled "*s_f*" in the output. We reported both results using the actual and predicted values of the dependent variable in the decompositions.

Alternatively, I_2 summarizes inequality using half the squared coefficient of variation (the Generalized Entropy measure I2), rather than the coefficient of variation (CV). It is important to point out that based on various empirical studies, a variable may show negative contribution to inequality. This is because the mean of a composite variable may be negative.

3.3. Justification for the Approach

In most applied cases, the available data or testable information is given by a set of conserved quantities (average values of some moment functions), associated with the probability distribution in question. This is the way the generalized entropy model is most often used in statistical thermodynamics. Another possibility is to prescribe some symmetries of the probability distribution. Equivalence between the conserved quantities and corresponding symmetry groups implies the same level of equivalence for these two ways of specifying the testable information in the generalized entropy method.

The generalized entropy model is also needed to guarantee the uniqueness and consistency of probability assignments obtained by different methods, statistical process and logical inference in particular. The generalized entropy model makes explicit our freedom in using different forms of prior data. As a special case, a uniform prior probability density (Laplace's principle of indifference) may be adopted. Thus, the generalized entropy model is not just an alternative to the methods of inference of classical statistics, but it is an important

conceptual generalization of that method. In ordinary language, the model of generalized entropy can be said to express an assertion of epistemic modesty, or of concentrated ignorance. The selected distribution is the one that makes the least claim to being informed beyond the stated prior data, that is to say the one that admits the most ignorance beyond the stated prior data.

3.4 Identifying the Unit of Analysis

The Unit of analysis for this study is households. This study looks at expenditures of a household in two perspectives, namely, food expenditure and non-food expenditure in respect of individual members of the household. Our unit of analysis is thus the household and the extent of inequality between households.

3.5 Determining the Measure of Welfare

The most common indicators for the measurement of welfare and on which inequality index is computed are income of household and expenditure of household. This study employs expenditure of the household as a basis of measuring inequality. The reason for adopting household expenditure is because it has been argued that income is problematic in the sense that incomes do not often reflect the true position of household welfare because of insincerity in the disclosure of real income of a household (Olaniyan, 2003). For this reason, this study uses household per capita expenditure as the measure of welfare on which inequality index is computed.

3.6 Data Description

The dataset for the analysis in this study is the 2008/2009 Harmonized Nigeria Living Standard Survey (HNLSS) published in 2010 by the National Bureau of Statistics (NBS). The survey covered all the 36 states of the federation including the Federal Capital Territory FCT. The sample studied for the Harmonized Nigeria Living Standard was designed to have Local Government Area (LGA) as reporting domain. However, the sample design for the survey also facilitated the provision of estimates at national and sub-national levels (National, zone and state). The sampling frame for all the 774 LGAs in the country used the Enumeration Areas (EA)

demarcated by the National Population Commission (NPopC) for the 2006 Housing and Population Census. The frame was constructed into replicates such that each LGA had 3 replicates and in each replicate there are 10 EAs serially numbered 01-10. A complete listing of housing units and households was done in each of the EAs just before the start of the main survey (NBS, 2010).

A two-stage sample procedure was adopted in the survey of which selection of Enumeration Areas (EAs) constituted the first stage/Primary Sampling Units (PSUs), while selection of Households (HHs) formed the second stage/Secondary or Ultimate Sampling Units (USUs). A sample size of 10 EAs was selected per LGA for study, while 10 HHs were systematically selected in each EA where the HNLSS Household Part A Questionnaires were administered. This produced 100 households per LGA and 77,400 HHs nationally (NBS, 2010).

CHAPTER FOUR

PRESENTATION AND INTERPRETATION OF RESULTS

4.1. Nonparametric Results (Decomposition of Inequality into Within and Between Group)

Table 1 shows the share of food and non-food expenditure by quintiles in urban and rural areas. The table shows that the poorer and poorest quintiles have more share of food expenditure but have very small share of non-food expenditure in urban and rural areas. Conversely, the richest quintiles have more share of non-food expenditure than they have of food expenditure. This implies that inequality in non-food expenditure is widespread in both urban and rural areas in Nigeria. This is shown clearly in quantitative terms in Tables 2 to 5.

Table 1: Percentage Shares of Food and Non-food Expenditure by Quintiles in Rural and Urban Areas

quintile	Quintile shares			
	Rural		Urban	
	Foodexp Share, (%)	Non-foodExp Share, (%)	FoodExp Share, (%)	Non-foodExp Share, (%)
Poorest	3.56	1.07	4.21	2.51
Poorer	8.53	2.92	8.67	5.34
Middle	13.97	5.86	13.45	9.41
Richer	22.76	13.78	21.85	17.05
Richest	51.18	76.37	51.82	65.69

Source: Author's computations from HLSS 2010 using stata

Decompositions of inequality in food and non-food expenditures are presented in tables 2 to 5. Tables 2 and 3 show decomposition of food and non-food expenditure by geopolitical zones. The generalized Entropy indices and Gini coefficients are reported in both tables as well as the within-group and between-group decompositions of the entropy indices. Decomposition of inequality in non-food expenditure shows large values of the Gini coefficients in table 2 and also large values of Entropy indices such as Theil index, GE(1). These suggest that inequality in non-food expenditure is very high in Nigeria and larger in North West and North East geopolitical

zones. For example, Theil Index for North-East and North-West are 1.25374 and 1.1801 respectively, while the corresponding Gini coefficients are respectively 0.74579 and 0.73093. The Gini coefficients for North-Central, South-East, South-West and South-South are 0.68543, 0.68282, 0.639, and 0.60217 respectively.

These numbers suggest that even though inequality in non-food expenditure is very high across the six geopolitical zones, it is relatively lower in the South South and South West. At the lower end of the table is reported the within-group and between-group inequalities using the generalised Entropy Indices. Using the Theil index, within-group inequality is the major source of inequality across the geopolitical zones contributing about 97.0 percent to the total inequality compared to only 1.6 percent contribution from between-group inequality. This implies that inequalities in non-food expenditure existing within zones should be a major concern to policy makers than inequality between the zones. This may be attributed to disparities in education, health and recreational expenditures between the rich and the poor within zones, while across zones, the non-food expenditure pattern does not differ much.

Table 2: Decompositions of Inequality in Non-food Expenditure by Geopolitical Zones

zone	Popn. share	Income Share	GE(-1)	GE(0)	GE(1)	GE(2)	Gini
north central	0.14859	0.11274	3.0819	0.97424	0.97571	2.25249	0.68543
north east	0.13673	0.12042	4.63491	1.21839	1.25374	3.60137	0.74579
north west	0.24715	0.21328	7.73077	1.20544	1.18009	3.54508	0.73093
south east	0.11649	0.13461	3.57693	1.01811	0.95086	2.13174	0.68282
south south	0.15109	0.17457	2.52497	0.81747	0.8063	1.647	0.639
south west	0.19995	0.24439	1.38855	0.68505	0.77271	1.99065	0.60217
Decomposition of Generalised Entropy (GE) Indexes into Within and Between Groups							
Within-group inequality, GE_W(a)			4.45516	0.98836	0.97025	2.48547	
Between-group inequality, GE_B(a):			0.01633	0.01604	0.01586	0.01579	

Source: Author's computations from HLSS 2010 using stata

Table 3 shows the decomposition of food expenditure by the six geopolitical zones. Both the Theil Index and Gini coefficients are lower compared to the corresponding values for the non-food expenditure. From the table, the Gini coefficients for North-Central, North-East, North-West, South-East, South-South and South-West are 0.50, 0.42, 0.44, 0.45, 0.50, and 0.43 respectively, while the corresponding figures for the Theil Index are 0.43, 0.29, 0.36, 0.35, 0.44, and 0.32 respectively. Contrary to inequality in non-food expenditure, these figures indicate that inequality in food expenditure is lowest in the North-East, followed by South-South and North-West. The within-group and between-group decompositions also show that within-group inequality in food expenditure contributes about 36.5 percent to the overall inequality, while between-group inequality contributes only 3.5 percent to the total inequality using the Theil Index. This is also consistent with other measures of entropy indices reported in the table. However, the gap between these sources of inequality is smaller than that of non-food expenditure. These results are represented in the Lorenz curves presented in figures 2, 4 and 5 in results Appendix B.

Table 3: Decompositions of Inequality in Food Expenditure by Geopolitical Zones

Zone	Popn. share	Income share	GE(-1)	GE(0)	GE(1)	GE(2)	Gini
North central	0.14743	0.21283	1.345	0.50328	0.43019	0.56464	0.49939
North east	0.13552	0.16674	0.76407	0.33532	0.29309	0.35912	0.41648
North west	0.25458	0.27866	0.6981	0.34695	0.35792	0.59016	0.43679
South east	0.11525	0.09465	0.66876	0.38622	0.34718	0.43332	0.4549
South south	0.14953	0.10721	1.11068	0.48768	0.43846	0.58557	0.50496
South west	0.19768	0.13991	0.51094	0.33432	0.32127	0.42251	0.43419
Decomposition of Generalised Entropy (GE) Indexes into Within and Between Groups							
Within-group inequality, GE_W(a)			0.8521	0.39149	0.36498	0.54769	
Between-group inequality, GE_B(a):			0.03653	0.03555	0.03521	0.03551	

Source: Author's computations from HLSS 2010 using stata

Tables 4 and 5 respectively report decomposition of inequality in non-food and food expenditure by urban and rural areas. In table 4, the decomposition of inequality in non-food is shown. This also shows similar results as those reported for the geopolitical zones with respect to between

and within-group inequality. Within-group inequality contributes about 96.6 percent of non-food expenditure, while between-group inequality contributes only 2 percent using the Theil decomposition. The generalized entropy indices show that inequality in non-food expenditure is higher in rural than in urban areas while the overall inequality figure of 0.6 and above are considered to be very high. This gap is shown pictorially in figure 1 in Appendix B.

Table 5 shows the decomposition for food expenditure. The results show that inequality figures between urban and rural areas are similar. Within-group inequality remains the dominant source of overall inequality than inequality between urban and rural areas. This again suggests that policies to reduce inequality should focus more on inequalities existing among households within urban or within rural areas rather than inequality existing between urban and rural households. Within-group inequality contributes about 39.2 percent of the overall inequality while between-group inequality contributes only a negligible 0.81 percent.

Table 4: Decompositions of Inequality in Non-food Expenditure by Sector

Sector	Popn. Share	Income Share	GE(-1)	GE(0)	GE(1)	GE(2)	Gini
urban	0.37	0.46735	1.21574	0.70446	0.79619	1.95309	0.6151
rural	0.63	0.53265	5.49743	1.14988	1.11566	2.94886	0.72172
Decomposition of Generalised Entropy (GE) Indexes into Within and Between Groups							
Within-group inequality, GE_W(a):			4.45246	0.98507	0.96636	2.48093	
Between-group inequality, GE_B(a):			0.01903	0.01932	0.01975	0.02033	

Source: Author's computations from HLSS 2010 using stata

Table 5: Decompositions of Inequality in Food Expenditure by Sector

Sector	Popn.share	Income Share	GE(-1)	GE(0)	GE(1)	GE(2)	Gini
urban	0.36579	0.30518	0.73083	0.39716	0.38232	0.54314	0.46711
rural	0.63421	0.69482	0.96658	0.43107	0.39634	0.57406	0.47273
Decomposition of Generalised Entropy (GE) Indexes into Within and Between Groups							
Within-group inequality, GE_W(a):			0.87997	0.41866	0.39206	0.57528	
Between-group inequality, GE_B(a):			0.00866	0.00838	0.00813	0.00792	

Source: Author's computations from HLSS 2010 using stata

4.2.Determinants of Inequality in Food and Non-food Expenditure (Regression Based Decomposition Results)

Tables 6 and 7 show regression-based decomposition of inequality into the contributing sources using Shorrock and Shields approach. The results are reported for both the actual and predicted values using the Theil index as well as for half the square of coefficient of variation for non-food and food expenditure (presented in Tables 12 and 13 in Appendix A, and are not different from the ones reported in the tables below). The results in table 6 show the sources or determinants of inequality in non-food expenditure for both Shorocks and Shields approach.

The estimates for the non-food expenditure show that female-headed households contribute about 30.5 percent to inequality in non-food expenditure, while for the predicted values, it accounts for as high as 51.3 percent of the total inequality in non-food expenditure in Nigeria. Household size is the next largest contributor to inequality in non-food expenditure accounting for about 12.7 percent, and about 21.4 percent using the Shields decomposition. Sector, which takes the value 1 if rural and 0 otherwise, accounts for about 9.94 percent of total inequality in non-food expenditure and 16.738 percent using the predicted values of non-food expenditure. This means that living in rural area increases inequality in non-food expenditure by over 10 percent. Marital status of the household head inequality is decreasing as it has negative effect on the inequality in non-food expenditure. Another significant determinant of inequality in non-food expenditure is the household dwelling characteristics which accounts for about 4 percent of the inequality using the actual values and 6.64 percent using the predicted values.

Other factors that increase inequality in the household non-food expenditure in Nigeria are the living conditions of the households, namely, the materials of the outside wall, materials used for the floor of the dwelling, roofing material lighting and water source. In Nigeria, there are significant disparities between non-poor and poor households in terms of these characteristics and significant disparities also exist between urban and rural households in terms of these factors. Other characteristics such as whether the household receives remittances or not, education level of the head, and dependency ratio in the household, do not contribute to inequality in non-food expenditure since their percentage contributions are zero.

Table 7 presents the determinants of inequality in food expenditure in Nigeria. From the table, it can be noted that the largest determinant of inequality in food expenditure is living in rural area which accounts for about 36.8 percent of the disparities and as high as 64.1 percent using the Fields decomposition. This could be due to the fact that most of the poor live in the rural areas and there is a wide gap in food expenditure between the rural poor and rural non-poor. Most of the non-poor households that live in the rural areas include the teachers in public and private schools, local government employees, and business or shop owners. These groups of households maintain a good standard of living compared to the peasant farmers and labourers in the rural area. The next largest determinant is water source that accounts for about 5.8 percent of inequality in food expenditure and about 10.2 percent using the predicted values. Household size contributes about 4.3 percent to inequality in food expenditure in Nigeria and about 7.4 percent using the predicted values of food expenditure. Again, household living conditions such as material of outside wall and roofing materials of the household are major determinants of inequality in food expenditure. This implies that low expenditure in food is also reflected in the poor quality materials such as mud and palm used in flooring and roofing the dwelling of the households. On the other hand, high expenditure on food is also reflected in iron sheets, concretes, cements, and tiles used in roofing and flooring the household dwellings.

Table 6: Decomposition of Inequality in Non-food Expenditure by Household Characteristics (Contributing Sources) using Theil Index

Decomp.	LogNon-food Expenditure					Predicted Values of logNon-food Expenditure				
	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)
residual	40.604	0.048	0.000	4.05E+15	3.44E+16					
sector	9.942	0.012	14.177	0.267	2.265	16.738	0.015	14.177	0.267	2.939
hhsz	12.702	0.015	6.259	0.584	4.953	21.386	0.019	6.259	0.584	6.427
hhsex_female	30.478	0.036	-20.651	-0.352	-2.987	51.313	0.047	-20.651	-0.352	-3.875
hhagey	-0.047	0.000	0.176	0.344	2.917	-0.078	0.000	0.176	0.344	3.785
hhmarsta	-10.274	-0.012	8.654	0.551	4.667	-17.297	-0.016	8.654	0.551	6.056
spouses	1.089	0.001	0.224	0.985	8.352	1.833	0.002	0.224	0.985	10.837
remittance	0.016	0.000	0.006	14.761	125.149	0.027	0.000	0.006	14.761	162.385
educ_level	0.000	0.000	0.031	0.582	4.937	0.000	0.000	0.031	0.582	6.406
depratio	0.000	0.000	0.079	0.245	2.075	0.001	0.000	0.079	0.245	2.692
dwelling	3.946	0.005	-4.523	-0.387	-3.285	6.644	0.006	-4.523	-0.387	-4.262
outside_wall	2.868	0.003	3.497	0.489	4.146	4.828	0.004	3.497	0.489	5.379
floor_dwelling	0.279	0.000	-5.192	-0.459	-3.895	0.469	0.000	-5.192	-0.459	-5.054
roofing_mat	2.956	0.004	2.975	0.568	4.813	4.976	0.005	2.975	0.568	6.245
cooking_fuel	-0.005	0.000	-0.492	-0.592	-5.016	-0.008	0.000	-0.492	-0.592	-6.509
lighting	2.442	0.003	-1.425	-0.985	-8.353	4.111	0.004	-1.425	-0.985	-10.838
water_source	3.004	0.004	-6.048	-0.505	-4.277	5.058	0.005	-6.048	-0.505	-5.550
Total	100.000	0.118	100.000	0.118	1.000	100.000	0.091	100.000	0.091	1.000

Source: Author's computations from HLSS 2010 using stata

Note: proportionate contribution of composite var f to inequality of Total,

$s_f = \rho_f * sd(f) / sd(\text{Total})$. $S_f = s_f * CV(\text{Total})$.

$m_f = \text{mean}(f)$. $sd(f) = \text{std.dev. of } f$. $CV_f = sd(f) / m_f$.

Total = lognfd. Source: Author's Computations

Table 7: Decomposition of Inequality in Food Expenditure by Household Characteristics (Contributing Sources) using Theil Index

Decomp.	LogFood Expenditure					Predicted Values of logFood Expenditure				
	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)
residual	42.612	0.038	0.000	-4.78E+14	-5.37E+15					
sector	36.807	0.033	22.377	0.27	3.00	64.137	0.043	22.377	0.267	3.963
hhsiz	4.272	0.004	4.135	0.58	6.57	7.444	0.005	4.135	0.584	8.672
hhsex_female	-0.427	0.000	-3.883	-0.35	-3.96	-0.744	-0.001	-3.883	-0.352	-5.229
hhagey	1.820	0.002	1.589	0.34	3.87	3.171	0.002	1.589	0.344	5.108
hhmarsta	2.152	0.002	-3.635	-0.55	-6.19	3.750	0.003	-3.635	-0.551	-8.171
spouses	-3.720	-0.003	-3.536	-0.98	-11.07	-6.482	-0.004	-3.536	-0.985	-14.615
remittance	0.085	0.000	0.020	14.77	166.05	0.148	0.000	0.020	14.768	219.197
educ_level	-0.003	0.000	0.036	0.58	6.55	-0.005	0.000	0.036	0.582	8.644
depratio	0.000	0.000	0.019	0.24	2.75	0.000	0.000	0.019	0.245	3.632
dwelling	1.320	0.001	-3.084	-0.39	-4.36	2.300	0.002	-3.084	-0.387	-5.750
outside_wall	3.200	0.003	-2.586	-0.49	-5.50	5.575	0.004	-2.586	-0.489	-7.258
floor_dwelling	-1.584	-0.001	4.175	0.46	5.17	-2.761	-0.002	4.175	0.459	6.819
roofing_mat	7.087	0.006	-4.495	-0.57	-6.38	12.350	0.008	-4.495	-0.568	-8.426
cooking_fuel	0.004	0.000	0.619	0.59	6.65	0.006	0.000	0.619	0.592	8.784
lighting	0.542	0.001	-1.079	-0.99	-11.08	0.944	0.001	-1.079	-0.985	-14.624
water_source	5.835	0.005	-3.569	-0.50	-5.67	10.168	0.007	-3.569	-0.505	-7.488
Total	100.000	0.089	100.000	0.09	1.00	100.000	0.067	100.000	0.067	1.000

Source: Author's computations from HLSS 2010 using stata

Note: proportionate contribution of composite var f to inequality of Total,

$s_f = \rho_f * sd(f) / sd(\text{Total})$. $S_f = s_f * CV(\text{Total})$.

$m_f = \text{mean}(f)$. $sd(f) = \text{std.dev. of } f$. $CV_f = sd(f) / m_f$.

Total = lognfd. Source: Author's Computations

CHAPTER FIVE

SUMMARY OF FINDINGS, POLICY RECOMMENDATIONS AND CONCLUSIONS

5.1. Summary of Findings

This research work has so far investigated the determinants of inequality in household expenditure by decomposing household expenditure into food and non-food categories and ascertaining the nature, sources and determinants of inequality in each expenditure category. The nonparametric and parametric approaches were adopted in the analysis. Specifically, the generalised class of Entropy indices were used to decompose inequality in food and non-food expenditure into within-group and between-group components, while the Entropy indices and the Gini coefficient were used to analyse inequality in food and non-food expenditures by urban and rural areas and by the six geopolitical zones in Nigeria.

The results indicate that inequality in non-food expenditure is very high both in urban and rural areas and across the six geopolitical zones compared to the expenditure in food. This implies that most of the inequality observed in household consumption expenditure is due to inequality in the non-food component. The Lorenz curves were drawn to show the inequalities in non-food and food expenditure. These curves give a pictorial representation of large inequality in non-food expenditure using the Gini coefficient measure. The curve for non-food expenditure dominates the curve for food expenditure. The inequality decompositions show that within-group inequality is the major source of inequality in both food and non-food expenditures in Nigeria and not between-group inequality. This finding corroborates the findings in most empirical studies reviewed in this research work which hold that within group inequality is the major source of inequality in household expenditure. However, the results revealed that within-group contribution to total inequality is much higher in non-food expenditure than in food expenditure.

Regression-based decompositions were used to show how household characteristics determine inequality in food and non-food expenditure in Nigeria. The decompositions show that variables such as living in rural areas, household size, household dwelling and household dwelling characteristics account for a significant proportion of inequality in food and non-food

expenditures. The percentage contribution to inequality of residing in rural area is much higher in food expenditure than in non-food expenditure, while the percentage contribution to inequality of household size and female-headed households is higher in non-food expenditure. On the other hand, household of female reduces inequality in food expenditure. These findings call for policy interventions in specific areas that policy can influence in order to reduce household consumption inequality.

5.2. Policy Recommendations

In order to reduce the rate of inequality, especially in non-food expenditure the following policy recommendations would be very helpful:

Policies should focus on addressing inequality within rural and urban areas especially with respect to non-food expenditure than in inequality existing between urban and rural areas. These non-food expenditures include expenditure in education, health, energy, accommodation, water and sanitation. For example, in order to reduce inequality in water expenditure, government should provide water to households in remote locations through pipe borne water or boreholes. Households with low income always tend to spend a large proportion of their incomes on health while richer households spending on health take a small proportion of their income. Hence, government should subsidise health expenditure for the poor so that it would be less catastrophic. This can help reduce inequality in household expenditure.

Another important area is to create income generating activities to increase the income of households in rural areas and to enable them to better finance their non-food expenditures. This would help reduce the wide disparity existing in non-food expenditure and hence reduce within-group inequality.

Another area that can help reduce inequality is sensitization of the population on the need to reduce household size especially those in the lower end of income distribution. Reducing household size in urban and rural areas would result in significant reduction in expenditure inequality. Large household size is a characteristic of poor households and this has been found to

have negative impacts on household per capita expenditure, and such impacts are larger for low income households.

Improving the living conditions of rural and urban households in the areas of provision of water supply and other basic amenities, would go a long way to reduce household inequality in non-food expenditure. This study found that household living conditions contribute to expenditure disparities.

5.3. Conclusion

This study has established that there is huge inequality in household expenditure in Nigeria and that household expenditure inequality is mostly due to inequality in the non-food component. It is the position of this study that decomposition of the analysis into food and non-food components as well as the regression-based decomposition provides a better way of understanding household inequality. Further studies would be needed to investigate household expenditure inequality by decomposing both food and non-food expenditure where available data would permit such decompositions. Again, panel analysis would be useful in future when such data begin to emerge in Nigeria.

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Appendix A

Table 8: Regression of log of Non-food Expenditure to Household Characteristics Used for Inequality Decomposition

Regression of lognfd on RHS variables						
(analytic weights assumed)						
(sum of wgt is 3.3031e+05)						
Source	SS	df	MS	Number of obs = 330310		
-----+-----				F(16, 330293) =30197.68		
Model	360768.843	16	22548.0527	Prob> F	= 0.0000	
Residual	246623.753330293		.746681743	R-squared	= 0.5940	
-----+-----				Adj R-squared = 0.5939		
Total	607392.596330309		1.83886178	Root MSE	= .86411	
lognfd	Coef.	Std. Err.	t	P> t	[95 percent Conf. Interval]	
sector	.9555413	.0045185	211.47	0.000	.9466851	.9643974
hhsz	.2053041	.0014098	145.63	0.000	.202541	.2080672
hhsex	-1.729936	.0096613	-179.06	0.000	-1.748872	-1.711
hhagey	.0003988	.0001273	3.13	0.002	.0001493	.0006483
hhmarsta	.3274627	.0019907	164.50	0.000	.323561	.3313644
spouses	.0476988	.0080733	5.91	0.000	.0318754	.0635222
remittance	.1596877	.0223187	7.15	0.000	.1159436	.2034317
s2a03b	.001527	.0011236	1.36	0.174	-.0006752	.0037291
depratio	.0115374	.0078029	1.48	0.139	-.0037561	.0268309
dwellng	-.1609892	.0016241	-99.13	0.000	-.1641723	-.1578061
outside_wall	.1326848	.0018333	72.38	0.000	.1290916	.136278
floor_dwelling	-.2179774	.0019343	-112.69	0.000	-.2217686	-.2141861
roofing_mat	.1371302	.0019826	69.17	0.000	.1332443	.1410161
cooking_fuel	-.0502433	.0025388	-19.79	0.000	-.0552194	-.0452673
lighting	-.0797046	.0011308	-70.48	0.000	-.0819209	-.0774882
water_source	-.0722597	.0003655	-197.67	0.000	-.0729761	-.0715432
_cons	11.75567	.0175212	670.94	0.000	11.72133	11.79001

Table 9: Regression of log of Predicted Values of Non-food Expenditure to Household Characteristics Used for Inequality Decomposition

Regression of lognfd on RHS variables							
(analytic weights assumed)							
(sum of wgt is 3.3031e+05)							
Source	SS	df	MS	Number of obs = 330310			
-----+-----				F(16,330293) =30197.68			
Model	360768.843	16	22548.0527	Prob> F	= 0.0000		
Residual	246623.753330293	.746681743		R-squared	= 0.5940		
-----+-----				Adj R-squared = 0.5939			
Total	607392.596330309	1.83886178		Root MSE	= .86411		
lognfd	Coef.	Std. Err.	t	P> t	[95 percent Conf. Interval]		
sector	.9555413	.0045185	211.47	0.000	.9466851	.9643974	
hhsize	.2053041	.0014098	145.63	0.000	.202541	.2080672	
hhsex	-1.729936	.0096613	-179.06	0.000	-1.748872	-1.711	
hhagey	.0003988	.0001273	3.13	0.002	.0001493	.0006483	
hhmarsta	.3274627	.0019907	164.50	0.000	.323561	.3313644	
spouses	.0476988	.0080733	5.91	0.000	.0318754	.0635222	
remittance	.1596877	.0223187	7.15	0.000	.1159436	.2034317	
s2a03b	.001527	.0011236	1.36	0.174	-.0006752	.0037291	
depratio	.0115374	.0078029	1.48	0.139	-.0037561	.0268309	
dwelling	-.1609892	.0016241	-99.13	0.000	-.1641723	-.1578061	
outside_wall	.1326848	.0018333	72.38	0.000	.1290916	.136278	
floor_dwelling	-.2179774	.0019343	-112.69	0.000	-.2217686	-.2141861	
roofing_mat	.1371302	.0019826	69.17	0.000	.1332443	.1410161	
cooking_fuel	-.0502433	.0025388	-19.79	0.000	-.0552194	-.0452673	
lighting	-.0797046	.0011308	-70.48	0.000	-.0819209	-.0774882	
water_source	-.0722597	.0003655	-197.67	0.000	-.0729761	-.0715432	
_cons	11.75567	.0175212	670.94	0.000	11.72133	11.79001	

Table 10: Regression of log of Food Expenditure to Household Characteristics Used for Inequality Decomposition

Regression of logfdexp on RHS variables						
(analytic weights assumed)						
(sum of wgt is 3.3082e+05)						
Source	SS	df	MS	Number of obs = 330818		
-----+-----				F(16,330801) =27844.45		
Model	180090.975	16	11255.6859	Prob> F	= 0.0000	
Residual	133721.166330801	.404234466		R-squared	= 0.5739	
-----+-----				Adj R-squared = 0.5739		
Total	313812.141330817	.948597384		Root MSE	= .63579	
logfdexp	Coef.	Std. Err.	t	P> t	[95 percent Conf. Interval]	
-----+-----						
sector	1.436294	.0033198	432.65	0.000	1.429787	1.4428
hhsz	.1291278	.0010331	124.99	0.000	.1271029	.1311527
hhsex	-.3099433	.007082	-43.77	0.000	-.3238237	-.2960628
hhagey	.0034222	.0000935	36.61	0.000	.003239	.0036055
hhmarsta	-.1310886	.0014626	-89.62	0.000	-.1339553	-.1282218
spouses	-.7160663	.0059026	-121.31	0.000	-.7276353	-.7044973
remittance	.4868136	.0164161	29.65	0.000	.4546384	.5189887
s2a03b	.0017242	.000826	2.09	0.037	.0001052	.0033432
depratio	.0025823	.0057368	0.45	0.653	-.0086617	.0138264
dwelling	-.10455	.0011935	-87.60	0.000	-.1068891	-.1022108
outside_wall	-.0934553	.0013476	-69.35	0.000	-.0960965	-.0908141
floor_dwelling	.1669732	.0014215	117.47	0.000	.1641872	.1697592
roofing_mat	-.1973221	.0014575	-135.38	0.000	-.2001788	-.1944654
cooking_fuel	.0602267	.0018661	32.27	0.000	.0565691	.0638843
lighting	-.057512	.0008307	-69.23	0.000	-.0591403	-.0558838
water_source	-.040615	.0002687	-151.17	0.000	-.0411416	-.0400884
_cons	10.1736	.012874	790.25	0.000	10.14836	10.19883

Table 11: Regression of log of Predicted Values of Food Expenditure to Household Characteristics Used for Inequality Decomposition

Regression of logfdexp on RHS variables						
(analytic weights assumed)						
(sum of wgt is 3.3082e+05)						
Source	SS	df	MS	Number of obs = 330818		
-----+-----				F(16,330801) =27844.45		
Model	180090.975	16	11255.6859	Prob> F	= 0.0000	
Residual	133721.166330801	.404234466		R-squared	= 0.5739	
-----+-----				Adj R-squared = 0.5739		
Total	313812.141330817	.948597384		Root MSE	= .63579	
logfdexp	Coef.	Std. Err.	t	P> t	[95 percent Conf. Interval]	
-----+-----						
sector	1.436294	.0033198	432.65	0.000	1.429787	1.4428
hhsz	.1291278	.0010331	124.99	0.000	.1271029	.1311527
hhsex	-.3099433	.007082	-43.77	0.000	-.3238237	-.2960628
hhagey	.0034222	.0000935	36.61	0.000	.003239	.0036055
hhmarsta	-.1310886	.0014626	-89.62	0.000	-.1339553	-.1282218
spouses	-.7160663	.0059026	-121.31	0.000	-.7276353	-.7044973
remittance	.4868136	.0164161	29.65	0.000	.4546384	.5189887
s2a03b	.0017242	.000826	2.09	0.037	.0001052	.0033432
depratio	.0025823	.0057368	0.45	0.653	-.0086617	.0138264
dwelling	-.10455	.0011935	-87.60	0.000	-.1068891	-.1022108
outside_wall	-.0934553	.0013476	-69.35	0.000	-.0960965	-.0908141
floor_dwelling	.1669732	.0014215	117.47	0.000	.1641872	.1697592
roofing_mat	-.1973221	.0014575	-135.38	0.000	-.2001788	-.1944654
cooking_fuel	.0602267	.0018661	32.27	0.000	.0565691	.0638843
lighting	-.057512	.0008307	-69.23	0.000	-.0591403	-.0558838
water_source	-.040615	.0002687	-151.17	0.000	-.0411416	-.0400884
_cons	10.1736	.012874	790.25	0.000	10.14836	10.19883

Table 12: Decomposition of Inequality in Non-food Expenditure by Household Characteristics (Contributing Sources) using Half the Square of CV

Decomp.	LogNon-food Expenditure					Predicted Values of logNon-food Expenditure				
	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)
Residual	40.604	0.003	0.000	8.21E+30	1.18E+33					
Sector	9.942	0.001	14.177	0.036	5.130	16.738	0.001	14.177	0.036	8.637
Hhsize	12.702	0.001	6.259	0.171	24.536	21.386	0.001	6.259	0.171	41.308
hhsex_female	30.478	0.002	-20.651	0.062	8.920	51.313	0.002	-20.651	0.062	15.017
Hhagey	-0.047	0.000	0.176	0.059	8.511	-0.078	0.000	0.176	0.059	14.330
Hhmarsta	-10.274	-0.001	8.654	0.152	21.784	-17.297	-0.001	8.654	0.152	36.675
Spouses	1.089	0.000	0.224	0.485	69.755	1.833	0.000	0.224	0.485	117.440
remittance	0.016	0.000	0.006	108.947	1.57E+04	0.027	0.000	0.006	108.947	26400.00
educ_level	0.000	0.000	0.031	0.170	24.373	0.000	0.000	0.031	0.170	41.035
Depratio	0.000	0.000	0.079	0.030	4.305	0.001	0.000	0.079	0.030	7.248
Dwelling	3.946	0.000	-4.523	0.075	10.790	6.644	0.000	-4.523	0.075	18.166
outside_wall	2.868	0.000	3.497	0.120	17.188	4.828	0.000	3.497	0.120	28.938
floor_dwelling	0.279	0.000	-5.192	0.106	15.170	0.469	0.000	-5.192	0.106	25.540
roofing_mat	2.956	0.000	2.975	0.161	23.165	4.976	0.000	2.975	0.161	39.000
cooking_fuel	-0.005	0.000	-0.492	0.175	25.161	-0.008	0.000	-0.492	0.175	42.362
Lighting	2.442	0.000	-1.425	0.485	69.772	4.111	0.000	-1.425	0.485	117.468
water_source	3.004	0.000	-6.048	0.127	18.295	5.058	0.000	-6.048	0.127	30.801
Total	100.000	0.007	100.000	0.007	1.000	100.000	0.004	100.000	0.004	1.000

Note: proportionate contribution of composite var f to inequality of Total,

$s_f = \rho_f * sd(f) / sd(\text{Total})$. $S_f = s_f * CV(\text{Total})$.

$m_f = \text{mean}(f)$. $sd(f) = \text{std.dev. of } f$. $CV_f = sd(f) / m_f$.

Total = lognfd. Source: Author's Computations

Table 13: Decomposition of Inequality in Food Expenditure by Household Characteristics (Contributing Sources) using Half the Square of CV

Decomp.	LogFood Expenditure					Predicted Values of logFood expenditure				
	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)	100*s_f	S_f	100*m_f/m	CV_f	CV_f/CV(total)
Residual	42.612	0.002	0.000	1.14E+29	2.88E+31					
Sector	36.807	0.002	22.377	0.036	9.01	64.137	0.0015	22.377	0.036	15.702
Hhsize	4.272	0.000	4.135	0.171	43.16	7.444	0.0002	4.135	0.171	75.201
hhsex_female	-0.427	0.000	-3.883	0.062	15.69	-0.744	0	-3.883	0.062	27.344
Hhagey	1.820	0.000	1.589	0.059	14.97	3.171	0.0001	1.589	0.059	26.087
Hhmarsta	2.152	0.000	-3.635	0.152	38.32	3.750	0.0001	-3.635	0.152	66.772
Spouses	-3.720	0.000	-3.536	0.485	122.59	-6.482	-0.0001	-3.536	0.485	213.609
remittance	0.085	0.000	0.020	109.043	2.76E+04	0.148	0	0.020	109.043	4.80E+04
educ_level	-0.003	0.000	0.036	0.170	42.876	-0.005	0	0.036	0.170	74.71
Depratio	0.000	0.000	0.019	0.030	7.572	0.000	0	0.019	0.030	13.19
Dwelling	1.320	0.000	-3.084	0.075	18.974	2.300	0.0001	-3.084	0.075	33.06
outside_wall	3.200	0.000	-2.586	0.120	30.233	5.575	0.0001	-2.586	0.120	52.68
floor_dwelling	-1.584	0.000	4.175	0.106	26.683	-2.761	-0.0001	4.175	0.106	46.50
roofing_mat	7.087	0.000	-4.495	0.161	40.748	12.350	0.0003	-4.495	0.161	71.00
cooking_fuel	0.004	0.000	0.619	0.175	44.277	0.006	0	0.619	0.175	77.15
Lighting	0.542	0.000	-1.079	0.485	122.726	0.944	0	-1.079	0.485	213.85
water_source	5.835	0.000	-3.569	0.127	32.180	10.168	0.0002	-3.569	0.127	56.07
Total	100.000	0.004	100.000	0.004	1	100.000	0.0023	100.000	0.002	1

Note: proportionate contribution of composite var f to inequality of Total,

$s_f = \rho_f * sd(f) / sd(\text{Total})$. $S_f = s_f * CV(\text{Total})$.

$m_f = \text{mean}(f)$. $sd(f) = \text{std.dev. of } f$. $CV_f = sd(f) / m_f$.

Total = lognfd. Source: Author's Computations

```
. sumdistnfdtexpd [aw= wta_pop] if sector==1, ng(5)
```

Distributional summary statistics, 5 quantile groups

Quantile |

group	Quantile	percent of median	Share, percent		L(p), percent
GL(p)					
1	57612.89	41.68	2.51	2.51	7500.86
2	104645.43	75.70	5.34	7.85	23458.12
3	185517.00	134.20	9.41	17.25	51577.01
4	358587.66	259.40	17.05	34.31	102553.48
5			65.69	100.00	298928.00

Share = quantile group share of total nfdtexpd;
L(p)=cumulative group share; GL(p)=L(p)*mean(nfdtexpd)

```
. sumdistnfdtexpd[aw= wta_pop] if sector==2, ng(5)
```

Distributional summary statistics, 5 quantile groups

Quantile |

group	Quantile	percent of median	Share, percent		L(p), percent
GL(p)					
1	19544.91	34.29	1.07	1.07	2146.01
2	40352.91	70.79	2.92	3.99	7986.92
3	82765.53	145.20	5.86	9.85	19712.76
4	220707.58	387.19	13.78	23.63	47283.45
5			76.37	100.00	200094.78

Share = quantile group share of total nfdtexpd;
L(p)=cumulative group share; GL(p)=L(p)*mean(nfdtexpd)

```
. sumdistfdtexpdr [aw= wta_pop] if sector==1, ng(5)
```

Distributional summary statistics, 5 quantile groups

Quantile |

group	Quantile	percent of median	Share, percent		L(p), percent
GL(p)					

-----+-----					
1	35967.15	49.36	4.21	4.21	4609.00
2	59270.64	81.34	8.67	12.88	14097.21
3	90942.76	124.81	13.45	26.33	28808.93
4	158848.91	218.01	21.85	48.18	52711.14
5			51.82	100.00	109410.57

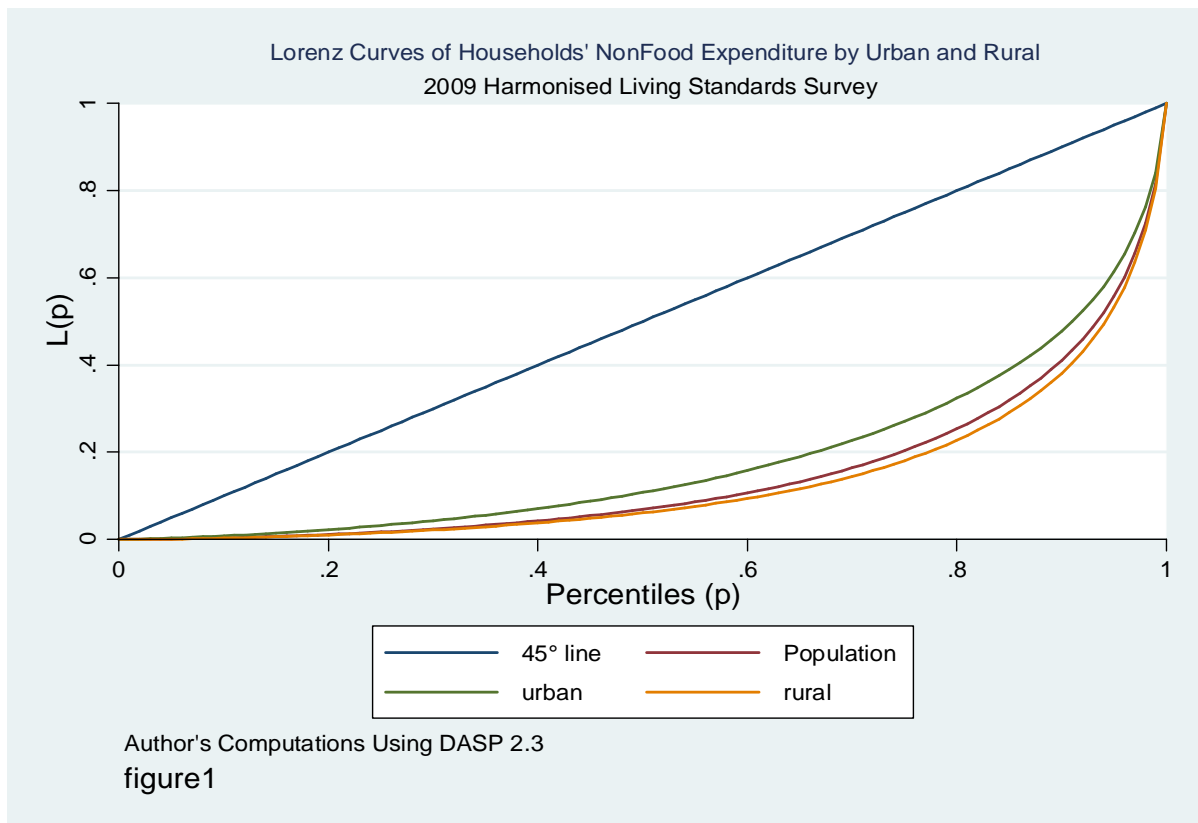
Share = quantile group share of total fdtxpdr;					
L(p)=cumulative group share; GL(p)=L(p)*mean(fdtxpdr)					

. sumdistfdtxpdr [aw= wta_pop] if sector==2, ng(5)					
Distributional summary statistics, 5 quantile groups					

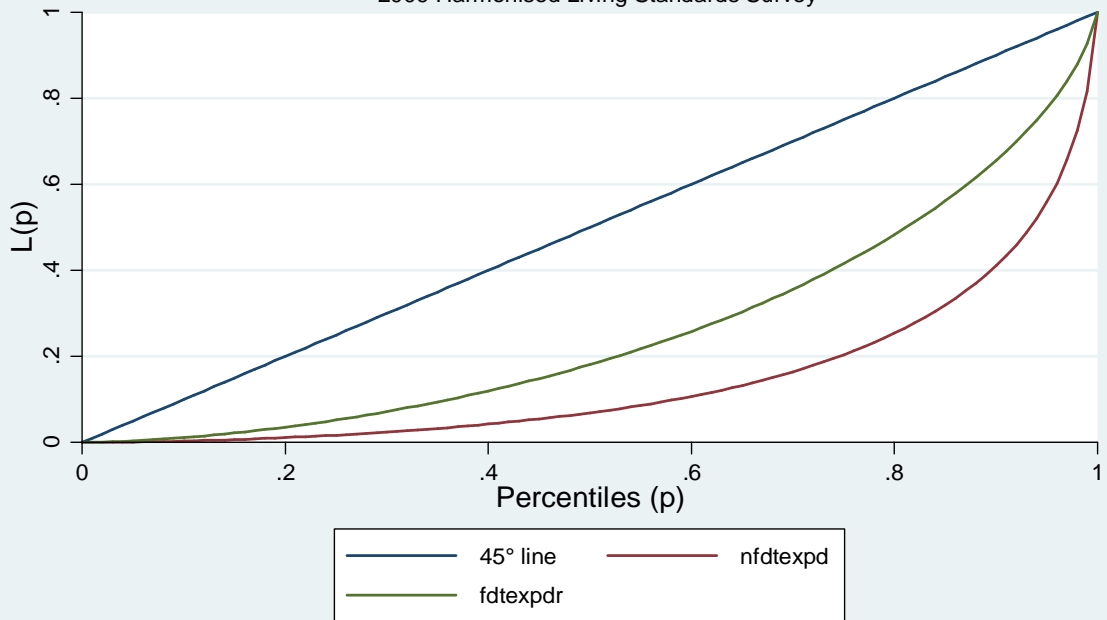
Quantile					
group		Quantile	percent of median	Share, percent	L(p), percent
GL(p)					
-----+-----					
1		43316.27	43.49	3.56	3.56
2		78692.66	79.00	8.53	12.09
3		126256.82	126.75	13.97	26.06
4		209573.34	210.40	22.76	48.82
5				51.18	100.00

Share = quantile group share of total fdtxpdr;					
L(p)=cumulative group share; GL(p)=L(p)*mean(fdtxpdr)					

Appendix B

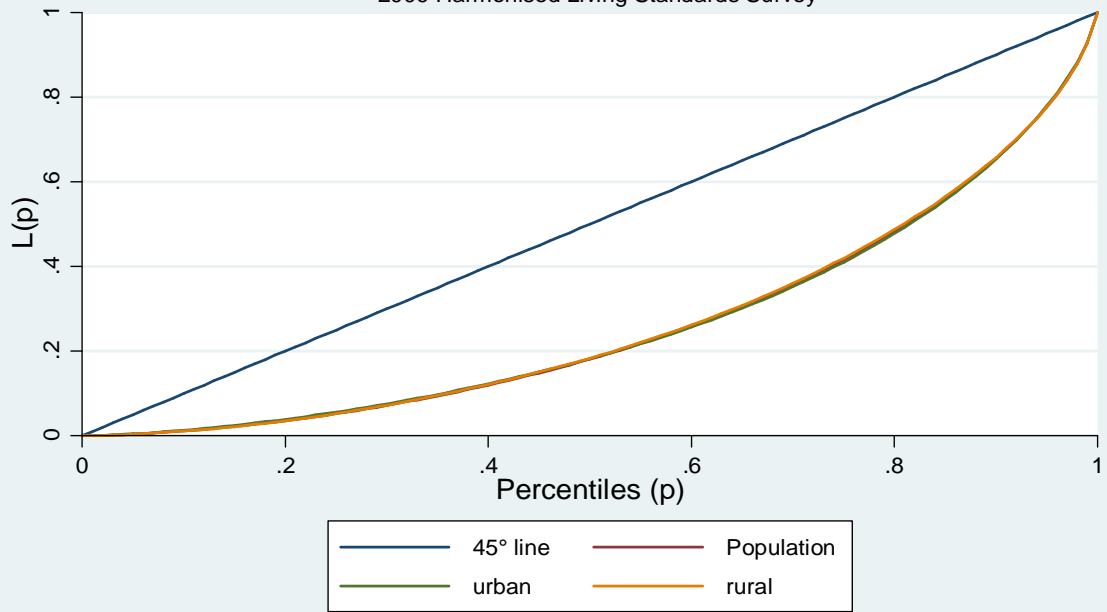


Lorenz Curves by Households' Food and Nonfood Expenditure
2009 Harmonised Living Standards Survey



Author's Computations
Figure 2

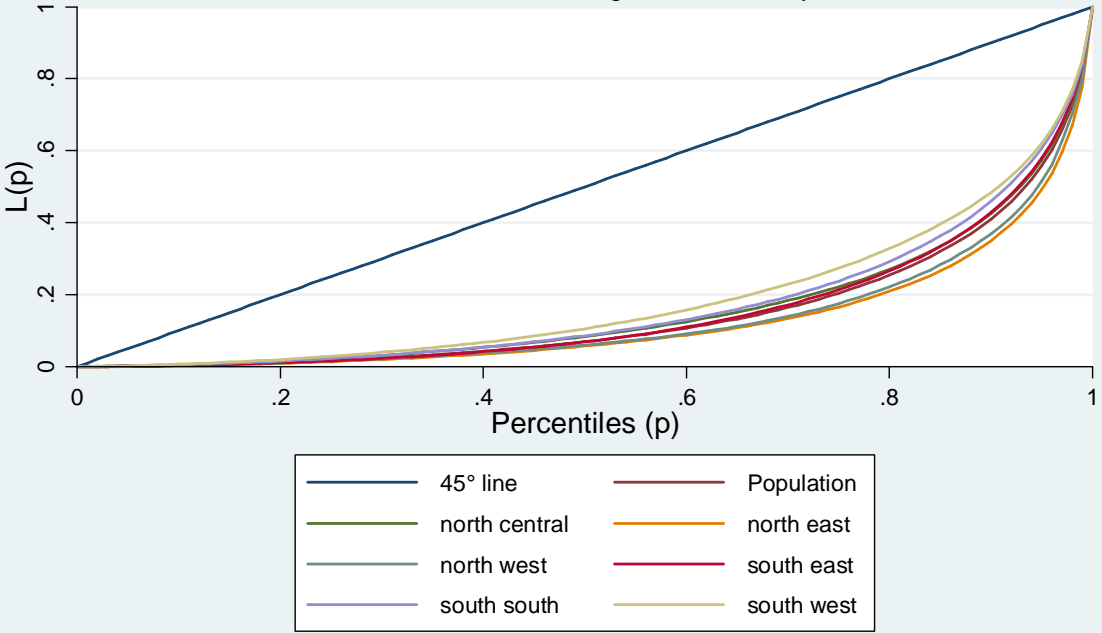
Lorenz Curves of Households' Food Expenditure by Urban and Rural
2009 Harmonised Living Standards Survey



Author's Computations using DASP 2.3

figure 3

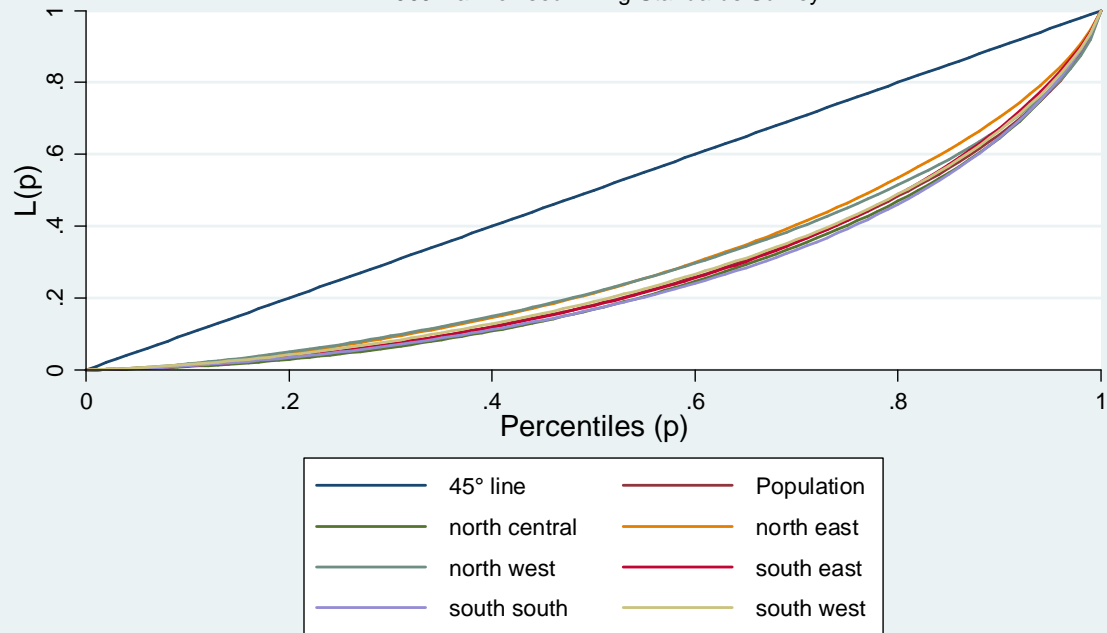
Lorenz Curves for Households' NonFood Expenditure by Zones
2009 Harmonised Living Standards Survey



Author's Computations Using DASP 2.3

Figure 4

Lorenz Curves of Households' Food Expenditure by Geopolitical Zones
2009 Harmonised Living Standards Survey



Author's Computation using DASP 2.3

Figure 5