



MEASUREMENT OF INCOME INEQUALITY IN ADDIS ABABA, ETHIOPIA

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ABSTRACT

High level of income inequality causes violence and social unrest, worsens insecurity and produces unfavorable environment for economic growth and development. As such, in the last few decades a huge amount of theoretical and empirical literature was devoted to the analysis of the link between development and inequality. There is also an increasing pressure on Governments across the globe to address inequality concerns. In the case of Ethiopia, even though, inequalities decreased overtime, they are found to be widened in urban areas than in rural areas especially in the capital city of the country, Addis Ababa. Therefore, the objective of the study is to measure income inequalities in Addis Ababa during 1995 and 2011 by employing Household Income Consumption and Expenditure data of Central Statistical Agency Survey (CSA). The contribution of some household socioeconomic characteristics (sex, education level and occupation of the head of the household) towards income inequality is measured through Gini coefficient Measure of income inequality by applying data analysis and statistical software (STATA) and Distributive Analysis Stata Package (DASP). The result shows that even though inequality in Addis Ababa has decreased from 1995 to 2011 it is still higher in Addis Ababa compared to other regions. Therefore special attention should be given by the Government to address the problems of inequality in Addis Ababa.

Key words: Central Statistical Agency, Gini coefficient, Statistical Software, Distributive Analysis Stata Package, Household Income, Consumption and Expenditure

Introduction

Studies on the pattern of income distribution have drawn the attention of economists for a long time (Clarke et al, 2003). Specifically the 1990s witnessed a renaissance in the theoretical and empirical attention of development economists to the distribution of income and wealth (Atkinson and Bourguignon, 2000). It is argued that high level of income inequality causes violence and social unrest, worsens insecurity and produce unfavorable environment for economic growth in a given country. In the last few decades a wide body of theoretical and empirical literature was devoted to the analysis of the link between development and inequality (kimhi, 2004). Inequality almost always leads to a rise in poverty and poverty in developing countries implies hunger and malnutrition. Inequality may be also harmful to the growth process itself, creating a vicious cycle of underdevelopment and poverty (Galor and Zeira, 1993). The effect of inequality on growth may change with country's stage of development. A growing body of research indicates the adverse implications of inequality for development and macroeconomic stability, arguing that it may lead to political and economic instability, weaken support for economic reforms, and undermine progress in education and health (Persson and Tabellini, 1994; Ostry et al., 2014). Recent empirical work confirms this relationship between rising income inequality and its impact on economic growth (Dabla Norris et al., 2015).

In many developing countries, studies have shown that income inequality had risen over the last two decades (Addison and Cornia, 2001; Kanbur and Lusting, 1999). Over the last decade, many of the countries that have entered a path of fast economic development and reduced poverty simultaneously experienced a rising gap between the rich and poor. As a result, in many of them, including those in sub-Saharan Africa (SSA), income inequality has increased. Further, there is an increasing pressure on Governments across the globe to address inequality concerns and this is particularly so in Africa given the jobless and non-inclusive nature of its growth experience (UNDP, 2015).

In Ethiopia also, the Government's development plans have had a strong focus on inclusive growth, together with an increase in pro-poor spending. This highlights the potential policy trade-offs between growth and inequality. Further, despite the significant expansion of government programs to combat food insecurity, food price shocks remain the biggest threat to Ethiopia's poorest households (IMF, 2015).

Recent studies in Ethiopia indicate that income gap is widening in the cities than rural areas due to the rising skill premium for higher education and the changes in the household characteristics.

Addis Ababa, the capital and center of Ethiopia and diplomatic centre of Africa, hosts 30 per cent of the urban population of Ethiopia. Its population has nearly doubled every decade. Its geographic location, combined with its political and socio-economic status have made it to host hundreds of thousands of people coming from all corners of the country in search of employment opportunities and services. High rate of unemployment (31per cent),concentration of slum dwelling, and poor housing, inadequate infrastructure and sanitary development, characterize Addis Ababa (Habitat,2008).

In the case of Ethiopia, even though inequalities decreased overtime, they are found to be widened in urban areas than in rural areas. The existence of higher population growth in Addis Ababa coupled with high rate of rural urban migration which accounts for about 40 per cent of the growth of urban population posing critical challenges, including high rate of unemployment, housing shortage and environmental deterioration. All these are found to be widening inequalities among the population of Addis Ababa. Therefore, the purpose of this study is to measure the level of income inequality in Addis Ababa through identifying the effects of some basic household characteristics.

The major objective of the study is to examine the changes of income inequality in Addis Ababa by measuring the level of income inequality during 1995 and 2011.The specific objectives are

- 1) To determine the contribution of some households socio economic characteristics (sex, education level and occupation of the head of the household etc.) on income inequality in Addis Ababa, Ethiopia, and
- 2) To illustrate the role of various macroeconomic and social policies to reduce inequality among the households in Addis Ababa.

Source of Data

The study employed secondary data of 1995-96 and 2010-11 of Household Income Consumption Expenditure survey (HICE) conducted by Central Statistics Agency of Ethiopia (CSA).HICE survey data are comprehensive and were collected from all the eleven administrative regions of Ethiopia (both rural and urban areas).The data enables us to understand the income (consumption-expenditure) dimension of the households in Ethiopia. The 1995-96 data set has covered a total of 12,342 households of which1245 observations were from Addis Ababa. The 2010-11 dataset has covered 27,830 households of which 3741 households were from Addis

Ababa. Since the scope of the study is limited to Addis Ababa this study is based on the data from a total of 4986 sample households.

Method of Analysis

This study measured the levels of inequality in Addis Ababa, Ethiopia by using the most common measure of inequality i.e Gini coefficient through the integrated application of STATA and DASP Software.

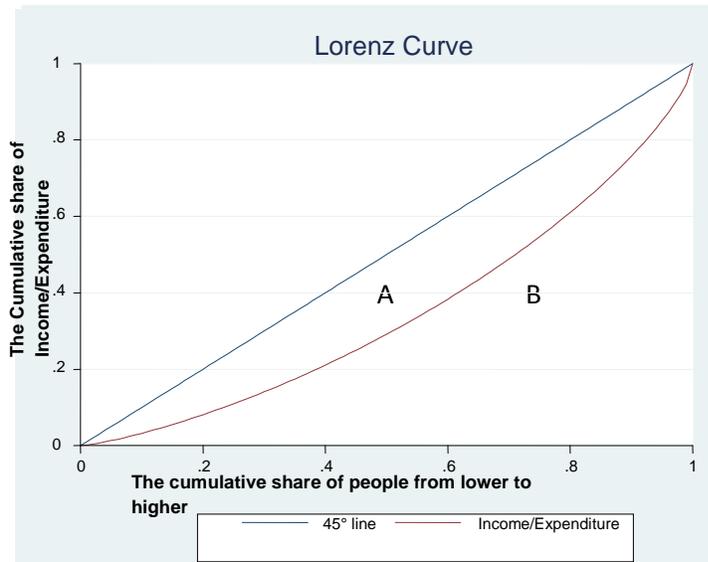
The Gini Coefficient Measure of Inequality

The Gini coefficient is a popular measure of inequality. It computes the average distance between the cumulated population shares and cumulated income/Expenditure shares. The Gini coefficient is derived from the Lorenz curve, which sorts the population from poorest to richest, and shows the cumulative proportion of the population from poorest to richest. It demonstrates the cumulative proportion of the population on the horizontal axis and the cumulative proportion of income/expenditure on the vertical axis. In other words, it is the ratio of the area between the Lorenz curve and the diagonal equality line to the total area of the triangle. Where, the Lorenz curve plots the cumulative proportion of income earned by the poorest x per cent of the population for different values of x and it has the ratio with values between 0 and 1.

The Gini coefficient value=0 corresponds to perfect income equality (i.e. everyone has the same income) and=1 corresponds to perfect income inequality.

With reference to Lorenz curve the Gini index is defined as a ratio of the area on the Lorenz curve diagram.

Figure 1: Lorenz curve



Lorenz curve representation of the Gini coefficient

From the above Graph, if the area between the line of perfect equality and Lorenz curve is A, and the area under the Lorenz curve is B, then the Gini Coefficient is $A/A+B$. Since $A+B=0.5$, the Gini coefficient $=2A=1-2B$. If the Lorenz curve is represented by the function $y=L(x)$, the value of B can be found with integration and

$$G = 1 - 2 \int_0^1 L(X) dx$$

Or without direct reference to the Lorenz curve it is possible to calculate Gini-index for a population with values $y_i, i = 1 \text{ to } n$ that are indexed in non-decreasing order ($y_i \leq y_{i+1}$)

$$G = \frac{1}{n} \left(n+1 - 2 \frac{\sum_{i=1}^n (n+1-i)y_i}{\sum_{i=1}^n y_i} \right)$$

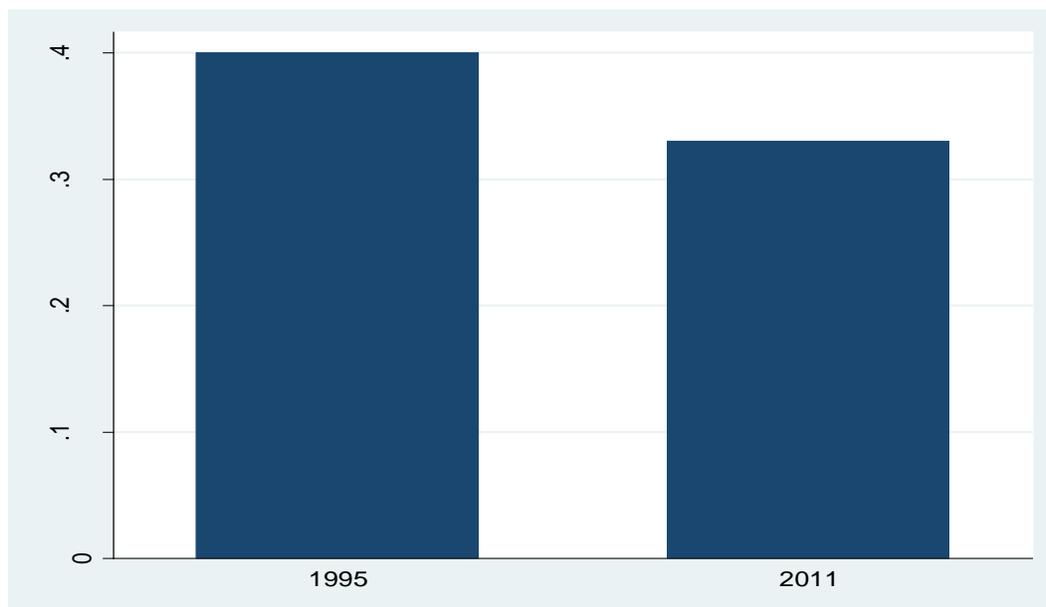
Results

In order to measure inequality the Gini coefficient measure of inequality is preferred. To compute the coefficient the data analysis and statistical software (STATA) and Distributive

Analysis Stata Package (DASP) applications were employed. The DASP application produces a comprehensive package of Stata modules to help analyze the distribution of living standards, including most popular statistics (indices, curves) used for the analysis of poverty, inequality, social welfare, and equity.

The results show that the Gini coefficient measure of inequality for Addis Ababa in 1995 was 0.40 and it declined to 0.34 in 2011. Changes in consumption inequality as measured by the Gini-coefficient are reported in the graph below.

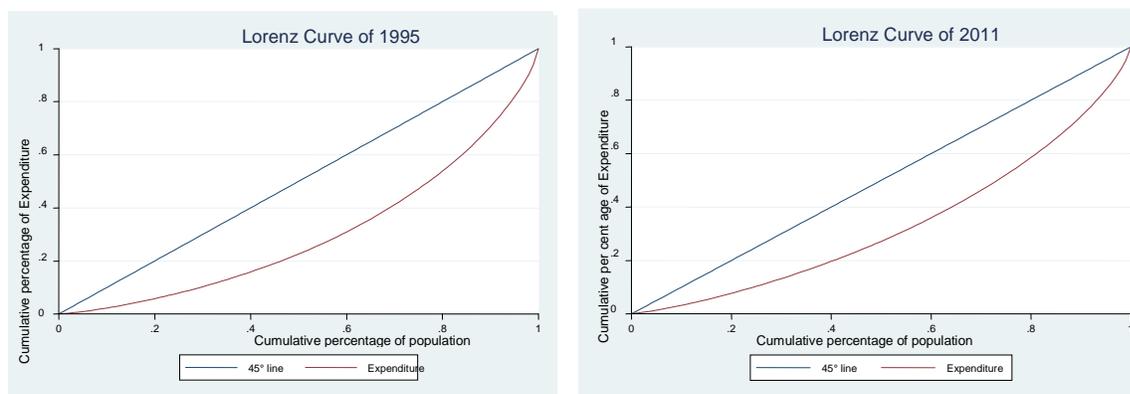
Figure 2 : Gini coefficient of Addis Ababa, Ethiopia of the year 1995 and 2011



Source: own calculation from 1995 and 2011 HICE survey of CSA

From 1995 to 2010/11, income (consumption) inequality measured by Gini Coefficient has shown a decline from 0.40 in 1995 to about 0.34 in 2010/11 due to the change in urban development policy after 2005. The Lorenz curve below also shows the Gini coefficient measure of inequality of the years 1995 and 2011.

Figure 3: Lorenz curve of the year 1995 and 2011



Source: own calculation from 1995 and 2011 HICE Survey data of CSA

Inequality and Sex of Head of the Household

It is observed that in both survey years of 1995 and 2011 there is no significant difference between inequality of male headed households and female headed households. In 1995, inequality of male headed households is slightly higher than female headed households. It is about 0.41 for male headed households and 0.39 for female headed households. In the year of 2011 both male headed households and female headed households have almost the same level of inequality, which is 0.33 for male headed households and 0.34 for female headed households.

Table 1: Inequality and sex of household Head in Addis Ababa

Year	Inequality based on sex of Head of the household			
	Male	Female	Total(Addis Ababa)	Ethiopia
1995	0.41	0.39	0.40	0.30
2011	0.33	0.34	0.34	0.29

Source: own calculation from 1995 and 2011 HICE survey data of CSA.

Inequality and Education of Head of the Household

The level of inequality varies as the level of education varies. Results show that in both survey years inequality decreases as level of education increases.

Table 2: Inequality and Education of Household Head in Addis Ababa

Educational Level	Gini Coefficient	
	1995	2011
Illiterate	0.38	0.33
Grade 12 completed	0.36	0.32
University /College Degree	0.29	0.26

Source: own calculation from 1995 and 2011 HICE survey data of CSA

From the table-2 it is observed that inequality decreases as the level of education increases. In 1995 the Gini coefficient for illiterate household heads is 0.38 and for those who have completed grade 12, Gini coefficient decreased to 0.36 and it further decreased to 0.29 for those household heads who have University/college degree. For the year 2011 the Gini coefficient for illiterate household heads is 0.33 and for those who have completed grade 12 it decreased to 0.32 and it further declined to 0.26 for those who have university/college degree. Therefore, it is possible to conclude that decreasing inequality is possible through investing on education.

Inequality and occupation of Head of the Household

From the table-3 it is observed that inequality varies in different occupations. Inequality for legislators is 0.26 for the year 1995 and 0.32 for the year 2011. For professionals it is 0.36 for the year 1995 and declined to 0.29 for the year 2011. In case of technicians and associate professionals it is 0.34 for 1995 and declined to 0.30 for 2011. There is a significant decline of inequality for clerks and it is 0.38 for 1995 and declined to 0.32 in 2011. The same trend is observed for service workers and for crafts and related trade workers. The Gini coefficient for service workers declined from 0.39 to 0.34 and for crafts and related trade workers declined from 0.45 to 0.39 from 1995 to 2011. On the other hand, it is pertinent to observe that the Gini coefficient for armed force personnel increased from 0.11 in the year 1995 to 0.32 in 2011. From the above it may be inferred that except in the case of armed personnel and legislators, in all other category of occupations inequalities declined in Addis Ababa. However, the decline in inequality is found to be very rapid in the case of crafts and related trade occupations.

Table 3: Inequality and Occupation of Household Head in Addis Ababa

Occupation	Gini coefficient of the year	
	1995	2011
Legislators	0.26	0.32
professionals	0.36	0.29
Technicians and associate professionals	0.34	0.30
clerks	0.38	0.32
Service workers	0.39	0.34
Craft and related trade workers	0.45	0.33
Armed forces	0.11	0.32

Source: own calculation from 1995 and 2011 HICE survey data of CSA

Conclusion and Recommendation

Our analysis shows that there was a marginal decline in inequality at the national level with Gini coefficient declining from 0.30 in 1995 to 0.29 in 2011. Whereas in Addis Ababa there was a substantial decline in inequality from 0.40 in 1995 to 0.34 in 2011. However, the value of Gini coefficient is found to be higher than the nation's value due to the highest level of population and unemployment rate in Addis Ababa.

Since Inequality leads to less stable, inefficient economic systems that restrain economic growth and pose a serious barrier to the eradication of poverty, the following measures will go a long way in tackling the problem of inequality.

Universalism in the provision of social services

Ensuring public funding for universal provision of basic facilities is crucial to the reduction of poverty and to the promotion of equality of opportunities. Therefore, the Government of Ethiopia as well as the Addis Ababa city administration should allot public funding with proper measures in implementation for the universal provision of basic facilities such as access to housing, clean drinking water, sanitation and electricity, as well as essential social services such as nutrition, health and education to reach specific segments of the population that face greater challenges.

Investing in education and strengthening of labor-market institutions

It is well known that investment in education contributed to a significant reduction in wage inequalities. Furthermore, widening access to education and ensuring more female enrolment in schools reduce gender wage gaps. As such, the Government of Ethiopia as well as Addis Ababa city administration should increase investment in education.

Labor market institutions also play an important role in moderating wage inequalities through increasing minimum wage, employment protection, unemployment benefits and regulation with respect to hiring and firing practices. Therefore, the government should have mechanisms that protect and support collective bargaining institutions such as labor market institutions.

Reducing social exclusion and intergenerational disadvantages

Marginalized and disadvantaged social groups fall behind the general population in terms of welfare outcomes. They often face inequality of opportunity that prevents them from accessing social services. Accordingly, for those particular groups of society that bear the brunt of multiple deprivation such as older persons, persons with disabilities, migrants and deprived females policymakers should aim at removing the obstacles for their full social and economic participation.

Creating more and better-paying jobs

Reducing inequality requires policies that encourage dynamic structural changes so as to increase the share of higher productivity activities among the labor force. Improvements in the wages of both skilled and non-skilled workers in major emerging economies have also contributed to lifting millions of people out of poverty and to reduce inequality. Therefore, the Government of Ethiopia should help people in creating both public and private work opportunities and should improve the wages of both skilled and non-skilled workers.

Social protection

Social protection refers to policies that ensure basic income security in the form of various social transfers such as pensions for older persons, income support for persons with disabilities, employment guarantee services for the unemployed. Therefore, the Government should give emphasis for universal social protection to reduce inequality in Addis Ababa.

Fiscal and monetary policies to reduce inequality

Fiscal policies can reduce inequality through progressive income taxation and highly-redistributive social transfers targeting education and health spending, as well as public child-benefit and old-age benefit. Monetary policies such as control of interest rates and the availability of credit for the poor can affect levels and patterns of inequality. Therefore, at the national level the Government should regulate fiscal and monetary policies to reduce inequality. Thus several macroeconomic and social policies in Ethiopia in general and in Addis Ababa in particular should be implemented to reduce income inequalities in Ethiopia.

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