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POVERTY, INEQUALITY AND GROWTH IN URBAN ETHIOPIA

By

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Abstract

This paper compares and analyses the spread, depth and severity of urban poverty and its relative sensitivity to changes in growth and inequality across individual urban units and over time. The Urban Socio-Economic Survey Data conducted by the Department of Economics of AAU and Department of Economics of Goteberg University of Sweden across seven urban centres in four rounds (1994,1995, 1997 and 2000) have been used.

Recent techniques for poverty analysis have been applied. The three decomposable poverty measures along with Gini indices have been estimated for individual urban centres over four study periods. Decomposition techniques of poverty, intended to examine different aspects of it, have extensively been applied. Decomposition of aggregate urban poverty into population weighted share of the sub-groups, allowed to investigate the relative contribution of each urban centre to the aggregate poverty. The elasticity of aggregate poverty to changes in growth or redistribution in i^{th} urban centre and analysis of targeting have been employed to prioritise urban centres for efficient allocation of scarce resources and hence maximum reduction in aggregate poverty. Decomposition of poverty at a given point in time into growth and distribution components has also been used to explore the relative sensitivity of poverty to growth and inequality. The observed change in poverty between two periods has also been decomposed into growth, redistribution and residual effects to examine the relative importance of growth or redistribution as a policy alternative to address the issue of poverty. Using poverty measures as dependent variables against growth and inequality as explanatory variables, the regression analysis of panel data have well been discussed to determine the relative elasticity of poverty with respect to growth and inequality.

The study thus indicated that urban poverty is so spread, deep and severe, and the existing inequality between poor and non-poor is terribly wide. Both poverty and inequality shows no tendency of decline through time. If total urban poverty reduction is the objective in the country, it is largely rewarding to focus on poverty situations in Addis so that maximum aggregate poverty reduction is possible. Although the magnitude of point elasticity of poverty with respect to growth and inequality varies with the type of poverty measures, it also depends largely on the initial condition of level of development and welfare distribution. While the relative dominance of growth or redistribution effects on the observed changes in poverty varies widely depending on the type of growth (distributionally neutral or not). The regression result on the other hand, indicated that poverty is highly sensitive to distribution than growth. The policy implication is that a comprehensive 'policy package' focused on the lower segments of the poor population and intended to promote growth and enhance equity should prior be implemented to attack poverty and inequality early on.

Chapter One: Introduction

1.1. Background

The problem of inequality and poverty entered into the discussion of economic development quite lately. Before the 1960's, industrialization and capital accumulation was the main concern of academicians and practitioners. It was widely believed that economic growth is the means to reduce poverty through trickledown process. Although industrialization brought a significant change in aggregate per capita growth (for instance, about 2.4 percent per year in the 1950's in Asia and Africa which later jumped to 3.5 percent between 1965-1970¹), the benefits of this did not fairly "trickledown" to lower income groups.

It was only recently that the worsening of income distribution at the early stage of economic growth was pronounced. Increasing concerns of both academic and policy makers on the issue can be witnessed. On the academic side, several studies addressed the failure of economic growth to trickledown its benefits to the majority in the system. Adelman and Robinson and others (1989) cautioned that economic growth worsens income inequality at the early stage of development. The World Bank initiated seminal work on "Redistribution with Growth" by Chenery and others (1974) changed the attention of policy makers and the course of thinking on development (Albert Fishlow, 1995). Changes in the course of thinking on development in general and income distribution in particular, and policy options are largely influenced by three main factors (Fishlow, 1995).

¹ Fishlow A. (1995) strongly argued the importance of income distribution to address the problem of poverty.

First, the acceptance of the Kuznet's hypothesis, which was empirically verified that inequality naturally tends to worsen at early stage of economic growth. Chenrey and others (1974) insisted that the redistribution of physical assets such as land and the development of human capital through an effective development policy on education and health could make a difference in narrowing the inequality gap. Second, the insistence of having an appropriate policy packages particularly targeting the poor. Finally, compatibility of simultaneous growth and income distribution argument: the argument, which emphasizes the importance of the type of policy that can allow attaining both objectives of growth and fair distribution (Chenery and others, 1974). Following the new attention on income distribution, several countries tried one way or the other to improve the existing inequality. Many of them, however, registered temporary success; it was not sustained due to excessive government intervention (Fishlow, 1995).

World Development Report 1980 (World Bank (1980) and basic needs approach, further pushed the direction of thinking towards poverty alleviation, the objectives of which is different from that of narrowing inequality. The emphasis of basic needs approach, as stated in Fishlow (1995, pp.32) is:

“The importance of separating generalized increases in income from the more significant attainment of the requirements for a permanent reduction in poverty –improvements in health, regular access to nutritional food, more education, and better and affordable shelter. Three arguments were advanced to support this view: first, many poor people are not themselves producers but are part of the dependent population. So, they have no direct earnings of the kind typically evaluated in distribution studies. Second, there is no guarantee that increased income will be spent on essential services. Better medical care may not be available –or safe drinking water or better housing. In such circumstances individuals are normally better off but lack the basis for permanent improvement. Third, households vary in their ability to spend wisely and effectively. They may irrationally prefer “better” consumption goods that contribute less to welfare than other goods that might serve as inputs to higher productivity” (pp.32-33).

It was believed that targeting the poor would ultimately improve equity as well.

World Development Report (World Bank, 1990) once again strengthened that poverty should be the primary agenda of international communities and policy makers in developing countries. The report suggested two policy strategies to be used in order to reduce poverty: attention to labor intensive growth and public investment on primary education and health.

1.2. Review of Ethiopian Economy

The Ethiopian economic, political and social conditions, which plummeted into deep crisis during the military regime (between 1974-1991), was reversed by coming to power of the Ethiopian Peoples Revolutionary Democratic Front (EPRDF). The transitional government established in 1991 launched a market oriented economic policy and calmed down the then existing structural and institutional constraints.

The Transitional Government took several measures to restore and stabilize the war-ravaged economy and bring political stability as its short-term strategy. Some of these measures were implemented after June 1991. They were: Launching of a market based economic policy and introducing of a federal structure were the first moves along with peace and stability objectives. Regionalization was supposed to allow the regional governments to plan and implement their programmes more efficiently. These government organs have a close contact with their local communities and have relatively better quality information regarding the priority needs of their population. For this reason the new federal system was established in 1991.

The choice of Agriculture Development Led Industrialization (ADLI) strategy was the second significant move, which mainly emphasized labor-intensive agricultural development and the linkages with small-scale industrial sector. Given the larger share of agricultural sector in the economy and its potential to the overall economic development justifies the strategy.

The third important measure was the effort that the government put on the rehabilitation and reconstruction of war-ravaged economy with the financial supports availed from different international institutions. The structural adjustment programmes in the Ethiopian context has also been adopted to help the economy revive from its overall depression. Democratization and particular emphasis to the participation and full involvement of communities in their concern is one significant quality of the government provided that it will improve and sustain through out. In addition to this, what are labeled as practical policy measures including “correction of price distortions, lifting restrictions on the private sector, instituting markets for factors of production, reducing imbalances, trade liberalizations, civil services reforms and decentralizations” have been put in place (TGE (1995).

Following these policy measures and the ensuing improvements in the structural and institutional constraints by the transitional government, the Ethiopian economy started reviving from its overall depression during the last few years of the military regime. Real GDP was on average growing at annual rate of 4.7% in the period between 1992 and 1998.

The average real per capita GDP growth rate was 3 % for the same period as compared to 1.9 percent during the Derge regime. Inflation, which is one of the macro variables affecting the lower income groups, particularly the urban poor, has been well controlled as a result of prudent monetary policy.

Although the Ethiopian Economy is now in a better condition as compared to the case before 1991, its relative position in the world and the average living standards of the population are still at their lowest stage as ever before. All the standard economic and social indicators rank Ethiopia first in the poorest category. Out of 210 country, Ethiopia ranked 210th in per capita GDP (WDR, 1999/2000), 172th out of 174 countries in terms of human development index (HDR, 1999). As compared to other African countries or (all LDCs) the Ethiopian economy is still crawling on the ground in many aspects. According to World Bank, World Development and Human Development Report (1998/99) real per capita GNP for Ethiopia (in terms dollar) was \$110, which is one of the lowest figure in the world. The same sources reported that the average figure for low-income countries in the same year was \$350 (which outweighs Ethiopian figure by 69%).

Several recent studies indicated that the level and severity of poverty in the country is so huge that it needs to be the primary agenda of both government and non-government organizations. WDR (1999/00) reported that more than 50 percent of the populations are in absolute poverty. The depth of poverty is more than 12%, which is the average budget deficit of the poor as compared to the poverty line.

The prevalence of low life expectancy, high child mortality, low school enrollment, and significant number of disabled and displaced people, beggary and unemployment are the common figures in urban areas particularly in Addis Ababa. The study made by Berhanu and et al (1999), the adult literacy rate for Ethiopia was estimated to be 35.5, which can be compared with 49.2 for LDCs, and 77.6 for the rest of the world. The same authors claimed that gross enrollment ratio for primary, secondary and tertiary level stand at 20 percent in 1995 compared with 36.4 percent for LDCs, 52 percent for Kenya, and 61.6 percent for the rest of the world. As regard to access to safe water supply and sanitation facilities are concerned, it was reported that only 27% and 10% of the population respectively have access to these facilities. The respective figures for LDCs are 71 and 30.

Regardless of the government's tireless effort made in the last few years to bring sustainable economic development and reduce the overwhelming poverty situation in the country, the problems, which had been there for the last two or more decades are, still present. Several reasons can be listed as to why the Ethiopian economy is always there in the poorest category.

First, the economy's fate is significantly dependent on backward agricultural sector, the production of which in return depends completely on nature. Its contribution to national economy in terms of GDP, employment creation etc is large but still a significant share of producers in the sector uses traditional and primitive techniques. However, the production in this sector are not that sufficient to satisfy the needs of the country's population due to high rate of population growth, the resultant environmental degradation, limited supply of

agricultural inputs, and the traditional (archaic) techniques of production along with bad weather conditions. Mainly due to these reasons significant proportion of (52%) rural population in the country are in the abject poverty, MEDaC, (1999).

Second, the deep-rooted structural constraints in the system can be blamed. It includes several aspects of the economy, which is snagged by low level of savings and investment, poor technology, shortage of skilled manpower, limited infrastructure, less diversification in export and heavy dependence on agriculture.

Third, we have political instability. It has always been said that Ethiopian history is the history of war particularly in northern part of the country. The meager resources available in the country have been shifted for the purpose of wars. Significant productive labor forces have been allocated to this purpose which otherwise would have been an important resource to build the national economy.

Fourth, external shocks are commonly considered as an important setback for developing countries in that the market share and decision power of LDCs is limited to influence the international community. Ethiopia faces similar challenges. Ethiopian economy is highly susceptible to such shocks including deterioration in market price of exported items, increasing in the prices of imports (e.g. oil price shocks), declining external resource flows etc. For instance, the Ethiopian export is mainly dependent on few agricultural products such as coffee and when such a shock occurs, its economic and social impacts will be heavy.

Last, but not least are social problems including population growth, unemployment, famine, HIV/AIDS and urban specific problems including poor housing, prostitution, beggary,, and disability, migration and overcrowding etc. These have also played significant roles to the miserable situation in the country.

However, comparison of current status with the situations before 1991 gives a good impression and triggers a bright future in the hearts of the population. The economy's performance in the last eight or so years was reasonably good. To realize the expectations and sustain balanced development requires/ depends on flexibility, transparency and open mindedness of the government. Many analysts of course argue that the unprecedented performance observed in the last few years can significantly be attributed not only to the government policies and its commitment but also to the huge external financial flows, good weather conditions and other exogenous factors.

1.3. The Issues of Poverty and Inequality

The issues of poverty and inequality have received much attention for the last three decades in Ethiopia also. During the Derg regime, policy makers and planners had been grappling to bring an egalitarian economy through “socialist” economic system; however, their efforts were futile and eventually the economy get plummeted into deep crisis.

The problems in urban areas were even more daunting. Along with the rapid growth of urban population, high urban poverty threatens political and economic stability. Urban areas are where the exodus of rural migrants for better job and better living standards and even some times forced flow (displacement for instance) create a big burden on the limited public services available in the cities thereby aggravating the problems of poverty and inequality. UNICEF (1995) estimated the population growth of Addis Ababa to be 5.8 percent per annum. In 1994, about 46 percent of Addis Ababa residents were migrants (EEA annual report, 1999/00). Poor housing and sanitary condition, high unemployment and underemployment caused by migration, low quality of public services, proliferation of street children, prostitution, beggaries etc are commonly visible almost in all urban centers (statistical estimates are available for each in MEDaC, 1999 and EEA, 1999/00 and others).

Wide inequality between the poor and non-poor is also common in urban areas. In the absence of dedicated effort from the concerned, market liberalization and competition worsens the situation of inequality in urban areas. The Gini coefficient (inequality

measure) estimated in 1994 for seven urban centers reveal this situation both within and between urban centers (Bigsten and Negatu, 1996).

Presently the urban centers are growing spread out in terms of its population size and space coverage, but their available social infrastructure and facilities is static or deteriorates. Housing and sanitation problems are common phenomena of urban centers. There is an increasing proliferation of slums, squatter settlements, and a rising shortage in basic services. Following sanitation and poor living conditions, the incident of infant mortality, and other diseases are rampant. The urban poor are the one mainly victimized by structural adjustment programs (SAP) following retrenchment, reduction in public expenditure etc at least in the short-run.

The urban poor, therefore, seem to be trapped in a vicious circle of poverty in which low income results in poor education, nutrition and health, which in turn lead to low productivity and income. So on this context and given the unique features and problems of urban areas, this study tries to explore the relationship between poverty, inequality and growth and analyze their behavioral variations across cross sectional units (individual urban centers) and over time four study periods. Such analysis will help to come up with possible policy recommendations.

1.4. Statement of the Problem

After the rejection of the 1950s belief that growth and industrialization can solve most social and economic problems, an interesting debate on the relationship between growth and equity were brought to the forefront. The role of policy in reducing poverty was also emphasized. These debates and policy concerns are practical problems that every country and policy makers face.

The Ethiopian government and its policy makers face similar challenges in identifying the relationship between growth and equity and possible policy options to reduce poverty. Ethiopia faces the challenges of managing its macro economy, which is highly susceptible to the external shock, on the one hand and attaining of self-sufficiency in food supply to its people, on the other. Despite all the efforts and the flow of technical and financial supports from abroad, our economy is relatively moving at a slow pace while that of developed and some developing countries are moving rapidly. Therefore, economic growth is one of the issues that need to be addressed.

The current political move toward democratization explicitly implies that the involvement of the poor in the economy and their share from it largely requires the attentions of government and non-government organizations. The current issue of globalization (and competitive economy at global level) and regionalization at domestic level necessitate strong effort from the government to look for the best policy strategy so as to take care of the issue of equity within and among the regions.

- There are no hard and fast rules that are applicable to every country for addressing the issues of growth, equity and poverty. But it is possible to ask whether there is a possibility of introducing policies and strategies, which are specifically relevant and optimal to our country in reducing poverty, and inequality gap, which at the same time does not slow down the progress of economic growth and development.

From this we pose the following questions: how spread, deep and severe is the urban poverty, and how it dynamically varies with inequality and growth across individual urban centers? Given the decomposition of poverty into its components, we ask how elastic is the urban poverty to either of its components (growth or inequality)? We also try to answer that which component is dominantly explains the variation in weighted aggregate and individual poverty. The answer for these questions may help us to show the type of policies to be designed to address urban poverty while taking into account the behavior of growth and inequality with respect to poverty.

1.5. Objective and Significance of the Study

Given the current conditions of urban areas in the country and the overwhelming concerns of the governmental and non-governmental organizations to narrow the widening gap of income inequality between the poor and the non-poor, it is important to understand the behavior of urban poverty and its dynamic relationship between growth and inequality. The current policy debate on the existence and non-existence of trade-off between growth and equity and the dilemma as to the importance of growth or equity or both to alleviate

poverty, demands a thorough analysis of the interactions between growth, equity and poverty.

Understanding the behavior and sensitivity of urban poverty with respect to growth and equity will help policy makers to have a clear direction in their effort in policy formulation and implementation. Effective allocation of the available resources and its impact on society (particularly for the poor) depends highly on the level of our understanding on the relationship between poverty, growth and inequality. Analysis of poverty with respect to inequality and growth is the first of its kind in the Ethiopian context and hence its contribution in this regard is so significant.

Overall objective is to

- ✎ Compare and analyze the spread, depth and severity of urban poverty and its relative sensitivity to changes in growth and inequality, while

Specific Objectives are to

- ✎ Compare and analyze variations in welfare distribution, and spread, depth and severity of poverty across individual urban center i and over time t .
- ✎ Investigate the possibility of targeting specific urban center(s) in terms of, for instance, of resource allocation for maximum aggregate poverty reduction. The relative importance of growth and redistribution will also be examined as to which policy option is appropriate for maximum aggregate poverty reduction
- ✎ Analyze the relative sensitivity of urban poverty for the changes in growth and distribution by employing different techniques of decomposition and econometric approach and
- ✎ Draw the policy implications based on the empirical results.

1.6. Limitation of the Study

The main limitation of this study is related to the data of different sorts. First of all, a single welfare indicator, consumption expenditure is taken to proxy the living standard of a given unit of analysis. Household reports on the *value of consumption* along with the *consumption expenditure* for the food items is not chosen for the possibility of measurement error inherent in valuation. Following the arguments of Deaton (1998) the shorter time unit (a week) is preferred for analysis and therefore, expenditure data reported for longer periods, particularly for nonfood items are averaged and converted to a weekly basis. But reports on the value of durable assets are not included for the inherent problems of subjectivity and incompleteness of information to calculate the use and depreciation value.

The other limitation is lack of reliable conversions of local units to standard measurements. Most of the reports on the quantities consumed were in local units, which vary significantly across different sites. So to convert the local units into the corresponding standard metric, it is necessary to have local specific conversion data. But in this particular analysis the conversion factor used for rural data have been averaged and adjust to the vicinity of the selected urban centers.

1.7. Contents of the Paper

This paper is organized as follows. The first chapter that we discussed so far is an introductory part, which reviewed the Ethiopian economy, and specified the problem and objective of the study. Chapter two embarks on reviewing literatures on theoretical and empirical works. Chapter three is concerned with the detail description of the data, methodology and model specification. Chapter four then starts the discussion on welfare distribution and poverty analysis. Welfare distributions within and between urban centers have been discussed with the help of different techniques and measurements. The spread, depth and severity of both aggregate and individual poverty and their interaction are investigated. Chapter five discusses the elasticity of poverty with respect to growth and inequality using different approaches. Decomposition and econometric modeling of panel data are examined. Finally, chapter six provides conclusion and policy implications.

Chapter Two: Literature Review

The concept of poverty, its causes and possible remedies has been perceived differently over different periods of time and across different countries. The views and remedies suggested before 18th century in Europe and before the 1950's in Africa, Asia, and Latin American countries were moralistic (cited in Ravallion and Lipton, 1993). Poverty was thought as incurable either through economic growth or deliberate public action. So it was approached in four ways: acceptance, palliation, insurance and/or theft (Ravallion and Lipton 1993, pp. 3). The idea behind acceptance was based on the premises that poverty is caused by some superpower, which is beyond the control of the poor, and hence the poor are forced to accept their given conditions. Himmelfard (1984) writes this as, “Embraced as a sacred vow [or] tolerated (or railed against) as unhappy fact of life”. (Cited in Lipton and Ravallion 1993]. Lewis (1966) expressed similar views. Lewis characterizes poverty as unavoidable natural phenomena, which the poor has to accept. He attributed poverty as constantly passing from generation to generation.

Palliation was also the other way of treating the impoverished by devout religious people through alms giving and similar gestures. Social insurance to the poor was well applied in England (example England's poor-law of 1597). When the poor has no option to survive, theft was an ethically accepted as the ultimate alternative. (Cited in Ravallion and Lipton, 1993)

However, moral approaches were later challenged by the classical economists, particularly by Adam Smith (1776). Smith argued that the accumulation of physical and human capitals

along with technical progress would be a solution to poverty reduction (Ravallion et al, 1993). There were, however, opponents to Smith's view. Malthus (1798), for example argued that not only free market growth, but also policies such as poor-laws aimed at increasing real wage rates, would self-destruct by inducing early marriage and therefore, larger fertility rates which ultimately increases the price of food up and reduces wage of labor (Ravallion and Lipton, 1993). Ricardo had also the fear on the of view of Smith that mechanization or free-market growth might not allow the participation of poor labor because of the implication that it induces high real wage.

Despite these objections, the Smithian view had dominantly been supported and implemented across Europe and other countries as the right approach to reduce poverty (cite in Ravallion et al, 1993). The Classical thinking toward poverty alleviation changed not only the ideas as to the root causes of poverty but also emphasized on the importance of assigning responsible bodies/institutions in the society to take care of the poor. It was believed that the existence of responsible public institution along with the efforts of mass education, provision of health services etc was appropriate to prevented or reduce poverty (Ravallion, 1993). Hegel (1821/1991) put his view by saying "For the poor the universal power [state] takes over the role of the family. The contingent character of alms-giving ...is supplemented by public powerhouse, hospitals, streetlight etc..."(cited in Ravallion et al 1993)

The transition from moralistic to policy for reducing poverty took place between 1750-1850; similar transition in developing countries: Africa, Asia, and Latin America took place very lately (Ravallion 1993). Following classical thinking, there proliferated the idea of industrialization/growth, and it was highly believed that industrialization raises the demand

for labor and hence enriches the poor. Rosenstein-Rodan's (1943) 'big push', Nurkse's (1963) 'balanced growth theory', and Lewis's (1954,55) surplus labor transfer theory shared the classical view of 'trickle down effect of growth' (Ravallion, 1993). They had the concern for poverty, but their belief was that growth and industrialization is the best and quickest way to reduce poverty. However, the impact of industrialization or growth on poverty moved in the reverse direction than originally expected. Its unexpected cost on poor due to the worsening of inequality was immense (Ravallion, 1993). Of course, there were some exceptional countries such as Taiwan and South Korea, which demonstrated the possibility of managing both growths with equity simultaneously. The work of Chu (1995) and Ravallion (1998) verifies that:

"By all accounts, Taiwan's post war experience has been one of growth with equity. It is one of the economies of East Asia that managed to achieve extraordinarily high rates of growth with extraordinarily (by international standards) low levels of inequality and, indeed, declining inequality".

The 1940s' and 1950s' overconfidence on growth lead to the neglect of poverty, and as the result it was vehemently objected by a number of authors in terms of its consequences on inequality. These objections brought significant changes both in terms of thinking and policy, toward poverty and its relation to growth and inequality (Ravallion and Lipton 1993). Apart from the popular arguments of Kuznet's (1955) and Lewis (1954), many others expressed their views on the requirement of social intervention to narrow the gap caused by growth. Better nutrition as an instrument for raising the productivity of the poor [Berg (1973)], strong emphasis on human development along with equitable growth (Adelman and Morris (19973), Schultz (1981), Psacharopoulos (1981)) etc, were clear indicators of the emergence of concern

for the poor. The policy implications of such a shift is well summarized by (Chenery et al (1974)) as “Redistribution with growth” and it is, of course the reflection of the rejection of ‘Trickle down principle’ of the classical thought (Ravallion and Lipton, 1993).

In spite of the early works of Kuznets (1955) and Lewis (1954), the concern for the consequences of economic growth on income distribution received less attention in developing world at the time. However, some of the efforts made to address the problem of income distribution received the attentions of Baer and Herve (1966) and Frank (1968). They argued that the growth rates of employment in urban areas lag beyond output and population growth, thereby increasing unemployment problem (Cline, (1976). Todaro (1969) had also the same idea, where he related the problem of distribution with migration of rural labor force to urban areas as a consequence of huge wage differential between the two.

Regarding the theoretical analysis of the interaction between growth and distribution, the classical analysis of Lewis (1954) and Kuzent (1955) had popularly been recognized. The analysis of Lewis (1954) viewed the problem by classifying the economy into two sectors: Modern/urban/industrial and Traditional/rural/agricultural sectors. Lewis assumes that given the indefinite supply of labor from the traditional sector to the modern sector at a fixed wage rate, and continuous reinvestment of profit by the capitalist, will increase the demand for labor, but at stagnant wage rates, inequality will worsen (Kanbur, 1998). However, Kanbur further assumed that when the rural surplus labor is eventually exhausted, there would be a possibility of wage increase and a decline in capitalist’s profits, eventually leading to narrow the existing inequality gap. The idea of Lewis was, of course, the same as that of Kuzents (1955): the “Inverted-‘U’ hypothesis”

Kuznets (1955) recognized the inter-sectoral shifts of population from agriculture-/rural to industrial-/urban sector as the characteristics of the growth process in developing countries. While analyzing the income distribution in the process, he indicated that the income distribution of the total population is the sum distribution of two components together (rural and urban). He analyzed the income distribution of two components separately and noticed that : (a) the average per capita income of the rural population is usually lower than that of the urban; (b) inequality in the percentage shares within the distribution for the rural population is somewhat narrower than that for the urban population. Thus, in his analysis Kuznet concluded that inequality in the total income distribution increase for two reasons: first, the increasing weight of urban population means an increase in share for the more unequal income distribution between the two. Second, due to the productivity difference in per capita income between urban industrial sector and rural agricultural sector, there will not be a tendency of narrowing income inequality in the process of economic growth.

The objective of Kuznets (1995) discourse was to explain the widening total income inequality at the initial stage of economic growth and its eventual improvement as the economy grows. It implies that the short-run widening of income inequality in the process of development is inevitable; which means the intervention of government in the process to redistribute the benefit of economic growth to the disadvantaged group is necessary.

Apart from the popular theories of Lewis (1954) and Kuznets (1955), there were other theoretical arguments regarding the relationship between growth and distribution. For instance, Todaro (1969) and Karvis (1960) explained the possibility of widening of income inequality in the labor

force in terms of wage differentiation. Karvis (1960) argued that the homogenous labor mass in pre-industrial society gradually becomes heterogeneous in terms of its income through the 'diversity of industries and occupations', leading to increasing inequality among the labor forces (Cline, 1976). The possible reasons suggested for the heterogeneity of the labor force was the influence of unions (Harberger, 1971) and /or on-the-job training as well as formal education (Reder, 1969). Baran (1958) implicitly attributed high inequality in LDC's to the unfortunate historical timing of the rise of the middle class in the less developed areas. Mende (1973) on the other hand attributed the case in point to the industrial country's exploitation of the former by the later under the guise of free trade. He tried to give an example of Japan, Russia and China as the one, which isolated themselves from the exploitation of industrialized countries and have sustained their growth (Cline, 1976). Ahluwalia and Chenery (1973) believed that the income distribution of developing countries is mainly determined by the distribution of assets such as land and human capital (i.e. education).

Most of the literatures reviewed as regard to the relationship between these variables leads us to the conclusion that the worsening of inequality at early stage of economic growth is almost inevitable. So, at this point we may ask ourselves what would happen to growth if there were an intervention to reduce inequality? Or what explanations are there in the literature as to the effects of income redistribution on growth?

Cline (1976) explains the issue with in the orthodox concern of saving and argued that the shifts of income from the rich to the poor (and especially from entrepreneurs to workers) would lower saving and injure growth. On the contrary, Cline pointed that redistribution of personal income would not affect personal savings given the Friedman 'Permanent income' and Modigliani 'life-

cycle consumption hypothesis'. Many authors including Cline, (1972), Lopes (1972), Figueroa (1972), Soligo and Land (1972), Tyler (1972) and others have recognized the demand decomposition effects of redistribution, whereby redistribution raises the weight of basic goods and lowers that of luxury goods in total demand and will induce growth effects of equalization due to differential in import propensities, economics of scale and factor requirements, among sectors (Cline, 1976). Rich (1973) pointed out that redistribution of the benefit of economic growth to the poor accelerates the reduction in population growth rate.

Based on the endogenous growth model, Galor and Tsiddon (1996), concludes that,

“ A relatively poor economy which values equity as well as prosperity may face a difficult trade-off between equity in the short-run and equity and prosperity in the long-run”. Other papers conclude the other way around: “equitable distribution of assets unambiguously raises growth rates” (e.g. Bannered and Newman, 1993). Perotti (1993) having data from similar economic structure as that of Galor and Tsiddon came to the conclusion that in the poor economies, under certain condition only, a very unequal distribution may give enough resources to those at the upper end to invest in education and thus generate economy/wide externality to in turn generate growth.

The literature review made so far can be summarized into five phases¹²:

The first phase : before 1940s, [before about 1950's in Africa, Asia and Latin America, Ravallion and Lipton, 1993], can be considered as a period in which poverty reduction strategy was dominated by the Moralistic approach (Illiffe, 1987). In those periods people had four approaches to poverty: acceptance, palliation, insurance and / or theft (Ravallion and Lipton,

1993). The second phase: from 1940s to 1950s, was the period of rapid growth and industrialization (Ravi Kanbur). The dominant thinking in those periods was that rapid growth and industrialization will be the best way to reduce poverty and it was the period in which the consequences of economic growth on income distribution was completely abandoned. The main proponents of these ideas were Rosenstein-Rodan (1943), Mahalanobis (1963), Nurkse (1963) etc. The third phase: from mid 1950s to the mid 1970s, during this period the distributional consequences of growth were explicitly considered. The recognition of the costs of economic growth on poverty called for the needs of intervention to manage the process. The exemplary work of Chenery et al (19974) with the summary phrase of ‘Redistribution with Growth’, and Robert McNamara’s (World Bank president, 1973), concern for rural areas and urban poor are some of the policy changes. The analysis of Lewis (1954), Kuzents (1955), and Fishlow (1972) are few of the theoretical arguments for the tradeoff between growth and inequality . The fourth phase: from mid 1970 to early 1990s, was dominated by the argument of “both more growth and more equity are possible”. The World Bank’s (1990) human development report asserts that “ ... not only is growth necessary for poverty reduction but that growth and equitable distribution of growth can indeed go hand-in-hand – all that is needed are the right policy.” World Bank report (1990) suggested two pronged strategies which are supposed to resolve the conflict between growth and distribution:(1) promotion of the productive uses of the poor’s most abundant asset, labor and (2) public investment in basic services such education, health, family planning, nutrition and infrastructure. These two are supposed to be complemented by social safety nets to protect the very poor and vulnerable. The final phase: The current arguments starting from 1990’s, questions the possibility of handling both growth and equity without conflict. So the

² Chronological ordering of views (literatures) on poverty, growth and inequality are mainly taken from Ravallion and Lipton (1993) and Ravi Kanbur (1998) and organized for convenience and easy tracing.

current move in the literature is resorted to the arguments of Lewis (1954) and Kuznets (1955). The widening of inequality in East Asia further triggered the doubt on the argument of non-tradeoff between growth and equity.

Regarding the empirical analysis, most of the works particularly in LDCs indicate that the relationship between growth and equity is mixed, mainly as the result of the quality of data set, the functional forms and country specific factors. Using cross sectional data from 44 developing countries provided by Adelman and Morris (1971), Cline (1976) estimated a regression equation relating inequality (as dependant variable measured by the ratio of the income share of the top 20% to the bottom 20% of recipients) and per capita income, the summary of growth (in quadratic functional form). His result significantly supported the “inverted ‘U ‘ hypothesis”. Adelman and Morris (1973) employed the step-wise variance analysis using the most important socio-economic variables including (a) an index of equality of access to secondary and university education (favoring equality), (b) natural resource abundance (favoring concentration at the top), (c) the government share in the investment and (d) the extent of dualism (with greater dualism associated with greater concentration). They grouped the country into two: “more concentrated and more even distributed” and came to the conclusion that “development is accompanied by an absolute as well as relative decline in the average income of the poor”. Using time series data for 13 developing countries (Ahluwalia, 1973a) observed that six countries showed increasing concentration, six indicated decreasing concentration and one showed constant concentration and thus he concluded that there is no generalized deterioration in inequality over time. He, however, supported the Kuznets hypothesis on his study in 1976. He estimated a regression line using income shares of different percentile groups as dependant variable and GNP as an explanatory variable (the summary measure of growth). He included different aspects of growth such as

human resource development (literacy rate, primary school enrollment, secondary school enrollment), share of production (proxied by share of agriculture in GDP, share of urban population), demographic characteristics (total population, growth rate of population), government activities (share of government revenue) and country dummies. His result strongly supported the Kuznets proposition, but he rejected the absolute impoverishment hypothesis.

Anand and Kanbur (1993a,b) rejected the Kuznets hypothesis using the same data set (but adjusted for higher quality) and different functional form than employed by Ahluwalia (1976).

Deininger and Squier (1996a,c) supported the hypothesis by estimating the regression equation using Gini coefficient (dependent variable) and per capita income, its inverse and dummies for socialist countries as explanatory variables. Similarly, Ogwang (1994) supported the Kuznets proposition but noted that the country specific variables such as policy and initial condition might have resulted in the weak relationship for the “inverted ‘U’ hypothesis”.

On the other hand Bruno, Ravallion and Squier (1995) rejected the “inverted ‘U’ hypothesis using country specific time series data for India.

Turning to the empirical tests of the effects of redistribution on growth, Bruno et al (1995) expressed their worry not only about the quality of data but also about the incorporation of a ‘noisy variable, inequality, on the right hand side [that] will bias the result’. However, Fishlow (1996) reported that the Latin American dummy does not support the proposition that initial inequality hurts the growth process. Cline (1972) assessed the effects of redistribution on growth empirically by combining the saving function in the model. Cline concluded that the growth effects of redistribution had been overemphasized. On the other hand, Deininger and Squire

(1996), using new data set, estimated growth as a function of initial inequality and other variables and came to the conclusion that the initial inequality on growth is not robust, but initial land inequality is associated with growth.

Even though it is highly questioned at the moment, the experience of 'East Asian Miracles' of 1960s, 1970s, and 1980s proved that equity with growth is possible given appropriate policies put in place.

✍ To conclude, the empirical tests of the relationship between growth, inequality and/or poverty are mixed. The results depend on the quality of given data set, the functional forms, and country specific variables such as policy and initial conditions. However, the consensus is that, given the quality of data sets and appropriate functional forms, inequality worsens at early stage of development (hence increase poverty). But as regards to the effects of redistribution on economic growth, the result depends on the chosen policy strategy. Most of the empirical works indicate that given low initial inequality and appropriate policies put in place, the simultaneous objectives of both growth and equity and hence poverty reduction can go hand-in-hand with out conflict.

Chapter Three: Data, Methodology and Model Specifications

3.1. Data Source and Analysis

The urban household socio-economic survey data conducted by the Department of Economics of AAU and the Department of Economics of Goteberg University of Sweden in seven selected urban centers in the country is used. The urban centers included in the sample are Addis Ababa, Awassa, Bahir Dar, Dessie, Dire Dawa, Jimma and Mekele. The data points cover four years: 1994, 1995, 1997, and 2000 for seven urban centers. The data is assumed to represent all urban centers in the country except those urban centers in arid and semi-arid regions. Combining four-years data points for seven urban centers will allow an econometric analysis of panel data.

A predetermined sample size of 1,500 was proportionally distributed to each urban center according to their respective population size³. Accordingly, it was determined that 900 household from Addis Ababa, 126 from Dire Dawa, 73 from Awassa, 101 from Dessie, and 100 each from the remaining three urban centers. Following the same procedure, the total sample size of each urban center was redistributed proportionally to their respective woredas in the center. Fifty percent of the Kebele associations under the woreda administration were randomly selected to redistribute the sample size of the representative's woreda. A systematic sampling technique has also been employed to randomly select a specified household using the records of residents in the respective kebele administration.

In this sampling frame, those who were not included in the kebele records such as homeless were excluded. The non-inclusion of these community groups may overestimate our measures of social welfare.

The contents and format of the survey questionnaire used in four rounds are almost the same except few cases in which the orders of sections are changed. Its Content is broadly grouped into different parts: household demographics, migration, employment and income, food and non-food expenditure, health, welfare and others (energy and cooking). We are mainly interested in the data reports on household demographics, and food and the non-food expenditures. Data on household demographics are employed to normalize the household level aggregate expenditures to individual level by adult equivalent scale, which takes into account variation between households in terms of family size, sex, and age and allow the welfare comparison between households.

Expenditure on food items is broken down into specific units of items. Food expenditure section has the components of market purchased food, own production/gift/aid, and outdoor consumption. Outdoor consumption expenditure is dropped from the analysis for it is impossible to estimate the calorie value of such expenditure. Data on non-food items includes more than 39 specific items and ownership of durable assets. However, reports on the ownership of durable assets are not included for it lacks information needed to estimate the use value or depreciation. It is assumed that dropping such information will not change the order of magnitude and the policy implications.

³ The detail description of the sampling techniques, procedures, site selections and data collection are available in Dercon and

Data collection took an average of four successive weeks in each round in each urban center Bereket et al (1999). The selected survey period (a month) is assumed to represent the average condition in all urban centers and it is therefore, not necessary to make temporal adjustment for possible price variations to happen while the data is under collection.

Regarding the reporting period, the questionnaire is designed in such a way that respondents report, particularly for market purchased foods, the amount purchased and amount consumed with corresponding expenditure and value of consumption for two alternative recall periods: a month and a week. The amounts for own production/gift/aid are reported for a week. While for non-food items, the respondents are required to report their total expenditure for both the last three months and for the last one year. But expenditures on transport (both local and long distance) and health and education to non-household members are reported on weekly and in few cases monthly basis.

Given the arguments made by Deaton (1998), the possibility of measurement error is larger for longer reporting periods (e.g. a year) because the respondents cannot recall and report the true amount spent or purchased. Deaton had noted that in the case of short recall period, there can also be a problem of “boundary” or “start-up” bias which means that the respondents report the events occurred before the beginning of the reporting period. However, as cited in Deaton (1998), Scott and Amenuvegbe (1990) the recalling capacity of the respondent deteriorates with time, and hence the possibility of measurement error related to longer recall period would significantly increase with time.

Kirishnan (1998)

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Kirishnan (1998)

Therefore, due to this reason, we preferred a short recall period as a reference unit of analysis, which is a week. On top of that, the existence of larger data points reported for short recall periods (such as a week) further strengthens our option of short recall period. Those data points reported for larger recall periods including non-food expenditure are therefore converted to a week. In the case of non-food expenditure, it was reported alternatively for three months and a year. From the Ethiopian context (or from experience) it is possible to argue that some non-food items are purchased once in a year and some others more than once and therefore, these alternative reports (three months and yearly expenditures) are averaged and converted to a week. Data reported as expenditure is preferred to the value of consumption because the involvement of subjective elements in the later is assumed to be inevitable and significant.

The households selected and sample sizes determined in the first round (1994) are not maintained through out four rounds. As observed from the data, some households are missed in between for different reasons and therefore replaced in second (1995), third (1997) and fourth (2000) rounds. We assumed that the replaced households will represent the missed ones and therefore, the analysis will not be biased as the result. The net sample size (number of households with all the required information) used through out four years are not the same. Due to different reasons, data points for some households are either incomplete or inconsistent or both. As a result the net total sample sizes in 1994, 1995, 1997 and 2000 are respectively 1480, 1456, 1459, 1455. The net sample size for each urban center also varies through time, though insignificant. Such insignificant variation in the actual sample size from planned will not affect the result. (See Annex, Table A2 for sample size distribution: Planned VS. Actual).

3.2. Methodology

3.2.1. Determination of welfare indicator

The first step in welfare analysis of a given household or individual is the determination of appropriate welfare indicator(s). It is well known that the welfare of a given household can be measured using a broad concept of living standard indicators including income/consumption, health, education, literacy, and nutrition etc. Social indicators such as health, education, nutrition, and literacy are usually taken as supplementary to the standard welfare indicator, for example, consumption or income.

For descriptive and analytical purposes it is convenient to use a single welfare indicator, even at the cost of simplification. It does not mean that a single welfare indicator captures all aspects of the well being of a given unit of analysis (e.g. household or individual) but it is assumed that such an indicator is a good proxy of the overall living standard of a given unit.

A single welfare indicator selected for this study is consumption expenditure. The other competent indicator is income. However, given several arguments in the literature against income as an indicator, particularly in developing countries, the selection of consumption expenditure is justified (Ravallion, 1992; Deaton, 1998; Deaton and Muellbauer, 1993).

The general arguments are partly theoretical and partly practical and data related.

Theoretically, by the permanent income hypothesis, consumption is a better measure of welfare indicator than income (Deaton, 1998). Households smooth their consumption overtime and it is relatively less fluctuating in developing countries as

compared to income. It is also difficult to use income as welfare indicator since income cannot necessarily be translated to welfare. Households having higher current income may be indebted ones and hence their welfare can be overstated. Conversely, those with lower current income may enjoy higher level of living standard if they had higher savings in past. The other important argument is associated with practical and measurement problem of income. The possibility of measurement error associate with income is large. For the detail arguments against income and in favor of consumption see Deaton (1998) and Ravallion (1992).

Decision on the components of consumption expenditures included in the analysis is as important as is the selection of the welfare indicator. As described in Section 3.1, the consumption expenditure data are broadly grouped into food expenditure and non-food expenditure. The food expenditure data are divided into three components: market purchased food, own production/gift/aid, and outdoors prepared food. Market purchased food includes more than 64 food items grouped into bundles of cereals, pulses and oil seeds, spices, milk and milk products, meat and others animal products, vegetables and fruits, drinks and stimulants, and other bundles. All market purchased food items are used in this study. Own production, gift and aid are also imputed using the average price data obtained from different sources (CSA, surveys along with household budget) and added to the household expenditure. But outdoor consumption expenditures are dropped from analysis because it is impossible to establish the calorie value of such consumption.

Non-food components include more than 39 items; out of which medical and educational expenditure made to non-household members are dropped because such expenditures are assumed to contribute to the welfare of some body else not to the household members. For instance, if we take an individual's lunch (in stead of weekly expenditure) as a unit of analysis and if the given individual give up his lunch to some body else, then he will immediately fall below the acceptable level of consumption. In other words, the inclusion of such expenditures may overestimate the welfare of a given individual or household. While expenditures for all other non-food items are considered. (Lists of food and non-food items are available in the original question from Economic department of Addis Ababa University). More over, data on the ownership of durable assets are not included for the inherent measurement problem and incompleteness of information to calculate the use and depreciation value.

The consumption data collected at household level can be aggregated as household total expenditure. However, in order to use individuals as unit of analysis and allow comparability across individuals, and overtime, the household level aggregate expenditure has to be adjusted in such a way that variation in household size, demographic composition and prices are taken into account.

As regard to household size and composition is concerned, the possible options are converting the aggregate expenditure to per capita expenditure (PCE) or per adult equivalent scale. The PCE approach assumes equal division of the aggregate expenditure among household members ignoring the differences in need associated with sex and age


composition. For example children and adult female may consume less than adult male and thus the assumptions of PCE, as a true indicator will bias the result. As observed by Deaton (1998), equal division of the total expenditure understates the true dispersion of consumption between individuals and thus inequality and poverty among household members.

For this reasons we construct the adult equivalent scale. The equivalent scale is based on the assumption that the only differences in tastes between households are because of variations in observable characteristics such as age, sex and activity. Since it is rare to have a reliable estimate for Ethiopia, this study employed the adult equivalent scale recommended by James and Schofield (1990)⁴. Per adult equivalent scale allocates a fraction of male adult equivalent to different age and sex groups of the family members. It is assumed that variations in activity differences among household members are captured by age and sex differences, which is in turn considered by equivalent scale.

Another critical issue in the analysis of household expenditure data is the requirement of spatial and temporal price adjustment. Using price data availed from CSA and unit values⁵, the spatial and over time Laspeyre /Paasche price indices are estimated for food expenditure. Due to lack of reliable prices (or lack analogous possibility of deriving unit values), the estimation of price indices for non-food items is difficult. The only available information for non-food items is food types and corresponding total expenditure.

⁴. The adult equivalent scale according to age and sex are annexed in Table A1.

⁵. Unit value is obtained by dividing total expenditure of each food item to the quantity consumed. Averaging the unit value accurately proxy the unit price and allow the estimation of spatial price indices.



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However, following Thomas (1987), the price indices for non-food items are approximated from the expenditure data itself. The procedure is as follows.

A given expenditure differences between urban centers for the given non-food item is assumed to be due to the price and quantity differences. The quantity differences arise partly due to money income and partly due to price. To estimate a price ratio, with all urban center average as a base, we divide average expenditure of item *i* in location *j* to the base average and multiply it by 100. This method assumes that location specific needs and quality differences across urban centers are insignificant.

3.2.2. Construction of poverty line

3.2.2.1. Food Poverty Line

The second most important issue (following the selection of appropriate welfare indicator) is the construction of the poverty line, which distinguishes the poor from the non-poor for the given welfare indicator. The methodology applied and types of poverty line constructed can crucially affect the comparison of living standard both between space and overtime and the pursuant policy implications.

Following Ravallion (1994, 1995), Bidani and Ravallion (1994), Atkinson (1993), and Lanjouw (1995) there are different types of poverty line and approaches of estimation. The types of poverty line include absolute, relative, subjective and multiple poverty lines.

Ravallion (1992) argues that absolute poverty line is more relevant to developing countries than relative ones. He indicated with empirical data that poverty line is relatively constant in LDCs than is in DCs. In our study the absolute poverty line is emphasized, though for comparison and evaluation of the significance of variation across urban centers, we shall also estimate the relative poverty line. FAO recommended minimum daily calorie requirement of 2200Kcal per adult equivalent (This is not significantly different from ENI national estimate of 2100Kcal) be used for the construction of poverty line in this study.

Different approaches of estimating poverty lines are available in the literature. Among these, we used the food energy intake (FEI) method to estimate the food poverty line used in this study⁶. The FEI approach anchors the poverty line to the most basic consumption need: food energy requirement. FEI approach is popularly implemented in several countries as are cited in Bidani and Ravallion (1994).

The food poverty lines corresponding to minimum calorie requirements indicated above are estimated by regressing calorie intake⁷ against consumption expenditure. Following the suggestion of Greer and Thorbecke (1986) and Kyereme and Thorbecke (1987), we adopted the former and derived the food poverty line from the semi-log Engle regression equation of,

$$(3.1) \quad \ln C_i = a + bK_i + u_i$$

⁶ The relative merits of alternative approaches to setting poverty lines have been analyzed by , for example, Ravallion (1994, 1995) Bidani and Ravallion (1994), Atkinson (1993) and Lanjouw (1995)

⁷ The amount of calorie for the quantity consumed of food items are estimated using the food composition data from former Ethiopian Nutrition Institute (ENI). It was difficult to obtain the calorie estimate corresponding to the specific food items in our consumption data. However, the available calorie data for related food items are averaged to the given bundles and used to convert the corresponding quantity consumed into calorie.

where C_i is adult equivalent food expenditure of household i , K_i is adult equivalent calorie consumption of household i , a and b are unknown parameters to be estimated and u_i is the random error term with constant variance and zero mean. Equation (3.1) is made to capture the fact that consumers shift to more luxurious food as they increase their food expenditure, where the corresponding increase in calories intake (or the content of calories in the food purchased) is not proportional to expenditure. The estimated regression equation is then given by,

$$(3.2) \quad \ln C_i = \hat{a} + \hat{b}K_i.$$

Given equation (3.2), the food expenditure level corresponding to the minimum recommended calorie requirement, M , is derived as

$$(3.3) \quad e^{(\ln C_i)} = Z^f = e^{(\hat{a} + \hat{b}M)}$$

Where Z^f is the real food poverty line, M is minimum recommended per adult calorie requirement, e the base of natural logarithm. Note that in this case we do not need unit price, as it is the case in cost of basic needs approach.

3.2.2.2. Allowance for Nonfood Goods

The food poverty line estimation is based on the minimum food energy or calorie requirement. But there is no analogous basis to set a basic non-food requirements, although it is natural to consider the minimum requirement of non-food items, without which an individual can obviously be grouped into poor (even if the minimum food requirement is met). Then how can such a minimum non-food allowance be incorporated into the food poverty line?

Here we used the method suggested by Ravallion and Bidani (1994). It is the cost of basic needs approach, which asks... “ What fraction of their budget those households which could in principle have met their food needs if they had devoted their entire expenditures to food (i.e. whose total expenditures are just equal to the food poverty line), actually devote to no-food item” (Hentschel and Lanjouw, 1996). The model estimates the demand function for food by running a regression of food share against a liner function of log of total spending (food plus non-food) in relation to the food poverty line.

Denoting S_{ij} as the share of total expenditure devoted to food by household i , Y_i as the total expenditure (food plus non-food), Z^f food poverty line, the regression equation is given by,

$$(3.4) \quad S_i = \alpha + \beta \log \left(\frac{Y_i}{Z^f} \right) + v_i.$$

Where α and β are unknown parameters to be estimated. Though Ravallion and Bidani (1994) suggested that the square value of $\log [Y_i / Z^f]$ will probably allow a better fit to the data, it does not make any significant improvement in our case.

As suggested by Bidani and Ravallion (1994), the total poverty line is derived as

$$(3.5) \quad Z = Z^f (2 - \alpha).$$

3.2.3. Poverty Measures

Poverty has broad and multidimensional definitions. As defined in Merriam-Webster's Collegiate Dictionary (1995), it is conventionally defined as "The state of one who lacks a usual or socially acceptable amount of money or material possessions." However, this definition fails to capture different aspects of poverty including the provision of public goods and services such as, health and education. Sen (1981) defined poverty in terms of capability, which he call " ... the freedom people enjoy to lead the kind of life they have reason to value, such as social functioning, better education, healthcare and longevity." In this regard UNDP has developed and defined poverty in terms of HDI, which captures three aspects of human deprivation: longevity, Literacy and living standard. As summarized by Kanbur et al (1999), "Longevity is measured by the percentage of people who die before age 40, literacy by the percentage of adults who are literate, and living standard by a combination of the percentage of the population with access health services, the percentage of the population with access to safe water, and the percentage of malnourished children under five." The other aspects of poverty emerged from participatory assessment includes the feelings of vulnerability, which is associated to risks and volatility of incomes, and lack of political power, which can be described as a sense of powerlessness and lack of voice Kanbur and Squire (1999).

After having chosen the acceptable well-being measure (consumption expenditure) of an individual and determining a threshold (the poverty line) with which to identify the poor

from the non-poor, the third most important step is the aggregation of the measure of poverty. Several literatures are available on the measurement of poverty (Ravallion, 1992). But it is required that any poverty measure should satisfy some desirable properties⁸. The monotonicity axiom: which requires that any poverty measure should increase when the income of a poor household decreases. The transfer axiom, on the other hand, requires that any poverty measure should increase when there is a transfer of income from poor to the less poor. This axiom implies that the poor is an individual, the larger should be the increase in poverty measure due to a reduction in his income (Kakawani, 1980). Another important property is that the aggregate poverty measure should be additively decomposable into components of social groups (e.g. urban and rural), sectors (e.g., the level of poverty of agricultural sector employees and service sector employee), regions etc. This property allows the analysis of poverty comparison between different units and the contribution of each unit to overall poverty. Both sub-group decomposition and decomposition of (observed) change in poverty in to growth and distribution will extensively be analyzed in this study.

One of the popular poverty measure, which will be used in this study is the one proposed by Foster, Greer and Thorbecke (FGT) class poverty measure. The FGT class poverty measure satisfies all the desirable properties mentioned above.

There are two alternative approaches of computing the FGT class poverty measures. The first approach is based on unit record data, i.e. when the welfare indicator data (in our case consumption expenditure) for individual household (unit of analysis) is used to compute

⁸ Surveys on the literature of poverty measures and their desirable properties are extensively discussed by Foster, Greer and

the three poverty measures. Estimation of poverty measures using unit record data is very uncommon. However, the general specification of poverty measures using unit record is given by

$$(3.6) \quad \mathbf{p}_\alpha = \frac{1}{n} \sum_{i=1}^q \left[\frac{z - Y_i}{z} \right]^\alpha$$

where p_α as poverty index, n the population size, q the number of poor people, Y_i total per adult consumption expenditure in the i^{th} household, and Z the poverty line and α , which is less than or equal to zero is an inequality aversion parameter (Kakawani, 1990). As α increases the weight given to the poorest poor increase. For instance, taking two poor individuals A and B, where B is the poorest individual, we can show how the parameter α is distribution sensitive and captures the severity when it is equal to 2. If individual A has income x such that $x < z$ and B has income of y such that $y < x$, then the ratio, $x - z / z < y - z / z$ and for $\alpha = 2$, $[x - z / z]^2 < [y - z / z]^2$. Now the three poverty measures can be derived from equation (6). If $\alpha = 0$, we obtain the head count index (P0), if $\alpha = 1$, we obtain the poverty gap ratio (P1) and if $\alpha = 2$, we obtain the square of poverty gap ratio (P2).

The head count index estimates the proportion (percentage) of population with a standard of living below the poverty line but it violates the properties of monotonicity and transfer axioms (Kakwani, 1980). It does not indicate how poor the poor are: it is unchanged when we take one Birr from the poorest and transfer to another poor individual. However, the poverty gap ratio, which measures the average deficit of the poor below the poverty line or the depth of poverty, overcomes the limitation of head count measure. The problem with the poverty gap ratio is that it is insensitive to the distribution of well being within the poor (Ravallion et al, 1991). On the other hand, the square of poverty gap ratio satisfies the

Thorbecke (1984), Atkinson (1987), Kakwani (1980)

desired properties of poverty measure, i.e. it is monotonic, satisfies the transfer axiom and at the same time distribution sensitive. It measures the severity of poverty (Ravallion et al, 1991).

However, we do not use the unit record data to estimate these poverty measures, rather it is the grouped data, which is more common and computationally more easier. The three poverty measures along with the point elasticities (see equation 3.14 to 3.19, used to compute point elasticities of the three poverty measures with respect to growth and inequality parameter) and Gini index can easily be estimated from grouped data. On top of that Ravallion (1992) cautiously noted that the estimates from unit record data should not be considered as more accurate than those from grouped data. In grouped data there is a possibility of averaging errors such as negative consumption, which otherwise significantly biases the estimates of severity measure. Ravallion also warns that the source of bias in sampling such as non-uniformity over the population in stratified sampling, can affect poverty measures when it is estimated from unit record data.

In grouping, per adult consumption expenditure data for the sample population are set in ascending order and divided into equal sub-groups (for example, it can be divided into equal ten groups or deciles: the first 10 percent, the second 10 percent up to the last 10 percent of the population) such that the mean consumption expenditure of each group (decile) is calculated and set in ascending order corresponding to the percentage of population. The three poverty measures are therefore computed from this data set using the parameterized Lorenz curve.

In grouped data, there is no exact boundary line to separate poor from the non-poor (that is, there is no value in grouped data corresponding to the poverty line). Therefore, the parameterized Lorenz curve is involved to interpolate such boundary line. In other words,

poverty measures computed from grouped data are derived from parameterized Lorenz curve (i.e. the poverty measures are functions of parameters obtained from the Lorenz curve). There are two popular Lorenz curve models: Generalized Quadratic model (Villasenor and Arnord, 1989) and Beta Model (Kakawani, 1981). Following Datt (1991), the formulae for the three poverty measures as a function of the Lorenz curve parameters for two models are given in Table 3.1.

Note that either of the two Lorenz curve model, depending on its fitness to the data, is used to compute the corresponding poverty measures⁹. The model is also used to generate new data sets on Gini coefficients along with poverty measures so that we can have a panel data points to run an econometric regression equation relating poverty indices (dependent variable) against mean expenditure (the proxy for economic growth), Gini coefficient, urban dummy and other variables (as found significant). See section 3.3.3 for model specification for the panel data analysis.

⁹ The poverty measuring software, POVCAL (Chen, Datt, and Ravallion, 1991) computes both model of Lorenz curve and selects the one that fits the data better. Povcal also estimates the three corresponding poverty measures along with Gini index and point elasticity of the three poverty measures with respect to growth and distribution (see equation 3.8 to 3.19 for specification of point elasticity)

Table 3.1: Poverty measures derived from alternative parameterized Lorenz curve^a

	Beta Lorenz Curve	GQ Lorenz curve
L(p)	$L(p) = p - \theta p \kappa (1-p)^\delta$	$L(1-L) = a(p^2-L) + bL((p-1)+c(p-L))$ Or $L(p) = -[bp + e + (mp^2 + np + e^2)^{1/2}]/2$
P ₀	$P_0 = \theta P_0^\kappa (1-P_0)^\delta \left[\frac{\kappa}{P_0} - \frac{\delta}{1-P_0} \right] = 1 - \frac{\bar{Z}}{\mu}$	$P_0 = -[n+r(b+2Z/\mu)\{(b+2Z/\mu)^2-m\}^{1/2}]/(2m)$
P ₁	$P_1 = P_0 - \left(\frac{\mu}{Z}\right)L(P_0)$	$P_1 = P_0 - \left(\frac{\mu}{Z}\right)L(P_0)$
P ₂	$P_2 = \left(1 - \frac{\mu}{Z}\right) \left[2P_1 - \left(1 - \frac{\mu}{Z}\right)P_0 \right] + \theta^2 \left(\frac{\mu^2}{Z^2}\right) \left[\kappa^2 B(P_0, 2\kappa - 1, 2\delta + 1) - 2\kappa\delta B(P_0, 2\kappa, 2\delta) + \delta^2 B(P_0, 2\kappa + 1, 2\delta - 1) \right]$	$P_2 = 2P_1 - P_0 - (\mu^2/Z^2)[aP_0 + bL(P_0) - (R/16)\ln\{1-P_0/S_1/1-P_0/S_2\}]$

Note: L(p) is Lorenz curve equation, which is defined as the cumulative fraction of consumption expenditure by the P×100 percent of the population. θ , κ , δ are parameters of Beta Lorenz curve to be estimated. While a, b and c are parameters of GQ Lorenz curve. P₀, P₁, P₂ are the three poverty measures. Z is the real absolute poverty line and μ is the real mean per adult consumption expenditure

$${}^a B(h,r,s) = \int_0^h p^{r-1} (1-p)^{s-1} dp; e = (a+b+c+1); m = b^2 - 4a; n = 2be - 4c;$$

$$r = (n^2 - 4me^2)^{1/2}; s_1 = (r-n)/(2m); s_2 = -(r+n)/(2m)$$

Source: Taken from Datt and Ravallion (1992)

3.2.4. Measures of Inequality and Growth

Inequality, which is the main concern of both practitioners and academia, needs particular attention in our country. Policy makers usually bypass it because they implicitly assume that the “trickle down” effect of 1960s will take care of the distribution. However, given the current economic system, which is quickly moving toward market economy and increasing internal and external competition, inequality has to be measured and the required policy implication needs to be drawn.

Inequality or consumption distributions among individuals, groups, regions etc are measured in several ways. The common inequality measures available in the literature include, Gini coefficient, coefficient of variation and the Theil indices. These inequality measures satisfy the Dalton (1920) “principle of transfer” (Deaton, 1998, pp.139). The principle of transfer requires that any inequality measure should decrease when there is transfer of income from a richer person to a poorer one, provided that the transfer is not sufficiently large to reverse their relative position. Statistical measures including central tendency (mean, median, mode) and dispersion measures (variance, interquartile range etc) are commonly employed for comparison. The income or expenditure share of different income groups (upper decile, lower decile, upper quintile, the lower 20% of the population share etc) in a given society has been used as well to reveal the existing disparity among a population. In this study our main interest of inequality measure is the Gini coefficient, although others including Theil indices and the distribution of consumption between different segments (deciles) of the population with in the given urban center and between urban centers will be employed.

The Gini index, which has a direct link to the Lorenz curve, will be derived from either of the parameterized Lorenz models that we discussed above.

As regard to economic growth, it will be proxied by the adult equivalent consumption expenditure Ravallion (1989, 1992), Datt and Ravallion (1991), Kakwani (1990, 1993), Ali (1996).

3.3. Model Specification

3.3.1 The Decomposition Framework

Ravallion (1989) introduced decomposition of change in poverty into growth and distribution components. Later on, Datt and Ravallion (1992), Kakwani (1993) and Ali (1996) further developed with little differences between them.

Following Ravallion (1992) and others, the poverty index P_α , can be fully determined by the poverty line Z , the mean expenditure μ and inequality index G . It can be written as:

$$(3.7) \quad P_\alpha = P(\mu/Z, G)$$

Where μ is the mean consumption expenditure, G (in this study it represents Gini index, unless other wise stated) is a vector of parameters fully describing the Lorenz curve. The poverty measure is assumed to be homogenous of degree zero in mean consumption expenditure, μ and poverty line Z (Ali et al, 1996). The restrictions imposed on the function $P(\cdot)$ are that the partial derivative of poverty index with respect to mean expenditure and poverty line are expected to be negative and with that of inequality parameter is positive (i.e. $\partial P/\partial\mu < 0$, $\partial P/\partial Z < 0$ and $\partial P/\partial G > 0$) (Ali, 1996).

3.3.1.1. Static Decomposition

The static decomposition assumes complete additive separability of change in poverty into growth and distribution. Employing the total differentiation technique, we can decompose equation (3.7) into a percentage change in growth and Distribution as follows:

$$(3.8) \quad dP = \left(\frac{\partial P}{\partial \mu} \right) d\mu + \left(\frac{\partial P}{\partial Z} \right) dZ + \left(\frac{\partial P}{\partial G} \right) dG$$

Following the literature we assume that the poverty line is fixed, i.e.

$dZ = 0$, which implies that equation (3.8) becomes:

$$(3.9) \quad dP = \left(\frac{\partial P}{\partial \mu} \right) d\mu + \left(\frac{\partial P}{\partial G} \right) dG$$

Note that the assumption of constant poverty line in the static decomposition will allow us to compare the incidence, depth and severity of poverty and the corresponding inequality status over time and across individual urban centers so that consistency will be maintained¹⁰. Unless we assume a fixed poverty line, the contribution of economic growth to the poverty reduction will also be underestimated or the increase in poverty is considered to be the consequence of economic growth in the state of distributionally biased growth.¹¹

¹⁰ See Ravallion (1992) for the discussion of consistency and specificity.

Dividing the whole expression in equation (3.9) by P, we obtain,

$$(3.10) \quad \frac{dP}{P} = \left(\frac{\partial P}{\partial \mu} \right) \frac{d\mu}{P} + \left(\frac{\partial P}{\partial G} \right) \frac{dG}{P}$$

If we multiply the first and second terms in the right hand side by μ/μ and G/G respectively, and make some arrangements, we obtain:

$$(3.11) \quad \frac{dP}{P} = \left(\frac{\partial P}{\partial \mu} \frac{\mu}{P} \right) \frac{d\mu}{\mu} + \left(\frac{\partial P}{\partial G} \frac{G}{P} \right) \frac{dG}{G}$$

Where dP/P , $d\mu/\mu$, and dG/G are the growth rates of poverty, mean expenditure and the

Gini index. Let $\left(\frac{\partial P}{\partial \mu} \frac{\mu}{P} \right) = \gamma$, which is the elasticity of the poverty index with respect to

mean expenditure (μ) and let $\left(\frac{\partial P}{\partial G} \frac{G}{P} \right) = \beta$ which is the elasticity of poverty index

with respect to the distribution parameter (the Gini coefficient). Thus we have,

$$(3.12) \quad \frac{dP}{P} = \gamma \frac{d\mu}{\mu} + \beta \frac{dG}{G}$$

$$(3.13) \quad \Rightarrow \ln P_{\alpha it} = \gamma_{\alpha it} \ln \mu_{it} + \beta_{\alpha it} \ln G_{it}.$$

Where $i = 1, 2, \dots, 7$; $t = 1, 2, 3, 4$; $\alpha = 0, 1, 2$; i denote the i th urban center while t stands for time and α is inequality aversion parameter. According to the assumption of complete separability of change in poverty into growth and distribution, an error or residual term in equation (3.13) is zero.

¹¹ Ravallion et al, (1991, pp. 347-349) have empirically found that the poverty line tends to increase with economic growth particularly in developed countries.

Specific formulation for the derivation of elasticity of the three poverty measures for changes in mean consumption and Gini coefficients in urban center i over time t is given as follows:

- Elasticity of $P_{\alpha it}$ for changes in mean consumption expenditure:

$$(3.14) \quad P_{0it}: \gamma_{0it} = - \frac{Zf(z)}{P_{0it}}$$

$$(3.15) \quad P_{1it}: \gamma_{1it} = - \frac{(P_{0it} - P_{1it})}{P_{1it}}$$

$$(3.16) \quad P_{2it}: \gamma_{2it} = - \frac{(P_{1it} - P_{2it})}{P_{2it}}$$

Where γ_{0it} , γ_{1it} , γ_{2it} are the elasticity of P_{0it} , P_{1it} , P_{2it} with respect to growth (mean consumption) in urban center i at time t ; $f(z)$ ¹² is the probability density function $f(y_{it})$ when $y_{it}=z$. Elasticity of $P_{\alpha it}$ for changes in Gini index is given as,

$$(3.17) \quad P_{0it}: \beta_{0it} = - \frac{(\mu - Z)}{Z} \gamma_{0it}$$

$$(3.18) \quad P_{1it}: \beta_{1it} = \gamma_{1it} + \frac{\mu P_{0it}}{Z P_{1it}}$$

$$(3.19) \quad P_{2it}: \beta_{2it} = \gamma_{2it} + \frac{\mu P_{1it}}{Z P_{2it}}$$

Where β_{0it} , β_{1it} , β_{2it} are elasticity of P_{0it} , P_{1it} , P_{2it} with respect to inequality (Gini index) in urban center i at time t respectively.

These point elasticities of the three poverty measures are therefore, used to analyze the relative sensitivity of poverty to growth and distribution across i and over time t .

¹² See Kakawani (1990) for the computation of $f(z)$

3.3.1.2. Dynamic Decomposition

The dynamic decomposition of a change in poverty into growth and inequality refers to the change between two periods. The actual change in poverty between two periods can be decomposed into its growth, redistribution and the interaction effects using two alternative methods: (1) the method due to Datt and Ravallion and (2) that of Ali (1997).

Given the poverty index function $P_{\alpha t} = P(\mu_{t/Z}, G_t)$, the first method assumes fixed poverty line (Z) at initial reference date, while the second allows it to vary over time. As we discussed above, it is fixed (absolute) poverty line assumption that we adopted through out this study and therefore the method of Datt and Ravallion is adopted. The decomposition equation is then given as follows:

The change in poverty between time t and $t+n$ can be decomposed as:

$$(3.20) \quad P_{\alpha, it+n} - P_{\alpha, it} = P_{\alpha, it+n}^* - P_{\alpha, it} + P_{\alpha, it+n}^{**} - P_{\alpha, it} + R$$

$$\Rightarrow \text{Total change } (\Delta P_{\alpha}) = \text{Growth effect} + \text{Redistribution} + \text{Interaction}$$

Effect
Effect

The growth effect is obtained as the difference between initial poverty measures P_{α} and the simulated poverty measure P_{α}^* . P_{α}^* is estimated using the mean consumption at time $t+n$ and the Lorenz curve at time t . In other words, growth is allowed to change while redistribution is fixed at initial period. For instance, if we want to estimate growth effect between year 1994

and 1995 for the given urban center, we use P_{α}^{94} and P_{α}^{95*} . P_{α}^{95*} is simulated poverty measure using the mean consumption at 1995 while holding distribution constant at the initial year 1994. Thus the growth effect is the change in poverty due to a change in mean expenditure while holding Lorenz curve constant. Similarly, a pure redistribution effect is the difference between P_{α} and P_{α}^{**} , where P_{α}^{**} is the simulated poverty measure. P_{α}^{**} is calculated using the Lorenz curve (distribution) at $t+n$ while holding mean (growth) constant at time t . Thus distribution effect is the change in poverty purely due to a change in inequality keeping the mean expenditure constant. On the other hand, the residual component (R) is taken as the interaction effect between effects of growth and redistribution (Ravallion et al, 1991). Residual exists when the decomposition is not completely separable between growth and distribution, i.e. when growth is not distributionally neutral or redistribution has some how interacted with growth. As interpreted by Ravallion (1991) residual is, “the difference between the growth (redistribution) components evaluated at the terminal and the initial Lorenz curve (means), respectively”.

3.3.1.3. Sub-Group Decomposition

Following Kakwani (1990) and Kanbur (1987) we assume that total urban population is divided into seven exclusive and exhaustive sub-groups so that the sum of population fraction,

$\sum_{i=1}^7 f_i = 1$. Then, the aggregate urban poverty is population-weighted sum of poverty indices in

each urban center.

The weighted aggregate urban poverty P_{α} at time t is decomposable into sub-groups, if

$$(3.21) \quad P_{\alpha t} = \sum_{i=1}^7 \mathbf{f}_i \mathbf{P}_{\alpha it}$$

For the three poverty measures it is given by:

$$(3.22) \quad P_{0t} = \sum_{i=1}^7 \mathbf{f}_i \mathbf{P}_{0it}$$

$$(3.23) \quad P_{1t} = \sum_{i=1}^7 \mathbf{f}_i \mathbf{P}_{1it}$$

$$(3.24) \quad P_{2t} = \sum_{i=1}^7 \mathbf{f}_i \mathbf{P}_{2it}$$

After differentiating the above three weighted total poverty expressions, equation (3.20) to (3.22), with respect to mean consumption and Gini index of urban center i at time t , we obtain the elasticity of total poverty for a unit change in mean consumption and a unit change in Gini index in urban center i at time t .¹³

¹³ Note that each poverty measures are functions of μ_i , G_i and Z and we ignored them for convenience. See equation (3.10) for general functional form of poverty and see equations (3.11) to (3.16) for the differentiation of each poverty with respect to growth and distribution

The Elasticity of Total Poverty (P_{0t}, P_{1t}, P_{2t}) w.r.t μ_{it} and G_{it} ¹⁴

Elasticity of $P_{\alpha t}$ for μ_{it}

$$(3.25) \quad P_{0t}: \gamma_{0it}^* = \frac{P_{0it}f_{it}}{P_{0t}} \gamma_{0it}$$

$$(3.26) \quad P_{1t}: \gamma_{1it}^* = \frac{P_{1it}f_{it}}{P_{1t}} \gamma_{1it}$$

$$(3.27) \quad P_{2t}: \gamma_{2it}^* = \frac{P_{2it}f_{it}}{P_{2t}} \gamma_{2it}$$

where $\gamma_{0it}, \gamma_{1it}, \gamma_{2it}$ are point elasticities as defined above while P_{0t}, P_{1t}, P_{2t} are population weighted total poverty measures.

Elasticity of $P_{\alpha t}$ for G_i

$$(3.28) \quad P_{0t}: \beta_{0it}^* = \frac{P_{0it}f_{it}}{P_{0t}} \beta_{0it}$$

$$(3.29) \quad P_{1t}: \beta_{1it}^* = \frac{P_{1it}f_{it}}{P_{1t}} \beta_{1it}$$

$$(3.30) \quad P_{2t}: \beta_{2it}^* = \frac{P_{2it}f_{it}}{P_{2t}} \beta_{2it}$$

where $\beta_{0it}, \beta_{1it}, \beta_{2it}$ are point elasticities as defined above.

¹⁴ For the detail discussion and derivation the elasticity of total poverty with respect to growth and inequality see Kakwani (1990)

3.3.1.4. Targeting Indicator

Given limited resources, it is more important to target the poorest individuals so as to attain maximum poverty reduction. The task of identifying the poorest individual is however, quiet difficult and costly. Practically, therefore, the next alternative strategy is to target a poorest group such as unemployed youngsters, women headed households, or the poorest region/urban center so that maximum total poverty reduction is possible. So what would be the criteria that may help the decision makers to identify a target group(s)? Following Kakwani (1990) and others, the targeting indicator with respect to each poverty measures is developed.

Given that the total urban population is geographically divided into seven urban centers, here we would try to see what would happen to the total poverty if the consumption of every individual in urban center i is increased by an amount δ . This implies that Gini index in urban center i at time t would be reduced by $\left(\frac{\delta}{\mu_{it} + \delta}\right)$ percent. Given equation (3.12), the reduction in poverty in urban center i at time t comes partly from the increase in consumption (δ) and partly from the reduction in Gini index, $\left(\frac{\delta}{\mu_{it} + \delta}\right)$.

It is given by,

$$(3.31) \quad \frac{dP_{\alpha it}}{P_{\alpha it}} = \gamma_{\alpha it} \frac{\delta}{\mu_{it}} - \beta_{\alpha it} \left(\frac{\delta}{\mu_{it} + \delta} \right)$$

If we multiply both sides of equation (3.31) by population weighted poverty index () in urban center i at time t and divide the whole expression by the sum of population weighted poverty index given in equation (3.21), we obtain the proportional reduction in total

poverty when the consumption of each individual in i^{th} urban center is increased by δ . It is given by,

$$(3.32) \quad \frac{dP_{\alpha t}}{P_{\alpha t}} = \frac{f_i p_{\alpha it}}{P_{\alpha t}} \delta \begin{bmatrix} \gamma_{it} & -\beta_{it} \\ \mu_{it} & \mu_{it} + \delta \end{bmatrix}$$

To compare proportional reduction in total poverty with the total amount of resources allocated to urban center i , we divide equation (3.32) by the total cost of targeting I^{th} urban center, which is equal to $f_i \delta$. To analyze the marginal effect of an increase in δ , we assume δ approaches zero, and then the target indicator, derived from equation (3.32) is given by

$$(3.33) \quad K_i = - \frac{P_{\alpha it}}{P_{\alpha t} \mu_{it}} (\gamma_{\alpha it} - \beta_{\alpha it})$$

The corresponding proportional reduction in total poverty when a unit resource is equally spent across all urban centers is given by,

$$(3.34) \quad K = - \frac{1}{\mu_t} (\gamma_{\alpha t} - \beta_{\alpha t})$$

Where μ_t is the per adult mean consumption for all urban average, $\gamma_{\alpha t} = \sum_{i=1}^7 \gamma_{\alpha it}^*$, the elasticity of total poverty with respect to growth (see equation 3.25 to 3.27) and $\beta_{\alpha t} = \sum_{i=1}^7 \beta_{\alpha it}^*$, the elasticity of total poverty with respect to inequality (see equation 3.28 to 3.30)

The normal targeting indicator is then given as the ratio of targeting to no targeting, which is given by,

$$(3.31) \quad K_i P_{\alpha t} = \frac{- \frac{P_{\alpha it}}{P_{\alpha t} \mu_{it}} [\gamma_{\alpha it} - \beta_{\alpha it}]}{- \frac{1}{\mu_t} [\gamma_{\alpha t} - \beta_{\alpha t}]} = \frac{K_i}{K}$$

where K_i is the percentage reduction in total poverty when a unit resource (for example 1 Birr) is spent for poverty alleviation in urban center i . If $K_i > K_j$, there will be greater reduction in percentage of total poverty as a result of the allocation of a unit resource (poverty alleviation budget) in urban center i , than j . On the other hand, K is the target indicator for the whole urban center, i.e. the percentage reduction in total poverty when a unit resource is spent for poverty alleviation in all urban center (no targeting at all).

Therefore, $K_i P_{\alpha t}$ is the ratio of $\frac{K_i}{K}$ and it takes the minimum value of zero and maximum value greater than one. If $K_i P_{\alpha t}$ is equal to zero then targeting the i^{th} urban center results in zero poverty reduction and if $K_i P_{\alpha t}$ takes the maximum value-value greater than one (i.e. compared to other urban center) then it means the allocation of larger proportion of poverty budget to the i^{th} urban center allows maximum total poverty reduction. However, if $K_i P_{\alpha t}$ takes the value of one then targeting to i^{th} urban center is neither superior nor inferior to no targeting (no targeting at all).

Specific formulation of target indicator with respect to each poverty measurers are given as:

$$(3.32) \quad K_i P_{0t} = \frac{-P_{0it} [\gamma_{0it} - \beta_{0it}]}{-P_{0t} \mu_{it} - \frac{1}{\mu_t} [\gamma_{0t} - \beta_{0t}]}$$

$$(3.33) \quad K_i P_{1t} = \frac{-P_{1it} [\gamma_{1it} - \beta_{1it}]}{-P_{1t} \mu_{it} - \frac{1}{\mu_t} [\gamma_{1t} - \beta_{1t}]}$$

$$(3.34) \quad K_i P_{2t} = \frac{-P_{2it} [\gamma_{2it} - \beta_{2it}]}{-P_{2t} \mu_{it} - \frac{1}{\mu_t} [\gamma_{2t} - \beta_{2t}]}$$

3.3.2. Econometric Model specification

There are three general alternative model specifications in panel data analysis:

1. Variable-coefficient model
2. Variable-intercept model
3. Pooled model

3.3.2.1. Variable-coefficient model

Variable coefficient model assumes variation in all coefficients (both intercept and slopes) across all cross sectional units i and over time t . The implication is that specific model for each unit i at time t should be estimated. That is, NTK parameters should be estimated using only NT observations (which means for N data points across i , T time series observations overtime t and K parameters). Obviously there is no way that we can estimate such a number of parameters using only NT observations that is much less than the number of parameters.

However, for completeness, the general specification of variable-coefficient models is given as,

$$(3.35) \quad \ln P_{\alpha it} = \delta_{it} + \beta_{it} \ln \mu_{it} + \gamma_{it} \ln G_{it} + \varepsilon_{it}$$

where $i = 1, 2, \dots, 7$

$t = 1, 2, 3, 4$

$\alpha = 0, 1, 2$

P is the poverty measure, μ is the mean consumption expenditure per week per adult, G is the Gini coefficients of inequality measure, and γ , β and δ are parameters to be estimated for

each unit at time t . ε_{it} is an error term with zero mean and constant variance. This is a two-way specification, in which coefficients are allowed to vary across i and time t . But if we assume a one-way specification, the coefficients vary across individual units i and constant over time t , and vice versa¹⁵.

However, we argue that estimating such a model costs much in terms of degrees of freedom particularly in our data sets in which we have small numbers of observations of cross sections and over time. The results to be obtained from such limited data points are not reliable and may be biased. On top of that the assumptions of variable slopes across i or over time t or both may not be appropriate due to the fact that national policy variables (for example, growth and income distribution) or (and) socioeconomic structures etc, which are assumed to be controlled by the slope coefficients, are near constant across i and over time t . Because at national level over all economic policies are the same for all urban center over time. It is also difficult to aggregate the individual results and make inference about the whole population (Hsiao, 1986). Therefore, we impose restrictions on variable-coefficient model such that all the slope coefficients are constant across units and over time but intercept terms vary, i.e. the variable intercept model.

3.3.2.2. Variable-intercept Model

Depending on the assumption that we make about the behavior of heterogeneity, the variable intercept model is sub-divided into two: Fixed effect model (FEM) and random effect model (REM). FEM assumes that variations across all i or over time t or both will be captured by

¹⁵ The two alternative one-way specifications of variable coefficients can be referred from Hsiao (1986)

the intercept terms of the regression model and it explicitly allows for the individual and/or time heterogeneity contained in the temporal-cross-sectional data. The FEM gives zero weight to “between group variation” or it is some time called the with-in group estimate (Hsiao, 1986). It completely ignores the between source of variation.

On the other hand, the random effect model assumes that all effects of omitted “individual time-varying variables”¹⁶ are each individually unimportant but are collectively significant and possess the property of random terms (Hsiao, 1986). The weight given to the “between-group variation” in the random effect model is greater than zero¹⁷.

The one-way and two-way random effect models are specified as,

$$(3.36) \quad \ln P_{oit} = \alpha_0 + \vartheta_1 \ln \mu_{it} + \vartheta_2 \ln G_{it} + \xi_i + \varepsilon_{it} \quad \left. \vphantom{\ln P_{oit}} \right\} \text{One-way REM}$$

$$(3.37) \quad \ln P_{oit} = \kappa_0 + \tau_1 \ln \mu_{it} + \tau_2 \ln G_{it} + \zeta_t + \varepsilon_{it}$$

$$(3.38) \quad \ln P_{oit} = \delta + \beta \ln \mu_{it} + \gamma \ln G_{it} + \xi_i + \zeta_t + \varepsilon_{it}. \quad \left. \vphantom{\ln P_{oit}} \right\} \text{Two-way REM}$$

The basic assumption of REM is that it treats the individual specific (ξ_i) or time specific (ζ_t) or both effects like the standard error term (ε_{it}). Therefore, the error term has two components in the one-way estimate and three components in two-way estimate (Hsiao, 1986).

¹⁶ Individual time varying variables are variables that vary across cross sectional units at a given point in time and also exhibit variation through time.

¹⁷ The OLS estimator (pooled model) gives a weight of 1 for the between group variation (Hsiao, 1986)

The three components are given as,

$$(3.39) \quad V_{it} = \xi_i + \zeta_t + \varepsilon_{it},$$

where $E(\xi_i) = E(\zeta_t) = E(\varepsilon_{it}) = 0$, $E(\xi_i \zeta_t) = E(\xi_i \varepsilon_{it}) = E(\zeta_t \varepsilon_{it}) = 0$

$$E(\xi_i \xi_j) \begin{cases} = \sigma_\xi^2 & \text{if } i=j \\ 0 & \text{if } i \neq j \end{cases}$$

$$E(\zeta_t \zeta_s) \begin{cases} = \sigma_\zeta^2 & \text{if } t=s \\ 0 & \text{if } t \neq s \end{cases}$$

$$E(\varepsilon_{it} \varepsilon_{js}) \begin{cases} = \sigma_\varepsilon^2 & \text{if } i=j, t=s \\ 0 & \text{Otherwise} \end{cases}$$

The other assumption in the random effect model is that there is no correlation between the error components and the explanatory variables¹⁸.

We proceed to specify FEM as our unrestricted general model, so that other restricted models are tested against it. In fixed effect model, which has three¹⁹ alternative models are estimated depending on the assumptions of heterogeneity: First, individual time-invariant model, in which

¹⁸ One important difference between FEM and REM is the assumption of no correlation between residuals and effect terms. When it is assumed that residual is correlated with the explanatory variable, correlation corrected fixed effect model is estimated (cited in Hsiao, 1987).

¹⁹ For three alternative assumptions and respective models, see Hsiao (1986)

the intercept term is assumed not constant across i while it is constant over time; second, period individual-invariant model, in which the opposite assumption is imposed and finally, individual time-varying model, whereby heterogeneity in dependent variable is assumed across all individual units and over time.

2a. Individual time-invariant model:

The individual time-invariant model is given by,

$$(3.40) \quad \ln P_{cit} = \delta_i + \beta \ln \mu_{it} + \gamma \ln G_{it} + \varepsilon_{it}$$

where $i = 1, 2, \dots, 7$

$t = 1, 2, 3, 4$

$\alpha = 0, 1, 2$

P is the poverty measure, μ is the mean consumption expenditure per week per adult, and G is the Gini coefficients of inequality measure. γ and β are constant slope coefficients while δ_i is individual specific intercept. ε_{it} is an error term with zero mean and constant variance. δ_i is unique to each cross sectional unit i . In other words, δ_i is considered as cross sectional dummy variable to account for the effects of those omitted variables that are peculiar to each urban center but staying constant over time t . The assumption of constant time effect in individual time invariant model ignores the over time variation in poverty (between-variations). Using the alternative assumption, i.e. the individual specific effect is zero and time specific effect is not, we specify period individual invariant model.

2b. Period individual-invariant model

This model makes the opposite assumption to the individual time invariant model. In this model, time specific effects are considered as period dummy variables to capture the effects of those omitted variables that are unique to each time period but staying constant across individual units. It is given as,

$$(3.41) \quad \ln P_{cit} = \theta_t + \eta \ln \mu_{it} + \rho \ln G_{it} + \upsilon_{it},$$

where θ_t is time specific effect (time specific dummy), η and ρ are constant slope coefficients to be estimated and υ_{it} is the disturbance term with zero mean and constant variance. However, combining models (3.40) and (3.41), we can analysis the existence of two-way fixed effects (both individual and time effects) since models (3.40) and (3.41) are based on the assumption of one over the other (opposite to each other).

2c. Individual time-varying Model

The individual time-varying model is the combination of models (3.40) and (3.41). In the combined model, omitted variables that are unique across cross sectional units for the given period and unique over time for the given units are fixed and constant across i and over time t . Thus the combined two-way fixed effect model is given as,

$$(3.42) \quad \ln P_{cit} = \delta_{it} + \beta_1 \ln \mu_{it} + \beta_2 \ln G_{it} + \varepsilon_{it},$$

where the standard assumption of zero mean and constant variance of the error term ε_{it} is maintained. The parameter β_1 and β_2 are constant slope coefficients to be estimated while δ_{it} is a two way intercept terms. δ_{it} can be decomposed into components: mean of individual and time effects together and individual and time effects separately. We can specify the decomposed model as,

$$(3.43) \quad \ln P_{oit} = \phi + \beta_1 \ln \mu_{it} + \beta_2 \ln G_{it} + \pi_i + \lambda_t + \varepsilon_{it}$$

where ϕ is the mean intercept, π_i is individual effect and λ_t is time effect. Since in our model π_i and λ_t are fixed and constant, we cannot estimate ϕ , π_i and λ_t separately because of perfect multi-collinearity (Hsiao, 1986). Therefore, we impose the restriction that

$$\sum_{i=1}^7 \pi_i = 0 \quad \text{and} \quad \sum_{t=1}^4 \lambda_t = 0$$

and estimate model (3.40) as two-way model so that the individual (π_i) and time effects (λ_t) are the deviation of the i^{th} unit or t^{th} period from the common mean (ϕ). The conclusion that we will make based on the fixed effect model is conditional on the individual and time effects. As we can see from the regression table, the intercept term for one-way fixed effect model is not estimated while the mean intercept for two-way fixed effect model is estimated. Whether the mean is estimated or not, the magnitude of the slope coefficients remain unchanged (Hsiao, 1986) and the conclusion in both cases is conditional given that the residual term is normal (with zero mean and constant variance, see Hsiao, 1986).

To test the over all homogeneity over different types of heterogeneous models (that we specified above), we also estimated the pooled model.

3.3.2.3. Pooled Model

Pooled model is a classical regression model. Following Hsiao (1986) and Green (1993), the OLS estimate with NT data points is best linear unbiased estimate when all coefficients (intercept and slopes) are assumed constant across individual unit i and over time t . The pooled model is given as,

$$(3.44) \quad \ln P_{\alpha it} = \varphi_0 + \varphi_1 \ln \mu_{it} + \varphi_2 \ln G_{it} + \nu_{it},$$

where φ_0 , φ_1 and φ_2 are constant parameters to be estimated and ν_{it} is an error term which identically and independently distributed with zero mean and constant variance across i and t . Note that explanatory variables for the three poverty measures are identical and therefore, specifications for the three poverty measures are the same except that the dependent variable takes their respective poverty measures (i.e. $P_{\alpha it} = P_{0it}$ or P_{1it} or P_{2it} if $\alpha = 0$ or 1 or 2).

3.3.2.4. Model Testing

To fix one appropriate model (among all models specified above) corresponding to each poverty measures, we adopt the following procedures of testing one model over the other, i.e. restricted versus unrestricted model testing procedures.

The following steps are adopted.

One-way model testing procedures

1. Test whether there is a significant difference between REM and the classical regression model using the Breusch and Pagan (1980) LM test, i.e., test model (3.36) Vs Model (3.44). The null hypothesis is that pool model is appropriate.
2. Test whether there is a significant difference between FEM and the classical regression model (model 3.44) using Log Likelihood ration test, i.e., test model (3.40) Vs Model (3.44). The null hypothesis is that pool model is appropriate.
3. Test whether there is a significant difference between FEM and REM using Hausman Test, i.e., test model (3.40) Vs Model (3.36). The null hypothesis is that REM is appropriate.

Two-way model testing procedures

1. In two-way effect model, we combine one-way models: model (3.36) and (3.37), and model (3.40) and (3.41). Thus we have the combined models (3.38) and (3.43), which are respectively two-way random effect and two-way fixed effect models.

At this stage we follow the same procedure as we did in one-way testing to determine the appropriate model, i.e. test model (3.38) Vs model (3.44) using Breusch and pagan LM test, where the null is that model (3.44) is appropriate.

2. Test model (3.43) Vs model (3.44) using Log likelihood ration test, where the null is that model (3.44) is appropriate.
3. Test model (3.43) Vs model (3.38) using Hausman test, where the null is that model (3.38) is appropriate.

Chapter Four: Welfare Distributions and Poverty

4.1. Distribution of Consumption Expenditure

4.1.1. Group Data Analysis

The welfare of an individual or a group of individuals can be measured using consumption expenditures. The assumption is that the better off individual (or group of individuals) spend more on consumption than the poor. Differences in consumption expenditures, adjusted for spatial and temporal price variations and as well as family size and composition allows us to put every individual or group of individuals on the same yardstick so that their differences in living standard over time and in space can be compared.

For convenience, the real consumption expenditures per week per adult of the sample population in a given urban center are arranged in ascending order (poorest to rich) and categorized into 10 groups (deciles). The mean consumption expenditure of each decile is calculated, i.e. the real mean consumption expenditure of the first poorest 10 percent of the sample population, the second 10 percent and so on, up to the richest 10 percent of the population are calculated and set in ascending order²⁰. (See Table 4.1 for the mean of each decile and the percentage received by each decile).

²⁰ For the recent discussion of grouped data analysis, see for instance, Gouveia M. and Tavares J. (1995), Mekonnen T. (1997)

Table 4.1: Distribution of Weekly Mean Consumption (in real terms) among Deciles by city and year

Deciles	Addis Ababa (%)		Awassa (%)		Bahir Dar (%)		Dessie (%)		Dire Dawa (%)		Jimma (%)		Mekele (%)		
1994	1	6.57	1.57	5.50	1.25	8.50	1.60	8.38	2.13	14.05	2.53	12.06	2.50	8.41	1.77
	2	11.47	2.73	12.65	2.87	19.22	3.62	12.37	3.14	24.19	4.35	18.95	3.92	16.76	3.53
	3	15.77	3.76	19.33	4.39	26.13	4.92	17.88	4.53	29.07	5.23	24.39	5.05	23.12	4.87
	4	20.18	4.81	22.84	5.19	30.92	5.82	22.54	5.72	34.46	6.20	30.11	6.23	28.34	5.98
	5	24.64	5.87	27.24	6.19	35.93	6.77	27.48	6.97	40.22	7.24	34.91	7.22	33.45	7.05
	6	29.24	6.97	37.83	8.60	45.29	8.53	33.30	8.44	46.70	8.40	42.35	8.76	40.05	8.44
	7	36.62	8.72	48.51	11.02	58.22	10.97	41.16	10.44	52.78	9.50	53.78	11.13	47.06	9.92
	8	46.88	11.17	55.35	12.58	69.57	13.10	47.20	11.97	61.53	11.07	69.62	14.41	59.88	12.63
	9	67.49	16.08	70.40	16.00	80.28	15.12	63.96	16.22	79.71	14.34	85.53	17.70	80.31	16.93
	10	160.92	38.33	140.47	31.92	156.87	29.55	120.07	30.45	173.07	31.14	111.53	23.08	136.91	28.87
Mean	41.98		44.01		53.09		39.43		55.58		48.32		47.43		
1995	1	4.79	1.10	5.50	1.00	5.50	1.00	4.62	.72	7.71	1.59	6.69	1.32	2.18	.54
	2	8.83	2.03	9.27	1.69	9.27	1.69	10.75	1.67	15.17	3.12	12.27	2.42	6.34	1.56
	3	12.29	2.82	14.04	2.56	14.04	2.56	18.09	2.82	19.40	3.99	17.96	3.54	12.43	3.06
	4	16.22	3.72	20.28	3.70	20.28	3.70	24.03	3.74	24.49	5.04	21.95	4.32	17.00	4.18
	5	20.85	4.79	26.19	4.78	26.19	4.78	30.21	4.70	31.41	6.46	28.78	5.67	22.59	5.55
	6	26.56	6.10	31.51	5.75	31.51	5.75	38.51	5.99	36.74	7.55	37.00	7.29	30.96	7.61
	7	34.81	7.99	38.94	7.10	38.94	7.10	53.64	8.35	42.25	8.69	46.05	9.07	44.23	10.87
	8	47.30	10.86	50.64	9.24	50.64	9.24	68.33	10.63	59.17	12.17	54.56	10.75	58.35	14.34
	9	73.35	16.84	75.20	13.72	75.20	13.72	95.87	14.92	81.16	16.69	74.92	14.76	72.94	17.93
	10	190.62	43.76	276.55	50.45	276.55	50.45	298.48	46.45	168.84	34.72	207.46	40.87	139.83	34.37
Mean	43.56		54.81		54.81		64.25		48.63		50.76		40.69		

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

(Continued...)

Table 4.1: Distribution of Weekly Mean Consumption (in real terms) among Deciles by city and year

Deciles	Addis Ababa (%)		Awassa (%)		Bahir Dar (%)		Dessie (%)		Dire Dawa (%)		Jimma (%)		Mekele (%)		
1997	1	6.11	1.06	4.62	.72	5.03	.81	11.00	.64	9.77	2.33	6.87	1.15	5.65	.80
	2	11.60	2.02	10.75	1.67	11.35	1.83	23.22	1.36	16.72	3.99	11.55	1.93	12.40	1.77
	3	15.68	2.73	18.09	2.82	15.69	2.53	39.16	2.29	20.34	4.86	16.12	2.69	21.19	3.02
	4	20.18	3.51	24.03	3.74	21.86	3.53	68.69	4.01	23.98	5.73	20.85	3.48	29.34	4.18
	5	26.08	4.53	30.21	4.70	26.64	4.30	103.25	6.03	26.21	6.26	28.11	4.69	34.16	4.86
	6	34.11	5.93	38.51	5.99	33.77	5.45	140.08	8.17	32.95	7.87	35.21	5.88	43.65	6.21
	7	43.27	7.52	53.64	8.35	42.96	6.93	185.45	10.82	43.17	10.31	42.30	7.06	55.76	7.94
	8	57.98	10.08	68.33	10.63	63.77	10.29	240.31	14.02	58.84	14.05	53.90	9.00	76.38	10.87
	9	84.09	14.61	95.87	14.92	104.00	16.78	322.38	18.81	75.86	18.12	74.73	12.48	101.42	14.44
	10	276.28	48.02	298.48	46.45	294.86	47.56	580.00	33.85	110.89	26.48	309.17	51.63	322.40	45.90
Mean	57.54		64.25		61.99		171.35		41.87		59.88		70.23		
2000	1	6.72	1.76	7.71	1.59	4.27	1.01	6.26	1.34	4.95	1.12	7.73	2.57	8.50	2.45
	2	11.03	2.89	15.17	3.12	10.56	2.49	11.08	2.38	10.53	2.38	13.10	4.35	14.07	4.05
	3	14.72	3.85	19.40	3.99	15.49	3.66	16.65	3.57	17.31	3.91	15.52	5.15	18.25	5.26
	4	18.79	4.92	24.49	5.04	19.95	4.71	22.83	4.90	24.00	5.42	17.70	5.88	20.20	5.82
	5	23.07	6.04	31.41	6.46	25.75	6.08	29.39	6.30	29.77	6.72	21.94	7.28	24.35	7.01
	6	28.35	7.42	36.74	7.55	31.75	7.49	35.70	7.66	35.74	8.07	26.42	8.77	28.27	8.14
	7	34.78	9.10	42.25	8.69	37.68	8.89	40.33	8.65	42.40	9.57	30.76	10.21	34.41	9.91
	8	44.59	11.67	59.17	12.17	50.57	11.94	54.88	11.77	53.48	12.08	37.84	12.56	41.99	12.09
	9	61.40	16.07	81.16	16.69	70.67	16.68	79.96	17.15	78.87	17.81	50.42	16.74	59.03	17.00
	10	138.64	36.28	168.84	34.72	157.01	37.06	169.24	36.29	145.82	32.93	79.81	26.49	98.10	28.26
Mean	38.21		48.63		42.37		46.63		44.29		30.12		34.72		

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

In this section we try to see,

- (i) the distribution of total consumption expenditure among different segments of the population within the given urban center at a time
- (ii) the effects of changes in the economy on a given segments (decile) of the population over time and their relative positions and
- (iii) how the benefits or deterioration in the economy (for instance, an increase or a decrease in real GDP, real per capita income etc) is distributed within and between urban centers, i.e. to trace and compare the movements of macro level indicators with particular reference to our data.

As we can see from the Table 4.1, distribution of consumption among different segments of the population within each urban center is disperse. A disproportionately big share of the total consumption is received by the top decile of the population. Though the distributions vary from urban to urban and from time to time, the general observation is that in most cases, more than 35 percent of the total real consumption expenditure is made by the top 10 percent of the sample population. If we look at the distribution in Addis Ababa for instance, the top 10 percent of the population spent Birr 160.92 per week per adult (38.33%) while the poorest 10 percent spent Birr 6.57 (1.57%) per week per adult in 1994. The corresponding figures for 1995 indicate that the distribution is even worst. As we can see from Table 4.1, the lowest and middle segments of the sample population in Addis Ababa has faced a significantly decline in their mean consumption while that of the higher income groups (the top 20 percent of the population) enjoyed improvements in their mean consumption in 1995.

Although all segments of the population got better off in 1997 as compared to 1994 and 1995, distribution of total benefit is severely distorted in favor of the top deciles. Around 1.06 percent of the total consumption expenditure is made by the poorest 10 percent, while the top 10 percent of the population spent 48 percent. The aggregate inequality measures, such as Gini index, describe this more clearly. For example for, 1994, 1995 and 1997 the Gini indices for Addis Ababa were 49.07, 55.97 and 58.15 percent, respectively (see Table 4.2).

The distribution of consumption expenditures among deciles for other urban centers and its behaviors in time, are similar to those of Addis. For instance, for Bahir Dar, the within distribution (distribution among deciles in a given year) and changes through time are not far different from what we examined for Addis Ababa. There was a decline in the welfare of lower and middle segments of the population in 1995 as compared to 1994, and there were improvements to all segments of the population in 1997 (although the distribution of such improvement favors the top deciles). Looking closely at the share of each decile and changes of their share across urban centers and over time, it is clear that the welfare dispersion increases as we move from bottom to top deciles. Distribution is more compressed among lower and middle deciles while among top decile it is too disperse.

The implication that can be drawn from the above discussions are (1) an unfairly big proportion of the benefits of economic growth seems to go to the top deciles while, the share of poorest deciles are disproportionately low and sustained through out four years of our study periods (2) factors behind such biased distributions in welfare among deciles are not significantly different across urban centers.

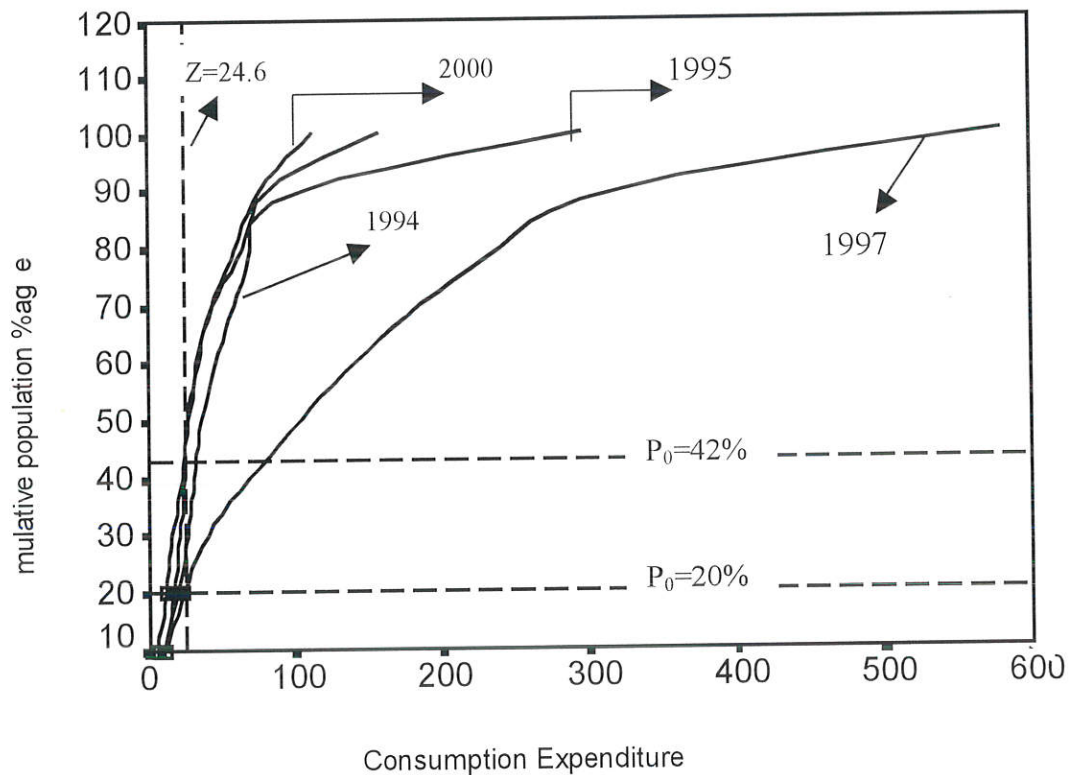
The policy implication is that unless the economic growth outweighs the bad color of inequality or the poor are particularly targeted²¹, it is not easy to attain poverty alleviation objectives in short term.

4.1.2. Graphical Presentation of Welfare Distribution

The cumulative density function, which is a plot of per adult consumption expenditure-starting from the poorest-on the horizontal axis against the cumulative percentage of population (lower decile to top) on the vertical axis is an important tool of analysis employed in this section. The plotted line represents how much, out of the total expenditure, is spent by the given percentage of population. Usually it is employed to test the robustness of head count ratio in ranking the welfare distribution. If one cumulative density function entirely lies above the other (i.e. they do not cross each other), it is easy to say that for a given level of poverty line or ranges of poverty lines, the percentage of population living below such poverty line is greater in cases where cumulative density function lies above the other. For instance, in Graph 4.1 for any reasonable range of poverty lines, the number of poor population in 1997 is lower than any other years in Bahir Dar.

²¹ Targeting the poor group and analysis of targeting indicator will be discussed in section 4.2.4

Graph 4.1: Temporal Distribution of Consumption expenditure: Bahir Dar



Source: Author's estimation based on Urban Socio-economic Survey Data from Economics Department.

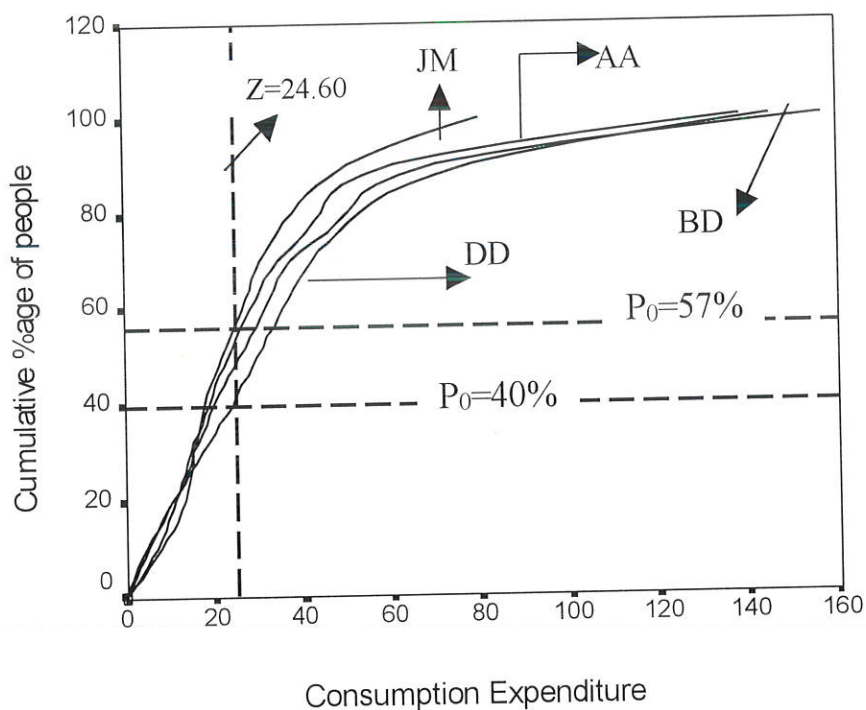
Graph 4.1 plots the consumption distribution for Bahir Dar and compares the distributions over the years: 1994, 1995, 1997 and 2000. From the graph, we can see the cumulative distribution function in 1997 lays entirely below the 1994, 1995 and 2000 distributions. This means, no matter what poverty line we choose, there will be a lower percentage of people in poverty in 1997 than in the other years. For any reasonable range of poverty lines, the incidence of poverty is much higher in 1995 and 2000 while it is lower in 1997 and 1994. The distributions of 1995 and 2000 are not easily separable at the lower and middle deciles. However, the top deciles of 1995 have more resources than 2000. For absolute poverty line of Birr 24.60 per week per adult,

the percent of population falling below the poverty line ranges from 20 percent in 1997 to 42 percent in 1995 in the given urban center.

Comparing one-year distribution (for example, plot 1995 versus plot 1994) with the other clearly shows the existing high degree of dispersion among the sample populations in a given city. If we look at the plots in 1994, 1995 and 2000, the distribution at the bottom and middle are almost vertical, implying that the distribution among such segments of the population is not as disperse as is the case among the top deciles.

Graph 4.2: Cross Comparison of Consumption Distribution between

Addis, Jimma, D.Dawa and B.dar in 2000



Source: Author's estimation based on Urban Socio-economic Survey Data from Economics Department.

Graph 4.2 compares the distribution of consumption expenditure across selected towns (Addis Ababa, Jimma, Dire Dawa, and Bahir Dar in 2000). The graph shows that the variation in distribution among cities is not wide. But for any reasonable ranges of poverty lines, the number

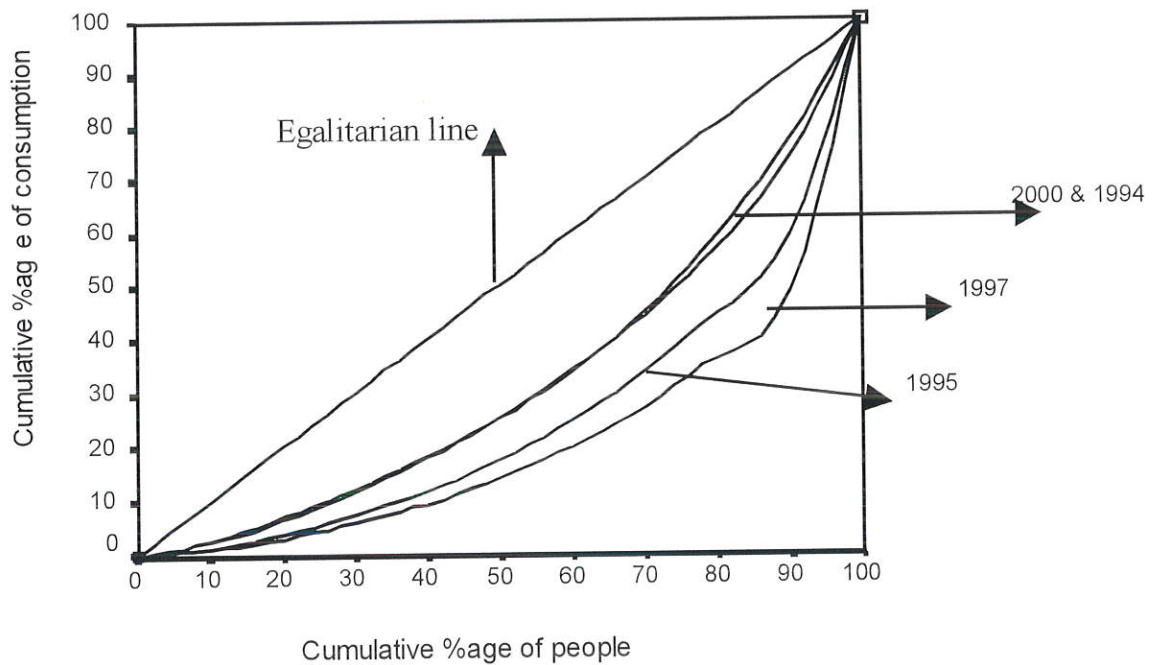
of poor population is higher in Bahir Dar (BD) than Dessie (DS), higher in Addis Ababa (AA) than Bahir Dar and higher in Jimma (JM) than Addis Ababa. Specifically, the number of poor population ranges from 40 percent to 57 percent for the given real absolute poverty line of Birr 24.60 per week per adult in year 2000.

4.1.3. Cumulative Distribution: Lorenz Curve

The most familiar graphical tool for examining the distribution of consumption expenditures is the Lorenz curve, which is a plot of cumulative percentage of population-starting from the poorest- on the horizontal axis against cumulative percentage of real consumption expenditure per week per adult on the horizontal axis. Four Lorenz curves are plotted on Graph 4.3. If consumption were equally distributed, the Lorenz curve would be on the 'egalitarian line', while in the case of complete inequality, with the richest group having everything would generate a Lorenz curve right on the horizontal axis. When one Lorenz curve does not cross over the other, the upper one is more egalitarian (i.e. more equal) than the lower one.

Graph 4.3 represents the degree of inequality in each year and its variation over time for Jimma. As we can see from the graph, Lorenz curve in one year (for example in 1997) is significantly different from the other year (for example, 1994).

Graph 4.3: Cumulative Distribution: Lorenz Curve
(Jimma 1994-2000)



Source: Author's estimation based on Urban Socio-economic Survey Data from Economics Department.

However, the Lorenz curve plots for other urban centers through time and cross comparison plots indicate less variations: two or more curves go tight together or crosses each other (due to space constraint we are not interested to report every comparable plots of Lorenz curves).

The above plots (note that the coordinates of the plots for Graph 4.3 are taken from Table 4.1) show for example, that the poorest 20 (40) percent of the sample population in 1994 consumes 6.42(17.70) percent of the total consumption, that the poorest 20 (40) in 1995 consumes 3.73 (11.60) percent of total consumption, that the poorest 20 (40) percent in 1997 consumes 3.08 (9.25) percent of total consumption, and the poorest 20 (40) percent in 2000 consumes 6.91 (17.94) percent of the total consumption. Distribution in 1995 is more egalitarian than 1997 and

1994/2000 is more egalitarian than 1995. However, it is not possible to rank the distribution between 1994 and 2000 using the Lorenz curve criteria because the two Lorenz curves cross each other²².

4.1.4. Inequality: Gini Index

Gini index, which is derived from the Lorenz curve, is one of the popular inequality measures that aggregates total population distribution into a single number. In cross or over time comparison, Lorenz curve criteria are not applicable to rank one distribution over the others when they cross each other. Therefore, in such cases, the Gini index is more appropriate and better represents the existing welfare distribution.

Although Gini index varies from time to time or from town to town, it increases or decreases depending on the movement of the mean consumption. The over time comparison for a given town indicates that inequality was high in most towns in 1995 (in four towns) and 1997 (in three towns) while it was relatively low in 1994 and 2000. However, if we look at the movement of Gini index from one year to the other, it is clear that in most cases the direction of change is the same across urban center. For instance, from Table 4.2, we observe that Gini index increased in all urban centers between 1994 and 1995, declined in most urban centers between 1995 and 1997, declined in all urban centers between 1997 and 2000 and increased in most urban centers between 1994 and 2000. It is not surprising to see that Gini index moves following the trend of mean consumption, because inequality is increasing when there is an increase in growth (proxied

²² In such cases Shorrocks (1983) suggested a Generalized Lorenz curve criteria. See Miguel Gouveia and Jose Tavares (1995) for empirical analysis.

by mean consumption). This obviously indicates the existence of a trade-off¹⁴ between growth and equity, i.e. inequality gets worsened when there is an increase in the growth. We are not sure, however, that we should conclude from this analysis that the Kuznet's hypothesis of increase in inequality at the initial stage of development and its reversal at later stage is the reality in our data set.

On the other hand, the cross-urban comparison does not show any specificity that inequality is low or high in one urban center than in other. It seems that it is random depending on the level of development in a given town.

According to the results that we discussed above, inequality is relatively high in all urban centers and is increasing as compared to the base year 1994 value. It is comparable to the 1993 estimates for 16 urban areas in SSA countries, where the highest Gini is 51.28 percent (in CAR) and the least 32.05 (in Niger)²³. In our case the highest for all urban average is 59.75 percent (1997) and the least is 37.72 (in 2000) percent. The result is also consistent with the general impression that inequality is relatively high in urban areas.

¹⁴ See Annex A6 for marginal rate of substitution (MRS) value, which is the value of percentage increase in mean consumption (growth) required in order to maintain a given poverty measure no to increase following a one percent increase in Gini index.

²³ See for the detail discussion of poverty and inequality comparison across SSA countries, see Ali Abdel Gadir Ali and Erik Thorbecke (1998)

4.2. Urban Poverty Profile

4.2.1. Level Analysis

The issue of poverty has recently received particular attention from the academic, government and international communities. The World Bank and IMF and other international institutions are primarily targeting poverty alleviation as their main objectives and have targeted to reduce the current (1990) absolute poverty (measured by head count ratio) by half by 2015 (OECD, 1996). The current inspiration of both government and non-governmental organizations toward integrated poverty alleviation in Ethiopia is also due to the fact that poverty is one of the bad colors that we are facing. Given an increasing trend of urban population, largely due to rural-urban migration, increasing unemployment, and at the same time unbalanced provision of public services, it is indispensable to analyze urban poverty and its behavior using recent techniques and available data sets.

One of the important steps in poverty analysis is the determination of a poverty line, which is to truncate the poor from the non-poor. There are several types and approaches of determining this line. In this study, the absolute poverty line (food poverty line plus non-food allowance) is determined. The absolute food poverty line is determined using the food energy intake (FEI) approach, (see equation (3.3) in Section 3.2.2.1) while non-food allowance is made following Bidani and Ravallion (1994) suggestion, (see equation (3.4) Section 3.2.2.2). Accordingly a total absolute (and fixed across urban and over time) poverty of Birr 24.60 per week per adult is determined, (see equation 3.5 for the total poverty line formulae). The total absolute poverty line (in real terms) consists of Birr 18.92 per week per adult for food and Birr 5.68 per week per adult for non-food expenditure.

Table 4.2: Distribution of Urban Poverty profile by city and year

Year	Urban center	P ₀	P ₁	P ₂	G	μ	μ ^p
1994	Addis Ababa	45.11	18.62	10.12	49.07	41.98	14.45
	Awassa	36.35	15.71	9.35	43.95	44.01	13.97
	Bahir Dar	24.01	9.12	5.28	39.98	53.09	15.26
	Dessie	38.93	15.07	7.86	40.05	39.04	15.08
	Dire Dawa	15.91	4.74	2.56	38.04	55.58	17.27
	Jimma	25.84	8.21	3.48	35.18	48.32	16.78
	Mekele	29.32	10.81	5.67	39.89	47.93	15.53
	All urban	38.23	15.13	8.08	45.46	44.53	14.86
1995	Addis Ababa	51.53	24.60	14.64	55.97	43.56	12.86
	Awassa	44.05	20.25	12.08	60.70	54.81	13.29
	Bahir Dar	41.97	18.80	10.64	59.62	61.99	13.58
	Dessie	43.44	19.84	12.14	49.41	42.37	13.36
	Dire Dawa	39.71	15.85	8.50	55.53	55.00	14.78
	Jimma	37.33	15.90	9.02	51.44	50.76	14.12
	Mekele	45.66	25.14	17.83	50.70	40.68	11.06
	All urban	47.52	22.19	13.16	55.54	46.50	13.11
1997	Addis Ababa	42.22	18.35	10.18	58.15	57.54	13.91
	Awassa	36.36	17.12	10.75	58.15	64.25	13.02
	Bahir Dar	17.16	7.30	4.11	51.26	51.24	14.13
	Dessie	38.76	16.87	9.74	48.61	46.63	13.89
	Dire Dawa	33.85	11.67	5.13	54.23	67.71	16.12
	Jimma	40.22	17.17	9.58	60.73	59.88	14.10
	Mekele	31.06	13.89	8.71	56.96	70.23	13.60
	All urban	38.73	16.51	8.97	59.75	66.55	14.11
2000	Addis Ababa	47.98	19.87	10.64	46.93	38.21	14.41
	Awassa	35.07	13.19	6.58	45.91	48.63	15.35
	Bahir Dar	34.55	12.22	5.84	39.12	41.87	15.90
	Dessie	37.39	17.13	10.63	46.07	44.28	13.33
	Dire Dawa	30.59	10.34	4.92	40.02	46.32	16.28
	Jimma	51.46	19.03	9.16	36.02	30.12	15.50
	Mekele	44.28	15.58	9.13	44.61	39.20	15.94
	All urban	44.99	15.62	7.15	37.92	37.72	16.06

1 Note: μ^p is mean consumption expenditure per week per adult of the poor, which is given as $\mu^p = [1 - P_1 / P_0]Z$. Where Z is the real absolute poverty line, which is equal to Birr 24.60 per week per adult estimated from the data. Refer Table 3.1 for the formulae of the three poverty measures.

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

This result can fairly be compared with the 1996 estimates of MEDaC (the national absolute poverty line of Birr 22.40 per week per adult) and that of Mekonnen Taddess's estimates for all urban in 1997 (the average poverty line of Birr 23.50 per week per adult).

Consumption expenditure, adjusted for temporal and spatial price variation as well as variations in family size and composition allowed us to compare and present the over all picture of urban poverty as a whole. The three well-known poverty measures: head count ratio (P0: which measures the incidence or spread of poverty), poverty gap ratio (P1: which measures the depth of poverty) and square of poverty gap ratio (P2: which measures the severity of poverty) are used. The summaries of three poverty measures along with mean consumption of total population, mean consumption of the poor population and Gini index are reported in Table 4.2. Note that the three poverty measures and Gini indices along with point elasticities (point elasticities reported in Table 5.1) are estimated from the grouped data, using poverty measuring software, Povcal.

From the summary result (Table 4.2) we observe that in 1995 followed by 2000, poverty was high in all urban centers. For instance, in 1995 and 2000 all-urban average indicates that 47.52 percent and 45 percent of the urban population were respectively living below the absolute poverty line of Birr 24.60 per week per adult. It was also as deep as 22.19 percent in 1995 and 16.51 percent in 1997 (all urban value). In terms of severity measure, all urban value indicates that severity was high in 1995 with 13.16 percent.

In terms of head count ratio, across-city/town comparison indicates that a large number of the population are poor in Addis Ababa, while Bahir Dar and Dire Dawa are with relatively less

poverty incidences. As captured by P_1 and P_2 respectively, poverty is also deep and severe in Addis Ababa through out the four years as compared to any other urban centers and at the same time Dire Dawa and Bahir Dar are ranked with least degree of poverty depth and severity. As we observe from the Annex, Table A5, standard deviations indicate that the spread, depth and severity of poverty vary, widely among urban centers and over time.

Using the forecasted total urban population size of 9.5 million in 2000, we conclude that nearly about 4.3 million urban populations cannot afford a minimum real expenditure of Birr 24.60 per week per adult in 2000.

4.2.2. Sub-Group Decomposition Analysis

In this section, we are interested to investigate the contribution of each urban center to aggregate poverty, where aggregate poverty is population weighted sum of poverty indices in each urban center (population weight being the ratio of population in a given urban center to the total urban population so that their sum is equal to 1). Therefore, following Kakawani (1990) and Kanbur (1987) we assumed that the total urban population is sub-divided into seven exclusive and exhaustive groups so that the aggregate urban poverty is the sum of their respective population weighted poverty indices (see equations (3.21) to (3.24) in Section 3.3.1.3 for the specifications of population weighted sum and sub-group decomposition). The numerical results for three poverty measures are reported in Table 4.3.

Table 4.3: Sub-Group Decomposition of Aggregate poverty by city and year

Year	Urban center	P^*_{0it}	P^*_{1it}	P^*_{2it}
1994	Addis Ababa	35.10	14.49	7.88
	Awassa	0.93	0.40	0.24
	Bahir Dar	0.85	0.32	0.19
	Dessie	1.40	0.54	0.28
	Dire Dawa	1.01	0.30	0.16
	Jimma	0.66	0.21	0.09
	Mekele	1.05	0.39	0.20
	Weighted average	41.00	16.65	9.04
1995	Addis Ababa	40.07	19.13	11.39
	Awassa	1.12	0.52	0.31
	Bahir Dar	1.49	0.67	0.38
	Dessie	1.56	0.71	0.44
	Dire Dawa	2.54	1.01	0.54
	Jimma	0.96	0.41	0.23
	Mekele	1.63	0.90	0.64
	Weighted average	49.38	23.35	13.92
1997	Addis Ababa	32.79	14.25	7.91
	Awassa	0.93	0.44	0.28
	Bahir Dar	0.61	0.26	0.15
	Dessie	1.40	0.61	0.35
	Dire Dawa	2.17	0.75	0.33
	Jimma	1.04	0.44	0.25
	Mekele	1.12	0.50	0.31
	Weighted average	40.06	17.25	9.57
2000	Addis Ababa	37.18	15.40	8.25
	Awassa	0.91	0.34	0.17
	Bahir Dar	1.24	0.44	0.21
	Dessie	1.36	0.62	0.39
	Dire Dawa	1.98	0.67	0.32
	Jimma	1.33	0.49	0.24
	Mekele	1.60	0.56	0.33
	Weighted average	45.61	18.53	9.90

Note: P^*_0 , P^*_1 , P^*_2 are population weighted poverty measures for each urban center. For example P^*_{0i} is given by $P^*_{0i} = f_i P_{0i}$, where P_{0i} is head count index estimated for urban center i and f_i is the fraction of population of urban center i such that $\sum f_i = 1$, $i=1,2,\dots,7$. The remaining weighted poverty measures (P^*_1 and P^*_2) are estimated similarly. Population weighted sum for each year is therefore, given by $\sum_{i=1}^7 f_i P_{\alpha it}$. Look for the value of “weighted average poverty” for each year indicated at the bottom in the series. For detail refer equation (3.21) to (3.24)

Source: Author’s calculation based on Urban Socio-economic Survey Data from Economics Department.

From the summary table it is surprising to see that more than 80 percent of the aggregate urban poor populations are living in Addis Ababa and there is little tendency that the relative position of Addis Ababa's contribution to total poverty is changing through out four years of the analysis. If we look at the population weighted spread poverty measure (P_0), out of 41 percent weighted sum, about 35.10 percent; out of 49.38 percent weighted sum, about 40.07 percent; out of 40.06 percent weighted sum, about 32.79 percent and out of 45.61 percent weighted sum population, about 37.18 percent of the poor were living in Addis Ababa in 1994, 1995, 1997 and 2000 respectively.

As regard to the depth and severity is concerned, almost the same or in some cases even higher percentage of the depth and severity in poverty is observed in Addis Ababa. This implies that if total urban poverty reduction is the objective in the country, it is largely rewarding to focus on Addis Ababa so that maximum total poverty reduction is possible. This is not to mean that other urban centers should be ignored. Given the government policy of regionalization, it is must that the government needs to exercise fair allocation of resources between regions or urban centers.

4.2.3. Total Elasticity Analysis

As we did in Section 4.2.2, here we also divide total urban economy into seven sub-sectors and try to examine how changes in growth or distribution in one sub-sector affects total urban poverty. Note that total urban poverty is still the population-weighted sum of each sub-sector. Based on the methodology that we established in Section 3.3.1.3 (see equation 3.25 to 3.30), estimates of total poverty elasticities to changes in growth (assuming constant distribution) and

changes in inequality, i.e. changes in Gini index in urban center i (assuming constant growth) are reported and summarized in Table 4.4.

Table 4.4: Elasticity of Aggregate poverty for changes in growth or/and redistribution in i^{th} urban center

Year	Urban center	*	*	*	*	*	*
		γ_{0it}	β_{0it}	γ_{1it}	β_{1it}	γ_{2it}	β_{2it}
1994	Addis Ababa	-0.90	0.63	-1.24	2.36	-1.46	4.01
	Awassa	-0.03	0.02	-0.03	0.07	-0.04	0.12
	Bahir Dar	-0.03	0.04	-0.03	0.08	-0.03	0.12
	Dessie	-0.04	0.03	-0.05	0.08	-0.06	0.13
	Dire Dawa	-0.06	0.08	-0.04	0.09	-0.03	0.12
	Jimma	-0.03	0.02	-0.03	0.05	-0.03	0.06
	Mekele	-0.04	0.03	-0.04	0.08	-0.04	0.12
	All urban	-1.11	0.90	-1.38	2.77	-1.56	4.50
1995	Addis Ababa	-0.61	0.47	-0.89	2.14	-1.11	3.75
	Awassa	-0.02	0.03	-0.03	0.08	-0.03	0.14
	Bahir Dar	-0.03	0.04	-0.04	0.13	-0.04	0.20
	Dessie	-0.03	0.02	-0.04	0.08	-0.04	0.14
	Dire Dawa	-0.06	0.07	-0.07	0.18	-0.07	0.26
	Jimma	-0.02	0.02	-0.02	0.06	-0.03	0.10
	Mekele	-0.03	0.02	-0.03	0.08	-0.04	0.18
	All urban	-0.81	0.72	-1.08	2.76	-1.30	4.73
1997	Addis Ababa	-0.77	1.02	-1.07	3.37	-1.32	5.63
	Awassa	-0.02	0.04	-0.03	0.11	-0.03	0.21
	Bahir Dar	-0.01	0.06	-0.02	0.23	-0.02	0.36
	Dessie	-0.04	0.03	-0.05	0.11	-0.05	0.19
	Dire Dawa	-0.06	0.11	-0.08	0.26	-0.09	0.34
	Jimma	-0.03	0.04	-0.03	0.11	-0.04	0.18
	Mekele	-0.03	0.06	-0.04	0.15	-0.04	0.26
	All urban	-0.92	1.58	-1.28	4.79	-1.57	7.76
2000	Addis Ababa	-0.83	0.46	-1.17	1.94	-1.44	3.38
	Awassa	-0.03	0.02	-0.03	0.07	-0.03	0.10
	Bahir Dar	-0.04	0.03	-0.04	0.07	-0.05	0.10
	Dessie	-0.03	0.03	-0.04	0.09	-0.05	0.18
	Dire Dawa	-0.07	0.06	-0.07	0.13	-0.07	0.18
	Jimma	-0.03	0.01	-0.05	0.04	-0.05	0.07
	Mekele	-0.04	0.02	-0.05	0.08	-0.06	0.14
	All urban	-1.29	0.53	-1.58	1.84	-1.71	2.74

Note: variables on the top row represent elasticity of total poverty (the three poverty measures) with respect to changes in growth and Gini index in urban center i . See equations (3.25) to (3.30) for the specification of each.

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

For instance, the numerical value of -0.90 corresponding to Addis Ababa in 1994 means a unit increase in growth in mean consumption per adult in Addis Ababa (assuming constant Gini index) reduces total poverty incidence by 0.90 percent.

The impact of economic growth and distribution in a given urban center on total poverty varies widely due to the fact that Addis Ababa is an outlier in the sense that more than 80 percent of the total poor population are concentrated in Addis Ababa. This is reflected by the values of total elasticities to unit changes in growth or distribution in Addis Ababa. For instance, one percent economic growth in Addis Ababa with no change in the Gini index will reduce the total poverty in all urban centers (measured by head count ratio) by 0.90 percent, whereas the same growth rate in Awassa will reduce total poverty by 0.03 percent. Thus, economic growth in Addis Ababa is about 30 times more efficient than in Awassa in reducing aggregate poverty. Similarly a one percent reduction in inequality (given growth is constant) in Addis Ababa will reduce total poverty by 0.63 percent, while the same amount reduction in inequality in Awassa reduces total urban poverty only by 0.02 percent (which is almost 32 times efficient than it is in Awassa). As regard to other poverty measures, the results consistently support that particular emphasis should be paid on the poverty situation in Addis Ababa if reduction of total poverty is targeted. A possible policy implication here is that in order to attain maximum total poverty reduction in urban areas, it is important to identify and rank urban centers according to their relative contribution to overall urban poverty and hence allocate the available resources accordingly.

The sector decomposition analysis and total elasticity that we discussed in Sections 4.2.2 and 4.2.3 can be employed to identify a particular group(s) in society that policy makers should pay particular attention for a maximum reduction in total poverty. However, the approach developed by Kanbur (1987) and Kakawani (1990) is more appealing and it will be our next topic of discussion.

4.2.4. Targeting the Poor

In this section, we want to see whether targeting relatively the poorest urban center in terms of resource allocation (for example, poverty alleviation budget) is preferable to no targeting at all (i.e. spending the available resources equally in all urban centers). Given the difficulty of identifying and targeting the *poorest individuals* in a given urban center, targeting *the poorest urban center (if any)* may be an alternative strategy for policy makers to attain maximum total poverty reduction. This is not to mean that other urban centers are ignored. Given the current policy of regionalization, the intent of this section is to establish the strategy as to how one can attain the objective of fair allocation of resources such that maximum total poverty reduction is possible.

Basic assumption of group targeting is that the resources allocated to the i^{th} group will increase the mean consumption of each individual in the group by equal amount such that poverty reduction in the i^{th} group may produce a proportional reduction in total poverty. Therefore, targeting indicator is the percentage reduction in total poverty when a unit resource (one Birr) is spent for poverty alleviation in the i^{th} urban center as compared to the reduction in total poverty when a unit resource is equally spent across all urban centers (no targeting at all).

Based on the equations 3.32 to 3.34 in Section 3.3.1.4, the numerical values of targeting indicators with respect to the three poverty measures for seven urban centers corresponding to each year are summarized in Table 4.5. The value corresponding to each urban center in a given year is the percentage reduction in total poverty (population weighted) as a result of the

allocation of a unit resource (one Birr) to a given urban center. For instance, KIP0 of 1.25 for Dessie in 1994 indicates that the weighted average urban poverty (measured by head count ratio) can be reduced by 1.25 percent if a unit resource is targeted and implemented in Dessie. This may imply that a large proportion of the resources can be spent in Dessie followed by Addis in 1994 so as to achieve maximum poverty reduction.

For any urban center for which Kip_{α} value is less than unity, the amount of resources allocated for poverty alleviation may be lower than any other because the benefit of targeting is less than no targeting at all. However, if the value is greater than one, then targeting to no targeting is preferable for maximum total poverty reduction. Note that in the target equation ($KIP_{\alpha t}$

$$= \frac{-\frac{P_{\alpha it}}{P_{\alpha t} \mu_{it}} [\gamma_{\alpha it} - \beta_{\alpha it}]}{-\frac{1}{\mu_t} [\gamma_{\alpha t} - \beta_{\alpha t}]}$$

) that we established in Section 3.3.1.4, the numerator is the estimate of

targeting while the denominator estimates the value of no targeting at all.

Therefore, if the ratio of targeting to no targeting at all is less than unity, then the percentage of reduction in total poverty as a result of targeting to i^{th} urban center is less than the percentage reduction in total poverty when all urban centers are considered (no targeting at all). On the other hand, if the ratio equal to unity, then targeting to i^{th} urban center is not superior or inferior to no targeting at all.

Table 4.5: Urban Target Indicators with respect to the three poverty measures by city and year

Year	Urban center	^c KiP ₀	^c KiP ₁	^c KiP ₂	T (2.6) ^a	T (5.2) ^b
1994	Addis Ababa	1.17	1.10	1.20	20.74	10.50
	Awassa	1.04	0.89	1.01	22.05	11.16
	Bahir Dar	0.94	0.58	0.59	18.61	9.42
	Dessie	1.25	0.96	0.39	19.07	9.66
	Dire Dawa	1.02	0.39	0.30	13.78	6.98
	Jimma	1.00	0.63	0.53	14.90	7.54
	Mekele	1.05	0.71	0.69	17.92	9.07
	All urban	1.13	0.93	0.97	19.63	9.94
1995	Addis Ababa	1.06	1.12	1.11	25.28	12.80
	Awassa	1.13	0.96	0.91	23.98	12.14
	Bahir Dar	1.00	0.91	0.84	23.15	11.72
	Dessie	1.18	0.95	0.89	23.77	12.04
	Dire Dawa	1.24	0.86	0.71	19.85	10.05
	Jimma	1.16	0.81	0.71	21.62	10.95
	Mekele	0.95	0.99	1.13	31.16	15.78
	All urban	1.10	1.03	1.00	24.51	12.41
1997	Addis Ababa	1.15	1.24	1.20	22.22	11.25
	Awassa	1.02	1.07	1.12	24.80	12.56
	Bahir Dar	1.17	1.68	1.60	21.59	10.93
	Dessie	1.22	1.14	1.10	22.26	11.27
	Dire Dawa	1.16	0.52	0.76	16.47	8.34
	Jimma	1.22	1.18	1.12	21.69	10.98
	Mekele	1.03	0.91	0.91	23.09	11.69
	All urban	1.07	1.14	1.08	21.65	10.96
2000	Addis Ababa	0.87	0.96	0.96	20.83	10.55
	Awassa	0.79	0.70	0.64	18.38	9.31
	Bahir Dar	0.88	0.69	0.59	17.00	8.61
	Dessie	0.74	0.74	0.83	23.87	12.09
	Dire Dawa	0.85	0.61	0.50	16.07	8.14
	Jimma	1.06	1.02	0.92	17.99	9.11
	Mekele	0.88	0.78	0.85	16.89	8.55
	All urban	0.97	0.82	0.69	16.61	8.41

- a. T is the crossover time for an average poor person to escape poverty when the real per capita growth rate is 2.6 percent per annum. 2.6 percent growth rate of real per capita GDP is the average growth rate between 1992/93-1997/98 cited in EEA's annual report 1999/00. Formulae for crossover time is given in equation (4.1)
- b. The crossover time when real per capita growth rate is assumed to be two times that of 2.6 percent per annum. See Section 4.2.5 for the crossover time equation.
- c. Target indicators with respect to each poverty measures. See equations (3.31) to (3.34) for specification of general equations.

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

According to our empirical result, the targeting value varies widely from time to time. It also varies depending on the type of poverty measures used. For 1994, Dessie was the most appropriate urban center for targeting (with Kip_0 value of 1.25) while in 1995 the appropriate urban center was Dire Dawa with Kip_0 value of 1.24, and in 1997 Dessie and Jimma with their corresponding value of Kip_0 1.22 were more appropriate for targeting. To our surprise, targeting any particular urban center (s) was not necessary in 2000 because in all cases target indicators were less than 1. One possible reason for such fluctuation in the targeting indicator is due to the volatility in the national economy, particularly due to the fluctuation in the performance of the agricultural sector.

4.2.5. Poverty Alleviation: Growth or Redistribution?

The question of poverty alleviation is not a matter of choice between growth and distribution. It is rather a political decision usually in favor of growth (mainly influenced by the traditional belief that the benefit of economic growth will gradually trickle down to all segments of the population). Poverty alleviation, however, is more complicated and mysterious than what we think it is and that is why it is always present and even increasing in spite of all the efforts from all over the world. In order to appreciate and recognize the extent of urban poverty problem in terms of time (time required for the average person to escape from current poverty situation) and resources (resources required to pull all poor population out of poverty), we assume two extreme strategies: *no targeting at all and perfect targeting*.

In the no targeting scenario, the poor are not targeted at all and 100 percent weight is given to growth to reduce poverty. We assume that growth in per capita will perfectly trickle down to all segments of the population without affecting the existing distribution and therefore, after some time, all the poor population will escape the fixed absolute poverty line. Then we ask, how long this period will be?

At the other extreme is the perfect targeting scenario. The argument here is that growth will rarely benefit the poor. Therefore, the poor should be identified and the required resources should be redistributed. The simplified assumption in this scenario is that the poor are perfectly identified and redistribution of resources from non-poor to poor has no cost in terms of efficiency and growth (Kanbur, 1987). Here we try to answer the amount of resources required.

To answer the first question, we use the crossover time equation (Kanbur, 1987),

$$(4.1) \quad T = \frac{\ln\left(\frac{Z}{\mu^P}\right)}{\ln(1+g)}$$

where T is the average time required for the average poor person to escape absolute poverty, Z is the absolute poverty line, μ^P is mean consumption of the poor and g is annual growth rate of per capita income. To answer the second question we derive an equation from the poverty deficit ratio in equation (3.6), which is given by,

$$(4.2) \quad P_1 = \frac{\sum_{i=1}^q (Z - C_i)}{NZ} \Rightarrow P_1 NZ = \sum_{i=1}^q (Z - C_i),$$

where P_1 is poverty deficit, N is total population size, q is number of poor population, C_i is the real per adult consumption expenditure of each household. Therefore, P_1NZ is, the total deficit of the poor population and hence the required resources to pull the poor out of poverty.

As indicated in Section 4.2.1, there are about 9.5 million urban populations out of which nearly about 4.3 million are poor in the year 2000. Therefore, if we take year 2000 as the initial reference point and the real per capita growth rate of 2.6 percent per annum (Cited in EEA, 1999/00), then the average poor person in 2000 will escape the absolute poverty nearly after 17 years. In terms of our data, the above conclusion (for the fixed poverty line) implies that the consumption expenditure of every individual in the society will shift upward by 2.6 percent each year such that the average poor person will graduate from poverty after 17 years.

In terms of US dollar, the real per adult consumption expenditure (real per adult consumption expenditure and real per capita GDP are used interchangeably) for urban population in 2000 was about \$215.54, which can roughly be compared with the national average of \$110 real per capita GDP (UNDP, 1998). Given the assumption of 2.6 percent per annum growth rate of the real per capita for 17 years (with out affecting distribution) from now, the current urban real per adult consumption expenditure (or the real per capita GDP) would reach to around \$330.30 in year 2017, which is slightly less than the average figure (\$350) for low-income countries in year 1997 and much less than the average figure (\$500) for sub-Saharan African countries in the same year.

If we are more optimistic to assume the real per capita growth rate to be 5.2 per cent per annum (two times the pervious one), then the crossover time will be reduced by half. (See Table 4.5 for

the estimates of crossover time for each urban center corresponding to each year and Table 4.2 for the mean consumption of the poor population).

However, if we assume perfect targeting of resources on urban poor, which are about 4.3 million in the country²⁴, the resources required to pull such number of poor out of poverty for a week is about 36.5 million Birr (in real terms) or for one year it is about 1.752 Billion Birr (P_1 , which is 0.1562 for all urban in 2000 is used), which is about 33% of the government tax revenue in 1997/98. The amount of resources required to set the average poor person free from poverty for 17 years is also about Birr 29.784 Billion (i.e. Birr 1.752 Billion x17 year).

Regarding the implementation of perfect targeting strategy is concerned, the assumption is made that these resources (i.e. the resources estimated above) will be redistributed to the poor population as 'pocket money' to finance their deficit in consumption expenditure. But this assumption is practically less appealing in terms of efficiency and sustainability. To be more practical, therefore, we can assume that the resources will be redistributed in the form of direct investment on sustainable projects, which are targeted to the benefit of the poor population so that the strategy (or redistribution policy) may be more reliable and faster than growth to alleviate urban poverty.

²⁴ According to CSA definition, urban areas are when the size of total population residing in one locality is greater or equal to 2000. The total urban population in the country, projected for the year 2000 is about 9.5 million. If our average head count index (45 percent) estimated from the year 2000 data set is valid, then, we can conclude that nearly about 4.3 million urban populations are poor

Chapter Five: Elasticity of Poverty with respect to Growth and Distribution

5.1. Decomposition Analysis

5.1.1. Static Decomposition Analysis

The static decomposition of poverty measures, which splits the measures into growth and inequality components, using one-year data points has interesting policy implications. The methodology of decomposition technique follows that of Datt and Ravallion (1992), Kakawani (1990) and Ali (1990). In the static decomposition framework, it is assumed that changes in poverty are additively separable into growth and distribution components, which implies that there is no interaction effect of growth and distribution²⁵. For the given poverty line (a real poverty line of Birr 24.60 per week per adult, estimated using the same data), each poverty measure is decomposed into growth and inequality components and the results are summarized in Table 5.1. The values in the summary table, as shown in columns γ_{0it} , γ_{1it} and γ_{2it} represents the elasticities of each poverty measures for a unit change in growth when distribution is assumed fixed while those shown in columns β_{0it} , β_{1it} and β_{2it} are the elasticities of each poverty measures for change in distribution when growth is assumed constant.

The magnitude of elasticities of each poverty measures for growth and distribution depends on the initial condition of the level of development and welfare distribution of a given urban center. When the living standards of a given urban center is in a bad condition (in terms of say, less mean consumption, high inequality or high poverty) the elasticities of poverty measures for changes in growth or distribution or both is low as compared to other urban centers, which are in (relatively) better conditions.

Let us see the specific points before we go to the general conclusions. First let us look at the head count measures. P_0 is more elastic to growth, particularly when the poor are clustered around the poverty line or the number of poor population relative to the sample size is small. Let us take an example in 1994. When urban centers are ranked from poorest to poor based on their head count ratio (or mean consumption), Addis is the poorest with 45.11% of the sample population living below the poverty line or real mean consumption expenditure of Birr 41.98 per week per adult, while Dire Dawa is least poor with the corresponding figures of 15.91% of poor population and Birr 55.58 mean consumptions. Corresponding to this order, the magnitude of elasticity of P_0 with respect to mean consumption for Addis is -1.05 while for Dire Dawa it is -2.59 . This implies that for the same rate of economic growth, P_0 in Dire Dawa is more sensitive to growth than it is for Addis; mainly because the degree of impoverishment in Addis is worse and at the same time a significant proportion of the poor population are concentrated far way from the poverty line, i.e. the consumption distribution measured by Gini index or the severity index measured by P_2 for Addis is much higher than it is for Dire Dawa.

²⁵ In the dynamic decomposition analysis (section 5.1.2) this assumption is dropped and the existence of interaction effect between growth and distribution (residual effect) is discussed.

Table 5.1: Point Elasticity of the three Poverty measures w.r.t Growth and Inequality

	γ_{0it}	β_{0it}	γ_{lit}	β_{lit}	γ_{2it}	β_{2it}	
1994	Addis A.	-1.05	0.74	-1.42	2.71	-1.68	4.60
	Awassa	-1.15	0.91	-1.31	2.83	-1.36	4.65
	Bahir Dar	-1.58	1.83	-1.63	4.04	-1.45	6.00
	Dessie	-1.29	0.77	-1.58	2.56	1.83	4.31
	Dire D.	-2.59	3.26	-2.36	5.22	-1.69	6.65
	Jimma	-1.57	1.51	-2.15	4.03	-2.71	6.54
	Mekele	-1.46	1.35	-1.71	3.51	-1.81	5.54
	All urban	-1.19	0.96	-1.52	3.05	-1.74	5.03
1995	Addis A.	-0.75	0.58	-1.09	2.61	-1.36	4.59
	Awassa	-0.94	1.15	-1.17	3.67	-1.35	6.12
	Bahir Dar	-0.87	1.32	-1.23	4.39	-1.53	7.37
	Dessie	-0.99	0.72	-1.19	2.58	-1.27	4.36
	Dire D.	-1.14	1.41	-1.50	4.09	-1.73	6.61
	Jimma	-1.13	1.20	-1.35	3.50	-1.52	5.75
	Mekele	-0.76	0.49	-0.82	2.18	-0.82	3.84
	All urban	-0.84	0.75	-1.14	2.90	-1.37	5.00
1997	Addis A.	-0.94	1.25	-1.30	4.08	-1.60	6.82
	Awassa	-0.97	1.56	-1.12	4.42	-1.18	7.13
	Bahir Dar	-0.70	4.19	-1.34	14.97	-1.56	23.26
	Dessie	-1.08	0.97	-1.30	3.06	-1.46	5.10
	Dire D.	-1.18	2.07	-1.90	6.08	-2.55	9.98
	Jimma	-1.05	1.50	-1.34	4.36	-1.58	7.14
	Mekele	-1.14	2.11	-1.23	5.15	-1.19	7.92
	All urban	-0.95	1.63	-1.34	5.00	-1.68	8.28
2000	Addis A.	-1.02	0.56	-1.41	2.34	-1.73	4.06
	Awassa	-1.26	1.23	-1.66	3.59	-2.01	5.91
	Bahir Dar	-1.44	1.00	-1.82	2.98	-2.18	4.93
	Dessie	-1.11	0.88	-1.18	2.74	-1.22	4.58
	Dire D.	-1.55	1.37	-1.96	3.61	-2.21	5.71
	Jimma	-1.15	0.26	-1.70	1.60	-2.15	2.93
	Mekele	-1.12	0.66	-1.52	2.49	-1.85	4.28
	All urban	-1.31	0.54	-1.88	2.18	-2.37	3.79

Note γ_{0it} = elasticity of P0 with respect to growth (proxied by consumption in urban center i) in location i.

β_{0it} = elasticity of P0 with respect to distribution (proxied by Gini) in location i. Others are defined similarly. See equations (3.13) to (3.19) for the formulae of each point elasticity

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

Let us take an example of the case in 1997 with respect to the severity measure, P_2 and its elasticity with respect to Gini index. For 1997 Awassa and Addis Ababa are ranked poorest with their respective P_2 figures of 10.75 and 10.18 while Dire Dawa and Bahir Dar are relatively less poor with their respective P_2 values of 4.11 and 5.13. As we can see from Table 5.1, their corresponding elasticities with respect to Gini index is as follows: elasticities for Addis Ababa and Awassa are respectively 6.82 and 7.13, while the corresponding values for Bahir Dar and Jimma are 23.26 and 9.98. The same way analysis lead us to conclude that urban poverty measured by the three poverty measures is relatively more sensitive to growth or distribution in urban centers where their relative initial living standard is better.

One possible policy implication is that it is not easy to bring a real change in the living standards of the poor in the shorter term when the concentration and degree of impoverishment is much higher. In other words, poverty is less sensitive to growth or distribution or both when the initial level of economic development is low. This conclusion is consistent with our intuitive understanding that the effort required to reduce poverty is high when the degree of impoverishment is high.

As regard to the behavior of the three poverty measures with respect to growth and distribution is concerned, it is in accordance with other empirical studies made in several African countries. The incidence measure is more elastic to growth than distribution while the deficit and severity measures are more elastic to distribution than growth. For instance, if we take Addis Ababa in 1994, the elasticity of incidence measure with respect to growth and distribution is -1.05 and 0.74 , while the elasticity of deficit with respect to growth (-

1.42) and distribution (2.71) and the elasticity of severity with respect to growth (-1.68) and distribution (4.60) are much higher.

Another important observation from Table 5.1 is that for most urban centers, the magnitude of elasticities of poverty with respect to growth and distribution is greater than unity. The implication is that if poverty reduction is adopted as a primary objective of development, then a policy that would result in one percent reduction in inequality (assuming that the policy does not have adverse growth effect) or one percent increase in economic growth (given inequality is constant) would reduce poverty by more than one percent, i.e. poverty reduction would be much faster than economic growth and improvement in equity. If we take the year 1994, all poverty measures, except P_0 , with respect to Gini index are significantly elastic with the elasticities ranging from 1.05 (elasticity of P_0) to 6.65 (elasticity of P_2). This means that with a one percent reduction in inequality, the severity will be reduced by more than 6 percent.

5.1.2. Dynamic Decomposition Analysis

In the static decomposition, we tried to see the relative sensitivity of poverty measures with respect to growth and distribution. Now in the following section, we will try to see how actual changes in poverty between two periods is decomposed into growth, redistribution and interaction effects so that the relative importance of each effect can be investigated.

Following Datt and Ravallion (1992) method, which assumes a fixed poverty line, total change in three poverty measures between the two periods are decomposed into

their respective components and are summarized in Tables 5.2 to 5.4. The positive entries indicate an increase while the negative entries indicate a decrease. For instance, negative entries for growth effect means the percentage reduction of a given poverty measure as the result of increase in real per adult consumption (assuming distribution constant at initial period). Similarly, the negative (positive) entries for distribution effect means the percentage decrease (increase) of a given poverty measure as a result of decrease (increase) in the consumption distribution measured by Gini coefficient (assuming constant real mean consumption, i.e. growth).

The magnitude and sign of growth and redistribution effect depends on the magnitude and direction of change in real mean consumption expenditure and Gini coefficient respectively. See Table 4.2 for the summary of mean consumption expenditure and Gini coefficient of the sample population along with the three poverty measures.

Let us focus our discussion on Table 5.2, which summarizes the decomposition of total change in poverty incidence (P_0) into growth, distribution and residual effects across all urban centers between the two selected periods (1994-1995, 1995-1997, 1997-2000 and 1994-2000). The conclusions that would be drawn from Table 5.2 will equally apply to Tables 5.3 and 5.4.

Between 1994 and 1995, poverty (P_0) has increased across all urban centers ranging from 4.51 percents increase in Dessie to 23.80 percent in Dire Dawa.

Table 5.2: Decomposition of Observed changes in P_0 between two periods into Growth, Redistribution and Residual Effects

Year	Urban center	ΔP_0	Growth effect	Redistribution effect	Residual effect
1994-1995	Addis Ababa	6.42	-1.74	7.86	0.30
	Awassa	7.70	-8.49	17.04	-0.85
	Bahir Dar	17.96	-5.37	23.69	-0.36
	Dessie	4.51	-3.51	8.10	-0.08
	Dire Dawa	23.80	0.43	23.33	0.04
	Jimma	11.49	-1.96	13.61	-0.16
	Mekele	16.34	6.92	10.86	-1.44
1995-1997	Addis Ababa	-9.31	-10.70	1.94	-0.55
	Awassa	-7.69	-6.37	-1.87	0.55
	Bahir Dar	-24.81	-29.05	-7.51	11.75
	Dessie	-4.68	-4.06	-0.52	-0.10
	Dire Dawa	-5.86	-9.03	2.52	0.65
	Jimma	2.89	-6.57	10.09	-0.63
	Mekele	-14.60	-6.50	7.40	-0.70
1997-2000	Addis Ababa	5.76	16.55	-12.75	1.96
	Awassa	-1.29	10.44	-12.61	0.88
	Bahir Dar	17.39	27.61	-17.90	7.68
	Dessie	-1.37	2.22	-3.46	-0.13
	Dire Dawa	-3.26	15.31	-18.45	-0.12
	Jimma	11.24	30.58	-23.80	4.46
	Mekele	13.22	25.61	-18.99	6.60
1994-2000	Addis Ababa	2.87	1.61	-4.54	5.80
	Awassa	-1.28	-2.75	4.56	-3.09
	Bahir Dar	10.54	-0.35	-10.58	21.47
	Dessie	-1.54	-4.03	5.48	-2.99
	Dire Dawa	14.68	-5.70	-8.01	28.39
	Jimma	25.62	-2.82	-25.90	54.34
	Mekele	14.96	-6.20	-16.90	38.06

Note: Negative entry represents a reduction. Negative entry for growth effect implies the contribution of growth in reducing poverty. The values are in percent. Refer equation (3.20) for the general formulae of decomposing observed changes in poverty into components. ΔP_0 is the observed change in head count ratio between two periods.

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

Such a homogeneous increase across all urban centers is dominantly attributed to the redistribution effects (worsening of consumption distribution). In other words, deterioration in welfare distribution eroded the benefits of growth, which in most urban centers (except Dire Dawa and Mekele) however reduced poverty incidence ranging from 1.96 percent in Jimma to 8.49 percent in Awassa. Though there are wide variations in the magnitude of the redistribution effects across individual urban centers, the dominance of redistribution effects in all urban centers implies that economic factors that worsened the welfare distributions are homogenous²⁶ across units.

This is not to mean that the redistribution effect dominates in all periods or in all urban centers for different periods. Between 1995 and 1997, the situation is reversed, i.e. growth effect dominated the redistribution effects. Poverty (P_0) is reduced in all urban centers (except Jimma) dominantly due to the growth effects. Though the contribution of growth to the reduction in poverty varies across urban centers, all urban population has captured the benefits of economic growth at national level.

The dominance of growth effects between 1995 and 1997 is consistent to the highest real GDP growth rate of 10.6 percents and real per capita growth rate of 7.5 percents per annum in 1996/97 (EEA, 1999/00). As argued, the main source of such a large amount of real GDP growth rate (per capita growth rate as well) is attributed to the favorable weather conditions and the corresponding growth in agricultural sectors in the economy (the contribution of the service sector was also significant).

²⁶ This result is consistent to our homogeneity assumption that we imposed in the parameters of growth and distribution under econometric analysis in Section 5.2.

The contribution of growth effect to changes in poverty between 1997 and 2000 however, is completely reversed. That is, i.e. deterioration in economic growth in all urban centers resulted in increased number of poor people attributed to growth effect (ranging from 2.22 percent of the sample population in Dessie to 30.58 percent in Jimma slipped back into poverty).

Such deterioration in real consumption in all urban centers can fairly be compared to the macro economic indicators in 1997/98. The negative real GDP growth rate of -0.5 percent, particularly attributed to a significant decline in the growth rate of agricultural sector (-10.30 percent) and similar drop in growth rate of real per capita GDP (-3.5 percent) consistently reflects the significance of growth effects and its potential to affect poverty in both directions.

On the other hand, due to the improvements in consumption distribution, the redistribution effect has uniformly contributed to the reduction in poverty in all urban centers. Depending on the magnitude of either of the two effects, the total change in P_0 is mixed between 1997 and 2000.

The magnitude and direction of residual effects varies widely across units and over time. In few cases, we observed that magnitude of the residual effect is much higher than expected. However, in most cases, its contribution to the total change in poverty is insignificant (less than one percents).

Table 5.3: Decomposition of Observed changes in P_1 between two periods into Growth, Redistribution and Residual Effect

		ΔP_1	Growth effect	Redistribution effect	Residual
1994-1995	Addis Ababa	5.98	-0.96	6.98	-0.04
	Awassa	4.54	-4.03	-14.83	23.40
	Bahir Dar	9.68	-2.04	13.43	-1.71
	Dessie	4.77	-1.65	6.77	-0.35
	Dire Dawa	11.11	0.12	10.87	0.12
	Jimma	7.69	-0.85	8.77	-0.23
	Mekele	14.33	2.94	11.16	0.23
1995-1997	Addis Ababa	-6.25	-6.99	0.97	-0.23
	Awassa	-3.13	-3.57	0.13	0.31
	Bahir Dar	-11.50	-15.05	0.64	2.91
	Dessie	-2.97	-2.16	-0.78	-0.03
	Dire Dawa	-4.18	-4.49	0.80	-0.49
	Jimma	1.27	-3.27	5.34	-0.80
	Mekele	-11.25	.	0.88	.
1997-2000	Addis Ababa	1.52	10.98	-8.09	-1.37
	Awassa	-3.93	5.98	-8.89	-1.02
	Bahir Dar	4.92	18.73	-7.27	-6.54
	Dessie	0.26	1.16	-0.76	-0.14
	Dire Dawa	-1.33	9.58	-7.18	-3.73
	Jimma	1.86	19.94	-13.58	-4.50
	Mekele	1.69	13.14	-11.22	-0.23
1994-2000	Addis Ababa	1.25	1.33	-2.55	2.47
	Awassa	-2.52	0.56	2.30	-5.38
	Bahir Dar	3.10	1.13	-4.56	6.53
	Dessie	2.06	-4.65	2.73	3.98
	Dire Dawa	5.60	-3.01	-3.26	11.87
	Jimma	10.82	0.24	-12.08	22.66
	Mekele	4.77	-0.99	-7.87	13.63

Note: Negative entry represents a reduction. Negative entry for growth effect implies the contribution of growth in reducing poverty. The values are in percent. Refer equation (3.20) for the general formulae of decomposing observed changes in poverty into components. ΔP_1 is the observed change in deficit measure between two periods.

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

Tables 5.3 and 5.4 show that the direction and relative importance of growth and distribution effects for changes in P_1 and P_2 are largely in the same order as those of the P_0 measure. For instance, the total change in P_1 and P_2 between 1994 and 1995 for all urban centers is mainly attributed to the distribution effects. Similar to P_0 , the reduction in P_1 and P_2 between 1995 and 1997 is dominantly attributed to the growth effect. Residual effects also behave in the same way as we saw it with respect to P_0 .

Based on the above discussions we can draw the following conclusions. First, The magnitude and directions of growth and redistribution effects depend on the magnitude and direction of changes in real mean consumption and Gini index. Second, the determinants behind the urban economic system, particularly associated to growth and distribution are homogenous across urban centers. In other words, when there are changes in growth and distribution in the economic system over the given periods, the effects of such changes on the level and severity of urban poverty do not significantly vary across cross sectional units. This implies the possibility of achieving maximum poverty reduction with the same policies and strategies for all urban centers. Third, a trade-off between growths and distribution is frequently observed. In other words, when there is an increase in growth there is a possibility of deterioration in distribution and vice versa. Finally, the relative importance of growth and distribution effects to the observed changes in poverty widely change due to the volatility in the national economic system, particularly due to fluctuations in the performance of the agricultural sector.

Table 5.4: Decomposition of Observed changes in P_2 between two periods into Growth, Redistribution and Residual Effects

		ΔP_2	Growth effect	Redistribution effect	Residual effect
1994-1995	Addis Ababa	4.52	-0.62	5.26	-0.12
	Awassa	2.73	-2.42	7.28	-2.13
	Bahir Dar	5.36	-1.03	8.05	-1.66
	Dessie	4.28	-0.98	5.60	-0.34
	Dire Dawa	5.94	0.05	5.79	0.10
	Jimma	5.54	-0.44	6.24	-0.26
	Mekele	12.16	1.40	9.92	0.84
1995-1997	Addis Ababa	-4.46	-4.99	0.67	-0.14
	Awassa	-1.33	-2.43	0.87	0.23
	Bahir Dar	-6.53	-9.25	2.83	-0.11
	Dessie	-2.40	-1.40	-0.96	-0.04
	Dire Dawa	-3.37	-2.67	-0.26	-0.44
	Jimma	0.56	-2.07	3.29	-0.66
	Mekele	-9.12	.	-1.23	.
1997-2000	Addis Ababa	0.46	7.95	-5.37	-2.12
	Awassa	-4.17	4.07	-6.75	-1.49
	Bahir Dar	1.73	14.56	-4.11	-8.72
	Dessie	0.89	0.76	0.23	-0.10
	Dire Dawa	-0.21	6.25	-3.14	-3.32
	Jimma	-0.42	14.33	-8.53	-6.22
	Mekele	0.42	8.60	-7.83	-0.35
1994-2000	Addis Ababa	0.52	1.16	-1.65	1.01
	Awassa	-2.77	1.58	1.40	-5.75
	Bahir Dar	0.56	1.71	-2.54	1.39
	Dessie	2.77	-4.31	1.76	5.32
	Dire Dawa	2.36	-1.32	-1.69	5.37
	Jimma	5.68	0.84	-6.63	11.47
	Mekele	3.46	-1.63	-6.21	11.30

Note: Negative entry represents a reduction. Negative entry for growth effect implies the contribution of growth in reducing poverty. The values are in percent. Refer equation (3.20) for the general formulae of decomposing observed changes in poverty into components. ΔP_2 is the observed change in severity measure between two periods.

Source: Author's calculation based on Urban Socio-economic Survey Data from Economics Department.

5.2. Econometric Analysis

5.2.1. Introduction

In this section, econometric analysis of a panel data is applied, on the relationship between poverty, inequality and growth. As discussed in the methodology section, data points on poverty (measured by the FGT class poverty measures) and inequality (measured by Gini index) are a priori generated from the grouped mean consumption expenditure for each urban center over for four years.²⁷ The growth variable, proxied by consumption expenditure, is the real mean consumption expenditure per week per adult estimated from the original data across individual units and over time.

As we specified in Section 3.2.3, there are three general alternative models for panel data analysis: Variable coefficient model, variable-intercept model and pooled model. However, variable-coefficient model is dropped from the analysis for the reasons that we discussed in Section 3.3.3. But both variable-intercept and pooled models are estimated for each poverty measures. To arrive at one representative specification for each poverty measures we imposed common assumption, frequently used in panel data analysis and tested one model over the other using the standard test statistics: Breusch and Pagan (1980) LM test, Likelihood ratio test, F test, Chi-square test and Hausman test. The standard procedures of testing the restricted model over the unrestricted model approaches are adopted. For comparison purposes, we report the outputs of alternative models.

²⁷ See Ali (1998), Datt and Ravallion (1992) for grouped data analysis and generation of poverty and inequality measures. The summary of the three poverty measures along with Gini coefficients and mean income are summarized in Table 4.2.

We estimated model (3.36), (3.37), (3.38), (3.40), (3.41), (3.43) and 3.44) for the three poverty measures and tested one over the other according to the steps that we established in Section 3.3.2²⁸. To avoid crowdedness, estimates of model (3.37) and model (3.41) are not reported but they are captured by the two-way models of 3.43 and 3.38.

5.2.2. Results and Discussions

To analyze the elasticity of poverty, measured by the three poverty measures, we specified different models based on alternative assumptions for panel data generating processes. The variable-coefficient model, which is based on the assumptions that both intercept and slope parameters vary across cross sectional unit or over time or both, is reject from the outset for the reasons mentioned above. Thus the variable- intercept and the pooled models are the two competent models employed to analyze and determine an appropriate model to each poverty measures. The variable-intercept model is further divided into fixed effect model (FEM) and random effect model (REM) based on the assumptions.

The regression output of FEM and REM, along with the pooled model, are estimated for both one-way and two-way models and summarized in Tables 5.5 to 5.7 for the three poverty measures. Following step-by-step procedures, we tried to fix one model among several alternative specifications [such as equations (3.36), (3.38), (3.40), (3.43) and (3.44)] for each poverty measures.

²⁸ For the detail discussion of each model and testing procedures, see econometric model specification Section 3.3.2.

Table 5.5: Regression Results (Dependent variable: $\ln p_0$)

	(3.40) ^a	(3.43) ^a	(3.36) ^a	(3.38) ^a	(3.44) ^a
$\ln \mu_{it}$	-0.86 (-6.90) ^b	-0.80 (-5.69)	-0.87 (-9.64)	-0.85 (-8.58)	-0.87 (-10.17)
$\ln G_{it}$	1.27 (7.05)	1.02 (2.84)	1.29 (7.87)	1.22 (5.75)	1.29 (8.22)
Constant	-	2.77 (1.95)	2.00 (3.50)	2.17 (2.67)	2 (3.62)
RSS	.31	.22	.38	.38	.38
R ²	.86	.89	.83	.83	.83
$\overline{R^2}$	0.81	.81	-	-	.82
LogL.	23.49	27.85	-	-	20.40
F (.)	14.98 (8,19) ^c	10.44 (12,15) ^c	-	-	60.75 (2,25) ^c

Model Test^d

1. (3.36) Vs.(3.44)= LM Test: Chi square with 1 degrees of freedom=0.21(0.65)^e
2. (3.40) Vs. (3.44): log likelihood ratio Test: Chi square with 6 degrees of freedom =6.18 (0.40)
3. (3.40) Vs. (3.36)=Hausman Test: Chi square with 2 degrees of freedom= 0.00 (0.99)
4. (3.38) Vs. (3.44) = LM Test: Chi square with 2 degrees of freedom=0.21 (0.90)
5. (3.43) Vs. (3.44) = log likelihood ratio Test: Chi square with 10 degrees of freedom =13.09 (0.22)
6. (3.43) Vs. (3.38)= Hausman Test: Chi square with 2 degrees of freedom=0.69 (0.71)

Note: To save space we did not report the regression result of model 3.37 and 3.41. Note also that White/Heteroscedasticity corrected covariance matrix is used.

LogL. = Log likelihood. RSS= Residual sum of square.

- a. Refers to the equation or model number in model specification section
- b. Figures in parenthesis in each case are t-values
- c. Figure in parenthesis in each case are degrees of freedom used for F test.
- d. Serial numbers in model test box are steps to be followed to determine the right model.
- e. A figure in parenthesis in model test box in each case represents the level of significance at which

the unrestricted model (alternative model) is significantly different from the restricted one (the null model is the one on the right side) Example: in model (3.43) Vs. (3.38), model 3.38 is the null model while model 3.43 is alternative one.

In the step followed to determine the appropriate model, which should be consistent to theory and expectation, we do see that the fitness of alternative models depend on the types of poverty measures used as dependent variable. If we take the regression results for $\ln P_0$ (the incident poverty measure) in Table 5.5, the Chi-square test (step 1) with 1 degrees of freedom strongly favors the classical regression model (3.44) over the REM (3.36) with the probability of 0.65 (rejection of model (3.44) being it is true.). While in the regression result of $\ln p_1$ (the deficit model) in Table 5.6, the value of Chi-square statistics with 1 degree of freedom is much higher (1.54) with lower probability (0.22) as compared to $\ln p_0$ estimates.

It is even more surprising if we compare the regression results of $\ln p_2$ (the severity models) in Table 5.7. As regard to the test of REM versus the pooled model, i.e. model (3.36) Vs. (3.44), the chi-square statistics with 1 degree of freedom leads to the opposite conclusion that the pooled model (the null hypothesis) does not fit $\ln p_2$ equation and hence rejected at 5 percent level of significance.

Now for the moment let us focus on Table 5.5 to determine an appropriate specification for $\ln p_0$ model. First, model (3.36) Vs. (3.44) test shows that model (3.44) should not be rejected. Second, model (3.40) Vs (3.44) test also do not reject the pooled model (3.44). The Hausman test of model (3.40) Vs. (3.36) strongly rejected model (3.40). However, this does not mean that the REM is appropriate. Since it has already been rejected as compare to the pool model, we conclude that the pooled model, model (3.44) is appropriate to $\ln p_0$ equation when one-way models are test against it. This implies that poverty, measured by P_0 , is homogeneous across urban centers given that the time specific effects are constant.

We further ask whether this conclusion applies when the time effects are assumed not constant (testing of two-way effect models against the pooled model). To answer this question, we analyze the test statistics indicated in step 4 to 6. The Chi-square test with 2 degrees of freedom in step 4 indicates that the pooled model is still strong. The tests of model (3.43) Vs. (3.44) in step 5, and model (3.43) Vs. (3.38) in step 6 rejected model (3.43). Therefore with high degree of confidence we conclude that model (3.44), the classical regression model, fits the incident poverty equation. This result implies that there is no significant variation in the incidence of poverty across urban centers at given point in time and over time for the given urban center. That is, given the population size of each urban center, the incidence of poverty measure is proportional to the population size. Decomposition of total poverty into population weighed sub-group (in Section 4.2.2) revealed that poverty incidence is proportional to population size of a given urban center.

Once more if we look at Table 5.5 model (3.44), all coefficients are significantly different from zero and are consistent with theory and expectation. The F test with 2 and 25 degrees of freedom is so significant [$F(2,25)=60.75$] and both R^2 and adj. R^2 shows that more than 82 percent of the variation in the dependant variable is explained. Note also that the value of Gini index parameter (1.29) is much higher than the growth parameter (-0.87), which implies that poverty measured by P0 is relatively more sensitive to income distribution than growth. The policy implication is obvious. A one percent reduction in inequality (measured by Gini coefficient) will reduce poverty by 1.29 percent and a one percent increase in growth (proxied by the mean consumption expenditure per week per adult) reduces poverty

by less than one percent (-0.87). A cursory look at the slope coefficients in all models indicate that there is no order of magnitude change, i.e. in all cases the relative elasticity of P0 with respect to Gini coefficient is greater than 1 while it is less than 1 with respect to growth. This result is consistent with the dynamic decomposition analysis²⁹ in Section 5.1.2. (See Table 5.2 for dynamic decomposition of P0.). In the dynamic decomposition table the redistribution effect dominated the growth and residual effects: in 14 out of 28 cases the redistribution effect dominantly contributed to the total changes in the incidence while the growth and residual effects are in 9 and 3 respectively.

Now let us see the regression results in Table 5.6 for the deficit poverty measure. In this case it is not straightforward to determine an appropriate model to $\ln p_1$ equation.

²⁹ Similar comparison can not be made with that of static decomposition in section 5.1.1 because in the static decomposition total change in poverty is assumed to be additively separable between growth and distribution, while in this case total change in poverty is not fully separable, there is an interaction effect (the residual component), which corresponds to the intercept term in the econometric result (Interpretation of the residual effect and intercept terms may not be same).

Table 5.6: Regression Results (Dependent variable: $\ln p_1$)

	(3.40) ^a	(3.43) ^a	(3.36) ^a	(3.38) ^a	(3.44) ^a
$\ln \mu_{it}$	-0.93 (-5.37) ^b	-0.83 (-4.79)	-0.95 (-7.66)	-0.95 (-7.79)	-0.98 (-8.09)
$\ln G_{it}$	1.87 (8.26)	1.28 (2.90)	1.90 (8.79)	1.90 (8.90)	1.95 (8.70)
Constant	-	0.97 (0.56)	-0.95 (1.30)	-0.92 (1.30)	-0.98 (1.25)
RSS	.47	.34	.77	.77	.77
R ²	.88	.90	.88	.80	.80
$\overline{R^2}$.83	.83	-	-	.78
LogL	17.65	22.04	-	-	10.50
F (.)	17.22 (8,19) ^c	11.98 (12,15) ^c	-	-	49.42 (2,25) ^c

Model Test^d

1. (3.36) Vs. (3.44): LM Test: Chi square with 1 degrees of freedom =1.54 (0.22)^e
2. (3.40) Vs. (3.44): log likelihood ratio Test: Chi square with 6 degrees of freedom =14.28 (0.03)
3. (3.40) Vs (3.36): Hausman Test: Chi square with 2 degrees of freedom =0.00 (0.99)
4. (3.38) Vs (3.44): LM Test: Chi square with 2 degrees of freedom =2.36 (0.31)
5. (3.43) Vs. (3.44): log likelihood ratio Test: Chi square with 10 degrees of freedom =21.26 (0.02)
6. (3.43) Vs. (3.38): Hausman Test: Chi square with 2 degrees of freedom =3.55 (0.17)

Note: To save space we did not report the regression result of model 3 and 6.

LogL= log likelihood. RSS= Residual sum of square.

- a. Refers to the equation or model number in model specification section
- b. Figures in parenthesis in each case are t-values
- c. Figure in parenthesis in each case are degrees of freedom used for F test.
- d. Serial numbers in model test box are steps to be followed to determine the right model.
- e. A figure in parenthesis in model test box in each case represents the level of significance at which the unrestricted model (alternative model) is significantly different from the restricted one (the null model, model on the right side) Example: (3.43) Vs. (3.38), model (3.38) is the null model while model (3.43) is alternative one

In the first test, model (3.36) Vs. (3.44), chi-square with 1 degrees of freedom do not reject the pooled model (3.44). However, the test of model (3.40) Vs. (3.44) rejected model (3.44) at 5 percent level of significance. But in step 3, the Hausman test strongly favored the random effect $\ln p_1$ model (3.36). Unless we set other criteria, it is not clear as to which model is appropriate to the $\ln p_1$ equation. Even the comparison of two-way effect models with pooled

one [model (3.38) vs. (3.44) in step 4, model (3.43) Vs. (3.44) in step 5 and model (3.43) Vs. (3.38) in step 6] did not come to help us to determine which model should be chosen. But one advantage is that the conclusion to be drawn is not significantly affected by the type of model, because there is no significant variations in the parameter estimates corresponding to the type of model and at the same time the order of magnitude remain the same. The basic conclusion of high sensitivity of poverty with respect to welfare distribution is intact. In all cases, the slope coefficients of both growth and distribution in $\ln p_1$ estimate are higher than they are in $\ln p_0$ estimate that is consistent to other studies (for example Ali, 1998). The elasticity of deficit poverty measure with respect to distribution variable is much higher (average of 1.87) than the case in $\ln p_0$. A 1 percent reduction in Gini coefficient will reduce deficit by 1.87 percent. As can be seen in the next paragraphs, the elasticity of severity measure (p_2) is even much higher with respect to Gini coefficient for the reason that p_2 is distribution sensitive.

Model determination in the case of severity is straightforward. If we look at Table 5.7 and follow the same steps as before, we finally come up with the random effect model (both one-way and two-way random effect models: model 3.36 and 3.38 respectively) as the appropriate specification for $\ln p_2$ equation.

First, model (3.36) versus model (3.44) tested by chi-square with 1 degrees of freedom rejected model (3.44) at 5 percent level of significance. The chi-square test (at 1 degrees of freedom) of model (3.40) versus (3.44) strongly favored fixed effect model over the pooled model. However, model (3.40) is highly biased as is compared to the random effect model in

step 3 with the probability of 0.99, which implies that though model (3.40) is so significant as compared to the pooled model, it is strongly outweighed by random effect model. The two-way model comparisons (from step 4 to 6) have also brought us to the same conclusion that random effect model is appropriate for $\ln p_2$ equation.

Table 5.7: Regression Results (Dependent variable: $\ln p_2$)

	(3.40) ^a	(3.43) ^a	(3.36) ^a	(3.38) ^a	(3.44) ^a
$\ln \mu_{it}$	-0.97 (-4.82) ^b	-0.83 (-4.18)	-0.99 (-6.84)	-0.91 (-5.47)	-1.05 (-6.84)
$\ln G_{it}$	2.22 (9.26)	1.55 (3.06)	2.25 (9.05)	2.01 (5.83)	2.34 (8.28)
Constant	.	-0.66 (-0.33)	-2.74 (-3.30)	-2.13 (1.66)	-2.83 (-2.84)
RSS	.59	.44	1.12	1.30	1.23
R ²	.89	.91	.76	.77	.76
$\overline{R^2}$.84	.84	.	.	.75
LogL	14.27	18.36	.	.	4.01
F (.)	18.70 (8,19) ^c	12.67 (12,15) ^c	.	.	40.819 (2,25) c

Model Test^d

1. (3.36) Vs.(3.44): LM Test: Chi square with 1 degrees of freedom =5.10 (0.024)^e
2. (3.40) Vs. (3.44): log likelihood ratio Test: Chi square with 6 degrees of freedom =20.52 (0.002)
3. (3.40) Vs. (3.36): Hausman Test: Chi square with 2 degrees of freedom =0.00 (0.99)
4. (3.38) Vs. (3.44): LM Test: Chi square with 2 degrees of freedom =6.63 (0.04)
5. (3.43) Vs. (3.44): log likelihood ratio Test: Chi square with 10 degrees of freedom =26.88 (0.003)
6. (3.43) Vs. (3.38): Hausman Test: Chi square with 2 degrees of freedom =2.43 (0.30)

Note: To save space we did not report the regression result of model 3.37 and 3.41.

LogL= log likelihood. RSS= Residual sum of square.

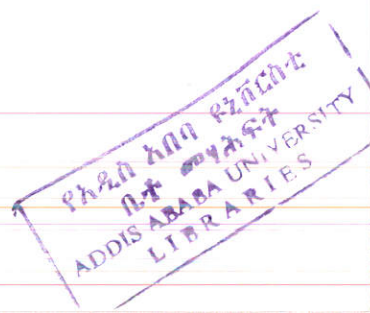
- a. Refers to the equation or model number in model specification section
- b. Figures in parenthesis in each case are t-values
- c. Figure in parenthesis in each case are degrees of freedom used for F test.
- d. Serial numbers in model test box are steps to be followed to determine the right model.
A figure in parenthesis in model test box in each case represents the level of significance at which the unrestricted model (alternative model) is significantly different from the restricted one (the null model, model on the right side) Example: (3.43) Vs. (3.38), model (3.38) is the null model while model (3.43) is alternative one.

Generally, it is perhaps clear from the results in Tables 5.5 to 5.7 that the conventional econometric criterion of statistical significance (all results are significantly different from zero at 5 percent or better level of significance) and the goodness of fit (fairly high R^2 and adjusted R^2) are satisfied. Parameter consistency with theory and expectation are apparently well accepted. Consistency to other similar empirical studies³⁰, particularly to the studies made in Sub-Saharan countries is intact.

On the basis of these results we make the following conclusions:

First, Poverty, measured by the three FGT class poverty measures is more sensitive to distribution than growth. The sensitivity of poverty with respect to Gini coefficient varies significantly with the type of poverty measures used. The average elasticity of incidence measure with respect to Gini coefficient is 1.22 that of deficit is 1.78 and that of severity measure is 2.07. While the average elasticities of the three poverty measures with respect to growth are -0.85, 0.93, and 0.95 respectively. Second, the behavior of poverty analysis across units and over time depends on the type of poverty measure used. A mere head count index is homogenous across cross sectional units for the given period and is also homogenous over time for the given urban center. However, the severity measure is heterogeneous in space and time, i.e. there are individual specific or time specific factors that make the severity level to vary from one urban center to an other or from one period to an other. However, such specific factors are random and are individually unimportant but collectively significant. Possible policy implication is that if poverty reductions are adopted as an overarching objective of development, then a policy of equity promoting along with growth enhancing strategy should be in place.

³⁰ Using a cross sectional data points from 16 Sub-Saharan African countries, Ali Abdel Gadir Ali (1998) concluded that three poverty measures are more sensitive to income distribution than growth. He also concluded that the elasticity of P0, P1, and P2



Chapter Six: Conclusions and Policy Implications

The urban sector plays a significant role in the process of social, political and economic changes in the country, yet it is entangled with several socio-economic problems, mainly as a result of its increasing population, rural urban migration, unemployment, proliferation of prostitution, street children and deterioration of urban public services etc. One of its big problems has always been poverty and unfair distribution of welfare. As we stated at the outset, the objective of this paper was to undertake an empirical analysis on the spread, depth and severity of urban poverty and its behavioral relationship with growth and distribution using recent analytical tools in order to draw possible policy implications.

Accordingly, the analysis of welfare distribution and its variation within and between urban centers have been considered using grouped data, graphical presentation and Gini indices. An effort has also been made to investigate the spread, depth and severity of poverty across individual urban centers and its temporal behavior over the study periods. Sub-group decomposition of total poverty into population-weighted share of each urban center was helpful to compare each urban center with highest or lowest concentration of poor population. The issue of generating a targeting indicator, which enables policy makers to allocate scarce resources on targeted urban center(s) in order to maximize aggregate poverty reduction, has also been one of the important topics of discussions. Particular attention was paid to the elasticity of total poverty for unit changes in growth or inequality in the i^{th} urban center. Finally, different techniques for decomposition of changes in poverty and econometric models for panel data were employed to analysis the relative sensitivity of poverty to changes in growth and redistribution. Based on these, we can draw several conclusions and policy implications.

with respect to Gini are not significantly different from 1, 2 and 3 respectively. Lack of similar study for Ethiopia, constrained us from comparison.

6.1. Conclusions

Welfare distributions of consumption expenditure between different segments of the population in a given urban center indicated that a big chunk of the resources are controlled by the top 20 percent of the population, while the share of the poorest segments of the population (the lowest 40 percent) is disproportionately low and sustained throughout the study periods across all urban centers. Comparative analysis of the distribution variations across urban centers also revealed that it changes significantly from time to time following the changes in the national economy. The aggregate inequality measures, Gini indices, confirmed the general impression that inequality is high in urban areas and increasing tendency through time. The trade-off between growth and equity shows that the required percentage increase in growth, in order to offset the effect of a unit increase in inequality is high.

The spread, depth and severity of urban poverty analysis show that it is generally high and increasing over time. Cross comparison of the three poverty measures indicated that there are wide variations between urban centers. Specifically, Addis Ababa is one with relatively high number of poor population living below the absolute poverty line of Birr 24.60 per week per, while Bahir Dar and Dire Dawa have relatively less poor population. Using the year 2000 data and the total urban population size forecasted for 2000, we concluded that about 4.3 million urban population in the country were living below the real absolute

poverty line of Birr 24.60 per week per adult, i.e. about 45 percent of total urban population.

Sub-group decomposition indicated that about 29 percent (1.25 million) of the total urban poor population is living in Addis Ababa alone. On the other hand, one percent increase in economic growth (with out any change in distribution) or one percent reduction in inequality (with out any change in growth) in Addis Ababa reduces total urban poverty as much as 3 or more times efficiently than any other urban center. On top of that the targeting indicator has prioritized Addis Ababa as an appropriate urban center for targeting. Therefore, we conclude that particular attention should be paid to poverty situations in Addis Ababa, if the overall objective is to maximize total urban poverty reduction in the country.

Point elasticity analysis indicated that the three poverty measures are relatively more sensitive to growth or redistribution depending on the initial condition of a given urban center. In other words, poverty is less sensitive to growth or redistribution when the initial level of economic development in a given urban center is worst and vice versa. This conclusion is consistent with our intuitive understanding that the effort required to reduce poverty is high when the degree of impoverishment is high. Specifically, the incidence measure of poverty (P_0) is more elastic to growth than distribution while the depth and severity measures are more elastic to distribution. This conclusion is in accordance with other empirical studies made in several other African countries.

The magnitude of point elasticity with respect to growth and distribution is greater than unity. This implies that the rate of reduction in poverty as a result of economic growth (or redistribution) is faster than economic growth (or redistribution). But the general observation is that poverty is relatively more sensitive to distribution than growth.

Decomposition of the observed change in poverty between two periods into growth, redistribution and residual effects implied that the relative importance of growth or redistribution effect (magnitude) and direction of the effects depend on the magnitude and direction of changes in mean consumption and Gini index. We also noticed that the determinant factors behind the process of urban economic system (factors associated to growth and distribution) are homogenous across urban center. In other words, when there are changes in growth and distribution in the economic system over a given periods, the effects of such changes on the spread, depth and severity of urban poverty do not vary significantly across urban centers.

A trade-off between growth and distribution is frequently observed, i.e. when there is an increase in growth there is a possibility of deterioration in distribution and vice versa.

The relative importance of growth and distribution effects to the observed changes in poverty change widely from time to time due to the volatility in the national economy, particularly as the result of fluctuations in the performance of agricultural sector.

Finally, from the econometric analysis of panel data we draw the following conclusion: Poverty, measured by the three FGT class poverty measures, is more elastic to distribution than growth. The elasticity of poverty measures with respect to Gini coefficient varies significantly with the type of poverty measures used. The average elasticity of incidence measure (P0) with respect to Gini coefficient is 1.22, that of depth measure (P1) is 1.78 and that of severity (P2) is 2.07. The corresponding average elasticity of the three poverty measures with respect to growth is -0.85 , -0.93 and -0.95 respectively.

The behavior of poverty across units and over time also depends on the type of poverty measures. A mere head count index is homogenous across cross sectional units for the given period and is also homogenous over time for a given urban center. However, the severity measures are heterogeneous across units and over time, i.e., there are individual specific factors that make severity level to vary from one urban center to another or from one period to another. However, such specific factors are random and are individually unimportant but collectively significant.

6.2. Policy Implications

The problem of poverty (and inequality) is one of the oldest problems in developing countries, where the efforts have been made to eradicate or reduce it to some reasonable level. However, it is always increasing mainly because the poor are handicapped from sharing equitably from the benefits of output growth. The poor have no physical assets, no human capital, no access to resources, no access to information etc. The development of market economic system and expansion of private sector have even further widened the

existing gap between poor and non-poor. Therefore, given the current economic system, the need for strong government intervention is nowhere justified than dealing with the problem of poverty and inequality.

The government should have 'a policy package', which should target the lower segment of the population and takes into account different aspects of the poor, limitations of previous policies and strategies. As we have seen in our discussion, growth can be one important tool to reduce urban poverty provided that the policy package is designed in such a way that the benefits of economic growth are fairly shared by the lower segments of the poor and enable them to escape poverty within a reasonable range of time.

However, given the initial condition of the large proportion of the urban population (initial conditions in terms of inequality, which is worst and poverty, which is so spread, deep and severe), conventional economic growth and policies cannot bring any tangible and sustainable changes in the livelihood of the poor within short time. Therefore, the initial condition dictates us to have an integrated policy package, which focuses on the poor and safeguards them from bad side of the initial economic growth. Poverty-focused plan is to increase the income of the poor and reduce the existing gap between poor and non-poor by redistributing the benefit of economic growth. Nevertheless, poverty-focused plan does not imply the abandonment of growth as an objective, rather it emphasizes that growth

The contribution of public health provision, pure water supply, sanitations and housing conditions targeted to the poor improves the welfare of the poor. In this case one complements the other. For example, improved water supply and sanitation means improved health, which means more productivity. Large proportions of the urban poor population are suffering from curable diseases, which mainly resulted from poor sanitary conditions. Therefore, investment in health and complementary activities targeted to the poor will make a big difference in the welfare of the poor.

1. Capacity building activities: This includes skill training, credit provision, awareness creation (on family planning, gender equality etc), participation of the public in policy formulation and implementation etc.
2. Employment creation: This includes expansion and encouragement of informal sector, encouragement of private sector to focus on labor-intensive growth etc.
3. Encouragement of non-government organizations: One of the important qualities of NGOs in this regard is that their main objective is the reduction of poverty, i.e. NGOs resources and times are largely targeted toward the lower segments of the population. Their capacity and experience to reach the poorest segments of the population is satisfactory. They have been much favored by international donors. For instance, USA channel one-third of their development assistance through NGOs (World Bank, 2000)
4. Requirement of autonomous institution to fight poverty³¹

³¹ This is a new suggestion. The proposed role of institution may include: (1) resource mobilization exclusively targeted toward the poor community groups from national and international level and address the need of these community groups in organized and efficient manner to attain maximum and permanent reduction in poverty, (2) undertake day-to-day monitoring and evaluation of the changes in the welfare of the poor, (3) undertake research and proposes appropriate policies and strategies for poverty alleviation.

should be equity enhancing, because as we have seen from our empirical result, poverty is largely sensitive to distribution and therefore, worsening of inequality following general economic growth will erode the benefits of growth and takes many more people to slip into poverty. Therefore, it implicitly implies that the general economic growth objective should be implemented in conjunction with an initial attack on poverty and inequality.

A Practical policy package, largely targeted to the benefit of the lower segment of the urban poor population in the country, may include several areas of government and non-government intervention. Broadly we would like to categorize the major intervention areas or activities into five:

1. Expansion of social infrastructure: this includes education, health, water supply and sanitation, housing etc.

The potential role of primary and secondary education in reducing unequal distribution of welfare has well been discussed in the literature. This would be more effective when it is intended to prepare children from poor family to be more productive, self-sufficient and enable them to deal with practical problems that they face. According to the World Bank report (cited in Fishlow, 1995) the rate of social return from primary education is 25 percent, secondary 15 to 18 percent and tertiary 13 to 16 percent. A study has also confirmed that 10 to 20 percent variation in inequality is explained by education. Berhrman (1993) indicated that those with no schooling have a 56 percent probability of being among the poorest 20 percent.

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Glossaries

AAU	Addis Ababa University
ADLI	Agricultural Development Led Industrialization
AERC	African Economic Research Consortium
CSA	Central Statistical Authority
DCs	Developed Countries
EEA	Ethiopian Economic Association
EHNRI	Ethiopian Health and nutrition Research Institute
ENI	Ethiopian Nutrition Institute
EPRDF	Ethiopian Peoples Revolutionary Democratic Front
FAO	Food and Agriculture Organization
FEI	Food Energy Intake
FEM	Fixed Effect Model
FGT	Foster, Greeer and Thorbecke
GDP	Gross Domestic Product
GNP	Gross National Product
HDI	Human Development Index
HIV/AIDS	
ILRI	International Livestock Research Institute
LDCs	Least Developed countries
LSMS	
MEDaC	Ministry of Economic Development and Cooperation
NGOs	Non Governmental Organizations
PCE	Per Capita Expenditure
REM	Random Effect Model
SAP	Structural Adjustment Programme
UNDP	United Nation Development Program
UNICEF	United National International Children's Emergency Fund
USA	United State of America
WB	World Bank
WDR	World Development Report

APPENDICES

Table A1: Adult Equivalent Consumption Units According to Age and Sex

<i>Age (years)</i>	<i>Adult Equivalent Consumption Unit</i>	
	Male	Female
0+	0.25	0.25
1+	0.37	0.36
2+	0.42	0.40
3+	0.46	0.43
4+	0.49	0.46
5+	0.53	0.48
6+	0.56	0.49
7+	0.58	0.49
8+	0.58	0.49
9+	0.58	0.49
10+	0.70	0.64
11+	0.71	0.64
12+	0.73	0.66
13+	0.77	0.68
14+	0.81	0.70
15+	0.85	0.70
16+	0.89	0.72
17+	0.92	0.75
18-29+	1.03	0.82
30-59+	1.03	0.83
>60	0.68	0.61
Adult	1	0.81

Source: James, W.P.T and E.C. Schofield (1990), "Human Energy requirements: A Manual for Planners and Nutritionist", Published for FAO by Oxford University press.

Table A2: Number of Households (sample sizes) used in the Analysis by City and Year

<i>City</i>	<i>Plan</i>	<i>1994</i>	<i>1995</i>	<i>1997</i>	<i>2000</i>
Addis Ababa	900	894	855	879	867
Awassa	73	71	74	67	76
Bahir Dar	100	100	105	99	98
Dessie	101	93	99	95	98
Dire Dawa	126	125	125	122	121
Jimma	100	99	100	100	96
Mekele	100	98	98	97	99
Total	1500	1480	1456	1459	1455

Source: Author's estimation based on Urban Socio-economic Survey data from Economics Department

Table A3: Average Household Members (Adult Equivalent) by City and Years

<i>CITY</i>	<i>1994</i>	<i>1995</i>	<i>1997</i>	<i>2000</i>
Addis Ababa	5.03	5.05	4.94	5.06
Awassa	5.28	5.11	4.94	5.88
Bahir Dar	4.54	4.24	3.84	4.60
Dessie	4.03	4.05	3.80	3.21
Dire Dawa	4.29	3.98	3.94	3.66
Jimma	4.63	4.55	4.44	4.28
Mekele	3.82	3.88	3.87	4.07
Aggregate	4.77	4.73	4.59	4.71

Source: Author's estimation based on Urban Socio-economic Survey data from Economics Department.

Table A4: summary of urban Poverty Indicators by Year

Year	Poverty Indicator	Mean	Std. Deviation	Minimum	Maximum
1994	P0	30.78	9.97	15.91	45.11
	P1	11.75	4.89	4.74	18.62
	P2	6.33	2.88	2.56	10.12
	G	40.88	4.46	35.18	49.07
	M	47.14	5.93	39.04	55.58
	μ^p	15.48	1.19	13.97	17.27
1995	P0	43.38	4.55	37.33	51.53
	P1	20.05	3.72	15.85	25.14
	P2	12.12	3.26	8.50	17.83
	G	54.77	4.42	49.41	60.70
	M	49.88	7.95	40.68	61.99
	μ^p	13.29	1.17	11.06	14.78
1997	P0	34.23	8.43	17.16	42.22
	P1	14.62	3.97	7.30	18.35
	P2	8.31	2.61	4.11	10.75
	G	55.44	4.29	48.61	60.73
	M	59.64	8.59	46.63	70.23
	μ^p	14.11	.96	13.02	16.12
2000	P0	40.19	7.77	30.59	51.46
	P1	15.34	3.58	10.34	19.87
	P2	8.13	2.33	4.92	10.64
	G	42.67	4.24	36.02	46.93
	M	41.23	6.15	30.12	48.63
	μ^p	15.25	1.04	13.33	16.28
All year average	P0	37.15	9.00	15.91	51.53
	P1	15.44	4.89	4.74	25.14
	P2	8.72	3.40	2.56	17.83
	G	48.44	7.96	35.18	60.73
	M	49.47	9.62	30.12	70.23
	μ^p	14.53	1.37	11.06	17.27

Source: Author's estimation based on Urban Socio-economic Survey data from Economics Department.

Table A5: summary of urban Poverty Indicators by urban center

<i>City</i>	<i>Poverty Indicator</i>	Mean	<i>Std. Deviation</i>	Minimum	Maximum
Addis Ababa	P0	46.71	3.98	42.22	51.53
	P1	20.36	2.90	18.35	24.60
	P2	11.40	2.18	10.12	14.64
	G	52.53	5.38	46.93	58.15
	μ	45.32	8.45	38.21	57.54
	μ^p	13.91	.74	12.86	14.45
Awassa	P0	37.96	4.11	35.07	44.05
	P1	16.57	2.94	13.19	20.25
	P2	9.69	2.35	6.58	12.08
	G	52.18	8.47	43.95	60.70
	μ	52.93	8.75	44.01	64.25
	μ^p	13.91	1.04	13.02	15.35
Bahir Dar	P0	29.42	11.01	17.16	41.97
	P1	11.86	5.05	7.30	18.80
	P2	6.47	2.87	4.11	10.64
	G	47.50	9.79	39.12	59.62
	μ	52.05	8.25	41.87	61.99
	μ^p	14.72	1.05	13.58	15.90
Dessie	P0	39.63	2.63	37.39	43.44
	P1	17.23	1.97	15.07	19.84
	P2	10.09	1.79	7.86	12.14
	G	46.04	4.24	40.05	49.41
	μ	43.08	3.21	39.04	46.63
	μ^p	13.92	.82	13.33	15.08

<i>City</i>	<i>Poverty Indicator</i>	Mean	<i>Std. Deviation</i>	Minimum	Maximum
Dire Dawa	P0	30.02	10.13	15.91	39.71
	P1	10.65	4.59	4.74	15.85
	P2	5.28	2.44	2.56	8.50
	G	46.96	9.20	38.04	55.53
	μ	56.15	8.79	46.32	67.71
	μ^p	16.11	1.02	14.78	17.27
Jimma	P0	38.71	10.53	25.84	51.46
	P1	15.08	4.76	8.21	19.03
	P2	7.81	2.90	3.48	9.58
	G	45.84	12.42	35.18	60.73
	μ	47.27	12.47	30.12	59.88
	μ^p	15.13	1.29	14.10	16.78
Mekele	P0	37.58	8.58	29.32	45.66
	P1	16.36	6.18	10.81	25.14
	P2	10.34	5.23	5.67	17.83
	G	48.04	7.41	39.89	56.96
	μ	49.51	14.33	39.20	70.23
	μ^p	14.03	2.23	11.06	15.94
All urban average	P0	37.15	9.00	15.91	51.53
	P1	15.44	4.89	4.74	25.14
	P2	8.72	3.40	2.56	17.83
	G	48.44	7.96	35.18	60.73
	μ	49.47	9.62	30.12	70.23
	μ^p	14.53	1.37	11.06	17.27

Source: Author's estimation based on Urban Socio-economic Survey data from Economics Department.

Table A6: Marginal Rate of Substitution with respect to the three Poverty Measures

Year	City	MRS_0	MRS_1	MRS_2
1994	Addis Ababa	.70	1.91	2.74
	Awassa	.79	2.16	3.42
	Bahir Dar	1.16	2.48	4.14
	Dessie	.60	1.62	2.36
	Dire Dawa	1.26	2.21	3.93
	Jimma	.96	1.87	2.41
	Mekele	.92	2.05	3.06
	All urban	.81	2.01	2.89
1995	Addis Ababa	.77	2.39	3.37
	Awassa	1.22	3.14	4.53
	Bahir Dar	1.52	3.57	4.82
	Dessie	.73	2.17	3.43
	Dire Dawa	1.24	2.73	3.82
	Jimma	1.06	2.59	3.78
	Mekele	.64	2.66	4.68
	All urban	.89	2.54	3.65
1997	Addis Ababa	1.33	3.14	4.26
	Awassa	1.61	3.95	6.04
	Bahir Dar	5.99	11.17	14.91
	Dessie	.90	2.35	3.49
	Dire Dawa	1.75	3.20	3.91
	Jimma	1.43	3.25	4.52
	Mekele	1.85	4.19	6.66
	All urban	1.72	3.73	4.93
2000	Addis Ababa	.55	1.66	2.35
	Awassa	.98	2.16	2.94
	Bahir Dar	.69	1.64	2.26
	Dessie	.79	2.32	3.75
	Dire Dawa	.88	1.84	2.58
	Jimma	.23	.94	1.36
	Mekele	.59	1.64	2.31
	All urban	.41	1.16	1.60

Source: Author's estimation based on Urban Socio-economic Survey data from Economics Department.

Note: values of Marginal rate of substitution with respect to the three poverty measures (MRS_0 , MRS_1 , MRS_2) can be defined as the rate of economic growth required to offset a unity increase in Gini index so that poverty will remain constant.

DECLARATION

I, the undersigned, declare that this thesis is my original work and has not been presented for a degree in any other university and all sources of materials used for this thesis have been duly acknowledged.

Name Belayneh Begajo

Signature 

Date July 2001.
Addis Ababa