Special Issue

POVERTY AND POVERTY DETERMINANTS IN ETHIOPIA

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SPECIAL ISSUE

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Editorial Note

In 1995, a group of international NGOs–ActionAid, CARE, OXFAM-UK, Rada Barnen, Red Barna and Save the Children–UK came together to set up a research project aimed at the link between economic reform and poverty reduction in Ethiopia. The research project was mainly driven by the overall scepticism felt at the time on the efficacy of Structural Adjustment Programmes (SAP) in reducing poverty. The main thrust of the research project was to identify several components of the economic reform and link them with the state of poverty in Ethiopia.

In 1999, a synthesis of the research effort by the collaborating NGOs was presented to policy makers, donors and academicians in a one-day workshop held at UNCC, Addis Ababa.

The five papers presented in this special issue of the *Ethiopian Journal of Economics* are partly a result of the initiative by the collaborating NGOs and also a parallel support provided by the African Research Consortium, based in Nairobi, for financial as well as intellectual support.

We hope readers will learn much from the papers presented here on several aspects of poverty and how sensitive the approaches one chooses to follow are. We also hope that it will inspire many to pursue the study of poverty as a subject of inquiry in development economics.

Finally, this special issue of the *Ethiopian Journal of Economics* is dedicated to the late Ato Mekonnen Tadesse who passed away in January 1999. Ato Mekonnen was a pioneer in the analysis of poverty in Ethiopia.

PERCEPTIONS OF WELFARE AND POVERTY: ANALYSIS OF QUALITATIVE RESPONSES OF A PANEL OF URBAN HOUSEHOLDS IN ETHIOPIA[*]

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Abstract

In this study we attempted to apply the subjective definition of poverty based on a version of the income evaluation question to analyse the perception of households about their welfare and to derive the poverty line and poverty measures in developing country setting. The results are encouraging and indicate that meaningful responses can be obtained to the income evaluation question. The findings show that in general households are more concerned about their absolute welfare than their welfare in comparison with others. In addition, we found that household needs rise with the size of the household, sex of the head of the household and the education of the head of the household.

1. INTRODUCTION

Decades of research on individual welfare and poverty have not yet resolved the major measurement issues. There are still controversies surrounding the choice of the welfare indicator, the derivation of the poverty line and the choice of poverty measures. While substantial progress has been made in developing poverty measures with important desirable properties (Foster et al., 1984) the determination of the poverty line continues to be a thorny issue. At the theoretical level the poverty line is defined as the expenditure of income level required to attain a given utility level chosen to define poverty. This approach, however, does not provide a well-defined notion of poverty that allows identification of the reference utility level and hence the cost of attaining it. The methods often employed in practice in setting poverty lines are therefore, not explicitly expressed in terms of welfare theory. Approaches that reject utility as a metric of welfare prefer to base the measurement of poverty on some form of commodity deprivation[1]. There is however, no unanimity on the specific form of the commodity deprivation that could serve as the basis of measurement.

Another dimension of the ongoing debate on the definition of poverty relates to the long-standing controversy on whether poverty should be viewed as a condition of absolute or relative deprivation[2]. Absolute poverty is defined as the inability to attain

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[*] The final version of this article was submitted in May 2002.

basic needs consumption level irrespective of the general standard of living. The relative concept, on the other hand, related poverty to the general welfare in society and often identifies the poor as those falling below a certain fraction of average income or a specific per centile of the income distribution. There are a number of conceptual and measurement problems raised in relation to both definitions. With respect to the concept of absolute poverty, it is argued that the basic needs consumption level is not easy to define (Atkinson 1975). The attempt to overcome this problem by trying to anchor the basic needs on food consumption does not solve the problem either as it is not possible to determine nutritional requirements uniquely. Normative judgments will, therefore, have to be made regarding what constitutes the basic nutritional requirement. There is, however, no guarantee that expert judgment will correspond to observed consumption behaviours which are determined not only by nutritional requirements but also by social conventions. Moreover, a greater degree of arbitrariness is involved in giving allowance for basic non-food consumption.[3] In view of these, it is argued that any meaningful poverty line is inevitably influenced by contemporary living standards and that poverty must not be seen as an absolute but a relative concept (e.g. Atkinson 1975 and Townsend 1979). Relative definitions of poverty too do not escape from the problem of being based on exogenously set parameters: the poverty cut-off point of the income distribution has to be chosen by the researcher.

At the other extreme is a strand of thought that rejects the "objective" definitions altogether and contends that poverty cannot be meaningfully quantified in terms of objective criteria and prefers to make subjective and qualitative poverty assessments.

An intermediate approach that has evolved in the last two decades is what is now referred to in the literature as the subjective poverty definition. This concept is based on the perception of individuals about their own well-being and attempts to relate such subjective welfare levels with the actually observed income. Such subjective welfare levels themselves are essentially based on some form of income evaluation: individuals are asked what they consider to be an absolutely minimal income or two state income levels they think correspond to different categorical labels designed to represent different welfare rankings. These are related to actually observed income to define a subjective poverty line (SPL) (see next section for formal definitions).

The subjective poverty definition has at least three advantages. First, it avoids an initial understanding (or definition) of poverty as an absolute or relative concept. Whether poverty should be considered absolute, relative or somewhere in between is determined from the data itself and hence as a perception of the society about welfare and poverty. Secondly, it does not require setting parameters a priori to identify the poverty line: they are determined empirically. Finally, its data requirement is easily obtainable: at the minimum data on income and responses to the qualitative income evaluation question will be sufficient. If more differentiated poverty lines are desired data on household size and composition and other relevant characteristics may be required.

Despite these advantages, however, its application has been restricted to poverty studies mainly in Europe and has virtually not been applied to studies in the developing world.[4] One reason that may be given is that the concept of income on which the SPL is based is hard to define in the context of developing countries where monetisation of the economy, particularly in rural communities is very low and the major income source is subsistence production. There is no strong reason why it cannot be applied to situations where cash income is predominant and meaningful responses can be obtained to qualitative income evaluation questions.

This study attempts to use a model based on a version of the income evaluation question to derive the SPL in an urban context in Ethiopia. Unlike most previous studies, the parameters of the model are estimated from a two-year panel of a sample of households in seven major urban centres of the country. Apart from deriving the poverty line, the estimated model is used to examine whether households perceive poverty as a relative or absolute concept and to assess factors that determine household welfare evaluation and hence the poverty line.

The next section reviews the major approaches used in measuring subjective poverty. Section 3 discusses the data and estimation procedures employed in the study, Section 4 presents the results and Section 5 concludes the paper.

2. APPROACHES TO MEASURING SUBJECTIVE POVERTY

The concept of subjective welfare and poverty starts from the premise that people are the best judges of their own situation and that their opinions should ultimately be the decisive factor in defining welfare and poverty. Subjective poverty measures are therefore derived on the basis of survey responses of individuals to questions designed to solicit their opinions about their welfare.

Two approaches are commonly employed to evaluate individual perceptions of welfare, and based on that to define poverty. One of the approaches defines poverty on the basis of individual responses to what is called "the minimum income question", and the other on the basis of the "income evaluation question".

The minimum income question asks the individual respondent to state the after-tax income he, under the circumstances he is in, considers to be "absolutely minimal" or, in other words, the income level below which he thinks he "would not be able to make ends meet".[5] The stated minimum income, designated by Y_{min}, is interpreted as the value of the cost function at the welfare level "making ends meet" (Danziger et al., 1984) and hence is taken to be the individual's poverty line. That is the individual is considered to be poor if his actual income, Y, is less than Y_{min}. Such a poverty line, however, may lead to inconsistency in classification; it is possible that individuals at the same standard of living may state different levels of minimum income and may, as a result, be classified differently. To impose consistency on the individual survey

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responses, it is postulated that the stated minimum income varies systematically with actual income and a vector of other individual characteristics, x, such as household size and composition and income in the respective reference group:

$$Y_{min} = f(Y, x)$$ [1]

And the poverty threshold, called the subjective poverty line (SPL) is defined as the solution of equation 1 given the values of x. i.e.

$$Y^*_{min} = f(Y^*, x)$$ [2]

Since, for given values of x, f can be assumed to be monotonically increasing in Y with an elasticity of α ($0 < \alpha < 1$), a unique solution. It consists as depicted in Fig.1a[6]. Individuals whose actual income is less than Y^*_{min} are considered to feel that their income to make ends meet, while those whose actual income exceeds Y^*_{min} to feel that it is sufficient. Hence Y^*_{min} is the income threshold that divides the poor from non-poor. The vector x however varies across individuals, in which case Equation [2] can be used to generate a set of poverty lines differentiated by the components of x as depicted in Fig.1b.
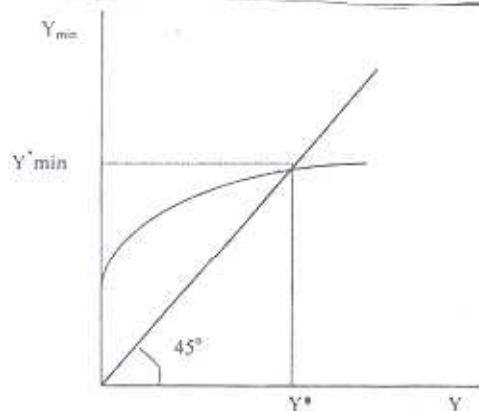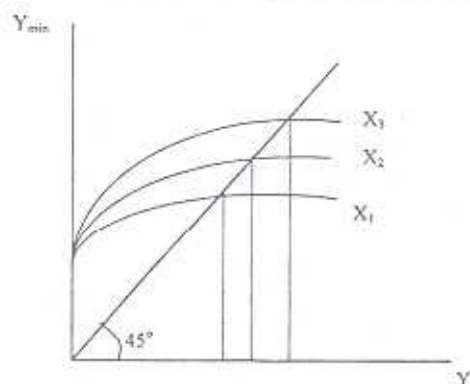

Fig. 1a: Single subjective poverty line   Fig. 1b: Differentiated subjective poverty lines

The second approach is based on some variation of the income evaluation question: Which after-tax monthly income would you in your circumstances consider to be very bad? And bad? Insufficient? Sufficient? Good? Very good? (Kapteyn. et al., 1985)

Assuming that the verbal labels "sufficient", "good", etc arouse the same emotional feelings among all respondents, and hence different individuals associate the same level of welfare with each label the survey responses can be used to compare individual welfare levels. This assumption, it is argued, is sufficient to make comparisons between welfare classes defined by the verbal qualifications without requiring any assumption regarding the precise relationship between welfare and income (Hagenaars 1986:45). The assumption could also be sufficient to derive the poverty line when the intention is to compare poverty within the broad welfare classes. The poverty line in that case can be readily obtained either by averaging the incomes of all those individuals who say their income is "sufficient" or by locating the intersection of the actual income level with that associated with the verbal explanation "sufficient" in the same way as is done in the case of the minimum income question. Both procedures proved the poverty line is associated with the welfare level "sufficient".

To compare welfare levels within the broad classes, the individual welfare function of income denoted by $U(y)$, is derived from the responses to the income evaluation question. The welfare function of income is a version of the operationalisation of the cardinal utility function of income and describes how an individual evaluates different levels of income. Assuming that welfare is cardinally measurable the verbal evaluations are converted into numerical values on the [0,1] interval by identifying them with equal quantiles. The relationship between an income level y and its evaluation is then represented by the log normal distribution, Λ, considered to be a theoretically and empirically plausible approximation, i.e.

$$U(y) = \Lambda(y; \mu; \sigma) = N(\ln y : \mu; \sigma) \tag{3}$$

Where N is the normal distribution function. Thus the individual responses can be summarised by the estimated parameters of the lognormal distribution μ and σ. Poverty is then defined as a situation of low welfare level and the poverty line as the income level which yields that welfare level. Thus for a low welfare level represented by δ ($0<\delta<1$), the poverty line, called the Leyden poverty line (LPL) is derived as a solution to:

$$\Lambda(y_{\delta i}; \mu_i, \sigma_i) = N(\ln y_{\delta i} - \mu_i) \sigma : 0, 1) = \delta \tag{4}$$

Where δ is exogenously determined[7]. As a solution to equation 4 we obtain:

$$\ln y_{\delta,i} = \lambda_i + \rho_i u_\delta \qquad [5]$$

Where u_δ is the δ-quantile of the standard normal distribution. The parameter λ is assumed to depend on the individual's actual income, Y and the vector of other household characteristics, x. ie $\lambda_i = f(Y.x)$. Thus we can write

$$\ln y_{\delta,i} = f(\ln Y.x) + \rho_i u_\delta \qquad [6]$$

Fixing ρ_i at some value (usually at its value in the sample) and solving

$$\ln y_\delta^* = f(\ln y_\delta^*.x) + \rho u_\delta \qquad [7]$$

gives the LPL. Just like the SPL, the LPL could also be differentiated on the basis of the components of x.

While the LPL is based on the underlying theory of the welfare function of income a similar theory from which a model explaining the SPL is derived does not exist. If the SPL, Y^*_{min}, is interpreted as the income level corresponding to the welfare level "making ends meet" or "absolutely minimal". Then the SPL reduces to be LPL apart from the fact that, in the former case, the associated welfare level is not exogenously determined but evaluated by the respondents themselves (Kapteyn et al., 1985). Both approaches, however, are based on the assumption that individuals associate the same level of welfare with the verbal explanations "making ends meet" in the former case, and "insufficient", "sufficient", etc in the latter. It is argued that there is no guarantee that the minimum income question leads to consistent responses; individuals similar in all respects may not provide similar responses to the question. The income evaluation question, on the other hand, is supposed to induce the respondent to be consistent by providing him the full scale of the welfare evaluation.

Both approaches, it is claimed, proved direct measures of welfare unlike traditional demand analysis in which welfare comparisons are derived indirectly from observed market behaviour. This allows us to assess the effect of exogenous variables or variables fixed in the short run such as household size, age, health status, etc., on the income level required to attain a given welfare. The welfare function of income, however, cannot be used to make prediction on individual economic behaviour as it is itself the result of the individual's behaviour (Hartog 1988). Moreover, as Hartog (1988:264) argues the welfare function of income is ex-ante evaluation in a world of limited information and not an ex-post measure of realised welfare and as a result cannot be integrated with standard consumer theory. Subsequent research (see for example Kapteyn 1994) has, however, shown that the income evaluation approach

(as well as the minimum income question) provides a direct measurement of welfare which can be used to identify household cost functions, thereby overcoming the well-known identification problem in demand analysis.

Despite their strong empirical content and limited data requirement as compared, for instance, with the widely used consumption-based measures of welfare and poverty, the application of these approaches has been confined to the developed countries of the west. This is most probably because the concept of income on which the procedures are anchored is hard to define in a developing country context where rural income is predominant and largely subsistence. It would, therefore, be difficult if not altogether impossible to get meaningful responses on questions directly based on income. To overcome this problem, Pradhan and Ravallion (1997) proposed a procedure for deriving the SPL on the basis of subjective evaluations of household consumption adequacy rather than income. Under this procedure households are asked to state whether they think their consumption[8] over a given period is adequate, inadequate, or more than adequate. Consistent with the definition discussed above, the poverty line is then defined as the expenditure level at which the subjective minimum is reached in expectation, for a given household characteristics. The poverty line is estimated from an ordered probit regression of the responses to the consumption adequacy question on consumption expenditure and a vector of household characteristics. This poverty line could also be differentiated by the household characteristics as in the cases discussed above.

3. DATA AND DESCRIPTIVE STATISTICS

The data for this study is drawn from the Ethiopian Urban Socio-economic Survey undertaken in 1995 and 1997 by the Department of Economics of Addis Ababa University in collaboration with the Michigan State University and Goteborg University, respectively, the first and last rounds in collaboration with GU, and the second with MSU. The survey covered a sample of about 1,500 households in each of the three rounds in selected seven major urban centres of the country—the capital Addis Ababa, Awasa, Bahr Dar, Dessie, Dire Dawa, Jima and Mekele. These urban centres were purposively selected to represent what were identified as major socio-economic characteristics of the country's urban population. Samples within each urban centre were, however, drawn through procedures which involved random selection.

In addition to gathering data on household demographic characteristics, employment and income, education and health status, consumption and expenditure, the survey had a module in which three basic qualitative questions on welfare and welfare changes were included. One of the questions in the 1995 and 19976 surveys, is similar to the income evaluation question and is phrased as follows:

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What income (net of taxes) would you, in your circumstances consider to be

Very low	Birr_____
Insufficient	Birr_____
Sufficient	Birr_____
Good	Birr_____
Very good	Birr_____

In this paper we will analyse the responses to this question. Since the responses will very much depend upon the way the question is posed and how the respondent understands the verbal labels, a few points are in order as to how the interviews were conducted. The questionnaires used in the survey are all in English, but the interviews were done in local languages[9] and to maintain uniformity commonly agreed translations were used. There may not, however be exact correspondence between the translated verbal qualifications in the different languages given the cultural diversity of the sample. Even without the added complications of translations, the standard problem with this kind of survey is that there is no guarantee that different respondents will attach the same welfare connotations to the verbal qualifications.

In the survey, the question is posed to the head of the household and the response therefore represents an individual's evaluation about the welfare of the entire household. A possible reservation against this procedure is that other members of the household may have different evaluations. This is not likely to be a serious problem in our case since the head is usually the sole or the main breadwinner and his evaluation tends to be most authentic.

Some basic descriptive statistics on the relevant characteristics of the sample and the responses to the income evaluation question are provided in Table 1.

The summaries presented in the tables reveal that as required on the average the income evaluations consistently rise with the verbal scales in all expenditure quintile. This in fact is also true for the individual records indicating that the ordinal nature of the categories has been, to a large extent, understood by respondents. Moreover, the quintile distributions indicate that the evaluations increase with income as is usually hypothesized about the relationship between the two. It is also interesting to note the evaluations have shifted upwards in 1997 as compared to 1995, and during the same period mean monthly expenditure increased in all urban centres. The mean values are also indicative of the income thresholds corresponding to welfare level represented by the verbal labels.

Table 1a: Mean Income Evaluations, Household Size and
Monthly Total Expenditure by Expenditure Quintile 1995

Quintile	Household	Total Expenditure	Very Low	Insufficient	Sufficient	Good	Very Good
1	4.67	145.58	131.07	216.9	338.57	458.95	649.17
2	5.66	299.27	170.39	268.48	423.24	595.56	862.31
3	6.36	452.97	234.15	360.28	623.40	844.80	1320.59
4	6.62	682.48	291.76	410.87	695.90	886.43	1223.06
5	7.59	1544.94	409.78	619.30	1014.25	1395.94	2197.86
Total	6.16	623.28	247.54	374.25	618.24	835.79	1248.79

Table 1b: Mean Income Evaluations, Household Size and
Monthly Total Expenditure by Expenditure Quintile 1997

Quintile	Household	Total Expenditure	Very Low	Insufficient	Sufficient	Good	Very Good
1	4.42	129.75	140.33	214.58	342.15	502.12	777.46
2	5.24	283.73	178.34	278.58	443.84	656.67	881.18
3	5.46	435.98	250.77	365.15	581.14	842.66	1138.60
4	6.0	681.74	319.77	481.18	664.33	938.88	1293.40
5	6.82	1618.52	408.79	635.97	1028.71	1432.84	2055.69
Total	5.59	630.53	259.73	293.72	612.29	872.15	1226.88

4. PROCEDURES USED FOR POVERTY LINE ESTIMATION

The responses to the income evaluation question are first analysed to identify factors that influence household perception of poverty. To this effect, following what is usually done in the literature, the equation explaining the parameter μ is specified as:

$$\mu_i = \beta_0 + \beta_1 \ln Y_i + \beta_2 \ln x_{2i} + \beta_3 x_{3i} \qquad [8]$$

where Y_i is the actual income of ith household, x_{2i} is household size, x_{3i} is mean income in the reference group of individual i. We defined poverty to correspond to the welfare level evaluated by the verbal explanation "sufficient" and substituted equation 8 into 5 and including other household characteristics and adding a time subscript t (t=1, 2) and an error term ε gives

$$\ln y^s_{it} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln x_{2it} + \beta_3 x_{3it} + \dots + \beta_k x_{kit} + \varepsilon_{it} \qquad [9]$$

Where y^s is the income level evaluated as sufficient. The second term in equation 6 drops out because $u\delta$ (δ-quantile of the standard normal distribution corresponding to the evaluation "sufficient" is zero in our case)[10].

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Unlike the usual practice and what the income evaluation presupposes, we have preferred to use total household consumption expenditure to household income because we found out that, in our surveys, income has been substantially underreported as compared with total expenditure and is, therefore, not a reliable measure of current standard of living. The underreporting may not be necessarily deliberate; it could be due to the fact that households, particularly low-income households, have non-regular multiple sources of income many of which are available during peak seasons of certain types of employment and used to smoothen consumption during slack periods and therefore may not have been reported at the time of the survey. Secondly, the use of consumption expenditure can further be justified by the fact that it may be a better indicator even of long-term average welfare.[11]

Equation [5] is first specified with log household size, log total consumption expenditure and log of reference group mean expenditure as explanatory variables and estimated as a random effects model by feasible generalised least squares. The log of reference group expenditure was statistically insignificant and the model was, thus, re-estimated by dropping this variable. The poverty lines differentiated by household size are obtained as the solution of the estimated equation:

$$Y^*_{suff} = exp\{(\beta_0 + \beta_2 \ln x_2)/(1- \beta_1)\} \qquad [10]$$

Where β_0, β_1 and β_2 are the estimated coefficients.

Then we estimated a more expanded version of the equation with disaggregated household characteristics as explanatory variables (Model 2)[12]. To account for reference group effect, we included log of mean income in each *woreda* (the second stage sampling area). Instead of household size we used the proportion of household members other than the head in different age groups differentiated by sex. The age and age squared of the household head, who in most cases served as our respondent, is included to allow for differences in perception as a result of different habits and having different reference groups (DeVos and Garner 1991). The sex of the head may also have similar effects on the perception of welfare: females may perceive the sufficiency of income differently from males and we included a dummy variable to account for this. Two other possible important determinants of the perception of welfare and poverty are number of income earners in the household and educational status of the head. These are accounted for by the inclusion of dummy variables. Still another factor that may positively influence perception of welfare is the size of assets owned by the household. Two sets of assets are identified in the study. One is the ownership of durables and the other is ownership of housing. Estimated values of the former as provided by the respondents themselves and a dummy variable for those ownership are included in the

regression. Since most of the above listed variables remain unchanged or do not change substantially over short time intervals, the equation is estimated for each of the two years separately by ordinary least squares.

Once the poverty lines are estimated from Equation [10], individual poverty is competed and then aggregated using the most widely applied poverty measures, the incidence of poverty, P_0, the depth of poverty, P_1, and the severity of poverty, P_2, given jointly by the formula:

$$P_a = \frac{1}{N} \sum_{i=1}^{Q} \frac{\left(Y^*_{suff} - Y_i\right)^a}{Y^*_{suff}} \qquad \alpha = 0, 1, 2 \qquad [11]$$

Where N is the sample size and Q is the number of households whose expenditure levels are below the corresponding estimated subjective poverty lines.

The regression estimates and the resulting poverty lines and poverty measures are discussed in the next section.

5. REGRESSION AND POVERTY ESTIMATES

5.1. Regression Results

The regression estimates of the two models are provided in Table 2. The coefficient of the size (β) of ln expenditure measures the elasticity of the poverty line with respect to total consumption expenditure and β_2 can be used to derive household size elasticity which is given by $\beta_2/1-\beta_1$. The estimated expenditure elasticity (0.393) is significantly greater than zero indicating that the poverty line is not independent of current consumption expenditure. This estimate is consistent with the results of similar studies based on the minimum income or the income evaluation questions. Danziger et al. (1984) obtained an estimate of 0.376. Colasanto et al. (1984) a value of 0.44, DeVos and Garner (1991) 0.43 and 0.552 from regressions of an extended model and Stanovnik (1992) values of 0.52 and 0.71.

The estimated coefficient of household size is also significantly different from zero. Its value (0.0919) is, however, much lower than estimates from similar studies. Danziger et al. (1984) obtained a value of 0.35, Colasanto et al. (1984) an estimate of 0.244, Stanovnik (1992) 0.15 and 0.285. Pradhan and Ravailion (1997) also obtained much higher estimates of 0.37 for Nepal and 0.23 for Jamaica though their results are based on a different method of estimating the subjective poverty line. Our estimate implies a household size elasticity of 0.15, i.e., an increase in household size by 10% entails only a 1.5% increase in the perceived line, hence suggesting that there exists substantial economies of scale in household consumption. Although this may not

seem surprising in the Ethiopian context where additional household members are often accommodated by sharing meals from the same pot and other consumer foods from existing stock, it substantially underestimates the consumption requirements of having more people in the household. It is, however, contrary to the widely held view that the majority of households in countries like ours do not face significant economies of scale in consumption since private goods constitute the bulk of their budget.

The OLS regression estimates for each year provide similar and interesting result. The estimated coefficient of log mean expenditure was found to be insignificant in both years (Table 2, columns 2 and 3) and hence did not affect the poverty line estimates in any meaningful way, suggesting that household perceive poverty as a purely absolute phenomenon, i.e., individuals do not refer to other people when evaluating their welfare status. Furthermore, the equation was estimated including dummy variables for each urban centre with and without log mean expenditure to see if there are other factors such as the provision of policy provided goods and differences in the cost of living in the different urban centres which together with mean expenditure or separately may affect the perception of poverty. The coefficients of all dummies (not reported here) were also found to be insignificant.

As far as demographic composition is concerned, households with proportionally higher female and male adult members tend to give higher income evaluations, much more so in the latter case than the former. The presence of more children also positively (but not necessarily significantly) affects the perception of welfare but not as much that of the presence of adults.

The other interesting result is the significant coefficient for the sex of the household head. It indicates that males generally give higher income evaluations than females. This indeed is likely to be the case given that most of the female heads in our sample are less educated and widowed, divorced or separated.

As expected, education of the head of the household has an important bearing on perception of welfare and poverty. Education was represented by dummy variables for four levels of training attainment of the household head: no schooling, some form of primary education, secondary education, college diploma holder and degree holder. The latter two categories were found to have positive and significant impact on perceived welfare, i.e., better educated individuals tend to give higher evaluation of income. The explanations given by DeVos and Garner (1991) and Hagenaars (1986) for similar findings might well be true in our case. Better-educated individuals may need higher incomes to reach high welfare levels in anticipation of which they have invested in their education. In countries like ours, education also tends to stir higher aspirations for the more expensive ways of modern life than is the case among the uneducated whose incomes are generally lower and hence their needs are largely limited to meeting the necessities of life. Moreover, better-educated individuals often

belong to reference groups with similar or higher levels of education and hence higher incomes which tend to influence them to have higher evaluations.

Table 2: Regression Estimates

Dependent Variables	Random Effects	OLS 1995	1997
Constant	3.639(0.082)*	(0.476)*	4.048(0.366)*
ln total expenditure	0.393 (0.014)*	0.365(0.023)*	0.335(0.021)*
ln household size	0.092(0.023)*		
ln mean expenditure		0.020(0.067)	-0.009(0.052)
Age of head		0.004 (0.007)	0.002(0.006)
Age of head squared		-0.0001(0.00001)	.
Proportion of children <5		0.129(0.203)	0.00004(0.00006)
Proportion of children 5 to 14		0.123(0.122)	0.251(0.177)
Proportion of female adults		0.446(0.134)*	0.198(0.102)*
Proportion of male adults		0.334(0.136)*	0.398(0.114)*
Proportion of elderly >59		-0.296(0.266)	0.173(0.117)
Sex of head		0.025(0.039)	0.287(0.211)
No person employed		0.037(0.075)	0.085(0.035)
One person employed		0.016(0.053)	-0.147(0.067)*
Two persons employed		0.008(0.053)	-0.073(0.049)
No schooling		0.029(0.043)	-0.047(0.053)
Secondary		0.074(0.072)	-0.049(0.039)
College diploma		0.182(0.059)	0.051(0.067)
College degree		0.214(0.077)*	0.109(0.054)*
Value of durables		0.00002(0.000001)*	0.209(0.071)
Ownership of housing		0.022(0.036)	0.000004(0.0000 08)*
R^2 #Adj R^2	0.322	0.313	0.057(0.033)*
F-ratio		29.54	
			0.363
			35.37

Note: The figures in parenthesis are the standard errors
* Significant

A similar representation was used for employment. Dummy variables were included for each of three categories of households: all members unemployed, one member working, and two or more members working. Contrary to what is expected, almost all coefficients of these variables are insignificant. The only exception is the negative and significant coefficient for households in which there is no working member. This result suggests that such households provided much lower income evaluations than the average consumption needs for the sample.

Surprisingly, the coefficient of age of household head and the other demographic composition variables are all founded to be highly insignificant. Older respondents are expected to state higher income needs than younger ones and households with more children are generally expected to have higher costs which will positively affect their income evaluations. Though insignificant, the estimated coefficients are of the expected sign.

With regard to the effect of assets, the regression results show that both ownership of durables and housing positively and significantly influence household perception of welfare and poverty. Generally, higher income households are better placed to have their own housing as well as a larger number and more valuable durabe goods.

5.2. Poverty Lines and Measures

Since most of the estimates of the coefficients of the demographic variables were found to be insignificant and to make comparisons with the consumption-based estimates, we use the results from the regression of Model 1 to derive the subjective poverty lines differentiated only by household size.

The results presented in Table 3 indicate that while on the average the SPL and the poverty lines derived from the consumption expenditure data[14] are reasonably close, the former is much higher than the latter for small households (with size less than the mean household size of six) and lower for large households. This is due to the very low size elasticity of the SPL (0.15) obtained from the regression estimates which, by the definition of the SPL remains constant across all households. The value is substantially lower than the elasticity by the consumption-based poverty lines, which is estimated to be 1.015. Clearly this is extremely high and rules out the possibilities of economies of scale in consumption. This follows from the fact poverty lines were estimated per capita without incorporating any thing to account for size economies and the household level poverty lines obtained by multiplying these by household size.

Table 3: Subjective and Consumption-based Poverty Lines by Household Size (Birr)*

| Household Size | 1995 | | 1997 | |
	SPL	Consumption-Based poverty lines	SPL	Consumption-Based poverty lines
1	361.66	90.99	361.66	87.73
2	434.92	184.60	434.92	173.94
3	462.40	276.05	462.40	254.01
4	482.96	364.69	482.96	342.75
5	499.53	456.52	499.53	428.02
6	513.49	546.62	513.49	508.93
7	525.59	638.77	525.59	594.12
8	536.30	534.16	536.30	690.99
9	545.94	835.88	554.94	772.94
10 and above	562.35	1021.40	561.47	943.99
Average	507.69	566.30	499.17	476.65

*Ethiopian Birr = USD in 1995 and USD in 1997 during the survey periods

The implications of the above results on the estimation of the poverty measure is obvious. While the SPL overestimates poverty among small households and underestimates it among large households, the reverse is true for the consumption-based poverty lines as can be seen from the poverty measures reported in Table 4. As is evident from the figures in the table, while the results from the two approaches are reasonably close for moderately-sized households, they are at extreme variance at the lower and upper tails of the household size distribution. The SPL results in extremely high incidence, depth and severity of poverty for households with three or less members, much higher than the overall averages as well as the consumption poverty measures. On the contrary, it provides unduly low poverty estimates for households with eight or more members.

Apart from these discrepancies, the subjective poverty measurement provides very close estimates to the consumption-based measures and more or less comparable regional poverty profile. The overall incidence, depth and severity of subjective poverty (56.5, 25 and 14.5 per cent in 1995 and 56.6, 25.7 and 15.1 per cent, respectively in 1997) are strikingly close to the corresponding consumption poverty measures (56.9, 27.4 and 14.1 per cent in 1995 and 50.5, 21.5 and 12 per cent in 1997). Since the consumption poverty lines are strictly absolute, the correspondence between the two measures reinforces the finding from the regression estimates which suggested that households perceive poverty as a completely absolute phenomenon. Since the subjective poverty line tries to identify the income level which the individual thinks is sufficient to meet basic needs, appropriate choices of the parameters of the consumption-based poverty lines and the definition of the choice of the basket of goods to accord with what a given society perceives to constitute poverty could lead to such close correspondence between the two concepts and the implied poverty measures.

The poverty profiles by centre also provide comparable results. The poverty rankings are not strictly consistent, but there is a general agreement between the two methods in identifying towns where poverty is high or low.

Another dimension of comparison is to see how closely the subjective and consumption poverty estimations correspond in identifying households as poor or non-poor. The results on this comparison given in Table 6 show that there is a very high correspondence between the two approaches: 81.4 and 83.8 per cent of the sample households in 1995 and 1997, respectively, have been identically classified as poor or non-poor by both methods. There was non-correspondence only in 18.6 and 16.2 per cent of the cases in 1995 and 1997, respectively. The high correlation between the two definitions is also confirmed by the highly significant ξ^2 static.

Table 4: Subjective and Consumption-based Poverty Measures by Household Size (Birr)

| Urban Centre | 1995 | | | 1997 |
	Subjective poverty P_0	Consumption poverty	SPL	Consumption Poverty
1	0.795	0.205	0.80	0.28
2	0.831	0.407	0.648	0.239
3	0.759	0.527	0.691	0.432
4	0.605	0.448	0.585	0.47
5	0.558	0.487	0.543	0.482
6	0.553	0.599	0.503	0.509
7	0.516	0.65	0.553	0.60
8	0.481	0.677	0.542	0.635
9	0.525	0.692	0.526	0.705
10 and above	0.338	0.685	0.345	0.644
Total	0.565	0.569	0.566	0.506

Table 5: Estimates of the Incidence, Depth and Severity of Subjective and Consumption Poverty by Urban Centre

| Urban centre | 1995 | | | | | | 1997 | | | | | |
| | Subjective | | | Consumption | | | Subjective | | | Consumption | | |
	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2	P_0	P_1	P_2
Addis Ababa	0.58	0.246	0.137	0.637	0.278	0.156	0.55	0.243	0.139	0.53	0.225	0.125
Awassa	0.508	0.227	0.121	0.508	0.238	0.135	0.459	0.22	0.14	0.443	0.227	0.148
Bahr Dar	0.462	0.208	0.134	0.434	0.188	0.11	0.487	0.235	0.147	0.372	0.16	0.09
Dessie	0.708	0.358	0.224	0.556	0.225	0.125	0.75	0.402	0.273	0.556	0.237	0.137
Dire Dawa	0.50	0.21	0.116	0.391	0.14	0.008	0.691	0.29	0.161	0.482	0.173	0.091
Jimma	0.522	0.241	0.143	0.456	0.197	0.11	0.556	0.285	0.183	0.478	0.222	0.126
Mekele	0.587	0.314	0.217	0.538	0.274	0.192	0.539	0.219	0.119	0.474	0.178	0.096
Total	0.565	0.25	0.145	0.509	0.274	0.141	0.566	0.257	0.151	0.505	0.215	0.12

Table 6: Coincidence of Subjective and Consumption Poverty

Year	Small households identified as poor or non-poor by both methods	Poor by SPL and non poor by consumption poverty lines	Non-poor by SPL and poor by consumption poverty lines	ξ^2 static
1995	81.4	9.1	9.5	469.3
1997	83.8	11.2	5.0	542.3

There is an even much higher correspondence in identifying households that may be regarded as very poor: 94 and 91 per cent of the sample households falling below the 10th and 20th per centiles of the expenditure distribution have been correctly identified as poor by both approaches. Thus, the subjective poverty definition could provide as much robust results in identifying the poor as the consumption-based poverty line, for instance, for poverty reduction programmes.

6. SUMMARY AND CONCLUSION

Studies of household welfare and poverty in the developing world are almost exclusively based on objective measures derived from household budget surveys. In this study we attempted to apply the subjective definition of poverty based on a version of the income evaluation question to analyse the perception of households about their welfare and to derive the poverty line and poverty measures in developing country setting. The results are encouraging and indicate that meaningful responses can be obtained to the income evaluation question.

The analysis of the responses suggest that households perceive welfare and poverty as an absolute and not as a relative concept. Moreover the perceptions are influenced by a host of household socio-economic characteristics. Households with more children and adults are more likely to report higher income needs. Similarly, education significantly and positively affects income evaluation: males are more likely to report higher income needs than females; and ownership of assets and housing also have similar effects.

The subjective poverty lines and poverty measures are in very close correspondence to those derived from consumption expenditure data. The subjective and the consumption poverty definition also identify, in large measure, the same individuals as poor and the poverty profiles obtained are closely comparable. The subjective poverty lines could therefore be used as effective tools for identifying the poor for purposes of poverty reduction programmes, at least as effectively as the consumption-based measures.

NOTES

[1] The capabilities approach proposed by Sen (1985) must be distinguished from command over commodities. Sen defines well-being as the ability to live long being well nourished, being literate and so on and poverty as lack of these capabilities. This concept has not yet been effectively operationalised and hence the approach has seen virtually no empirical applications.

[2] The former definition is widely applied in studies of poverty in developing countries while the latter are common to studies in Europe. In fact, there are arguments to the effect that absolute poverty definitions are more appropriate in the context of developing countries (e.g. Ravallion et al., 1991).

[3] In the most commonly used procedures – the food energy intake (FEI) and cost of basic needs (CBN) methods – a minimum calorie requirements has to be chosen a priori. In the FEI method it is this choice that essentially determines the basic non-food expenditure. The various procedures used for determining basic non-food consumption under the CBN method are criticized either for arbitrariness or biasedness (see Ravallion 1994, for discussion on this).

[4] One direct application of the SPL is by Yohannes Kinfu (1995) in his study of *A Sample of Households in Dire Dawa, Ethiopia*, a town also covered in this study. The study by Pradhan and Ravallion (1997) uses consumption adequacy questions to derive the SPL for Jamaica and Nepal (see Section 2 for discussion on this).

[5] An early application of this version of the question is found in Goedhart et al. (1977). Other applications include van Praag et al. (1980) on data from the member countries of the European Community, Danziger, et al. (1984), and

Colasanto, et al. (1984) on US data. De Vos and Garner (1991) on data from the US and the Netherlands and Stanovik (1992) on Slovene data.

[*] Most of the studies cited above, in line with this postulate, formulate a log-linear function for the relationship between the minimum income and actual income and its application to data has indicated that it is an appropriate specification.

[†] In the literature, this is largely considered to be set by politicians and hence the poverty line is also called a "politically determined poverty line" (see for example, van Praag et al. (1980)). Since δ represents a certain welfare level chosen to represent the poverty threshold, it could be set at desired scale corresponding to the welfare levels given in the verbal responses to the income evaluation (see for example, Hagenaars 1986).

[§] This could refer to the household's total consumption or to specific consumption categories: food, non-food, housing, clothing, health, education, etc. It is also possible to limit the question to more specific consumption items strategically important in determining welfare.

[¶] Most of the interviews were conducted in Amharic, as it is the lingua franca in most parts of Ethiopia, particularly in urban areas. Other local languages were also used when respondents do not speak Amharic or preferred some other language.

[10] Following the equal-quintile assumption, the verbal labels "very low", "insufficient", "sufficient", "good" and "very good" can be represented by 0.1, 0.3, 0.5, 0.7 and 0.9 respectively. The standard score corresponding to "sufficient" is, therefore, zero. Note that we are defining the LPL at the welfare level δ=0.5 as sometimes recommended in the literature (e.g. Hagenaars 1986). Note also that by choosing the income level evaluated by "sufficient" as the individual poverty threshold, we are not necessarily subscribing to the cardinality assumption which underlies the derivation of the LPL.

[11] See, for example, Lipton and Ravallion (1995) for this and other arguments in favour of using consumption expenditure as a proxy to income.

[12] Versions of the model with an extended number of variables have been estimated by Hagenaars (1986), who also used variables as differentiating factors of the estimates of poverty lines, and Vos and Garner (1991).

[14] These poverty lines are derived by dividing the food poverty line obtained using the basic needs approach by the food share in an earlier work (see Mekonnen 1997).

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CHANGES IN WELFARE AND POVERTY: AN APPLICATION OF STOCHASTIC DOMINANCE CRITERIA[*]

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Abstract

The study analyses changes in urban and rural poverty levels in Ethiopia between 1994 and 1997 using stochastic dominance criteria. The results show that there are only small differences in urban and rural poverty levels. Rural poverty was significantly reduced between 1994 and 1997, while urban poverty remained largely unchanged. Both urban and rural areas saw an increase in average incomes combined with an increase in inequality. The welfare evaluation of these changes depends on one's valuation of efficiency or mean income change relative to equity change. We use a welfare criterion proposed by Tam and Zhang, by which rural welfare can be seen to have increased even for relatively egalitarian preferences, while urban welfare did not increase even in the case of little concern for equity.

1. INTRODUCTION

This paper analyses changes in the levels of rural and urban poverty in Ethiopia between 1994 and 1997. Particularly, we attempt to address the problem of applying an appropriate poverty line in the analysis of poverty using stochastic dominance criteria. This is particularly important in the Ethiopian setting, where errors in the measurement of a poverty line is confounded by the prevalence of multiple prices in regional markets, different units of measurement of quantities consumed, varying consumption patterns of households across regions and other differences in characteristics that affect welfare comparisons. The paper examines the implications of changes in mean per-capita expenditure and income distribution on overall welfare and poverty for urban as well as rural areas of Ethiopia and is organised as follows. Section 2 discusses the stochastic dominance literature as applied to welfare and poverty comparisons, while section 3 reports our empirical results. Section 4 provides a summary and conclusions.

2. STOCHASTIC DOMINANCE, WELFARE AND POVERTY: A REVIEW

Looking at the body of literature on the measurement of poverty that has emerged since the pioneering work of Sen (1973), it is not difficult to see its strong influence on

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the measurement of inequality. It also owes a great deal to the classical work of Atkinson (1970), who developed analytical constructs that link statistical measures of income inequality and their welfare interpretations (see Haggenars 1987). Atkinson integrated the notion of social welfare functions in the comparison of different situations with statistical summary measures of income distribution, so that popular measures such as the Lorenz curve and the Gini-coefficient came to reflect an underlying social welfare function that meets certain regularity conditions. Thus, Atkinson, invoking the stochastic dominance concept popular in the finance literature, showed that if two income distributions have the same mean and if one of the distributions Lorenz dominates the other, social welfare (which is quasi-concave in income) in one distribution is higher than in the other. Sen (1973) demonstrated that if two distributions have unequal means, then Lorenz dominance does not offer any clear-cut welfare inferences. However, Rothschild and Stiglitz (1973) argued that comparison of welfare in a situation of unequal means could be made on the basis of the income received by the kth poorest people. Saposnik (1981) proved that rank dominance of absolute incomes of Lorenz curves is sufficient and necessary to generate welfare dominance, irrespective of the level of mean income. This is what is known as first degree stochastic dominance. Rank dominance utilises efficiency criteria alone, since dominance follows if the income of individuals in each decile is higher than that in the distribution being compared, regardless of the level of inequality within each distribution.

The application of rank dominance to income distribution was facilitated by the development and simplifications of distribution-free test procedures in Beach and Davidson (1983), Beach and Richmond (1985) and Beach et al. (1994). Following this, Bishop et al. (1991) and others have applied rank dominance to the comparison of welfare on the basis of the ordinates of Lorenz curves. The application to poverty was self-evident. Atkinson (1987) and Foster and Shorrocks (1988) proved that for all additive poverty indices, that is for those based on a utilitarian social welfare function, the dominance of a distribution within a given range of poverty lines is equivalent to the poverty ordering implied by the poverty indices.

The task of poverty measurement involves two distinct but interrelated aspects: the identification of the poor, and the measurement of how much poverty there is. The first aspect is mainly concerned with the setting of a poverty line, which divides the population into poor and non-poor. The conceptual and empirical basis of setting poverty lines has for long been relegated to the background in the literature of poverty measurement (see Ravallion 1998 for a recent discussion of this issue). Emphasis has been given to the construction of aggregate poverty indices that meet certain ethically consistent criteria. However, in empirical applications and in policy analyses, the estimation of the poverty line became a subject of great concern. Most measures are quite sensitive to the level of the poverty line and thus, worries about the lack of accuracy of the measurement of the poverty line has meant that the poverty indices have lacked the robustness needed for reliable poverty comparisons. They have therefore become less useful for policy makers.

Most studies approach the estimation of the poverty line without much concern as to how it can distort poverty profiles and analysis, but the sensitivity of the poverty line to slight changes in household composition, tastes, price differences and other factors that affect household welfare, is a constant challenge. One of the problems often mentioned (Atkinson 1987; Fields and Bourginignon 1997) is the issue of instant gradation in welfare when a person crosses the poverty line by a fraction of a dollar. While the distinction between poor and non-poor is one of the fundamental issues of concern in poverty analysis, the welfare effect of a marginal increase in income at the poverty line is enormous.[2] The application of dominance testing offers an opportunity to provide poverty orderings by taking a wider range of poverty lines into account. If for the specified range, one distribution rank dominates another distribution, then poverty, whichever way measured, is higher in the rank dominated distribution.

More formally, the stochastic dominance test criterion may be described as follows: Suppose $F(y)$ is a distribution function or cumulative density function of income $f(y)$ (so that $F(y)=\int(fy)\,dy$) where y is a vector of household income arranged in ascending order such that $y_1 < y_2 < ..., < y_n$. The inverse distribution function or quintile function, $y(p):\inf\{ F(y) \geq p\}$, $p \in [0,1]$, yields individuals' incomes in increasing order. If W_p denotes the class of anonymous, increasing welfare functions, then, following Saposnik (1981), for two distributions, X and Y, we have the following theorem:

$$X >_R Y \ (X \text{ rank dominates } Y) \text{ iff } w(X) > w(Y) \ \forall \ w \in Wp.$$

Thus, distribution X dominates distribution Y iff $x(p) \geq Y(p) \ \forall \ p \in [0,1]$. If $\forall \ p \in [0,1]$ $X(p)=Y(P)$, then X and Y have the same income distribution and standard of living. If $X(p) > Y(p)$ for some p, and $X(p) < Y(p)$ for some other p, the distributions cannot be ordered using the rank dominance criterion.

Atkinson (1987) and Foster and Shorrocks (1988) show, as a corollary to the above dominance theorem, that rank dominance for all z, the poverty line, implies that the head-count ratio, defined as the proportion of the population in poverty is higher in one distribution than another in the range specified for the poverty line. They also show that rank dominance implies higher order dominance which extends also to dominance for additive poverty indices, such as the P_α class defined as $P_\alpha = \int\{z - f(y)/z\}^\alpha \, dy$, where z represents the poverty line, f(y) is the density function of the income distribution, and α is distribution parameter.[3] In the current poverty literature, this class of poverty indices is known as the Foster-Greer-Thorbecke indices.

Rank dominance is a sufficient condition for higher order dominance, but is neither necessary nor works backwards. Generally, rank dominance, that is a simple dominance comparison of two Lorenz curves, has an intuitive appeal if the mean incomes in the two distributions are the same. If that is not the case, dominance testing fails to account for the effect of a higher level of income, which by itself is a

welfare-improving phenomenon, given that distributions are held unchanged. Thus, Dasgupta, Sen and Starrett (1973) proposed the Generalised Lorenz dominance criterion, which was further explored by Shorrocks (1983) and Kakwani (1984) to get around with the problem of focusing only on efficiency considerations. Thus, rank dominance, a situation where the cumulative incomes of one Lorenz curve lies above another for all ordinates of the Lorenz curve, is equivalent to first-degree stochastic dominance as in the finance literature, where expected returns on different investment opportunities are ranked.

The extension to a situation of unequal mean incomes also imposed stricter regularity conditions on the underlying social welfare function, which have to be scur-concave and additive over individual incomes. Generalised Lorenz dominance (called the second degree dominance, see for instance, Bishop et al., 1991, 1993) is simply scaling up the ordinates of the ordinary Lorenz curve by mean income to account for differences in the level of mean income. It is to be recalled that the slope of the Lorenz curve does not change if all of its ordinates are multiplied by a scalar. Generalised Lorenz dominance in terms of poverty measurement is equivalent to comparing the poverty gap measure (or the depth of poverty) between two distributions regardless of the poverty line. By this recursive process, third degree stochastic dominance is equivalent to dominance of poverty severity between two distributions. Thus, if we have first degree dominance for the relevant range of the poverty line, then, it means that the head-count ratio is also significantly different between the two distributions. Second degree dominance implies that the depth of poverty in one distribution is higher than the other regardless of where the poverty line is fixed, and so on.

The statistics necessary to conduct dominance testing is quite straightforward following the work of Beach and Davidson (1983). Consider a situation where the individual incomes y_i are arranged in ascending order and divided into p quintile groups, which in the case of deciles is $p_1=0.1$, $p_2=0.2$, ... , $p_{10}=1$. Given the assumption that the mean and variance of the distribution exist and are finite, an income quintile, ξ_p, corresponding to abscissa p ($0 \leq p \leq 1$) on a Lorenz curve is defined implicitly by $F(\xi_p)$, where F is monotonic. Thus, corresponding to a set of k-1 abscissa, $0<p_1<p_2<...<p_{k-1}$, we have a set of k-1 population income quintiles, $\xi_{p1}<\xi_{p2}<....<\xi_{pk-1}$, and a set of k cumulative means, $\gamma_i \equiv E(Y \mid Y \leq \xi_{pi})$, for incomes less than or equal to ξ_{pi}. We can also define the conditional means, $\mu_i = E(y \mid \xi_{pi-1} < Y < \xi_{pi})$. The test procedure for dominance is based on these estimators. Until the paper by Beach and Davidson (1983), inference based on the ordinates of the Lorenz curve had to rely on parameterised Lorenz functions, but this is not adequate to undertake the joint test (mean income and Lorenz ordinates) of dominance. It has been proved in Beach and Davidson (1983) that the above ordinates of the Lorenz curve are asymptotically normal with mean zero and has a variance-covariance matrix $\Omega = (w_{ij})$, where

$$w_{ij} = p_i [\lambda_i^2 + (1-p_j)(\xi_{pi}-Y_i)(\xi_{pj}-Y_j) + (\xi_{pi}-Y_i)(Y_j.Y_i)$$

is the asymptotic variance of the k cumulative means. Beach et al. (1994) showed that a statistical test based on the conditional means of the Lorenz ordinates can be constructed to test the hypothesis of dominance between two Lorenz curves (say distributions 1 and 2) using the statistical test for mean difference. The test statistics for large samples can be written as:

$$T_i = (\mu_{i1} - \mu_{i2}) / \{ \sqrt{(var(\mu_{i1})/N1 + var(\mu_{i2})/N2} \},$$

where T_i can be looked upon as a t-ratio. The null-hypothesis is to accept that the relevant quintiles have conditional means, which are equal. If this is accepted for the entire range of the distribution, then, the two distributions are said to have equal welfare ranking, whatever the level of the poverty line is. If there is a crossing, then a further criterion has to be imposed. Bishop et al. (1991) have stated that if two distributions cross, and the crossing is statisitcally significant, then ranking the two distributions will not be possible according to a social welfare functions. Dominance exists if for all other quintiles the distributions exhibit equal mean and have at least one dominance in either direction, and if it is statistically significant. If there are two ordinates with different signs, which are statistically significant, then dominance testing cannot rank the distributions according to a criterion underlying quasi-concave social welfare functions.

Empirical poverty studies (e.g., Bishop et al., 1991) generally find that distributions with higher mean income dominates because of the emphasis given to efficiency considerations. This prompted Tam and Zhang (1996) to suggest a Lorenz dominance criterion of β-order that can take equity considerations into account, even when mean income of two distributions are significantly different from each other. Normally, a Generalised Lorenz curve is defined as $G(P) = \mu L(P)$, where, $L(p)$ is the ordinary Lorenz curve. Notice that $L(p) = \int pd(p) / \mu$. Thus, the ordinates of the Generalised curve are given by the vector $Y:(p_1 Y_1, p_2 Y_2, ..., p_k Y_k)$. Tam and Zhang suggested that instead of multiplying the ordinates of the Lorenz curve by the mean of the total distribution, m, we can use μ^{β}, where $0 \leq \beta \leq 1$, so that preference can be given to equity even in a situation of unequal means. It is noticed that a scaling up of the Lorenz curve by a constant does not change the relative inequality in a distribution. If $\beta = 1$, then, the β order Lorenz curve reduces to the Generalised Lorenz curve. If $\beta < 1$, then, preference for equity is considered along with efficiency (that is higher income is always better for given levels of inequality). This measure thus allows a choice of the amount of mean income increase that is needed to compensate for an increase in inequality to keep welfare constant.

The Generalized Lorenz Dominance criterion proposes that welfare in Y is higher than in X if and only if

$$GL(Y,p) = \mu_y L(Y,p) \geq GL(X,p) = \mu_x L(X,p) \qquad [1]$$

where μ_y and μ_x respectively stand for per capita income in income distribution Y and X. Tam and Zhang (1996) argue that the trade-off between economic growth (efficiency) and inequality (equity) is not well captured by the Generalized Lorenz dominance criterion. They show that the Generalized dominance criterion implies that there has been a welfare improvement if the incomes of all people, except for the richest person, remain unchanged, and mean income increases as a result of an increase in the income of the richest person. In this case, it is obvious that *income shares* of all people, except for the richest one, decline. They propose what is known as the β-dominance criterion, where the Generalized Lorenz dominance is shown to be a special case.

The β-criterion is based on (1), which after some rearrangement can be rewritten as:

$$\frac{\sum_{i=1}^{n} y_i}{\sum_{i=1}^{n} x_i} \geq 1 \qquad\qquad [2]$$

Following (2), Tam and Zhang proposed a β-criterion as follows:

$$\frac{\sum_{i=1}^{n} y_i}{\sum_{i=1}^{n} x_i} \geq \tau^{1-\beta}, 0 \prec \beta \prec 1 \qquad\qquad [3]$$

where $\tau = \mu_y/\mu_x$, and β indicates the degree of preference for efficiency. The higher β is, the higher is one's preference for efficiency and vice versa. If $\beta=1$, the β-dominance criterion reduces to the Generalized Lorenz dominance criterion. The Tam and Zhang criterion is a Rawlsian type of criterion, whereby welfare can only increase if the poor share in the growth. Welfare will here increase only if there is an increase in the income of the poorest group or person.

3. RESULTS OF STOCHASTIC DOMINANCE TESTS

The data for this study is taken from two independent panel surveys—one urban and the other rural—conducted by the Department of Economics of the Addis Ababa University, the former in collaboration with the Centre for the Study of African

Economies of Oxford University and the International Food Policy Research Institute and the latter with the Department of Economics, Goteborg University.

Table 1 reports the conditional means by decile and overall means between 1994-1997 for rural and urban households. Over time, there has been an increase in real per capita expenditure in urban as well as rural areas, which is statistically significant. Because of our concern about the temporary jump in rural incomes in 1995, we restrict our inter-temporal comparisons to 1997 versus 1994. The average rate of growth in per capita expenditures in real terms in rural areas was 9.2%, while it was 8.8% between 1994 and 1997 in urban areas.[4] All values are in constant 1994 prices. That is, per capita consumption expenditure for urban areas was adjusted for regional and temporal price changes based on the price data from the Central Statistical Authority (CSA). For rural areas, we used price data colleted parallel with the household surveys.

The difference in per capita expenditure between rural and urban households is small for 1994 and 1997 (while in 1995 rural households reported real per capita consumption expenditures significantly higher than urban households). In terms of welfare and poverty, the rank dominance criterion we employed led to the result that urban poverty was generally not significantly different from rural poverty for a fairly high poverty line.

The Generalized Lorenz dominance criterion, a test sometimes referred as second-order dominance, for rural and urban households is reported in Table 2. Our results suggest that differences in mean income did differentiate in urban from rural areas in 1994 for any income level up to the fifth decile. That is, we could rank urban areas as having higher welfare than rural areas by the Generalised Lorenz dominance criterion up to that level of the poverty line. However, the situation in 1997 is consistent with the one for rank dominance. There was no significant welfare difference between rural and urban households according to our estimates.

The comparison of welfare and poverty changes over time in rural and urban areas is subject to a methodological problem as far as the test statistics are concerned. As indicated above, the statistical test used to compare income distributions is built on the assumption that the samples are drawn independently. In our case, with data from a panel, each round does not stand on its own. Households interviewed in each round are generally the same, leading to the problem of dependent sample distributions.[5] Still, to get a feel for what did happen over time, we use the 1994 and 1997 distribution data to compare changes in poverty and welfare for both urban and rural households (see Table 3). In rural areas, there is strong evidence that poverty declined between 1994 and 1997 for a poverty line up to the mean expenditure of the bottom fifth decile. In urban areas, the 1994 distribution dominated the 1997 one for the bottom decile, while changes remained insignificant all the way up to the income of the top decile. During this period, rural poverty thus declined, while that of urban poverty remained largely unchanged. This finding is corroborated by the direct

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computation of the poverty indices.

Table 1: Rank Dominance Criterion: Rural vs. Urban Per capita Expenditure: Birr per month per person

	1994				1995				1997			
P_i	Conditional Mean Rural	Cond Mean Urban	Difference in Cond. Mean	T Ratio*	Cond. Mean Rural	Cond. Mean Urban	Mean Difference	T Ratio*	Cond. Mean Rural	Cond. Mean Urban	Mean Diff.	T Ratio*
0.1	18.9	18.28	-0.6	0.61	16.04	19.76	3.72	-3.33	22.28	20.54	-1.74	2.30
0.2	30.0	32.92	2.9	-1.62	29.92	34.82	4.9	-2.35	36.26	35.95	-0.31	0.13
0.3	40.5	44.74	4.2	-1.82	42.94	46.75	3.81	-1.49	48.7	48.45	-0.25	0.09
0.4	52.1	55.99	3.9	-1.27	56.19	58.43	2.24	-0.64	60.29	62.45	2.16	-0.63
0.5	65.2	67.37	2.2	-0.55	74.56	71.14	-3.42	0.67	72.53	75.97	3.44	-0.76
0.6	80.0	80.15	0.2	-0.03	96.21	85.64	-10.57	1.53	88.6	94.8	6.2	-0.92
0.7	97.4	99.05	1.6	-0.21	125.27	106.99	-18.28	1.80	112.01	121.29	9.28	-0.96
0.8	116.8	127.14	10.3	-0.97	167.71	137.13	-30.58	1.99	144.58	151.68	7.1	-0.52
0.9	147.1	170.38	23.3	-1.43	244.03	183.55	-60.48	2.37	197.6	204.19	6.39	-0.29
1	249.5	341.96	92.4	-3.19	654.99	350.09	-304.9	9.84	365.44	450.46	85.02	-3.23
Overall Mean	90.0	103.8	13.8	-2.01	150.6	109.44	41.28	11.5	114.8	126.59	11.9	-2.3

Source: Calculations based on household panel data
*T≥ 2.8 is significant at 5% level of significance.

Table 2: Generalised Lorenz Dominance Criterion Between Urban and Rural Households

Generalized Lorenz Ordinates

	1994			1995			1997		
P_i	Rural	Urban	T-ratios	Rural	Urban	T-ratios	Rural	Urban	T-ratios
0.1	1.9	1.8	6.06	1.6	2.0	-3.3	2.2	2.1	1.50
0.2	4.9	5.1	-4.92	4.6	5.5	-3.3	5.9	5.6	0.80
0.3	8.9	9.6	-5.61	8.9	10.1	-3.0	10.7	10.5	0.54
0.4	14.2	15.2	-4.64	14.5	16.0	-2.4	16.8	16.7	0.02
0.5	20.7	21.9	-3.38	22.0	23.1	-1.3	24.0	24.3	-0.40
0.6	28.7	29.9	-2.16	31.6	31.7	-0.1	32.9	33.8	-0.83
0.7	38.4	39.9	-1.63	44.1	42.4	1.1	44.1	45.9	-1.22
0.8	50.1	52.6	-1.94	60.9	56.1	2.2	58.5	61.1	-1.31
0.9	64.8	69.6	-2.63	85.3	74.4	3.6	78.3	81.5	-1.21
1.0	89.8	103.8	-4.61	150.8	109.4	5.9	114.8	126.6	-2.23

Source: Computed from Panel data.

The investigation of welfare and poverty for urban households was extended by classifying the urban sites into three major urban groups: the capital city, Addis Ababa, the Northern urban group (Mekele, Dessie and Bahir Dar) and the Southern urban group (Jimma, Aswassa and Dire Dawa). Such a classification is of interest, since it can capture some of the regional characteristics of the sites. Addis Ababa is the largest city in Ethiopia with an approximate population of 3-4 million people. The other towns are smaller, but are situated in locations with different types of rural economic activities. The Northern urban groups are predominantly in the area of the cereal producing farming systems, while the Southern cities are located in cash-crop producing areas.

Table 3 : Urban and Rural Real Expenditure Decile Means, Mean Differentials 1994-1997

Decile	Conditional Mean 94 (μ_{94}) Urban	Cond Mean 97 (μ_{97}) Urban	$\mu_{97}-\mu_{94}$ (Urban)	T-Ratio	Cond. Mean 94 (μ_{94}) (Rural)	Cond. Mean 97 (μ_{97}) (Rural)	$\mu_{97}-\mu_{94}$ (Rural)	T-Ratio
1	20.76	21.05	0.71	0.36	18.9	22.28	3.9	3.35
2	37.4	37.33	-0.07	-0.031	30.0	36.26	6.26	3.54
3	4	50.42	-0.42	-0.146	40.6	48.7	8.1	3.39
4	63.49	64.85	1.36	0.373	52.1	60.29	8.19	2.50
5	76.55	79.23	2.68	0.553	65.2	72.53	7.33	1.70
6	91.06	98.33	7.27	1.046	80.0	88.6	8.6	1.41
7	112.57	125.62	13.05	1.102	97.4	112.01	14.61	1.71
8	144.27	157.18	12.91	0.84	116.8	144.58	27.78	2.31
9	192.89	209.91	17.02	0.771	147.1	197.8	50.7	2.68
10	378.6	442.12	63.52		249.5	365.44	115.94	
Overall Mean	116.75	128.52	11.77	2.33	90.0	114.8	24.8	

Source: Computed from panel data.

Between 1994-1997, the trends for these regional groupings were consistent with what was observed for the whole group (See AT1-AT6). Welfare and poverty remained largely unchanged. The changes in mean income were not significant for the Northern and Southern urban groups, but for Addis Ababa the situation is slightly different. There we saw a significant increase of mean per capita income by about 10% between 1994 and 1997. Still, by the rank dominance criterion, overall welfare remained largely unchanged for Addis Ababa, despite the increase in mean income. A Generalised Lorenz dominance test was undertaken to explore the implications of higher mean income for overall welfare. It was found that welfare by this criterion increased between 1994 and 1997. It is important to note that the Lorenz domination test procedure is biased towards efficiency as shown by Tam and Zhang (1996), This means that even if the increase in income is captured by the people in the highest deciles, overall welfare is said to have increased, although income of the people in the lowest deciles remained unchanged. For the Northern and Southern regions there were no significant improvement in mean income and no rank dominance is observed.

Our comparisons across regions gave some interesting results. Addis Ababa was rank dominated both by Southern and Northern regions in 1994. (In 1995 Southern urban regions dominated the Northern and Addis Ababa regions). The implication in terms of poverty is that in 1994, Addis Ababa had a larger fraction of the population in poverty than any of these two urban regions for any poverty line. In 1995, the Southern region experienced low poverty as defined by the head count ratio compared to other regions. This probably had to do with the major coffee boom the country experienced at about the time of the 1995 survey. In 1997, all urban regions had similar level of welfare and poverty.

So far, our efforts to compare welfare and poverty changes have been based on rank and generalised Lorenz dominance criteria. We now attempt to provide more insight based on the β-dominance criterion introduced by Tam and Zhang (1996). From Equation [3], let β* be related to the quintile that registered the highest improvement between two periods (computed from columns 5 and 6 in Table 4) Then we equate that ratio with the mean ratio for two periods and get β*.[6] We apply the β-dominance criterion to compare welfare changes for Ethiopia between rural and urban areas for the period 1994-1997.

By construction, $0 \leq \beta \leq 1$. If the estimated value β*<0, it means that whatever the amount of growth experienced between the two periods, welfare cannot improve because of the increase in inequality. That is, the concern about the worsening in inequality is so strong that no amount of economic growth can justify an increase in it. On the other hand, if β*>1, welfare improves because of growth regardless of the level of inequality. That is, there is no trade-off between growth and inequality. For 0<β*<1, there is a trade-off between growth and inequality depending on one's valuation of efficiency versus equity.

Table 4: Lorenz Ordinates and Ratios for Ethiopia: 1994-1997

Population Share	P94rural	P94urban	P97rural	P97urban	P94rural/P97rural	P94urban/P97urban
	(1)	(2)	(3)	(4)	(5)	(6)
10	0.021	0.017	0.019	0.015	1.103619	1.169262
20	0.055	0.049	0.050	0.042	1.082922	1.169013
30	0.100	0.091	0.093	0.079	1.079998	1.155559
40	0.158	0.145	0.145	0.127	1.092652	1.135777
50	0.230	0.210	0.208	0.188	1.108507	1.115497
60	0.319	0.287	0.285	0.262	1.116912	1.095585
70	0.426	0.383	0.384	0.354	1.108524	1.081079
80	0.556	0.506	0.512	0.469	1.084732	1.078211
90	0.720	0.669	0.684	0.631	1.052491	1.060792
Gini Coefficient	39	43	44	48		

Source: Own calculations based on household panel data, Department of Economics, AAU.

We calculated the largest value of β* for rural and urban households for Ethiopia to measure the welfare implications of the growth in per capita income. We found a maximum β* value of about 0.44 for rural households and 1.03 for urban households. The extent to which welfare improved is subject to ones perceptions of equity. A person with a greater weight for equity (here a b less than 0.44) would argue that welfare did not increase in rural Ethiopia, while one with a greater emphasis on economic growth (with a b larger than 0.44) would argue that welfare improved. For urban areas, even for an individual who is all for growth, by our criterion welfare has deteriorated since the value of β* is greater than one. The results of the welfare evaluation thus depend quite a lot on the value judgment attached to inequality and economic growth. The approach used here allows a choice of the amount of increase

in mean income that is needed to compensate for increased inequality. This is reflected in the b parameter. These results demonstrate the inherent trade-off existing in a growing economy, especially one that takes the first step to the long journey of development from a condition of very low income and high level of income inequality.

4. CONCLUSIONS

Over the short time period considered in this paper, the evidence suggests that there were considerable improvements in the state of welfare in rural areas, while urban areas generally recorded only small improvements. Our regional profile of urban poverty showed that in 1994, Addis Ababa had a higher incidence of poverty than other urban areas. This changed to equal poverty incidence in 1997. Similarly, in 1995, the Southern urban areas generally had a higher overall welfare and lower poverty than any other urban areas probably due to the significant increase in incomes caused by the coffee boom.

To draw attention to the threat of rising income inequality in a growing economy, we used various Lorenz dominance criteria to compare welfare between 1994 and 1997 for rural and urban areas. Our result show that welfare changes in rural areas are positive according to standard criteria, while even changes in the rural areas might be considered to be negative within the Tam and Zhang framework if the evaluator has a very high valuation of equity. For urban areas welfare computed in this (radical) way actually worsened due to increase in inequality in spite of some increase in real per capita income.

Our comparisons of welfare and poverty show no clear difference between rural and urban areas. This is a surprising result, given the presumption that poverty is higher in rural areas than in urban areas in Africa. We would need further evidence to back up this unusual result, but it may well reflect the fact that urban areas of Ethiopia have seen a lot of immigration from the rural areas, at the same time as relatively little in terms of advanced economic activity is available. Most of economic activities that one sees in urban Ethiopia are very basic. The problem of poverty in Ethiopia is thus not confined to the rural areas, but is to be found in all regions. This needs to be taken into account by policy makers.

NOTES

[1] Bishop et al. (1993) applied stochastic dominance testing to poverty comparisons for selected countries.

[2] Sen (1980) noted that the behavior of poverty indices around the poverty line does not adhere to the notion of declining marginal utility of income, which is an important assumption in social welfare analysis. As argued by critiques of Sen's index (notably Thon 1979, 1981), the jump exhibited in Sen's index around the poverty line is one of its major drawbacks. Recently, Shorrocks (1995) dealt with the discontinuity issue, but Sen argued that poverty

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indices around the poverty line should be highly elastic with per capita income because it is always very important to have one less poor person in a community.

[3] See Foster et al., 1984 for the derivation of this poverty index.

[4] The increase in per capita real expenditure among the panel households between 1994-1995 in rural areas was a dramatic 65%. This declined by 24% in 1997, leading to an average increase of about 14% in the three years. If we skip 1995, the average growth rate in real per capita expenditure among rural households in the panel would come to 9.2%. The growth rate in per capita consumption growth rate for urban areas that we reported here was computed by taking into account the actual time difference in survey periods between 1994 and 1997, which was about 2 and half years.

[5] Davidson and Duclos (2000) constructed a non-parametric test statistics when the sample distributions are dependent.

$$\left[\frac{L(y_i, p)}{L(x_i, p)}\right] = \left[\frac{\mu_y}{\mu_x}\right]^{1-\beta^*} \Rightarrow$$

[6]
$$\ln \frac{\left[\dfrac{L(y_i, p)}{L(x_i, p)}\right]}{\left[\dfrac{\mu_y}{\mu_x}\right]} = 1 - \beta^*$$

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APPENDIX TABLES

AT1 : Urban Real Expenditure Decile Means and Mean Differentials - Addis Ababa 1994-1997

Decile	Conditional mean 94 (μ_{94})	Cond. mean 95 (μ_{95})	Cond. mean 97 (μ_{97})	$\mu_{95}-\mu_{94}$	t-ratio	$\mu_{97}-\mu_{95}$	t-ratio	$\mu_{97}-\mu_{94}$	t-ratio
1	18.95	21.33	21.05	2.38	1.508	-0.28	-0.161	2.1	1.277
2	32.78	35.92	36.55	3.14	1.206	0.63	0.23	3.77	1.421
3	43.57	47.66	48.28	4.09	1.29	0.62	0.178	4.71	1.392
4	54.86	58.99	62.38	4.13	0.926	3.39	0.729	7.52	1.392
5	67.17	69.45	75.69	2.28	0.424	6.24	1.044	8.52	1.555
6	78.56	83.6	93.33	5.04	0.711	9.73	1.131	14.77	1.436
7	95.73	103.27	119.33	7.54	0.701	16.06	1.303	23.6	1.796
8	127.18	133.15	150.7	5.97	0.343	17.55	0.933	23.52	1.939
9	176.92	186.62	206.5	9.7	0.342	19.88	0.648	29.58	1.285
10	366.63	354.94	464.27	-11.69		109.33		97.64	
Overall Mean	106.35	109.49	127.81	3.14	0.563	18.32	2.781	21.46	3.176

AT2 : Urban Real Expenditure Decile means and Mean Differentials - Northern Towns 1994-1997

Decile	Conditional Mean 94 (μ_{94})	Cond. Mean 95 (μ_{95})	Cond. Mean 97 (μ_{97})	$\mu_{95}-\mu_{94}$	t-ratio	$\mu_{97}-\mu_{95}$	t-ratio	$\mu_{97}-\mu_{94}$	t-ratio
1	24.7	17.42	22.07	-7.28	-1.875	4.65	1.446	-2.63	-0.694
2	47.2	36.83	39.68	-10.37	-1.684	2.85	0.483	-7.53	-1.264
3	61.44	53.78	55.42	-7.66	-0.956	1.64	0.208	-6.02	-0.779
4	78.89	69.72	69.75	-9.17	-1.193	0.03	0.003	-9.14	-1.248
5	91.36	84.77	88.43	-6.59	-0.473	3.66	0.286	-2.93	-0.198
6	108.18	102.06	110.23	-6.12	-0.414	8.17	0.477	2.05	0.127
7	132.63	125.69	138.34	-6.94	-0.308	12.65	0.524	5.71	0.236
8	165.14	153.64	175.96	-11.5	-0.367	22.32	0.628	10.82	0.323
9	210.55	194.71	224.55	-15.84	-0.347	29.84	0.569	14	0.27
10	430.31	341.14	443.45	-89.17		102.31		13.14	
Overall Mean	134.87	117.85	136.6	-17.02	1.655	18.75	1.844	1.73	0.168

AT3 : Urban real Expenditure Decile means and Mean Differentials - Southern Towns 1994-1997

Decile	Conditional Mean 94 (μ_{94})	Cond. Mean 95 (μ_{95})	Cond. Mean 97 (μ_{97})	$\mu_{95}-\mu_{94}$	t-ratio	$\mu_{97}-\mu_{95}$	t-ratio	$\mu_{97}-\mu_{94}$	t-ratio
1	27.84	27.03	21.16	-0.81	-0.204	-5.87	-1.993	-6.68	-1.741
2	49.9	47.29	37.84	-2.61	-0.408	-9.45	-1.518	-12.06	-2.015
3	65.11	62.82	52.8	-2.29	-0.305	-10.02	-1.396	-12.31	-1.659
4	79.8	78.83	67.05	-0.97	-0.093	-11.78	-1.154	-12.75	-1.347
5	95.9	95.74	83.4	-0.16	-0.013	-12.34	-0.996	-12.5	-1.028
6	113.54	116.08	101.2	2.54	0.147	-14.88	-0.793	-12.34	-0.697
7	133.58	143.1	133.59	9.52	0.413	-9.51	-0.379	0.01	-0.001
8	162.99	173.59	157.61	10.6	0.332	-15.98	-0.489	-5.38	-0.178
9	206.91	231.11	202.95	24.2	0.429	-28.16	-0.523	-3.96	-0.075
10	365.65	416.61	373.98	50.96		-42.63		8.33	
Overall Mean	129.42	140.05	122.89	10.63	1.072	-17.16	-1.719	-6.53	-0.679

AT4: Real Expenditure Decile Mean Differentials - Addis Ababa and Northern Towns 1994-1997

Decile	1994		1995		1997	
	$\mu_a - \mu_s$	t-ratio	$\mu_a - \mu_s$	t-ratio	$\mu_a - \mu_s$	t-ratio
1	-5.75	-1.641	3.91	1.395	-1.02	-0.359
2	-14.42	-2.84	-0.91	-0.18	-3.13	-0.617
3	-17.87	-2.797	-6.12	-0.919	-7.14	-1.055
4	-24.03	-4.601	-10.73	-1.366	-7.37	-0.913
5	-24.19	-1.905	-15.32	-1.571	-12.74	-1.265
6	-29.62	-2.589	-18.46	-1.394	-16.9	-1.218
7	-36.9	-1.958	-22.42	-1.191	-19.01	-0.966
8	-37.96	-1.397	-20.49	-0.768	-25.26	-0.927
9	-33.63	-0.846	-8.09	-0.198	-18.05	-0.426
10	-63.68		13.8		20.82	
Overall Mean	-28.52	-3.34	-8.36	-1.364	-8.89	-1.131

AT5 : Real Expenditure Decile Mean Differentials - Addis Ababa and Southern Towns 1994-1997

Decile	1994		1995		1997	
	$\mu_a - \mu_s$	t-ratio	$\mu_a - \mu_s$	t-ratio	$\mu_a - \mu_s$	t-ratio
1	-8.89	-2.567	-5.7	-2.28	-0.11	-0.046
2	-17.12	-3.635	-11.37	-2.248	-1.29	-0.278
3	-21.54	-3.662	-15.16	-2.691	-4.52	-0.784
4	-24.94	-3.265	-19.84	-2.349	-4.67	-0.619
5	-28.73	-3.067	-26.29	-2.713	-7.71	-0.773
6	-34.98	-2.84	-32.48	-2.315	-7.87	-0.509
7	-37.85	-2.24	-39.83	-2.092	-14.26	-0.681
8	-35.81	-1.496	-40.44	-1.475	-6.91	-0.262
9	-29.99	-0.681	-44.49	-0.983	3.55	0.082
10	0.98		-61.06		88.29	
Overall mean	-23.07	-2.865	-30.56	-3.65	4.92	0.556

AT6: Real Expenditure Decile Mean Differentials
Addis Ababa and Northern and Southern Towns 1994-1997

Decile	1994		1995		1997	
	$\mu_s - \mu_n$	t-ratio	$\mu_s - \mu_n$	t-ratio	$\mu_s - \mu_n$	t-ratio
1	-3.14	-0.668	-9.61	-2.856	0.91	0.284
2	-2.7	-0.419	-10.46	-1.56	1.84	0.296
3	-3.67	-0.452	-9.04	-1.118	2.62	0.327
4	-0.91	-0.114	-9.11	-0.85	2.7	0.278
5	-4.54	-0.306	-10.97	-0.868	5.03	0.404
6	-5.36	-0.347	-14.02	-0.789	9.03	0.497
7	-0.95	-0.041	-17.41	-0.712	4.75	0.190
8	2.15	0.067	-19.95	-0.59	18.35	0.572
9	3.64	0.07	-36.4	-0.676	21.6	0.431
10	68.36		-120.47		69.47	
Overall Mean	5.45	0.553	-22.2	-2.5	13.71	1.419

POVERTY AND WELFARE IN ETHIOPIA: PROFILE AND DETERMINANTS*

Arne Bigsten, Bereket Kebede, Abebe Shimeles and Mekonen Taddesse

Abstract

This paper investigates the state of poverty and its determinants covering the period 1994-1997 on the basis of a panel data that covers 3,000 households both from urban as well as rural areas. The main findings show that poverty on the average declined during this period mainly due to increase in per capita income, particularly in rural areas. The extent of the reduction in poverty would have been much stronger if not for the worsening of income inequality. Profile of poverty shows that poverty in Ethiopia affects urban as well as rural areas at comparable scale and intensity. At the household level, factors such as human and physical capital bear a strong influence on the probability of being in poverty. Factors such as access to markets, resources and urbanisation affect greatly on the chance of being in poverty.

INTRODUCTION

This paper deals with poverty, income distribution and welfare issues in Ethiopia in mid-1990s. The choice of the period is dictated by the availability of two important and extensive household surveys on living standards since 1994. One is the National Household Budget Survey carried out by the Welfare Monitoring Unit in collaboration with the Central Statistical Authority in 1995/96. This survey covered 12,000 households which are selected to be representative of the national population. The second data set is generated by the Department of Economics, Addis Ababa University in collaboration with the University of Oxford, Centre for the Study of African Economies and Gothenburg University. This is a panel data covering 3000 households, equally divided between urban and rural areas. The results in this paper cover the period 1994-1997 based on these data sets.

Most of the results have been reported in previous studies by the Welfare Monitoring Unit (1999) and Mekonnen et al. (1999). Based on these results, this study provides profile of poverty in Ethiopia by region, occupation and sector. To do that, Section 1 of the paper provides a lengthy and detailed review of the literature on the measurement of poverty, Section 2 reports the extent of poverty in Ethiopia, its trend over time and profile with a discussion on the determinants of poverty at the household level. Section 3 makes a brief reference to the policy challenges of reducing poverty in

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Ethiopia. Section 4 is summary and conclusions.

1. POVERTY MEASUREMENT: A REVIEW

The concern over poverty in the industrialised world declined as faster economic growth and development ensured better life for the majority and it was regarded as a problem of a few marginalised segments of the population that can be addressed through elaborate social security systems. Thus, in the period immediately after the Second World War economics in general addressed poverty as a secondary issue, an addendum to the discussion of income inequality. It was the batch of Indian economists who, for the first time in the developing world, acknowledged the pervading effects of poverty in their planning exercise in the 1950s and attempted to treat poverty explicitly in plan models.

The literature on the measurement of poverty owes Sen (1976) a great deal for breaking the ground in an area that had remained hitherto hidden behind the veil of income inequality despite growing poverty all over the world.

Since then, the measurement of poverty has focused on the development of properties that satisfy certain ethical criterion and on that basis to derive an index that can capture the notion of poverty. This approach made good use of the well-known concept of social welfare functions which are in turn functions of the indirect utility functions of individual households.[1] In the literature, this approach is better known as the welfarist approach to the measurement of poverty.

In later works, Sen (1983, 1985) and others (e.g. Streeten 1994) argued that the Welfarist approach to the measurement of poverty considers material goods and services as *an end* to the attainment of well-being, while in fact they are also a *means* towards achieving well-being by allowing the individual to function well. This view is known as non-welfarist approach or the capabilities approach which has eventually inspired the publication of Human Development Indices by the UNDP. The core of the distinction in the two approaches in poverty analysis is the fact that the Welfarist approach imposes a *priori* utility maximisation by an individual to lead by itself to well-being, while the non-Welfarist approach argues that commodities availed to an individual are vehicles of better life and activities. Thus, a mere increase in income of an individual may not lead to an improvement in his well-being because of a number of factors-environmental as well as personal (see, for details, Lipton and Ravallion 1995).

1.1. Definitions: Axioms of Poverty Analysis

The pioneering work by Sen (1976) on the measurement of poverty was the formulation of axioms that are deemed to hold as in the literature on the measurement of income inequality. Sen began his treatise by offering a critique of poverty indices that were commonly used at that time, known better as the Head count ratio and the Poverty gap ratio. More formally, given that the structure of income distribution in a population is

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ranked in ascending order such that:

$$y_1 \leq y_2 \leq \ldots \leq y_q \leq z \leq y_{q+1} \ldots \leq y_n$$

where z is an exogenously given poverty line, a level of income below which an individual is classified to be poor, then, the Head count ratio, H, is defined as:

$$H = q/n \qquad\qquad [1]$$

where q is the number of people earning an income level below z and n is the total number of people in the population.

Similarly, the Poverty Gap or the income gap ratio, I, is defined as:

$$I = \frac{\sum_{i=1}^{q}(z - y_i)}{qz} \qquad\qquad [2]$$

H and I, measure respectively, the percentage of people falling below the poverty line income level, or prevalence of poverty and the average level of deprivation among the poor.[2] In short, I measures the aggregate deficit of income experienced by the poor population relative to the poverty line.

Sen (1976) has shown that these two popular measures of poverty violate one or both of the following appealing axioms:

a) The monotonocity axiom-all other things being equal, a reduction in the income of a person below the poverty line must increase the poverty index;

b) The transfer axiom-all other things being equal, a pure transfer from a person below the poverty line to someone who is richer, but may still be poor, must increase the poverty index.

It can be seen quite easily that H violates both monotoncity and transfer axioms while I violates the transfer axiom. In the words of Sen (1976, 1983), any poverty index worthy of consideration should be able to provide three basic information on poverty: it should be able to identify who the poor are, capture their average deprivation and thirdly their relative deprivation among themselves. As a result, H captures only who the poor are, or measures the prevalence of poverty, I measures the average deprivation.

Instead, Sen (1976) formulated a poverty index by departing from what he called a general expression of a poverty index defined as:[3]

$$Q(x) = A(z, y) \sum_{i \in (x)}^{q} (z - y_i) v_i (z, y) \tag{3}$$

where $Q(x)$ is the set of people with income no higher than a designated x, $Q(x)$ is the aggregate income gap, $v_i(z, y)$ is the non-negative weight to the income gap of the ith person; and $A(z, y)$ is a normalising factor. Note that y enters as a vector. Sen defines a poverty measure, $P = Max \ Q(x)$, that is P is the maximum weighted income gap of the poor in a given group or community where the income shortfall of the ith person and the jth person must receive different weights. In doing so, Sen incorporated the ordered rank weight to capture relative deprivation.

If the income of the poor in a population is equal, Sen argued that complete information on poverty can be obtained from an index $P = H.I$, which according to Sen represents both the identity of the poor and their average deprivation. However, if the level of income of the poor is different, as it is the case in reality, then, the axioms of montonocity, normalisation and ordinal rank order weights are sufficient to generate a poverty index acceptable by a certain social welfare function. Thus, he suggested,

$$S = H[I + (1-I)G_p] \tag{4}$$

where G_p is the Gini-coefficient among the poor population. It can be shown that if we allow the index given in [4] to embrace the entire income distribution, it evolves into a measure of relative income inequality in a population. We note that the distinction in the type of poverty being measured rests on the way the poverty line is defined. If the poverty line is meant to represent a level of income barely sufficient to meet basic needs and nothing more, then, the underlying poverty measured is known as absolute poverty, whereas if the poverty line is defined as a proportion of mean income of the income distribution, it designates relative poverty.

The literature following Sen focused on the refinement of poverty indices by introducing a number of other desirable properties that can fully represent a range of ethical considerations by offering rooms for flexibility.

Thon (1979,1981) argued that Sen's index violates certain kinds of transfers and leads to ambiguity. For instance, it can be shown that a transfer of income from a poor person to someone who was poor and becomes non-poor because of the transfer decreases poverty as measured by Sen's index. Thon's extension, and later a number of others, (Kakwani 1980) made an attempt at constructing indices that meet a number of

desirable properties. Another strand of research also pursued the construction of poverty indices on the basis of social welfare functions employing the underlying ethical properties. Notable among these are the works of Blackbory and Donaldson (1980), Clark, et al. (1981) and Chakarvarty (1983) who truncated the underlying income distribution of a population to the relevant segment and defined poverty as a deviation from an "equally distributed income" among the poor.

The list of requirements that has to be satisfied by a poverty index has grown longer with the literature on the measurement of poverty. The most important properties that are expected to be met by any poverty index, $P(y,z)$ defined over z and the underlying income distribution of the population are the following:[4]

i. $P(y,z)$ is independent of the incomes of the rich, that is the poverty index is based on censored income distribution. Some times this property is known as axiom of focus.

ii. $P(y,z)$ is increasing in z.

iii. Given other things, a reduction in income of a person below the poverty line must increase the poverty index (monotoncity axiom).

iv. Given other things, a pure transfer of income from a person below the poverty line to anyone who is richer must increase the poverty index, unless the number of persons below the poverty line is strictly reduced by the transfer (weak transfer axiom).

v. Given other things, a pure transfer of income from a person below the poverty line to anyone who is richer must increase the poverty index (strong transfer axiom).

vi. $P(y,z)$ is left unchanged by a permutation of the incomes (impartiality).

vii. $P(y,z)$ is jointly continuous in (y,z).

viii. Additive decomposability: The poverty index for a population can be written as a weighted average of the poverty indices for a set of mutually exclusive and collectively exhaustive sub-populations.

The issue that whether the poverty indices suggested in the literature meet all these requirements has been a subject of inquiry. Kundu (1983) demonstrated that if the fixed population axiom is violated, no single poverty index can meet all the properties listed above. Haggenars (1987) showed succinctly that no poverty index can meet all the desirable properties simultaneously and that a choice of a poverty index always implies the preference of some normative judgements over another. It is important for policy makers to make their selection of a poverty index based on properties consistent with their policy objectives since the same scenario is judged differently by different poverty indices.

1.2. Popular Aggregate Poverty Measures

In the current literature, poverty indices are summary measures defined over mean income, the relevant poverty line, and the parameters characterising the underlying

income distribution. The general form is given by:

$$P = P(\mu / z, L) \tag{5}$$

where μ is mean income of the population, z is the poverty line determined exogeneously and L is the parameter characterising the income distribution as measured by the Lorenz function.[5]

The specification of P as in [5] has enormous advantages from practical considerations. It is possible to construct tests of statistical significance (see Kakwani 1990) of a poverty estimate for a given poverty line, it is simpler to decompose changes in poverty into those related with changes in mean income of society and underlying distribution. In addition, one can easily compute elasticity values with respect to mean income and inequality parameters if the poverty index is specified as in above.

Furthermore, it can be shown quite easily that all ethically flexible and sound indices of poverty indices suggested in the literature can be expressed in terms of mean income and the income distribution.

If a poverty index of the form [5] is homogenous of degree zero with respect to the poverty line and the mean income, then the index measures relative poverty, on the other hand, it measures absolute poverty if the poverty index remains unchanged when the same amount of income is added or subtracted from all the incomes and the poverty line itself.

For poverty measures given by H and I in [3] and [4] one can readily show that by knowing the parameters of the underlying Lorenz function, which gives the consumption expenditure by the poorest p% of the population, $H=\mu(L'(p)$ which is the inverse function of the distribution function $p=F(y)$, and so $L'(H)=z/\mu$. I is then calculated readily using the fact that mean among the poor $=\mu L (H)/H$. Given the parameters of the Lorenz function, then, H and I can be read-off easily.

Explicit specification of P has led in the literature to the use of the popular index originally suggested by Foster, Greer and Thorbecke (1984) (hereafter the FGT-index) and later on shown to possess rigorously the desirable properties stated in the preceding section. For continuous income distribution, the FGT-index is given as:

$$P_a = \int_0^z [\frac{(z-y)}{z}]^\alpha f(y)dy \tag{6}$$

where $\alpha \geq 0$.

It is observed that for $\alpha=0$ and 1, the FGT-index reduces to H and I, which are interpreted respectively as poverty indices measuring the prevalence and intensity of poverty (see Ravallion, 1992). For $\alpha=2$ the FGT-index has been interpreted to measure the severity of poverty. As the value given to α increases, then the underlying poverty index offers more weight to the distribution of income found at the lower end.

The FGT-index is the most popular index used in the recent literature. Its attraction lies in the fact that while capturing the most desirable properties of a poverty index, it is also decomposable and sub-group consistent. That means, if there are n mutually exclusive sub-groups of households, classified either along regions of residence, sector of employment or some other means of classification, then, the FGT index allows that the overall poverty can be expressed in terms of poverty within each sub-group. That is, if P_s represents poverty estimated within each sub-group s, then overall poverty is given by:

$$P = \sum_{s=1}^{n} w_s P_s \qquad [7]$$

where w_s represents the population share of the s sub-group to total population.[6] The task of measuring poverty is complete once the appropriate poverty line is determined and the poverty index is chosen. The latter part of the task is treated at some length in this section. What remains is to review the developments in the literature concerning the estimation of the poverty line.

1.3. Setting Poverty Lines

Definition

Poverty line is understood as a level of standard of living below which a household is designated as being in poverty. The exact location of a poverty line is difficult to define and varies across a spectrum of factors peculiar to individual households. Inherently, poverty line remains subjective and relative when the host of factors determining the standard of living of a household are taken into consideration. A given household can be considered poor by some measure of a standard of living and as non-poor by another indicator.

Welfare Implications

The Welfarist approach anchors the concept of poverty line on the link between income and utility or standard of living which offers an opportunity to interpret the poverty line as the minimum cost of achieving a certain level of utility defining poverty. This money metric utility is derived from neo-classical theory of consumer behaviour.

It is well known that given a utility function u defined over exhaustive commodities $x_1, \ldots,$

x_n and respective market prices, $p_1, \ldots p_n$, and a fixed income of a consumer, y, the consumer's problem can be stated as:

$$\text{Max } u\left(x_1, \ldots, x_n\right) \text{ subject to: } y \geq \sum_{i=1}^{n} x_i P_i \qquad [8]$$

A solution to the constrained problem leads to the indirect utility function $V(P,y)$, where P is a vector of prices and y is the level of income. The inverse of the indirect utility function or the dual of the maximising problem in [8] provides the expenditure function given by: $y = E(P,u)$. If we define u^r to represent a reference utility level designating poverty, then, the poverty line z is given by : $z = E(P,u^r)$, which is defined as the money cost of achieving a certain level of utility defining poverty.

Thus, it is analytically possible to link the determination of the poverty line from underlying demand systems that are derived from neo-classical choice theory.

But, implementing this approach is beset with a number of measurement and identification problems. On the one hand, the reference utility level defining poverty is difficult to establish. Some works (e.g., Lewis and Ulph 1988) suggest that poverty can be thought of a discontinuity in the utility function for lack of certain commodities or services. The demand functions that emerge from such an approach are very difficult to estimate empirically because of identification problems.

The difficulties encountered and the complexities arising from the conceptualisation of the poverty line reduced its estimation to a single indicator in the literature: observed income or expenditure sufficient to meet a certain level of basic needs as defined by local standards. A recurring problem in the use of income or total expenditure to set the poverty line is the issue of family size and scale of economies in the process of consuming a range of goods and services.

Equivalence Scales

Households are composed of family members with different age and sex, leading to differences in needs, consumption habits and preferences. The same level of income cannot serve equally the needs of households that are different in composition. Some households can attain basic needs with lower income than others.

In the theory of demand, this problem is known as the problem of scales of economies in consumption expenditures, and various methods have been suggested to adjust differences in the composition of households using the concept of equivalence scales (see, Deaton and Muellbauer 1980 for a comprehensive survey). The equivalence scale concept is based on the assumption that households having different composition reveal their preferences in the market for given income and price structure. It is thus, possible

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to establish equivalence in the consumption needs of households having different composition. One of the most popular equivalence scale suggested in the literature is adult equivalence which establishes an equivalence in the consumption of an adult, a child, etc.[7] It is argued however that in a situation where the poor consume both marketable and non-marketable goods, it is difficult to use equivalent scales generated from preferences revealed only from marketable goods (Lipton and Ravallion 1995). On the other hand, some also staunchly argue that equivalence scales should be estimated from the data itself (see Coulter, et al., 1992) since the measurement error arising from the use of ready-made equivalence scales can severely affect the measurement of poverty.

The main issue in the measurement of poverty is not in the precision of our estimate of the poverty line per se but in being able to compare precisely poverty among households. One has to be careful not to classify households earning the same income into poor and non-poor, leading to the absence of robustness of poverty measurements. In this connection, the literature is also apprehensive of the implications in the definition of a poverty line. That is, if a person is moved above the poverty line by one extra dollar, the implication is that he changes his life style from being poor to non-poor. Such instant gradation causes discontinuity in the poverty measurement at the poverty line for which the justification for this is far from satisfactory (see Atkinson 1987; Lipton and Ravallion 1995).

Setting Poverty Lines: Practical Methods

Despite the conceptual complexities in defining poverty lines, the tradition of fixing a certain basic needs as minimum to avoid poverty (say minimum wage legsilations) or defining a basket of consumption goods as representing basic goods is not a recent phenomenon. The basic question remains that it is possible to have a poverty line that can offer a poverty profile which is consistent–i.e. the relative position of households remain unchanged whichever sub-group they belong to.

In the current literature the most popular methods of estimating poverty lines are the Food-energy Intake method and the Cost of Basic needs method.

The Food-Energy Intake (FEI) Method

This method of setting the poverty line stipulates the cost of attaining a predetermined level of food energy intake. There are a number of ways of estimating the total expenditure needed to arrive at the stipulated food energy intake. The common procedure is to run a regression of cost of a basket of commodities consumed by each household over the calorie equivalent or the food energy implied from the basket of goods. Then, to proceed to calculate how much it would cost to buy a basket of commodities that would be considered as sufficient. The energy intake is a predetermined value expressed in terms of calorie equivalents. Another procedure is to take a sub-sample of households with total expenditure equivalent or close to the

stipulated calorie level and compute a simple average. The FEI method provides automatically the total expenditure implied by the level of food expenditure that provides the stipulated calorie intake, since the latter are dependent variables in the regression equation. Thus, for a specified level of calorie, a corresponding total expenditure is obtained immediately.

This method has been extensively applied in the literature (see for instance and Greer and Thorbecke 1986). Despite its simplicity in estimation there are some caveats to be considered when one uses this method. One is the fact that the FEI method has the difficulty of mapping calorie intakes into expenditure spaces in a manner consistent with preferences and taste of consumers. Ravallion and Bidani (1994) argued that the FEI method is weak in terms of offering a consistent and robust poverty profile. There is no provision in the FEI method for differences in relative prices, tastes and preferences across sub-groups. Instead, they suggested the Cost of Basic Needs approach that anchors on the estimation of relevant Engel functions consistent with the neo-classical theory of demand.

The Cost of Basic Needs Approach (CBN)

The measurement of a poverty line based on basic needs is not new in the literature. It dates back to the work by Rowntree (1901) who attempted to construct a poverty line by defining a basic needs basket to study poverty in New York (see Atkinson 1987 for comments). Since then, the Basic Needs approach to define the poverty line came to be used in practical applications in various research works. But, the fact that the definition of basic needs remained elusive conceptually and has become difficult to reconcile with proper theory of choice, the FEI method swayed for much of the later works in the construction of poverty lines.

The approach developed by Ravallion and Bidani (1994) is to estimate the Engel function for food expenditure by regressing the food share on the logarithm of total expenditure taking care of differences in household size, composition and other exogenous variables. Ravallion and Bidani (1994) have compared and contrasted the two methods of constructing poverty lines using the Indonesian data and concluded that the CBN methods offers a consistent and robust poverty profile.

2. POVERTY, INCOME DISTRIBUTION AND WELFARE IN ETHIOPIA: THE MICRO EVIDENCE

The measurement of poverty reported in this section is based on the Foster-Greer-Thorbecke class of indices reviewed in section I. It is recalled that this measure provides the magnitude, depth and severity of poverty in a given situation. These measures are frequently used because of their immediate policy implications to growth and redistribution.

2.1. National Household Income, Consumption and Expenditure Survey[*]

National accounts put the figure for Ethiopia's per capita GDP between US$ 100-115 for 1990's. As it stands this figure is indeed telling of the appalling gap between Ethiopia and the average for Sub-Saharan Africa, which was US$ 490 in 1995. An estimate of per capita expenditure based on a national household budget survey put this figure at US$ 167 (Birr 1085) in 1995, nearly 50% more than the estimate we find in national accounts. The figure for urban areas was about US$217 (Birr 1411), while it was US$159 (Birr 1034) for rural areas.

As might be expected, per capita expenditure is distributed unevenly across geographic regions, with Tigray reporting the lowest (US$139), followed by Amhara region (US$141), while Addis Ababa reported the highest (US$241), followed by Harari region (US$225). Obviously, such disparities in per capita expenditure give rise to parallel disparities in the level of poverty experienced, since per capita expenditure is our measure of welfare.

The level of the absolute poverty line estimated for Ethiopia in 1995 was Birr 1075 (US$ 165), very close to the mean per capita expenditure. Accordingly, the headcount ratio for Ethiopia in 1995 was estimated to be around 46%, with 47.5% in rural areas and 33.2% in urban areas.

An alternative poverty line that uses 2/3 of the mean per capita expenditure (often referred as relative poverty line) led to a national headcount ratio of 31%, with 30% in rural areas and 22% in urban areas. The determination of the poverty line plays a crucial role in the measurement of poverty. As is observed, a switch from one definition of a poverty line to another leads to a substantial change in the poverty rates estimated. In the context of poor countries like Ethiopia, it appears that the concept of relative poverty is subsumed under the notion of absolute poverty in the sense that some of the absolutely poor are considered non-poor in relative terms. This seemingly contradictory classification is due to the convention of using 2/3 of the mean as a measure of relative poverty. A person who is poor in absolute terms and non-poor in relative terms is difficult to understand, while the converse is reasonable enough. Thus, the relative poverty line can be looked at a measure of extreme or ultra poverty.

Across regions, Table (1) reports that the highest level of absolute poverty as measured by the headcount ratio was reported for Tigray (58%), followed by Amhara (57%) and Southern Region (56.5%). The lowest is recorded for Dire Dawa (24.6%) and Harari (29.1%).

Table 1: Poverty Profile in Ethiopia by Main Administrative Regions

Region	P0
Tigrai	57.9
Affar	51.8
Amhara	56.7
Oromia	34.7
Somali	34.6
Benshangul-gumuz	47.6
Southern Region	56.5
Gambella	41.8
Hararri	29.1
Addis Ababa	30.0
Dire Dawa	24.6
National	46.0

Source: Welfare Monitoring Unit (1999).

2. 2. Household Panel Data

2.2.1. The Data

The data are from two separate but closely related household surveys, one rural and the other urban, undertaken by the Department of Economics of Addis Ababa University. The rural surveys are done in collaboration with the Centre for the Study of African Economies of Oxford University and the International Food Policy Research Institute (IFPRI) and the urban with the Department of Economics of Gothenburg University, Sweden, and Michigan State University. The two surveys covered nearly 3000 households, the sample size in each being about the same. The rural and urban samples were drawn independently of each other but the questionnaires were carefully standardised to enable the collection of comparable data sets allowing for the differences in the two settings.

The rural household survey was undertaken in 15 sites in four rounds–the first two in 1994, the third in 1995 and the last covers 1997. Though small, relative to the size, distribution and diversity of the rural population, the sample tried to capture as many of the major socio-economic groups, agro-ecological zones and farming systems as possible by spreading the sites in the most important regions of the country. While the survey areas were purposively selected to represent the diversity of the rural economy, households in each site were sampled randomly, the sample size being proportional to the population in the region (for details on the sampling procedure, see Bereket 1994).

The urban surveys were conducted over a period of four successive weeks during a month considered to represent the average conditions. They covered seven major cities and towns – the capital Addis Ababa, Awassa, Bahr Dar, Dessie, Dire Dawa, Jima and Mekele –selected to represent what were identified as major urban settings and socio-economic characteristics of the urban population in the country. A predetermined sample size of 1500 households was allocated to each urban centre in proportion to the

total population of the selected urban centres and subsequently to each *wereda* (district) in the urban centre. Households were then selected by systematic sampling from half of the *kebeles* (the lowest administration units) in each *wereda* using the registration of residences available at the urban administrative units as sampling frame. Such a frame clearly misses an important social group from the point view of poverty measurement, the homeless, a group whose ranks are swelling at an alarming rate in most, particularly large, urban centres of the country.

The same initial sample size of 1500 households was maintained in all subsequent rounds of both the rural and urban surveys by replacing households that dropped out. The sampled communities have been largely stable during the survey period as a result of which attrition has been extremely low—about 3% from the rural and 7% from the urban samples. With further loss of data of about the same proportions due to mismatching of household identifications, panel data on 1403 households from the rural survey and 1249 households from the urban surveys in the three years were compiled. From these a "national" panel sample was constructed as follows. Since the first and second rounds of the rural survey were undertaken in 1994 (the former covering the first and the latter the second part of the year), they are merged to form the 1994 relevant variables. The 1995 and 1997 rural data were obtained from the third and fourth rounds with appropriate scaling (which depends on ratio of the first and second rounds) to take account of possible seasonal variations. These were merged with proportional sub-samples of the urban panel (about 15%, the urban weight in the country's population) to form the national panel sample of 1654 households used in this study.

Both surveys collected data on the demographic characteristics of households, their educational and health status, ownership of assets, employment and income, credit, and consumption and expenditure.

2.3. Results

Table (1) reports per capita expenditure in real terms for national, rural and urban areas for the period 1994-1997. The figures for real per capita expenditure in each survey site were computed in two steps. First, the cost of basic needs is constructed for each survey site. Second, one of the survey sites was taken as a reference so that real per capita expenditure figures for each household are arrived at by using the ratio of site poverty lines by the poverty line of the reference site to deflate nominal expenditure. This allows easy comparison and merging of the expenditure figures.

Table (2): Per Capita Real Consumption Expenditure (Birr)

	1994	1995	1997
Rural	1089	1500	1377
Urban	1248	1320	1457
National	1113	1473	1389

Source: Calculations based on household panel survey.

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Table (2) shows that the share of rural households in total consumption expenditure between 1994-1997 was respectively, 46.57%, 53% and 48.6%. This magnitude is similar with the contribution of the agricultural sector to GDP as reported in national accounts. In this period, per capita consumption expenditure recorded a significant jump between 1994 and 1995 (increase of 32% in one year!) and fell in 1997 by 5.7%. Between 1994 and 1997, per capita expenditure increased in rural areas by 8.8%, while in urban areas it increased by 5.3%, leading to an overall growth of 8.3% per annum.

The features of per capita expenditure for rural areas in 1995 are inexplicably high compared even to urban areas. As shown also in Table (2), this period recorded substantial worsening of income inequality where the Gini increased from 39% to 54% in one year! Given the extreme care taken in computing per capita consumption expenditure and the massive data cleaning exercises for the entire set, it is difficult to attribute the features to measurement or computational errors unique to this survey period nor to the administration of the questionnaire. The major reason as reported in Annex (1) is the substantial consumption expenditure reported by the top decile in 1995 which showed an increase of more than 100% in one year. We also refrain from speculating what could have brought such shifts in the whole income distribution and levels of per capita expenditure until through examinations of the changes by household and by survey site are made. In what follows, we concentrate only on the changes in poverty and welfare between 1994 and 1997.

To estimate poverty we used the cost of basic needs approach to set the poverty lines for each site. Then, we used the poverty lines of one of the sites to estimate poverty by deflating per capita expenditure of other sites by a factor of the difference between site level poverty lines and the reference poverty line. That is, we have used the poverty lines as price deflators[9]. Hence, the reference poverty line was computed to be Birr 726 and was held unchanged over time. The resulting figures of poverty estimates and the Gini coefficient are given below:

Table (3): Poverty and Inequality in Ethiopia

Region	1994				1995				1997			
	P0	P1	P2	Gini	P0	P1	P2	Gini	P0	P1	P2	Gini
Rural	41	16	8	39	37	16	9	56	36	13	6	43
Urban	39.	15	8	44	38	15	8	45	36	15	9	48
National	41	16	8	39	37	16	9	54	36	13	6	43

Source: Calculations based on Household Panel data

Table (3) makes interesting reading: one poverty overall is more or less a phenomenon of both rural as well as urban areas. Conventional wisdom has it that poverty in poor countries tends to be large in rural areas both in magnitude and concentration. In 1994, poverty in urban areas was less than the rural counterpart by just 2%, and in 1994 they recorded the same level of poverty (36%). The main factor

responsible for this result is the high income inequality in urban areas in both periods as compared to rural areas. In fact, if we base our judgements of welfare using the expenditure distribution pattern reported in Annex Table (1), we see that for a poverty line up to the income of the eight[th] decile, poverty in rural areas would be less than in urban areas!

Overall, poverty declined between 1994-1997 by about 4.1% per year in the face of 8.3% increase in per capita consumption expenditure. This lower rate of decline is due to the worsening of income inequality at a rate of 3.3% per annum. When we look at the situation for the bottom ten percent of the population, the situation deteriorated in urban areas between 1994 and 1997. In rural areas, after a sharp decline in 1995, the situation of the bottom ten percent improved in 1997. Overall, the per capita expenditure of the poorest ten percent did not improve at best or it deteriorated. Whatever improvements that may have been recorded during this period in economic recovery and growth, it appears that the benefit went mainly to those at higher income brackets. In terms of welfare, it is not easy to make definite conclusions from our data on how it moved over time. Perhaps, one observation we make of the period 1994-1997 is that agriculture showed a dramatic rebound following the drought that hit the country in 1993/94 as there was plenty rainfall in most of the survey sites. Thus, without substantial change in the structure of the whole economy, it is possible to see erratic behaviour of consumption in predominantly poor community.

Determinants of Poverty in Ethiopia

To examine some correlates of poverty in rural and urban areas, we estimated probit functions for rural and urban sites separately. We have estimated the probits separately, on the one hand, because at least some of the correlates of poverty in rural and urban settings presumably differ and, on the other, if we use our 'national' sample the number of urban households becomes small decreasing our degrees of freedom. In both estimates, the dependent variable is a zero/one dummy for identifying households that are poor in 1994.

The independent variables for the rural sites are: household size, mean age of household members (and its square), age of household head (and its square), number of oxen owned by the household, size of land cultivated, dependency ratio defined as the percentage of household members below 15 and above 65 years of age to total household size and dummy variables (for primary education of household head and wife, for *teff*, coffee and *chat* producing households, sites located in the north and *enset* producing areas and off-farm employment). In addition to these, we included a variable reflecting the proximity of survey sites to big cities/towns; the index is computed by dividing the population of the nearest city/town by the distance from the survey site to it. The probit results for rural areas are given below.

Table (4): Probit Estimates for Rural Areas, 1994

Probit estimates

					Number of obs	=	1329
					LR chi2(18)	=	290.61
					Prob > chi2	=	0.0000
Log likelihood = -760.01419					Pseudo R2	=	0.1605

	Coef.	Std. Err.	z	P>|z|	[95% Conf.	Interval]
hhsize	.0844795	.0175509	4.813	0.000	.0500802	.1188787
meanage	.0074087	.019318	0.384	0.701	-.030454	.0452713
meanage2	-.0002301	.0002355	-0.977	0.329	-.0006916	.0002315
hhhfem	.2271838	.1012229	2.244	0.025	.0287905	.4255771
agehhh	.0314305	.0141203	2.226	0.026	.0037552	.0591059
agehhh2	-.0002647	.0001344	-1.970	0.049	-.0005281	-1.36e-06
hhhprime	-.0006818	.1491974	-0.005	0.996	-.2931033	.2917397
wifeprim	-.6138098	.3439941	-1.784	0.074	-1.288026	.0604062
teff	-.1581494	.0966075	-1.637	0.102	-.3474967	.0311978
coffee	-.2417821	.128873	-1.876	0.061	-.4943686	.0108043
chat	-1.018185	.1604911	-6.344	0.000	-1.332742	-.7036284
depndrat	.7954386	.2412301	3.297	0.001	.3226362	1.268241
north	-.255771	.1235679	-2.070	0.038	-.4979596	-.0135824
market	-.0001017	.0000164	-6.217	0.000	-.0001338	-.0000697
enset	-.1306455	.1489535	-0.877	0.380	-.4225889	.161298
oxen	-.1789566	.0309917	-5.774	0.000	-.2396992	-.118214
cultivat	-.0232918	.060088	-0.388	0.698	-.1410621	.0944786
offfarm	.2818287	.081483	3.459	0.001	.122125	.4415324
_cons	-1.109165	.4288339	-2.586	0.010	-1.949664	-.2686658

Source: Mekonnen, Bereket and Abebe (1999).

To have an idea of the probabilities attached to particular attributes (in addition to examining the coefficients of the dependent variables), we first computed the predicted probabilities for each household and calculated the mean of that for a group of households with similar attributes. These mean predicted probabilities are used, in addition to the estimated coefficients, in our subsequent discussions.

Mean age of household members, primary education of household head and wife, size of cultivated land, the production of *teff* and coffee do not seem to significantly (at 5% level) affect probabilities of falling into poverty.

Bigger households seem to experience higher incidence of poverty; but this is hardly surprising given the fact that we have used per capita expenditure figures for defining poverty levels (i.e., the use of the per capita expenditure ignores the effects from economies of scale). Female-headed households face a slightly higher probability of falling into poverty in rural areas; for instance, the mean predicted probability for female-headed households to fall into poverty is 0.48 but for male-headed ones 0.41. The probability of falling into poverty increases with the age of the household head but decreases at very low and very high levels (indicated by the negative coefficient for the its square). And households in the northern parts of the country have a lesser chance of falling into poverty than in the southern areas; the mean probability for

northern sites is 0.39 but for others 0.44.

As expected, the dependency ratio is strongly related to the probabilities of falling into poverty; the more the percentage of people below 15 and above 65 years of age in the household, the higher the probability of falling into poverty.

The production of marketed crops seems to decrease the chance of falling into poverty. *Teff* is one of the main domestically marketed crops in Ethiopia. Generally, rural households produce *teff* for the market and it is an important source of cash income. Coffee and *chat* are also important cash crops which are exported, coffee being the most important single export item of the country. All the coefficients of the three crops are negative indicating that households producing these have a lesser chance of falling into poverty. While the coefficients on *teff* and coffee become significant at around 6% and 10% levels of significance, the coefficient for *chat* is significant at even 1%. The mean probability for *chat*-producing households to fall into poverty is 0.24 while for those not producing *chat* increases to 0.44. This may highlight the importance of relatively new cash crops (particularly exportable) in the alleviation of poverty.

As expected, oxen owned by households are highly significant in decreasing the chance of falling into poverty. This effect can dramatically be illustrated by looking at the mean predicted probabilities of falling into poverty classified by the number of oxen owned by households; this is given in the table below.

Table (5) : Mean Predicted Probabilities of Falling into Poverty
by the Number of Oxen Owned by Households

Number of Oxen Owned by Households	Mean Predicted Probabilities
0	0.52
1	0.49
2	0.37
3	0.28
4	0.26
5	0.18
6	0.13
7	0.11
8	0.12
9	0.15
10	0.06

Source: Mekonnen, Bereket and Abebe (1999).

Except in two cases, the mean predicted probability of falling into poverty consistently decreases with the number of oxen owned by households; it plummets from a high of 0.52 to a very low figure of 0.06. This underscores the importance of oxen in the agricultural systems of most rural Ethiopia.

Households involved in off-farm employment are generally associated with a higher chance of falling into poverty. This may indicate that seeking off-farm employment is a consequence of poverty rather than a way enriching oneself.

Finally, as expected the 'market' variable decreases the chance of falling into poverty. Rural areas nearer relatively big cities/towns have a better access to markets and public services.

A similar probit was run for the urban sampled households. While dropping the variables that are not relevant for urban areas, we included dummies identifying regional capitals and occupation of household heads. The occupation of the household heads is classified into private business employer, own account worker, civil servant, public enterprise worker, private sector employee, casual worker and unemployed. The probit results are given in Table 6.

Table (6): Probit Estimates for Urban Areas, 1994

```
Probit estimates                              Number of obs    =       1330
                                              LR chi2(18)      =     287.81
                                              Prob > chi2      =     0.0000
Log likelihood = -746.10646                   Pseudo R2        =     0.1617
```

p0	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
hhsz94	.0721009	.0172424	4.182	0.000	.0383064	.1058954
meanage	-.0437891	.0186167	-2.352	0.019	-.0802771	-.007301
meanage2	.0003705	.000234	1.583	0.113	-.0000882	.0008292
femhhh	-.0341466	.0979042	-0.349	0.727	-.2260353	.1577421
agehhh	.0264806	.0133251	1.987	0.047	.0003638	.0525974
agehhh2	-.0002204	.0001365	-1.614	0.106	-.000488	.0000472
hhhprime	-.4762578	.0961755	-4.952	0.000	-.6647583	-.2877573
wifprime	-.4463262	.103384	-4.317	0.000	-.6489551	-.2436974
privbuss	-.975227	.3078486	-3.168	0.002	-1.578599	-.3718548
ownacent	-.6083281	.1172309	-5.189	0.000	-.8380964	-.3785599
civilser	-.2460617	.1309669	-1.879	0.060	-.502752	.0106286
publicen	-.5559138	.1654954	-3.359	0.001	-.8802788	-.2315489
privempl	-.8441298	.2175551	-3.880	0.000	-1.27053	-.4177297
casualwo	.2550208	.1643059	1.552	0.121	-.0670129	.5770546
unemploy	.1405296	.1791516	0.784	0.433	-.2106011	.4916602
depenrat	.8419948	.2173903	3.873	0.000	.4159176	1.268072
north	-.4087424	.0997901	-4.096	0.000	-.6043275	-.2131574
capitalc	.4218555	.0949848	4.441	0.000	.2356887	.6080223
cons	-.635158	.4901665	-1.296	0.195	-1.595867	.3255507

Source: Mekonnen, Bereket and Abebe (1999).

Household size, probably for the same reasons given above, is positively related with the chance of falling into poverty. An increase in the mean age of households

decreases the chance of falling into poverty and quadratic effects on both sides do not seem to be significant. Age of the household head increases the chance of falling into poverty but the probabilities slightly decrease at low and high age brackets.

If household head or the wife has completed primary education, that will significantly decrease the chance of the household falling into poverty; the coefficients on both variables are highly significant and the value of the coefficients are also relatively high.

As expected, the dependency ratios significantly increase the probability of falling into poverty. Households located in northern cities/town have a lesser chance of falling into poverty. Probably contrary to expectation, those households in regional capitals have a higher chance of falling into poverty.

Most of the coefficients on the occupation of household heads are highly significant indicating that in which sector people work has an important impact on their livelihood. Except causal workers and the unemployed, all the other job classifications are associated with a lower chance of falling into poverty. To further illustrate this point, the next table presents the mean predicted probabilities of falling into poverty by occupation of household heads.

Table (7): Mean Predicted Probabilities of Falling into Poverty by Occupation

Occupation	Probability in the Occupation	Probabilities Outside the Occupation
Private Business Employer	0.20	0.39
Own Account Worker	0.32	0.41
Civil Servant	0.30	0.41
Public Enterprise Worker	0.23	0.40
Private Sector Employee	0.22	0.40
Casual Worker	0.63	0.37
Unemployed	0.52	0.38

Source: Mekonen, Berekt and Abebe (1999).

Except in the cases of casual workers and the unemployed, in all other occupations the probabilities of falling into poverty are lower in the occupation than to that outside; the lowest with private business employers and the highest with casual workers. Interestingly, the probability is higher among casual workers than the unemployed. This may indicate that those who can afford to wait longer being unemployed have a better means of supporting themselves; in other words, their reservation wages are higher. This probably indicates that the unemployed depend on social networks that support them from falling into abject poverty while looking for better jobs.

There are some striking similarities and differences in the results for the urban and rural sites. The age of the household head and probabilities of falling into poverty are similarly related in urban and rural sites; first increasing and then decreasing (inverted-U) which may imply increasing returns to age/experience. Even though most

of the coefficients are not statistically significant, the mean ages of household members seem to operate in opposite directions in rural and urban areas. In the rural areas probability of poverty first increases and then falls with mean age (inverted-U) but just the opposite happens in urban areas. This may partially be explained by the fact that in rural areas people work more in the earlier and latter part of their lives than their counterparts in urban areas; a typical rural person starts productive work younger and works even when relatively old. In urban areas, people retire relatively early (particularly those in formal employment).

Probably, the most striking result is related to the effect of having at least a primary education by the household head and wife. Having at least a primary level of education decreases the chance of falling into poverty in both the rural and urban areas. But both coefficients are statistically insignificant (at 5% level) in rural areas but highly significant (at 1% level) in the urban areas. This has an important implication on the returns to education. It seems that education, at least the type of education offered now in Ethiopia, has a more important positive effect on the welfare of households if they are living in urban areas. This may be related to the fact that education is geared towards urban employment.

3. POLICY CHALLENGES OF REDUCING POVERTY IN ETHIOPIA

We have seen in section 2 that poverty in Ethiopia is widespread by any measure of welfare indicator. Some of the salient feature that stand out are that poverty in Ethiopia affects more or less at equal intensity and depth urban and rural areas. This is true also for the measures of income inequality. Secondly, given the low level of per capita expenditure, a significant majority at the national level fall below the absolute poverty line. In addition, rapid changes in income inequality followed the changes in per capita consumption expenditure.

The overall message of such indicative result is that economic growth is a necessary but not a sufficient condition to effectively reduce poverty in Ethiopia. Growth essentially has to benefit those who are well below the poverty line, if poverty reduction is what drives the policy objectives of the government. As indicated, in a spell of economic recovery between 1994-1997, much of the benefit went to people above the poverty line and in some cases the extremely poor lost in the absolute sense.

Poverty reduction remains a formidable challenge to Ethiopia. Overall, a 1% increase in per capita income is associated with a 1% decline in the level of the headcount ratio. This is in a fortunate situation where income inequality is assumed to remain unchanged over a long time horizon. It is not difficult to compute the number of years an average poor person would have to wait until his income reaches the fixed poverty line to escape poverty. This is calculated from the poverty-gap index which provides the percentage shortfalls of the poor from the poverty line. In a rather optimistic

scenario of a 4% annual increase in the income of the poor would take at least 25 years before he reaches the income level that is sufficient to guarantee basic needs. And, it is hard to imagine how a person could remain an active member of the labour force for such long time given the toll in health condition brought by insufficient calorie levels. Morally, as well as politically, it is impossible to rely on economic growth alone to trickle down to the poor. Thus, poverty reduction is more than securing a sustained growth in per capita GDP.

It has also been reported that poverty is structural and varies significantly with some household attributes. These are, the sex and age of the head of the household, the type of crop planted in rural areas, the occupational categories in urban areas, level of education attained by head of the household, distance from markets, etc.. Like most of Africa, therefore, poverty is a way of life which can only be transformed through changes in the underlying structure of the economy that touches upon the whole range of issues. A work of caution that may have to be made is that some of the determinants of poverty that are outlined in the probit regression model can be equally regarded as effects of poverty itself. The distinction is important in terms of policy implications. For instance, would it be the case that poverty declines significantly in Ethiopia if the country achieves universal primary education soon?

In terms of regional priorities, it is important for policy makers to focus on regions with the highest concentration of poverty, not on those with the highest levels of poverty. This could be illustrated by using the property of additive decomposability of the poverty indices used in the paper. Regions like Oromia, Amhara and Southern regions have the highest share of poverty in Ethiopia because of the size of the population in the regions. Rapid poverty reduction can only be achieved if poverty declined faster in these areas.

SUMMARY AND CONCLUSIONS

In the mid 1990s the percentage of households that could not meet the basic needs for survival fell in the range of 40-45%. This figure underestimates poverty given the low level of per capita expenditure and the implied poverty line. By any account, however, Ethiopia harbours one of the worst poverty conditions in today's world. Poverty is equally widespread in urban and rural areas, complicating the policy options for the government.

Income inequality is reported to be high for such an economy. Rural and urban levels of income inequality are comparable. In a spell of short period of economic recovery, inequality in urban as well as rural areas increased sharply. This scenario suggests the danger that economic growth alone cannot address the problem of poverty in Ethiopia.

The fact that poverty is multifaceted and cuts across the whole spectrum of household

characteristics makes is a condition deeply entrenched in the structure of the entire economy. As such therefore, nothing short of structural transformation can overcome the enormity of the problem in Ethiopia. The current levels as such are suggestive of the implications to social stability and progress in future. There are areas of interventions that can speed up the process of poverty reduction. Investment in human capital, improved economic infrastructures, price incentives, reform in areas of labor market are some of the priorities that may bear directly on the condition of poverty in Ethiopia.

NOTES

[1] The construction of social-welfare functions from individual utility functions follows the early traditions as in Dalton (1920) which was translated first into income space by Atkinson (1970) to take later on the interpretation of indirect utility function which is defined over income and prices as a dual to the expenditure function in the process of maximizing utility by individual households.

[2] The Poverty Gap ratio is sometimes expressed in terms of the aggregate gap of the poor as a proportion of GDP or the aggregate income of the poor, when each poor individual receives an income equal to the poverty line.

[3] Sen (1976), pp. 224-226.

[4] See Rodgers and Rodgers (1991) and Chakravarty (1983) for details.

[5] The Lorenz function can be represented by a curve with cumulative share of income or expenditure on the horizontal axis and the cumulative percentage of the population on the vertical axis. Thus, if p represents the cumulative percentage of population, then, L(p) offers the corresponding consumption expenditure or income by the poorest p%. See Gastwirth (1971) and Kakwani (1980) for mathematical properties of the Lorenz function.

[6] The issue of decomposability and sub-group consistency is an important area in the measurement of poverty. For a detailed discussion, see Hagenaars (1987) and Foster and Shorrocks (1991).

[7] World Health Organisation has constructed an adult equivalence ratio for a range of household size and sex to be used for comparing consumption expenditures.

[8] This section is based on a report by Ministry of Economic Development and External Cooperation (1999).

[9] See Ravallion 1998 for the discussion of this approach.

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Annex Table (1): Decile Distribution of Real Per Capita Expenditure for Ethiopia: Birr Per Month (1994-1997)

	1994			1995			1997		
	National	Rural	Urban	National	Rural	Urban	National	Rural	Urban
10	19	19.10	18.0	16.17	16.15	18.47	22.06	21.89	17.95
10	30.49	30.49	32.67	29.95	30.03	33.60	36.09	36.03	32.59
10	41.44	41.33	44.39	42.97	43.05	45.10	48.47	48.56	45.38
10	52.58	52.82	55.57	56.0	56.22	57.88	60.02	59.91	58.72
10	65.33	65.38	67.54	73.49	73.42	70.17	72.37	72.22	73.41
10	80.15	79.93	80.66	93.83	94.11	84.80	88.50	88.72	89.99
10	97.45	97.54	99.57	120.93	121.21	103.94	114.10	113.77	111.66
10	117.92	117.54	128.29	160.12	160.02	131.72	146.53	146.73	139.88
10	149.60	149.31	169.74	229.68	229.86	178.91	197.9	197.44	195.93
10	254.36	253.94	344.75	613	614.39	371.23	368.26	362.41	448.52
Mean	99.0	90.74	104.11	138.0	143.84	109.58	116.0	114.76	121.4

Source: Household Panel Survey:1994-1997.

DETERMINANTS AND DYNAMICS OF URBAN POVERTY IN ETHIOPIA[*]

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Abstract

This paper investigates the determinants and dynamics of poverty in urban areas in Ethiopia. The results show that urban poverty is quite high in Ethiopia, indicating the seriousness of the problem. We observed high fluctuations in living standards mainly driven by fluctuations in food prices, particularly those of cereals. Thus, price stabilisation policies form important ingredients for fighting poverty. Factors that affect the dynamics of poverty are mainly education of head of the household and size of the household. Policies that promote human capital and control of population growth reduce greatly the probability of falling into poverty.

1. INTRODUCTION

For the last few decades, rural poverty has been a major concern in Ethiopia for quite understandable reasons. The bulk of the poor in the country resides in rural areas and the intensity of poverty is so rampant that, during and lean harvest years, millions are in danger of death from starvation. Even during relatively better years, incomes are very low to go round the year and as a result households usually suffer from malnutrition, particularly in pre-harvest seasons.

By rural standards, urban areas may be considered to have better living standards. Trends in recent years, however, indicate that poverty in most urban centres has been rising rapidly and building up fast to crisis proportions. The major reason for this is the economic decline in general and the stagnation in the rural economy in particular, the country experienced in the eighties. Most urban centres have also undergone rapid population growth due to the influx of migrants from rural areas affected by drought, famine and civil conflict. Most of these migrants are destitute and better opportunities do not await them in towns. The influx rather creates strain on the labour market and urban social service provisions and is likely to raise the cost of living, thereby affecting adversely the welfare of long-time urban residents.

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[*] The final version of this article was submitted in May 2002.

Current economic reform programmes are more likely to adversely affect urban rather than rural areas. The lifting of subsidies on basic goods and services, public expenditure cuts, streamlining of the civil service, tax reform measures, monetary contraction, and depreciation of the exchange rate are likely to have stronger repercussions on urban life, at least in the medium run.

Changes in urban poverty may therefore be due to the rural destitute joining the ranks of the urban poor. It could also be the net result of a dynamic process of some urban households moving into and others out of poverty. Understanding this dynamic process is of crucial importance in formulating poverty reduction programmes. Moreover, policy formulation benefit a lot if the characteristics of households vulnerable to welfare decline and households that are likely to improve their living standards are known at each stage of the reform process. This study tries to shed some light on the dynamics of urban poverty based on a panel data for 1994, 1995 and 1997 collected from a sample of households in seven major urban centres of the country.

2. THE DATA

The study uses data on a panel of households drawn from the Ethiopia Urban Socio-economic Survey conducted in three successive rounds in 1994, 1995 and 1997 by the Department of Economics of Addis Ababa University, the first and third rounds in collaboration with the Department of Economics of Goteberg University and the second with the Department of Agricultural Economics at Michigan State University. The surveys covered 1500 households in seven major urban centres – Addis Ababa, Awassa, Bahr Dar, Dessie, Dire Dawa, Jimma and Mekele-selected to represent the major urban socio-economic settings in the country. Addis Ababa, of course, is by far the largest city and domicile to diverse socio-economic groups. Awassa and Jimma were included in the sample to represent the mainly coffee-producing areas and, in the former case, to capture the socio-economic characteristics of the predominantly enset culture as well as the different socio-economic groups in southern Ethiopia. While Bahr Dar is located in the richer cereal producing areas in the north, Dessie and Mekele represent towns in poorer cereal-producing areas and catchments that are drought-prone and often affected by famine. Dire Dawa is mainly a trading centre on the route to Djibouti and is located in chat and coffee producing eastern part of the country.

Samples from each of these urban centres were selected by allocating the predetermined sample size of 1500 households in proportion to the total population of the selected urban centres in 1992 as estimated by the Central Statistical Authority. Accordingly, 900 households in Addis Ababa, 126 in Dire Dawa, 73 in Awassa, 101 in Dessie and 00 in each of the rest of the towns were sampled. These were further allocated proportionally at wereda (district) level and subsequently to 50% of kebeles (lowest administrative units) drawn randomly which served as primary sampling units.

Households were then selected from each of these primary units based on sampling frames prepared from the housing registry available at the kebele administrative offices. The sampling frames are obviously far from complete; in particular they miss an important social group from the point of view of poverty assessment, the homeless whose ranks are rapidly swelling in most large urban centres of the country.

All three rounds tried to cover the same households and to maintain the same sample size. Some households, however, had to be replaced in the second and third rounds because they either refused to participate or have moved from their previous addresses. In constructing the panel data, we also encountered problems in matching the households due to errors in recording household identification codes. These reduced the panel used in this study to 1249 households.

The survey generated comparable data sets on the demographic characteristics of households, the educational level of members of households and their health status (including anthropometric measurements), employment, credit, income, and consumption and expenditure. Attempt was made to solicit data on incomes of all members and from all possible sources: wage and salaries, business income, in kind payments, and remittances. The consumption data included both food and non-food consumption. Under the former, the survey recorded purchased food consumed at home and outdoors as well as consumption from own harvest, payments in kind, loan or food aid during a week. Quarterly and monthly recall was used to collect the non-food consumption data (for more details on the sampling procedure and data, see DE AAU&GU 1995).

In this study we preferred to use the consumption rather the income data to measure and construct the profile of urban poverty. Apart from the conceptual problems that arise in using income as a measure of living standards (for detailed discussion on this, see, for example, Lipton and Ravallion 1995), measurement error is bound to be serious, particularly in countries like ours. Indeed, in our data income is substantially understated compared with consumption expenditure. Households, particularly the poor, obtain incomes from multiple sources, some of which are non-regular. While income from regular sources are reported relatively more accurately, non-regular income is either not reported at all or understated which could lead to undue overestimation of poverty.

Using consumption expenditure as an indicator of welfare also has its own problems (see Lipton and Ravallion 1995 for detailed discussion on this). In relation to the data used in this study, three problems are worth noting. First, consumption includes, though accounting only 3.5%, own produced food items which raise the problem of valuation. This is handled by valuing all such non-marketed consumption at prices collected at the time of the household survey. More serious is the problem of how to include the benefits derived from own housing and the use of durable goods. While we have included rent paid by tenant households, we have not accounted for house ownership thereby underestimating the welfare levels of households living in their own

houses. Secondly, there is the problem of the intra-household distribution of consumption and differences in needs and tastes among members. A common practice is to make adjustments by deflating consumption expenditure by endogenously derived or exogenously determined adult equivalent units. Apart from the computational complexities involved in estimating equivalent scales from observed household data, it is not clear how well they reflect the needs and the intra-household distribution of consumption and there are theoretical problems in interpreting the estimates (Ravallion 1992). In view of these and unavailability of adult equivalent scales estimated for Ethiopia previously, we have used the WHO Conversion factors developed for Africa. Thirdly, food sharing with non-members, it is observed in the survey, is quite a common practice and is likely to have implications on household welfare. The survey has collected information on this and it is used to make appropriate adjustments.

The survey also collected data on other welfare indicators such as housing including type of tenancy, type of housing and availability of associated services; ownership of consumer durables—type, number and estimated value—as well as depletion and acquisition of such goods.

3. POVERTY MEASUREMENT AND PROFILE

3.1. Setting the Poverty Lines

Poverty is a multi-dimensional concept and can be defined in several ways. This is concerned with measuring absolute poverty in urban Ethiopia This concept abstracts from non-material factors that influence human satisfaction and limit poverty only to material deprivation, the inability to attain an income or consumption level considered to be minimal to lead a normal life by the standards of a given society. Within this domain, the exercise is to classify a population into the poor, those who fall below what is regarded as an absolute minimal standard of living, and the non-poor. This requires setting what constitutes an absolute minimal standard of living, the poverty line.

The most commonly used procedures for setting the poverty line are the food energy intake (FEI) method and the cost of basic needs (CBN) approach. The FEI method located the poverty line as the income or consumption expenditure level just adequate to meet a predetermined food energy requirement. The usual practice is to derive the poverty line from the regression estimates of a cost-of-calories function which specifies expenditure as a function of calorie consumption (Greer and Thorbecke 1986) or its inverse (Kyreme and Thorbecke 1987). This method is computationally very simple and requires data only on quantities of food items consumed and food or total expenditure. While the method could provide a robust single national poverty line, it may result in inconsistent estimates when the aim is to make poverty comparisons among different sub-groups of a population or over time. This is

because the stipulated relationship between food energy intake and consumption expenditure will not be the same across sub-groups or over time, and will tend to shift due to difference in tastes, relative prices, activity levels, and provision of public goods (see Ravallion 1992; Lipton and Ravallion 1995; Ravallion and Bidani 1994).

The CBN method defines the poverty line as the cost of a bundle of goods considered to be sufficient to meet basic consumption needs. In implementing this definition, the CBN approach usually proceeds in two stages: first is to determine the food consumption bundle just adequate to meet a stipulated food energy requirement and then to give an allowance for basic nonfood consumption. The basic food basket is derived from the consumption of a reference household deemed to be typically poor. The food basket is then valued at regional prices to obtain the food poverty line. The allowance for basic nonfood consumption is again anchored on the consumption patterns of the poor. One approach based on this principle is to divide the food poverty line by average food share of households deemed to biases in the poverty profile (Ravallion and Bidani 1994) . An alternative approach, suggested by Ravallion (1993), is to scale up the food poverty line by the nonfood budget share estimated at the food poverty line from the regression parameters of a Working-Leser type Engel curve (see also Ravallion and Bidani 1994).[1]

Both the FEL and the CBN methods are anchored on an exogenously determined minimum energy requirement. The CBN method is now widely regarded as theoretically sound and empirically robust (for more details on this, see Ravallion and Bidani 1994).

In this study, we follow the CBN method to construct the food poverty line. In implementing this, we first derived the average quantities of food items that are most frequently consumed by households falling in the lower half of the expenditure distribution in 1994[2]. This is then converted into calorie consumption and scaled up to provide 2,200 kgcal per adult per day assumed to be the minimum energy requirement to perform normal physical activities. This bundle is held constant over the study period which amounts to assuming that the consumption pattern and behavior of the poor have remained unchanged. The food poverty lines are then estimated by valuing the bundle at prices that prevailed in each urban centre at the time of expenditure surveys collected by the Central Statistical Authority.

The basic food basket derived using the above procedure is reported in Table 1. The table shows that the diet of the poor is heavily dominated by cereals and pulses. Of 21 food items in the basket, 12 are cereals, pulses or their products. More importantly, cereals and cereal products alone account for 81% of calorie consumption and 61% of food expenditure of households who managed to attain a consumption level at the food poverty line. Inclusion of pulses and pulse products in the diet raises the proportions to 90% and 70%, respectively (see Table 2).

In giving allowance to basic nonfood consumption, we adopted the Orshansky method rather than the method suggested by Ravallion. The application of various specifications of the Engel curve resulted in much higher food share at the poverty line than is warranted by the data and subsequently in underestimation of the total poverty line and hence of total poverty. This procedure is anchored on the assumption that households are willing to forgo some basic food need in order to obtain a minimal nonfood consumption. Probably this is not a valid assumption in describing the observed consumption behaviour of our sample households. It may be that households follow a two-stage budgeting strategy, i.e. households would first allocate their budget to food consumption and then to nonfood items. While the Orshansky method also rests essentially on the same assumption as the one suggested by Ravallion, it follows a different procedure. The total poverty line is obtained by dividing the food poverty lines by average food budget share of households that are in the neighbourhood of the food poverty line.

The poverty lines estimated using the procedures described above are reported in Table 3. The poverty lines can be interpreted as a kind of price index reflecting the cost of living in the different urban centres. The estimates indicate that, of the seven urban centres covered in the study, Addis Ababa, Dire Dawa and Mekele are relatively more expensive to acquire basic needs while Bahr Dar is the cheapest. Both the food and total poverty lines rose substantially in 1995 as compared with the 1994 levels and then declined in 1997 reflecting the general price trend during the period.

3.2. Poverty Measures

Poverty measurement requires using a summary measure that aggregates over individuals or households. The most widely accepted measures and with important desirable properties for poverty comparisons are the family of P_a indexes suggested by Foster, et al.. (1984). Among these, the most commonly applied measures in empirical studies are defined as

$$P_a = \frac{1}{n} \sum_{i=1}^{q} \frac{(z - x_i)^a}{z} \; , \; \alpha = 0, \; 1, \; 2 \tag{1}$$

where x_i is income or consumption expenditure of household I, z is the poverty line, n is size of population and q is the number of the poor. P_o measures the incidence of poverty and tells us only the proportion of the population that are poor. P_1 helps us to capture this; it measures the depth of poverty, how much on the average the poor fall below the poverty line. P_2 is a measure of poverty by weighing the situation of the poor by the square of the shortfall of their income or expenditure from the poverty line.

The estimated poverty measures for the period 1994-97, reported in Tables 4-6, show that the overall incidences of urban poverty are quite very high, on average about 46 percent. The incidence of poverty rose sharply in 1995 to 51.6% from 46.7% in 1994 largely as a result of higher prices (the rate of inflation as measured by the Addis Ababa CPI was about 12% for food and 10% overall) and fell back in 1997 to almost its 1994 level again essentially in response to price changes, this time due to general price decline recorded in the first half of 1997. The decline in food prices was quite pronounced, at about 8%, between November 1995 and February 1997, months corresponding to our expenditure survey. Most marked was the decline in prices of cereals and pulses which constitute a substantial proportion of the consumption of the poor. This suggests that fluctuations in food prices and in particular of cereals (to a much lesser extent of pulses) could heavily impact on the welfare of the poor.

This trend is also reflected in the poverty situation in some of the urban centres. The trend is highly pronounced in Addis Ababa, from which about 60% of our sample is drawn. The incidence of poverty rose to nearly 61% in 1995 but dropped in 1997 even to a lower level than that of 1994. Some towns - Awassa, Jimma annd Mekele - however, enjoyed more or less a consistent decline in poverty - from 46 to 36%, from 44 to 36% in the first two towns and from about 37 to 30% in the latter case. Awassa and Jimma may have benefited from expanding coffee trade and incomes in Mekele may have risen due to reconstruction programmes. While poverty remained unchanged in Bahr Dar, Dessie and Dire Dawa experienced a sharp increase in poverty (from 40 to nearly 55 % in the former case and from 21 to 45% in the latter) during the three years. Dire Dawa may have suffered from a decline in the once booming contraband trade and in Dessie it may have to do with the 'hangover' effects of the influx of migrants into the town at the end of the civil war.

Examination of the estimates of the depth and severity of poverty (P_1 and P_2) also indicate the seriousness of the problem. The overall figures stand at 19 and 10 percent respectively in 1997. As monotonic transformations of P_o, they followed the pattern described above, rising in 1995 and falling in 1997. While the poverty-gap index (P_1) shows the average shortfall of the poor from the poverty line, the interpretation of index of severity (P_2) is not straightforward. Comparing the trends in the two measures and P_o however, can give an indication on whether the distribution among the poor has worsened or not (Grootaert 1995). Between 1994 and 1997, P_o declined marginally by less than 1% but P_1 and P_2 increased by 5.6 and 4.1%, respectively indicating that the poor became poorer during the three years. A look at Table 7, which presents the distribution of consumption expenditure, shows this more clearly. The share of the poorest 10% households in total expenditure shows this more clearly. This share of the poorest 10% households in total expenditure declined by about 18%. Actually the shares of all deciles, but the tenth, underwent a decline but the decline is more pronounced for households falling below the median of the distribution (the upper cut-off point of the fifth decile is very close to the estimated poverty lines). The share of the top 10% of the sample households, however, rose

substantially from 32% to 40%, indicating a sharp increase in inequality. Thus while the conditions of the urban poor worsened, the rich got much richer.

The poverty-gap index has also an important application. It can be used to estimate the size of resource transfer needed to eradicate poverty. Under the assumption of perfect targeting, the minimum cost of raising the expenditure levels of all poor up to the poverty line would be the sum of expenditure gaps of all poor, i.e.

$$RC = \sum (z - x_i)$$ [2]

The estimate of this resource cost for the sample comes to 16% of the total consumption expenditure of the non-poor. If a redistributive measure is to be taken through the introduction of a tax system, this would presuppose imposing, on average, a 16% tax on the incomes of the nonpoor on top of the existing rate. With the imposition of this rate, the required resource transfer could be raised from the top three deciles alone without putting any of the nonpoor at the risk of falling into poverty. Such a high increase in income tax may be undesirable from the efficiency point of view. Its effect could, however, be substantially reduced with the implementation of a progressive tax system. In broad terms, what this suggests is that redistributive measures within the urban sector itself cannot be ruled out as possible means of reducing poverty.

3.3. Poverty Profile

A poverty profile shows how a poverty measure varies across sub-groups of a population such as regions of residence, sectors of employment, educational status or other characteristics of households. It helps to inform policy by bringing out how sectoral or regional economic changes could affect the aggregate poverty measure (for more details see Ravallion, 1992; Lipton and Ravallion 1995). Suppose, for instance, a poverty profile shows that region A has a higher incidence of poverty, P_1, than region B and it is intended to reduce this through resource transfer by imposing a lump-sum tax on each household in B and distributing the proceeds equally to each household in A. This will reduce the aggregate depth of poverty, P_2. Thus, in general, to reduce P_a, through a transfer that increases incomes in a recipient sub-group by the same amount, the relevant poverty indicator is P_{a-1} (Lipton and Ravallion 1995:2580).

We can use the decomposability poverty of the P_a indexes used above to construct poverty profiles. An index P_a is said to be additively decomposable across sub-groups of a population if, for mutually exclusive sub-groups with a population share of k_j, it can be expressed as the weighted sum of the corresponding index in each sub-group, i.e.

$$P_a = K_j P_{aj}$$
[3]

Based on this, it is possible to compute the contribution, say, C_j of each sub-group to total poverty as

$$C_j = \frac{K_j P_{aj}}{P_a}$$
[4]

Using this result, we constructed two sets of decompositions of the aggregate incidence of poverty: by urban centre and household socio-economic characteristics presented in tables 8 and 9, respectively. The decomposition by urban centre shows that Addis Ababa has proportionately the highest concentration of the poor accounting for about 71% of aggregate poverty incidence in 1994 and 1995 and declining to 67%, but remained much higher than its sampling fraction of 60%. The shares of Awassa, Jimma and Mekele declined by nearly 50%, while those of Dessie and Dire Dawa rose sharply, more than doubling in the later case, probably for the same reasons discussed above.

The decompositions by household characteristics can be classified broadly into two: demographic characteristics such as household size, age, sex and marital status of the household head; and socio-economic characteristics including religion and ethnic background, educational status, sector of employment of the head and dependency rates defined here as household size divided by the number of members engaged in income earning activities.

Comparing the conditions of male and female-headed households, we see that poverty is much higher among the latter, about 52% as against 43% in the former case. The contribution of male-headed households is however greater due to their larger representation in the sample. Most of the female heads, we observe from the data, are widowed (54%), divorced (20%) or separated (8%). In the case of male-headed households the three categories put together account for less than 6%. Apart from suggesting that it is usually much harder for females to reconstruct a family once it breaks down, it also indicates that the household is left with much less income-earning opportunities when a male head is not there. Moreover, we found out that most of the female heads are either housewives or engaged in low-income earning activities, such as female household business activities (making and selling local drinks and food, for example) and other informal sector activities (these account for nearly 7%) but very few in public sector or formal private sector employment.

Marital status also has important implications for poverty. Households whose heads are widowed, divorced or separated experience high poverty incidence (50% or

substantially from 32% to 40%, indicating a sharp increase in inequality. Thus while the conditions of the urban poor worsened, the rich got much richer.

The poverty-gap index has also an important application. It can be used to estimate the size of resource transfer needed to eradicate poverty. Under the assumption of perfect targeting, the minimum cost of raising the expenditure levels of all poor up to the poverty line would be the sum of expenditure gaps of all poor, i.e.

$$RC = \sum (z - x_i) \qquad [2]$$

The estimate of this resource cost for the sample comes to 16% of the total consumption expenditure of the non-poor. If a redistributive measure is to be taken through the introduction of a tax system, this would presuppose imposing, on average, a 16% tax on the incomes of the nonpoor on top of the existing rate. With the imposition of this rate, the required resource transfer could be raised from the top three deciles alone without putting any of the nonpoor at the risk of falling into poverty. Such a high increase in income tax may be undesirable from the efficiency point of view. Its effect could, however, be substantially reduced with the implementation of a progressive tax system. In broad terms, what this suggests is that redistributive measures within the urban sector itself cannot be ruled out as possible means of reducing poverty.

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above) and account close to 40% of aggregate poverty. The condition is not much better for households with married heads; poverty incidence is about 45% but their share in total poverty is much higher (nearly 60%). Single household heads, however, have a much lower but rising (during the three years) incidence of poverty consistent with the finding below on the relationship between poverty and household size.

The decomposition by age of the household head shows that the incidence of poverty consistently rises as the head gets older. The share in aggregate poverty also increases up to 60 years. This contrasts with what is usually hypothesized: the household income and hence welfare increases up to a certain age and then declines. Our finding may have to do with the relationship between age and household size. Older household heads have larger families and poverty rises sharply with size. If having more people in the household meant greater income-earning opportunities, things would have improved as the household got larger. This is not the case in our sample; more people meant higher dependency rates and we found out, not surprisingly, poverty sharply increases with this ratio.

Examination of the poverty situation by educational level of the household head reveals that higher-level education is correlated with lower poverty. The poverty incidence is below 15% for households whose heads have college education, 28% for heads with secondary education and about 46% for those with primary education only. The poverty incidence as well as the contribution to aggregate poverty are not only lower for better educated household heads but they have also been declining overtime. Household heads with no schooling, on the other hand, experienced rising and high poverty incidence (above 60%); their situation also worsened over time. This finding suggests that investments in human resource development could have important bearings on poverty reduction.

From the decomposition by occupation of the head, it can be observed that poverty conditions are in certain types of employment than in others. Poverty incidence among casual and own account workers is not only high (65-70% and 42-50%, respectively) but has also been rising during the three years; and they have a proportionately higher contribution to aggregate poverty. In the latter case this might be due to the unsteady nature of employment and hence of income while the latter group is most likely employed in the informal sector whose income-generating capacity is usually very low. Poverty is very low among public sector and formal private sector employees and their situation does not seem to have worsened over time. Not surprising, poverty is very high and worsening among the unemployed and pensioners.

The religion and ethnic dimensions of poverty has also been examined. Orthodox Christians have a stable poverty incidence of about 47% and account for nearly 85% of aggregate poverty. Households affiliated to other Christian sects have lower and rapidly declining poverty incidence and share in aggregate poverty. Among Muslims,

poverty incidence rose from 42% and their contribution to aggregate poverty increased from 11% to 12%.

The three major ethnic groups—the Amhara, Oromo and Tigre-account for about 75% of aggregate poverty. Poverty increased from 43 to 46% among the first group, but declined marginally among the second (from about 55% to 53%) and the third (from 34.8 to 28.4%) during the three years. The situation among the second (from about 55% to 53%) and the third (from 34.8% to 28.4%) during the three years. The situation among the Gurage also improved.

4. POVERTY DYNAMICS AND DETERMINANTS

4.1. Movements In and Out of Poverty

In section 3.1 above we showed that poverty increased in 1995 and fell back in 1997 back to almost its initial level in 1994. A change in poverty could be due to some nonpoor households joining the existing poor or some of the poor escaping poverty. It could as well be the net outcome of some people moving into poverty and others moving out of poverty. It is important from the point of view of poverty reduction policy to distinguish households that are permanently poor from those that are temporarily poor. In the former case, long-term poverty reduction measures, such as permanent transfers, may be required while in the case of the latter, programmes that complement their incomes during the period that they are poor might only be needed (Grootaert et al., 1995). It is also crucial for policy formulation to identify the characteristics of households that are temporarily or permanently poor.

The fluctuations observed during the three-year period of this study is the net result of a dynamic process of some households escaping poverty and some nonpoor households becoming poor. Between 1994 and 1997, 14.8% of the sample households slipped into poverty while 15.2% moved out of poverty, thereby giving a 0.4% decline in the incidence of poverty (see Table 10). The increase in poverty in 1995 is due to more households becoming poor (16.6%) than the poor escaping poverty (11.5%) while the decline in 1997 from the 1995 level is the result of more households escaping poverty than those slipping into it.

Examination of the characteristics of households that move in and out of poverty (presented in Table 11) demonstrates that certain social groups are more vulnerable than others. Female-headed households have a higher probability of slipping into poverty than male-headed households. Similarly, the chance of falling into poverty rises with household size and the elderly are more likely to move into than move out of poverty. In line with the findings of the poverty profile presented in the previous section, widowed and divorced households have a very high and rising probability of suffering from a decline in standard of living leading to poverty. Again consistent with the decomposition results, the probability of escaping poverty generally declines with

higher educational level of the head of household. Looking at the picture by sector of employment, we see that casual workers, pensioners, and private sector employees have a higher chance of falling into than making it out of poverty.

4.2. Modeling the Determinants and Dynamics of Poverty

A host of factors affect living standards and poverty of households. In this paper we concentrate on some of the major household socio-economic characteristics that are correlated with living standards and hence poverty. Following Coulombe and McKay (1996) and Grootaert et al. (1995) the determinants of living standards are broadly classified into two: those that reflect household needs which include household size and composition; and those that determine the income-generating opportunities available to the household such as education, employment and ownership of assets.

In assessing the importance of the determinants of poverty most studies use probit or logit models (for example, Sahn and Ninno 1994; del Ninno 1994) and some a multi-nominal logit selection model (Coloumbe and McKay 1996). The application of these models entails loss of information because they focus on the poor and not on household welfare in general. Multivariate regression models on the other hand allow making the best use of available data (examples of applications are Kyreme and Thorbecke 1991; Ninno 1994). All these studies are, however, based on cross-section data and do not capture the dynamic aspects of poverty. Grootaert et al. (1995) use a dynamic model to capture the factors that determine changes in standard of living and the mobility of households in and out of poverty from panel data. This study adopted this last procedure. The model is derived from the standard utility maximization assumptions and uses real household expenditure per capita as money-metric measure of utility which takes into account differences in household size and relative prices. For lack of regional price deflators, we used here total household expenditure per adult equivalent as the dependent variable in the model with the exogenously predetermined household characteristics as the explanatory variables. The model in reduced form can be written as:

$$X_i = f(A_i, R_i) \tag{5}$$

Where X_i =Consumption expenditure of household I per adult equivalent; A_i =Assets of household I and R_i= A set of characteristics which represent the economic environment in which the household operates.

For application on panel data, taking the first difference of equation [5] we have

$$\Delta X_i = f(\Delta A_i) \tag{6}$$

R_i drops out of equation 6 because it is the same for all households and constant over time. Equation 2 expresses changes in standard of living a function only of household endowment and assumes that initial conditions do not matter. But Grootaert et

al.(1995) rightly argue that they do matter and must be incorporated into the equation. Thus the model can be written as

$$\Delta X_i = f(A_i, \Delta A_i, R_i) \tag{7}$$

We estimated two sets of regressions for equations 6 and 7 by OLS method, one for the period 1994-95 and another one for 1995-97 using variables that account for the household's endowments of human and physical capital as explanatory variables. The human capital variables include household size, age and sex composition, dummies for educational level of the head of the household and sector of employment, and number of employed members in the household. Age and squared age of the household head were also incorporated as explanatory variables to capture work experience and the stage in the life cycle of the household. The inclusion of consumption expenditure substantially improves the fit; and hence the 1994 and the 1995 consumptions per adult were used as initial conditions for the first and second set of regressions, respectively.

The household physical capital constitutes the physical assets which indicate the income-earning potential of the household such as ownership of productive equipment. For lack of sufficient information on other variables we included only ownership of housing and the number and value of consumer durables as regressors. While these do not contribute to income creation directly, they do so indirectly, for instance, by serving as collateral for borrowing. More importantly, such goods serve households for income smoothing as they can be sold to cover consumption at times of economic distress.

The different variables include changes in household composition, number of employed members, and ownership of durables.

The results are reported in tables 12a and 12b. The first columns of these tables present the estimates when consumption expenditure alone is used as a regressor. The slope coefficients are −0.54 and −0.73, suggesting that an increase/decrease in expenditure per adult is associated with a negative/positive change in household welfare as measured by the change in expenditure. Grootaert et al. (1995) argue that such a result implies that there are large transitory components in the expenditure of most households. This is also consistent with fluctuations in poverty discussed in section 3 and the high mobility into and out of poverty presented in section 4.1 above.

With regard to the human and physical capital of the household, we observe that their inclusion demonstrates a better fit of the regression. Among the human capital variables, household composition and education significantly affect changes in welfare. Households with more children, male adults and the elderly are more likely to suffer from welfare losses. Higher levels of education are associated with increase in welfare; households with secondary or tertiary education are more likely to enjoy welfare improvements while households with no schooling largely suffer from welfare

decline. Consistent with the findings discussed in section 3.3, age has a negative association with welfare changes. Among employment groups, only households whose heads are private business employer have a fairly high chance of improving their welfare.

Among the physical capital variables, ownership of housing does not have a strong impact as its coefficient is insignificant in all equations. The reason for this could be the fact that most households in our sample lives in government-owned housing paying only nominal rent as compared to the going market rate. Ownership of consumer durables, however, has significant effect on welfare changes.

In short, our findings indicate that households with many children and elderly and whose heads are old, and have little or no education, are more likely to suffer from welfare losses and hence slip into poverty. On the other hand, households with better educated heads or with fewer children and elderly have higher chances of improving their welfare and hence of escaping erosion into poverty.

5. CONCLUSIONS

The results of the poverty estimates in this study clearly indicate that, overall, urban poverty is quite high (about 46%) and worthy of serious attention. Moreover, households experience short-term fluctuations in standard of living primarily due to price movements. In particular, low-income households are severely affected by changes in food prices. Food accounts for a substantial proportion (about 65%) of the consumption expenditure of the poor and dominates the estimated poverty lines. In fact, few food items, specifically cereals (and to a lesser extent pulses), are most important both in terms of providing essential nutrients as well as budget share. Observed changes in poverty largely correspond to grain price movements. This suggests that grain price stabilization policies could have a strong impact in protecting the welfare of the poor. The observed annual fluctuations in poverty also suggest the need for monitoring welfare changes regularly at reasonably short time intervals.

Decompositions of poverty both by urban centre and household characteristics and the assessment of the dynamics and determinants of poverty reveal important results for poverty reduction policies. The poor are concentrated in major urban centres in particular in the capital, Addis Ababa. Changes in the estimated poverty measures are the net outcome of household mobility into and out of poverty. Examination of the socio-economic characteristics of the poor and the dynamic process of movements into and out of poverty indicates that certain groups are more likely to suffer welfare losses and hence fall into poverty than others. Better educated households have better chances of improving their welfare, pointing to the importance of human resource development programmes to poverty reduction. Large households with many elderly members and children have higher chances of falling into poverty than moving

out of it. This suggests that expansion of family planning programmes could play a significant role in reducing poverty in the long run.

Table 1: Basic Food Basket Giving 2,200 kgcal (per adult per month)

Food Item	Quantity (kg)	Food item	Quantity (kg or 1)
Cereals		Other food	
Teff	8.82	Milk	0.39
Barley	0.39	Bread	0.94
Wheat	2.42	Oil	0.47
Maize	2.5	Injera	1.64
Sorghum	2.5	Sugar	0.23
		Coffee	0.23
Pulses			
Lentils	0.39	Tels	0.39
Horse beans	0.23	Berbere	0.32
Horse beans	0.23	Salt	0.62
Cow Peas	0.23		
Shiro	0.94		
Vegetables			
Gomen	0.39		
Potatoes	0.94		
Onions	0.94		

Table 2: Calorie Contribution and Expenditure Share of Major Food Items at the Food Poverty Line

	Calorie Contribution(%)	Expenditure Share (%)
Cereals & Cereal products	81	61
Pulses & Pulse products	9	9
Other food	10	20
Total	100	100

Table 3: Food and Total Poverty Lines (Birr per adult per month)

Urban center	1994		1995		1997		Sample Size
	Food	Total	Food	Total	Food	Total	
Addis Ababa	67.30	90.95	70.61	112.08	58.61	96.08	753
Awassa	57.03	79.21	56.14	86.37	48.66	73.73	56
Bahiar Dar	54.40	72.50	54.92	85.81	45.48	64.06	86
Dessie	57.13	82.75	60.97	83.52	50.70	79.22	77
Dire Dawa	70.37	90.22	70.09	103.07	61.88	99.80	107
Jimma	55.40	79.95	53.75	85.32	45.45	61.42	91
Mekele	62.77	96.98	66.81	102.79	63.80	96.68	79
Weighted Average	64.73	88.17	66.77	104.05	56.42	89.67	1249

Table 4: Estimates of the Incidence of Poverty (P_o) 1994-97

Urban centre	1994		1995		1997	
	Food	Total	Food	Total	Food	Total
Addis Ababa	0.525	0.546	0.614	0.608	0.495	0.514
Awassa	0.464	0.464	0.339	0.339	0.339	0.357
Bahr Dar	0.279	0.279	0.302	0.337	0.291	0.279
Dessie	0.351	0.403	0.481	0.442	0.546	0.546
Dire Dawa	0.178	0.206	0.336	0.346	0.355	0.449
Jima	0.363	0.440	0.440	0.407	0.341	0.363
Mekele	0.342	0.367	0.346	0.397	0.354	0.304
All	0.441	0.467	0.519	0.516	0.445	0.463

Table 5: Estimates of the Depth of Poverty (P_1) 1994-97

Urban centre	1994		1995		1997	
	Food	Total	Food	Total	Food	Total
Addis Ababa	0.22	0.221	0.271	0.273	0.210	0.212
Awassa	0.218	0.206	0.148	0.159	0.167	0.162
BahrDar	0.085	0.91	0.131	0.135	0.127	0.117
Dessie	0.134	0.160	0.189	0.190	0.226	0.22
Dire Dawa	0.045	0.049	0.116	0.120	0.154	0.178
Jimma	0.14	0.161	0.171	0.166	0.119	0.119
Mekele	0.127	0.128	0.225	0.221	0.135	0.135
All	0.179	0.183	0.227	0.229	0.187	0.189

Table 6: Estimates of the Severity of Poverty (P_2) 1994-97

Urban Centre	1994		1995		1997	
	Food	Total	Food	Total	Food	Total
Addis Ababa	0.122	0.121	0.153	0.153	0.115	0.115
Awassa	0.125	0.125	0.087	0.091	0.098	0.099
Bahr Dar	0.043	0.047	0.074	0.074	0.073	0.059
Dessie	0.07	0.084	0.097	0.099	0.129	0.122
Dire Dawa	0.019	0.020	0.054	0.056	0.095	0.098
Jimma	0.075	0.079	0.09	0.092	0.056	0.056
Mekele	0.066	0.067	0.171	0.156	0.072	0.076
All	0.098	0.098	0.129	0.129	0.103	0.102

Table 7: Distribution of Monthly Per Adult Equivalent Consumption Expenditure 1994-97

Decile	1994		1995		1997	
	Mean	% share	Mean	%share	Mean	%share
1	23.64	1.77	23.64	1.57	23.77	1.45
2	41.15	3.23	42.15	2.81	41.34	2.57
3	56.29	4.28	56.29	3.81	55.72	3.44
4	71.67	5.45	71.67	4.84	71.41	4.37
5	86.05	6.56	86.05	5.93	88.05	5.43
6	103.20	7.92	103.20	7.24	112.48	6.93
7	127.01	9.59	127.01	8.92	142.92	8.88
8	163.96	12.56	163.96	11.61	183.84	11.33
9	218.50	16.62	218.50	15.95	252.63	15.45
10	423.82	31.99	423.82	37.33	651.44	40.16

Table 8: Decomposition of Poverty by Urban Centre

Urban Centre	Contribution to Po			Sampling Fraction
	1994	1995	1997	
Addis Ababa	70.5	71.0	67.0	60.3
Awassa	4.5	3.0	3.5	4.5
Bahr Dar	4.1	4.5	4.2	6.9
Dessie	5.3	5.3	7.3	6.2
Dire Dawa	3.8	5.7	8.3	8.6
Jimma	6.9	5.7	5.7	7.3
Mekele	5.0	4.8	4.2	6.3

Table 9: Decomposition by Household Characteristics

Household Characteristics	1994		1995		1997	
	% Poor	% Non Poor	% Poor	% Non-poor	% Poor	%Non Poor
Household Age Structure						
15-29	28.6	3.1	31.7	3.6	30.2	3.3
30-39	42.6	19.4	38.9	18.2	40.3	18.5
40.59	49.0	52.8	46.9	52.2	48.2	52.3
60 and above	50.0	24.7	50.9	25.9	52.1	26.0
Sex of Household Head						
Male	43.5	58.0	42.3	58.3	43.6	58.5
Female	52.5	42.0	50.4	41.7	51.4	41.5
Household Size						
1	33.9	3.3	27.3	2.3	21.4	2.1
2.5	38.6	37.7	44.7	39.6	37.9	37.4
6.9	53.6	47.7	58.1	46.7	54.9	49.3
10	63.5	11.3	70.2	11.3	62.5	11.2
Education of Household Head						
No schooling	59.5	24.2	61.4	25.7	64.1	26.3
Religious/tradition/	52.6	12.3	51.8	12.6	61.3	14.5
Primary (incomplete)	58.5	24.2	49.6	21.1	49.0	20.4
Primary (complete)	46.3	13.9	44.0	13.6	46.9	14.2
Secondary	28.4	10.8	28.4	11.2	28.4	10.9
Vocational/Technical	-	-	-	-	-	-
College and above	14.6	2.4	12.5	2.1	11.5	1.9
Occupation of/head of Households***						
Private business employer	16.0	0.7	24.0	0.9	12.0	0.5
Public sector employee	33.9	16.8	25.7	13.1	32.9	16.4
Private sector employee	30.0	3.1	40.0	4.2	36.7	3.8
Casual worker	65.1	9.3	61.4	9.0	69.9	10.0
Pensioner	52.5	16.0	53.7	16.8	52.5	16.1
Own account worker	41.2	15.2	50.2	17.2	42.1	16.1
Unemployed	60.5	11.8	61.1	12.2	57.9	11.4
Female Business activity	65.9	14.6	64.3	12.9	61.2	13.7
Marital Status by Head of Household						
Single	15.0	1.6	26.7	2.9	28.3	3.0
Married	46.1	59.9	44.3	59.4	45.3	59.2
Widowed	54.1	25.1	50.2	24.0	52.2	24.4
Divorced	49.5	9.2	44.7	9.1	46.7	8.7
Separated	52.1	4.3	54.2	4.7	56.3	4.7
Religion of Head of Household						
Orthodox Christian	47.7	84.8	52.8	84.9	47.1	84.5
Catholic	45.5	0.9	36.4	0.6	27.3	0.5
Protestant	46.4	2.2	50.0	2.2	39.3	1.9
Other Christian	40.0	0.3	60.0	0.5	20.0	0.2
Muslim	41.7	10.9	46.3	10.8	45.0	11.9
Ethnic Background of Head of Household	42.9	46.5	42.9	48.0	46.0	50.2
Amhara	42.9	46.5	42.9	48.0	46.0	50.2
Oromo	54.8	20.4	51.2	19.6	53.0	19.9
Tigre	34.8	8.4	32.9	8.1	28.4	6.9
Harari	33.3	0.3	16.7	0.2	16.7	0.2
Gurage	60.4	14.9	61.7	15.6	53.5	13.3

Table 10: Movements in and Out of Poverty

	1994-95		1995-97		1994-97	
	Count	%	Count	%	Count	%
Moved in	26/7	16.6	126	10.1	185	14.8
Moved Out	14/4	11.5	193	15.5	190	15.2
Net change	63	5.1	-67	-67	-5	-0.4

Table 11: Characteristics of Households that Move in and Out of Poverty

Household Characteristics	1994 to 1995		1995 to 1997		1997 to 1997	
	% Poor to Nonpoor	% Nonpoor to Poor	% Poor to Nonpoor	% Nonpoor to Poor	% Poor to Nonpoor	% Nonpoor to Poor
Household Age Structure						
15-29	11.1	22.2	17.5	7.9	12.7	14.3
30-39	11.5	13.7	15.3	10.7	14.8	12.5
40-59	11.9	16.1	14.6	9.6	15.0	14.1
60 and above	10.9	18.6	16.8	11.6	16.4	18.5
Sex of Household Head						
Male	11.6	16.6	13.9	9.0	14.0	14.1
Female	11.5	16.2	18.0	12.3	17.1	16.0
Household Size						
1	3.1	12.5	7.3	4.9	21.4	8.9
2-5	11.4	18.8	16.4	10.9	15.3	14.6
6-9	11.3	15.8	15.3	9.6	14.1	15.4
10	15.3	12.9	15.2	10.6	17.3	16.3
Education of Household Head						
No schooling	9.7	17.8	16.1	13.1	14.8	19.4
Religious/traditional	10.9	16.1	10.2	13.9	10.9	19.7
Primary (incomplete	19.2	15.8	17.1	10.8	23.2	13.7
Primary (complete)	12.0	19.4	17.7	10.9	14.3	14.9
Secondary	9.9	17.6	14.4	6.8	14.0	14.0
Vocational/technical	-	-	-	-	-	-
College and above	4.2	5.2	8.3	4.2	8.3	5.2
Occupation of/head of Households***	16.0	8.0	8.0	4.0	16.0	4.0
Private business	11.8	11.5	9.0	8.3	12.5	11.4
employer	11.7	23.3	13.3	8.3	16.7	23.3
Public sector employee	13.3	16.9	10.8	12.0	12.0	16.9
Private sector employee						
Casual worker	11.9	20.9	19.2	10.2	16.4	16.4
Pensioner						
Own account Worker	9.5	18.6	14.9	15.8	18.6	10.4
Unemployed	12.4	13.3	14.2	11.5	16.7	14.0
Others Female Business activity	15.5	14.0	19.4	14.7	19.4	16.3
Marital Status by Head of Household						
Single	6.7	21.7	11.7	10.0	5.0	18.3
Married	11.1	16.7	14.8	8.4	14.8	14.0
Widowed	14.2	16.1	19.5	16.1	18.3	16.4
Divorced	13.1	15.0	15.0	10.3	18.7	15.9
Separated	6.3	12.5	8.3	6.3	8.3	12.5
Religion of Head of Household						
None	11.1	11.1	11.1	11.1	-	-
Orthodox Christian	11.5	16.5	15.8	10.2	16.0	15.4
Catholic	18.2	9.1	18.2	9.1	18.2	-
Protestant	7.1	10.7	14.3	3.6	10.7	3.6
Other Christian	-	20.0	40.0	-	20.0	-
Muslim	12.8	18.1	12.8	11.4	11.3	14.6
Other	-	50.0	-	-	-	50.0
Ethnic Background of Head of Household						
Amhara	11.4	17.4	15.2	12.2	14.3	17.3
Oromo	11.5	14.3	13.8	9.2	15.7	13.8
Tigre	12.9	18.6	18.6	7.1	17.7	11.3
Harari	16.7	-	16.7	16.7	16.7	-
Gurage	11.2	17.5	20.3	7.0	18.8	11.8

Table 12a: Determinants of Welfare Change 1994 to 1995

Constant	90.4(11.5)	283.24(3.92)	278.21(3.85)
Base condition			
Cons.exp.per adult (1994)	-0.54(-12.9)	-0.72(-15-24)	-72(-15-14)
Human Capital			
No. of children		16.70(-4.65)	.15.98(-4.4)
No. of male adults		-13.87(-2.84)	-16.45(-3.32)
No. of female adutls		1.81(.37)	1.30(.26)
No of elederly		-18.86(-1.60)	-24.07(-1.95)
Sex of head		3.25(.21)	-58(-037)
Age of head		-6.01(-2.14)	-5.78(-2.06))
Age of head squared		.049(1.76)	0.48(1.72)
No schooling		-	-
Religious/traditional		16.23(.76)	16.68(.78)
Primary incomplete		18.29(.97)	19.82(1.05)
Primary complete		32.79(1.51)	33.85(1.56))
Secondary		63.65(2.81)	63.76(2.82)
College		65.92(2.36)	62.72(2.24)
Other educ.		-6.54(-30)	-6.18(-29)
Physical Capital			
House ownership		2.07(.176)	.79(.067)
No of durables		.99(1.513)	.98(1.50)
Value of durables		8.68(.227)	1.47(.384)
Employment			
Number employed in hh		14.63(2.40)	7.05(.643)
Private business employer		66.84(1.53)	81.54(1.81)
Own account worker		6.12(.281)	9.67(.442)
Female business activity		-28.78(-1.23)	-26.07(-1.11)
Public sector employee		-17.63(.812)	18.75(.853)
Private sector employee		-10.26(-.338)	-10.40(-341)
Casual worker		-40.06(-1.45)	-35.29(-1.27)
Pensioner		-23.51(-1.07)	-29.69(-1.35)
Unemployed		-11.58(-.427)	-13.90(-.513)
Change variables			
change in no. of children			6.94
Change in no. of male adults			-22.49(-2.07)
Change in no. of female adults			-7.33(-.769)
Change in no. of elderly			-26.07(-1.51)
Change of value of durable			-.001(-.120)
Change of number of durable			18.01(3.06)
Change in no. employed			6.10(.621)
Adi. R^2	0.12	0.18	0.18
F-ration	165.2	11.08	9.36

Table 12b: Determinants of Welfare Change 1995 to 1997

Constant	121.8(16..3)	197.0(2.58)	203.27(2.67)
Base condition			
-Cons.exp.per adult (1995)	-0.73(-25.0)	-85(-28.11)	-85(-28.47)
Human Capital			
No. of children		-16.34(-4.34)	-16.97(-4.49)
No. of male adults		-12.65(-2.54)	-17.29(-3.32)
No. of female adults		-14.60(-2.94)	-19.01(-3.63)
No. of elderly		-21.74(-1.81)	-32.58(-.067)
Sex of head		-1.26(-.078)	1.30(.081)
Age of head		-1.53(-.522)	-1.72(-592)
Age of head squared		013(.450)	014(.506)
No schooling		-	-
Religious/traditional		29.96(1.31)	29.57(1.30)
Primary incomplete		49.35(2.45)	45.43(2.27)
Primary complete		7.16(.311)	9.47(.414)
Secondary		66.68(2.76)	60.19(2.51)
College		145.14(4.89)	121.74(4.08)
Other educ.		39.88(1.74)	41.56(.1.83)
Physical Capital			
House ownership		-6.10(-.491)	-8.50(-.688)
No of durables		2.04(2.99)	2.08(3.09)
Value of durables		9.99(2.48)	8.49(2.13)
Employment			
Number employed in hh *		9.87 (1.72)	-17.29(-3.32)
Private business		91.84(1.99)	72.45(1.59)
employer		33.95(1.48)	30.68(1.35)
Own account worker			
Female business activity		-36.33(.1.47)	-36.52(-1.49)
Public sector employee		-2.95(-.129)	1.22(.054)
Private sector employee		-13.30(-.414)	-11.45(-.359)
Casual worker		-48.60 (-1.67)	-45.92(-1.59)
Pensioner		-26.90(-1.16)	-24.93(-1.09)
Unemployed			-
Change variables			
Change in no of children			-24.54(-1.61)
Change in no of male adults			-41.63(-2.93)
Change in no of female adults			-32.29(-2.69)
Change in no of elderly			-55.98(-2.11)
Change of value of durables			-1.29(-.055)
Change of value of durables			-8.70 (1.40)
Change in no. of employed			18.75(1.42)
Adj. R²	0.33	0.39	0.41
F-ratio	626.5	30.79	26.67

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The importance of this exercise for Ethiopia is beyond doubt. First, at present there are no reliable data on the evolution of poverty in Ethiopia from independent sources. In fact, not even a systematic and theoretically founded definition and calculation of a poverty line exists in Ethiopia. This paper will both present a poverty line and some measures of poverty on the basis of this poverty line. At the same time it aims to give a warning about the importance of clearly defined methodology to avoid meaningless discussions. Secondly, since 1992 a structural adjustment programme is in place. By virtue of the type of measures implemented, such as devaluation, commodity market liberalization, reduction in urban subsidies, it can be expected that the relative prices have moved more in favour of rural areas and against urban areas. While the process appears to yield net benefits for the growth of the economy, especially in parts of the agricultural sector, the effects on living standards—both in levels in urban and rural areas, but also the relative welfare of urban versus rural areas is important for policy makers. Indeed, it may be expected that urban areas have relatively speaking lost in their living standard compared to the rural areas.

Questions on the evolution of living standard in absolute or in relative terms need information over time. The present paper uses cross-section data from 1994, so it cannot give a clear answer to the question of the consequences of structural adjustment. Nevertheless, the answers are sufficiently suggestive to yield some conclusions even on this important question.

The structure of the paper is as follows. In section 3 a poverty line is derived for urban and rural areas in 1994. Then, using these lines, alternative measures of poverty will be given (section 4). In a discussion, lessons for future work on the measurement of poverty in Ethiopia will be drawn (section 5). First, however, a description will be given on the data used in the paper.

2. THE 1994 RURAL AND URBAN HOUSEHOLD SURVEYS

The data are taken from two independent surveys. The first survey was conducted between March and May of 1994 in 15 areas of the country with 1477 households actually interviewed. It was the first complete round of the Ethiopian Rural Household Survey (ERHS). Since then, two more rounds have been completed in 1995, while 400 households from the sample were already interviewed in 1989. No attempt has been made to have a 'representative sample' of rural Ethiopia and its more that 45 million people. Instead, a sample of clusters, representative of main agro-ecological zones in the country was drawn (see Bereket 1994). Given the importance of agriculture, the problem of comparability of slightly different farming systems would encourage reasonably large clusters. Nevertheless, given the geographical spread over the main rural areas of Ethiopia, the sample is very likely to provide a very relevant, if not a representative picture of the state of rural Ethiopia. Random sampling has been applied within each site, and the number of households

A COMPARISON OF POVERTY IN
RURAL AND URBAN ETHIOPIA[*]

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Abstract

The paper compares poverty levels between rural and urban areas in Ethiopia using several methods of constructing a poverty line. The findings suggest that, generally speaking, differences in poverty between urban and rural areas were on average small, even though, especially in rural areas, some areas were found to be extremely poor.

1. INTRODUCTION

Ethiopia is without any doubt one of the poorest countries in the world. Poverty reduction is high on the agenda of government and donors. Surprisingly though, relatively little exists in terms of comparative data on poverty. This paper combines two closely related surveys in rural and urban Ethiopia to provide estimates of poverty and especially on the relative levels of rural and urban poverty in 1994. Data are taken from surveys conducted in rural and urban Ethiopia by the Economics Department of Addis Ababa University in collaboration with the Institute of Development Research and the universities of Oxford and Goteborg.

Methodologically, the comparison between urban and rural poverty has to be done with care. As Ravallion and Bidani (1994) have shown for Indonesia, calorie-based definitions may yield misleading results if tastes for expensive relative to cheaper calories differ from area to area. While prices are generally acknowledged to be usually somewhat larger in urban areas, taste differences may result in an overemphasis of urban poverty. Our result on Ethiopia are clearly sensitive to this problem, but a systematic exploration of different ways of defining poverty lines allows us to reach reasonably robust conclusions.

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[*] The final version of this article was submitted in May 2002.

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Questions on the evolution of living standard in absolute or in relative terms need information over time. The present paper uses cross-section data from 1994, so it cannot give a clear answer to the question of the consequences of structural adjustment. Nevertheless, the answers are sufficiently suggestive to yield some conclusions even on this important question.

The structure of the paper is as follows. In section 3 a poverty line is derived for urban and rural areas in 1994. Then, using these lines, alternative measures of poverty will be given (section 4). In a discussion, lessons for future work on the measurement of poverty in Ethiopia will be drawn (section 5). First, however, a description will be given on the data used in the paper.

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interviewed in each site was proportional to the population of the region relative to the national population.

Table 1 gives the characteristics of the sample sites. Details on the sites surveyed in 1989 can be found in Webb, von Braun and Yohannes (1992). Details on the new sites from the 1994 survey can be found in Bereket (1994) and in the following table.

The second survey is the Urban Household Survey, conducted in November 1994 in 7 of the larger urban areas of the country: Addis Ababa, Awassa, Bahir Dar, Dessie, Dire Dawa, Jimma and Mekele. While the urban areas were not randomly selected, within each cluster households were randomly chosen, proportionally to national population data in these urban areas. Since the towns selected are the largest urban centers of the country, one can have confidence that this is a representative sample of the population in the most urbanized zones of the country.

Both surveys have a set of basic modules on issues such as consumption, health, assets, incomes and education. While each of the surveys had specific and different emphases,, many of the core modules were identical. This applies in particular to the modules used in the present study, the demographic data and the consumption data. Questions were asked in the same way with exactly the same recall periods, removing some of the important problems of comparing results from different surveys. This is a crucial element for the comparison, as the evidence discussed in Lanjouw and Lanjouw (1986) and in Scott and Amenuvegde (1990) has suggested that consumption measures from different consumption questionnaires (such as with respect to the length of the recall period, the number of products included, etc.) can usually not be compared. Both surveys were merged to one data set using weights for rural and urban areas using population figures from the census.

One shortcoming for the comparison is that price data were collected in different ways for both surveys. For the urban survey, data were obtained for most commodities from the Central Statistical Office, while for the rural survey data were used from a rural price survey conducted in conjunction with the household level survey by the same team of enumerators. As we will argue this may be a shortcoming, since the results appear to suggest problems in the comparison between rural and urban prices.

Finally, both surveys are the first round of a panel data survey. A subsequent urban round was conducted in 1995, while two more rounds of the rural survey took place in 1994 and in 1995. Further rounds of both surveys are being planned. This means that an instrument is in place to conduct further comparisons of the evolution in poverty in recent years.

Table 1: Characteristics of the Sample Sites

Survey site	Location	Background	Main Crops	Rainfall
Haresaw	Tigray	Poor and Vulnerable Area	Cereals	Bimodal
Geblen	Tigray	Poor and vulnerable area; used to be quite wealthy.	cereals	Bimodal
Shumsha	S.Wollo	Poor area in neighborhood of airport near Lalibela.	cereals	Bimodal
Korodegaga	Arsi	Poor cropping area in neighborhood of otherwise quite rich valley.	cereals	Bimodal
Doma	Gama Gofa	Resettlement Area (1985): Semiarid; droughts in 85,88,89,90, remote.	Enset, maize	Unimodal
Dinki	N.Shoa	Badly affected in famine in 84/85; not easily accessible even though near Debre Berhan.	Millet, teff	Bimodal
Gara Godo	Sidamo (Wolayta)	Densely packed enset-farming areas. Famine in 83/84. Malaria in Mid 88	Barley, enset	Bimodal
Adele Keke	Hararghe	Highland site Drought in 85/86	Millet, maize, coffee, chat	Unimodal
Imdibir	Shoa (Gurage)	Densely populated enset area	Enset, chat, coffee, maize	Bimodal
Aze Deboa	Shoa (Kembata)	Densely populated. Long tradition of substantial seasonal and temporary migration.	Enset, coffee maize, Teff,sorghum	Bimodal
Addado	Sidamo (Dilla)	Rich coffee producing area; densely populated.	Coffee, enset	no clear Pattern
Yetmen	Gojjam	Near Bichena. Ox-plough cereal farming system highlands	Teff, wheat and beans	Bimodal
Turfe Kechemane	S Shoa	Near Shashemen, Ox-plough. rich cereal area. Highlands.	Wheat, barley.teff potatoes	Bimodal
Sirbana Godeti	Shoa	Near Debre Zeit. Rich area. Much targeted by agricultural policy. Cereal, ox-plough system.	Teff	Bimodal
Debre Berhan	N.Shoa	Highland site. Near town.	Teff, barley, beans	Bimodal

3. THE CONSTRUCTION OF THE POVERTY LINE

The crucial question in poverty comparisons is the appropriate choice of a poverty line. Indeed, it can be argued that it is the choice of the poverty line which is the single most important determinant of poverty. A well-known approach is the Greer and Thorbecke (1986) approach. The underlying assumption is that households will not choose to go hungry and if they are wealthy enough, then they will consume more than enough food. In practice, minimum food requirements are defined using calorie intake requirements, usually put at about 2200 Kcal per capital. The poverty line is than the level of total consumption expenditure (food and non-food expenditure) needed to obtain the minimum food requirements. It is found by regressing total calorie-intake on actual total consumption and then to impute the value of total consumption at which a person is expected to just consume the minimum level of

calories. The advantage of the approach is the parsimonious us of information: the entire analysis can be done using only consumption and calories data.

The problem with this approach is how to control for differences in tastes and for differences in relative prices. Ravallion and Bidani (1994) have pointed to the problems of this approach if applied uncarefully to the problem of comparing rural and urban consumption. Since it is fair to say that spending patterns and needs may be different in urban and rural areas, one may be tempted to run the regressions for rural and urban areas separately. However, if urban areas have more expensive tastes–for example they are typically consuming more expensive cereals–then one would assign a much higher poverty line to urban areas (and therefore overestimate poverty) in comparison to rural areas where less expensive products are consumed. In other words, urban poverty is estimated too high in comparison to rural poverty in that case. This is an important problem if the point of the exercise is to compare poverty between rural and urban areas. In its simplest way, the Greer and Thorbecke (1986) approach cannot distinguish between these differences in tastes, in needs and in prices. A concept of the poverty line ought, however, to be able to correct for differences in the cost of living and needs, but a correction for tastes would be much more controversial and may yield misleading results for policy. As Ravallion (1992) has stressed, any measure of the poverty line involves choices which will affect the actual outcome of comparisons and care should be taken with them since they will affect the policy implications. Ravallion (1994) suggests an alternative approach, building further on Rowntree's seminal work. The idea is to construct one bundle of goods representing the basic needs of a person. The value of this bundle is then the poverty line, under which one cannot obtain minimum basic needs. The advantage is that the valuation of the bundle can be done for each different area, so that explicitly account can be taken of differences in the cost of living, without convoluting this correction with corrections for tastes. Problems remain however in how to account for differences in needs, if one is willing to consider them. We will discuss these further below. In this paper, the methodology described in Ravallion (1994) has been used for its transparency but also since it has been used extensively in other countries. Nevertheless, we will point to some of the problems involved.[1] In practice the following was done. First, all the consumption information, including the consumption from own production and stocks (mainly for rural areas), was expressed in money terms in the 1994 survey. In each site a separate price survey was implemented in the nearby markets at the same time of the expenditure and consumption survey, and those prices could be used to value subsistence consumption. In urban areas, such a survey was not implemented, and Central Statistical Office data were used, rather than within sample price information (see Deaton (1995) for a discussion of the arguments in favour and against this approach).

Secondly, consumption per household was corrected to take into account the household size and composition. Adult equivalent units (AEU) were derived for each household, and used to calculate consumption per adult equivalent. Data provided by

the World Health Organization were used to convert household members of different age and sex into equivalent male adults.[2]

Thirdly, a representative diet for a poor household was derived. This is not without problems. Since poverty lines are essentially tools to allow comparisons of welfare across households and regions, one would like to construct a diet for the poor which identical for the poor which identical for all households. We used different approaches here for comparison. In one approach, we constructed one national diet for rural and urban areas. However, this may result in problems if one would like to take into account differences in needs between urban and rural areas.

There was also a further complication, not considered in the literature. In a large country with different farming systems in different parts of the country, the construction of one diet for all rural areas is also problematic. In some parts of the South and the Centre of the country, enset (false banana), which is a permanent root crop, is the main staple, while this commodity is virtually not consumed in some other parts of rural Ethiopia. In these other areas, teff or somewhat cheaper alternatives are mainly consumed with 'injera', a type of pancake made from flour of these grains being the main food consumed. A problem is that the virtual absence of some of these commodities (such as enset) in some areas means that price data is lacking or at least unreliable. A national diet consisting of averages of these commodities is bound to suffer from problems in measurement. Nevertheless, an attempt to correct for some of these differences means a correction for 'tastes', even if they are closely linked to the farming system. Therefore, the approaches will be considered next to each other: a national diet, compared to a diet for enset areas (Imdibir in Gurage, Aze Deboa in Kembata and Adado near Dilla) and another for all other areass (Imdibir in Guraqge, Aze Deboaa in Kembata and Adado near Dilla).[3] For comparison, an urban area was also considered, since once one distinguishes different diets for different rural areas, then one cannot easily make the choice about which diet to use for the urban areas, which are places of an ethnically mixed population. Consequently, a separate diet for urban areas was also presented. Within the sample these representative diets were obtained using the consumption data for the lower half of the sample. For these diets the relative contribution to calorie-intakes was calculated. Following Ravallion (1994), these caloric contributions were used to construct a diet that yields 2200 Kcal per adult, which is the minimum needed for an adult to perform normal daily duties, as suggested by WHO. Table 2 presents the results.

The results suggest striking differences only on a small number of products. First, urban areas consume much more teff, while rural cereal areas consume mainly barley and sorghum. In rural enset areas, cereal consumption (except for maize) was very small, with enset being very important. The cost of this basket was calculated for 1994 using the data supplied by the price survey mentioned above for the rural survey and by using data from the Central Statistical Office for the urban areas. The cost of this food basket would provide a 'food consumption poverty line'.

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Table 2: Minimum Food Basket (per adult per month)

Food Item	Urban Areas	Cereal Areas	Enset Areas	Ethiopia
Cereals (in kg)				
Teff	8.51	1.63	0.29	1.52
Barley	0.53	4.24	0.73	2.58
Maize	4.56	3.82	4.95	4.41
Sorghum	0.70	4.53	0.05	2.40
Pulses (in kg)				
Lentils	0.53	0.35	0.05	0.25
Horse beans	0.26	1.84	0.68	1.26
Cow peas	0.53	0.35	0.34	0.31
Chick peas	0.18	0.71	0.97	0.57
Shiro	0.79	0.92	0.05	0.57
Vegetables (in kg)				
Gomen	0.35	0.21	0.44	0.31
Onion	0.79	0.35	0.19	0.38
Root crops (in kg)				
Potato	0.97	0.14	0.97	0.57
Enset	0	0	18.05	7.68
Other food items				
Milk (lt)	0.35	0.49	0.73	0.25
Coffee (kg)	0.26	0.57	0.39	0.50
Sugar (kg)	0.26	0.14	0.05	0.13
Salt (kg)	0.61	1.20	0.87	1.07
Cooking Oil(lt)	0.61	0.28	0.10	0.19
Berbere (kg)	0.61	0.85	0.24	0.5
Bread (kg)	0.97	0.14	0.63	0.38

Since the poor cannot be expected to live from food alone, the next issue is to add some amount of money for essential (basic needs') non-food consumption to obtain the poverty line. The approach in Ravallion and Bidani (1994) is followed to find the non-food share of those people whose food consumption is exactly sufficient for basic food requirements, through estimating an Engel-curve, correcting for household characteristics and with regional dummies to account for relative price differences. The estimated minimum non-food expenditure was added to the minimum cost of the food consumption basket to obtain the poverty line used in this paper.

Table 3 reports the poverty line for each village or town considered. Table (3a) gives them using a single 'national' diet and table 3b gives them when using a separate diet for cereal, enset and for urban areas. Data reported are the food poverty line, the total poverty line and the estimated food share at the level of minimum basic needs, which were used to calculate the value of the non-food share to be added to the food poverty line. The data are per adult equivalent per month in birr of 1994 (the US dollar exchange rate was then about 6 birr to the dollar). Besides poverty lines per area for which we have data, we also give a weighted average poverty line which can be considered as estimate of a 'national rural' poverty line.

Table 3a: Poverty Lines Based on a Single Basket of Food for all Sites
(in birr per adult per month)

	URBAN				RURAL			
Urban Center	Food	Total	Food Share	Region	Site	Food	Total	Food Share
Addis Ababa	58.23	74.90	0.78	Tigray	Haresaw	34.21	47.30	0.72
Awassa	39.81	49.30	0.81	Tigray	Geblen	38.14	45.00	0.85
Bahr Dar	44.80	54.30	0.83	N.Shoa	Dinki	31.86	38.90	0.82
Dessie	47.35	58.30	0.81	N.Shoa	D. Berhan	33.23	40.80	0.76
Dire Dawa	59.96	67.90	0.88	Gojjam	Yetmen	33.68	43.80	0.77
Jimma	39.81	49.50	0.80	N.Wollo	Shumsha	34.31	42.10	0.81
Mekele	52.54	67.60	0.78	E.Shoa	Sirbana Godeti	30.73	43.50	0.71
				E.Hararge	Adele Keke	39.56	53.70	0.74
				Arsi	Korodegaga	37.08	50.00	0.74
				S.Shoa	Shashemene	30.90	40.60	0.76
				Gurage	Indibir	30.18	38.30	0.79
				Kembata	Aze Deboa	31.04	43.50	0.71
				Sidama	Adado	34.87	42.90	0.81
				Wolayta	Gara Godo	43.32	59.50	0.73
				Gamo Gofa	Domaa	40.44	48.80	0.83
Average urban (weighted)	53.54	67.72	0.79	Average rural (weighted)		34.78	45.02	0.77

Table 3b: Poverty Lines Based on Separate Baskets of Food for Urban, and Cereal and Enset Rural Areas (in birr per adult per month)

	URBAN				RURAL			
Urban Center	Food	Total	Food Share	Region	Site	Food	Total	Food Share
Addis Ababa	66.25	85.10	0.78	Tigray	Haresaw	38.22	52.70	0.72
Awassa	51.62	63.80	0.81	Tigray	Geblen	42.35	49.90	0.85
Bahr Dar	52.22	63.20	0.83	N. Shoa	Dinki	35.59	43.40	0.82
Dessie	54.46	67.00	0.81	N. Shoa	Debre Berhan	36.31	44.50	0.76
Dire Dawa	71.15	80.30	0.88	Gojjam	Yetmen	38.52	50.10	0.77
Jimma	51.62	64.00	0.80	N.Wollo	Shumsha	39.62	48.60	0.81
Mekele	63.67	81.40	0.78	E.Shoa	Sirbana Godeti	34.06	48.10	0.71
				E. Hararge	Adele Keke	45.71	61.90	0.74
				Arsi	Korodegaga	42.70	57.50	0.74
				S.Shoa	Shashemene	28.85	37.90	0.76
				Gurage	Indibir	26.74	34.00	0.79
				Kembata	Aze Deboa	27.26	38.20	0.71
				Sidama	Adado	30.10	37.10	0.81
				Wolayta	Gara Godo	39.48	54.20	0.73
				Gamo Gofa	Domma	32.10	38.70	0.83
Average urban (weighted)	62.30	78.61	0.79	Average rural (weighted)		36.06	46.57	0.77

First, from both tables it can be seen that the poverty line is dominated by food expenditure: the food share is between 70 and 85 percent or even more, which is high even for development countries. Note also that the food share is not higher in rural areas; in many cases it is in fact lower than in the urban areas while on average it is very close. Secondly, not that the poverty lines calculated are, even at the highest estimates, only on average less than 80 birr per adult per month and less than 50 birr in rural areas. This means only about 8 to 13 US dollars per adult per month, which is far lower than the typically recommended World Bank norm of a dollar per person per day (e.g. World Bank 1990). This means that these poverty lines and the resulting poverty measures cannot be compared at all with some of the international poverty figures quoted. For these comparisons, much higher poverty lines are appropriate. Note that the result will be relatively low poverty measures which provide underestimates for international comparison exercises. The reason for these low estimates is the poverty of the diet across the country: very few different commodities are consumed and the poor consume mostly relatively poor and cheap types of food, which may not offer more than basic calories and a few other nutrients. The Ravallion method of constructing a diet from within the sample and with its emphasis on calories only means that the minimum diet in a country in which the poor consume only cheap calories without much variation will indeed turn out to be rather cheap.

Thirdly, focusing on the estimates of poverty lines using a single national basket, the urban poverty line is on average 68 birr per adult per month. Addis Ababa is, however, much more expensive to buy this minimum diet, while some of the other towns like Jimma, Bahar Dar and Awassa are much cheaper places. In rural areas, the average poverty line using a national basket is about 45 birr, but areas like Wolayta and the remote village of Domaa appears much more expensive. Fourthly, by comparing the measures using the separate baskets for broad areas rather than the single basket, it turns out that a separate urban basket results in a poverty line of about 79 birr, or 16 per cent more expensive than if a national basket were consumed. This confirms the general suspicion that urban areas tend to consume much more expensive food, such as teff, compared to rural areas. Note that the difference is not caused by higher non-food expenditure, since the food share is on average apparently very similar in urban and rural areas. In the rural areas, differences can be observed as well. It turns out that in cereal sites, the specific basket is more expensive than the national one, while in enset areas it is less expensive. This is consistent with a finding in the data that enset appears to be a cheap source of calories, even in some non-enset areas, but it is only consumed within very specific cultures and farming systems.

Finally, the estimates suggest that the cost of basic needs is much higher in urban areas than in rural areas. Using the separate line, the poverty line is about 69 per cent higher in urban areas than in rural areas. A somewhat disconcerting result is the fact that using the single basket for the whole country, the poverty line was found to be more than 50 per cent higher in urban areas than in rural areas. This latter result only stems from higher food prices in urban areas than in rural areas, while the former was also related to the effect of a more expensive basket.

Fifty per cent higher prices in urban areas appear somewhat too large. The urban survey was collected about six months after the rural survey data (April-May versus November); price data refer to these periods as well. However, between these dates very little inflation occurred–in fact, many food prices came down by October-November with a good new harvest coming after a relatively bad short rain season which affected many areas in the rural survey around the time of the interviews, yielding rather high prices. Since the prices were collected using different methodologies (the urban via the CSA, the rural prices survey as part of the general data collection), they appear to have affected the results[4]. To assess some of the consequences of this mis-measurement of prices, we also used an 'average' poverty line of 48 birr–the weighted average of the urban and rural poverty line using a single basket, to see what poverty would be if the basic basket would have costed the same everywhere in rural and urban areas.

4. MEASURES OF POVERTY IN 1994

Using the consumption per adult equivalent data and the poverty lines obtained, 3 poverty measures were calculated: the head count index (P_0), the poverty gap index (P_1). These indexes are calculated using the formula:

$$P_\alpha = \frac{1}{n} \sum \left(\frac{x-z}{z} \right)^\alpha$$

with a equal to 0,1 and 2 for P_0, P_1 and P_2 respectively, with y equal to consumption per adult equivalent, z equal to the poverty line and f(y) the density function of consumption per adult[5]. Effectively, P_0 simply counts the number of poor in the sample. Since this does not give any information about the depth of poverty, P_1 is given as well, measuring the average share of the minimum standard of living which the poor are lacking - in other words, it is a measure of the transfers needed to bring the poor at a minimum level of consumption. Finally, P_2 measures the intensity of poverty by squaring the transfers needed, so that very poor households are given a larger weight. In Table 4, various poverty indexes for 1994 are given for each site in the entire sample. In Table 4a measures are given using the definition of a poverty line using separate baskets for urban, enset and cereal areas. In Table 4b the results are given using the same basket for all areas.

Using separate baskets, it can bee seen that urban poverty is on average higher than rural: the head count index is 40 per cent compared to 31 per cent in rural areas, the poverty gap is 16 per cent compared to 11 per cent and the intensity index is 0.09 in urban areas compared to 0.05 in rural areas. However, the use of separate baskets seems to be largely responsible for this result. Using a single basket, poverty in rural and urban areas is closer, even though still higher in urban areas (e.g. the head count index is 32 per cent compared 30 per cent in rural areas). The use of a single or

separate index has clearly the biggest effect on the urban poverty measure, changing the result by a fifth.

A resulting national poverty figure from these indexes is approximately 30 per cent if a single basket is used. Note that the fact that this figure may seem relatively low is partly related to the nature of the method, which constructs a basket on the basis of the type of products consumed by the poor. It should not be seen as evidence that 'poverty is now relatively low', for example as a result of structural adjustment. The nature of the data does not allow an exact answer to this question. The only remarkable finding is that urban poverty appears relatively high.

Table 4a: Poverty Measures Using Separate Baskets

URBAN				RURAL				
Urban Centre	Head Count	Poverty Gap	Intensity of Poverty	Region	Site	Head Count	Poverty Gap	Intensity of Poverty
Addis Ababa	0.47	0.20	0.11	Tigray	Haresaw	0.43	0.12	0.06
Awassa	0.50	0.11	0.04	Tigray	Geblen	0.64	0.25	0.13
Bahr Dar	0.22	0.07	0.04	N.Shoa	Dinki	0.47	0.16	0.07
Dessie	0.33	0.17	0.08	N.Shoa	Debre Berhan	0.16	0.04	0.01
Dire Dawa	0.36	0.10	0.04	Gojjam	Yetmen	0.15	0.03	0.01
Jimma	0.28	0.13	0.07	N.Wollo	Shumsha	0.19	0.04	0.01
Mekele	0.18	0.09	0.04	E.Shoa	Sirbana Godeti	0.11	0.03	0.01
				E Hararge	Adele keke	0.11	0.04	0.02
				Arsi	Korodegaga	0.69	0.33	0.18
				S.Shoa	Shashemene	0.13	0.05	0.02
				Gurage	Inddibir	0.30	0.08	0.03
				Kembata	Aze Deboa	0.12	0.02	0.00
				Sidama	Adado	0.22	0.06	0.02
				Wolayta	Gara Godo	0.76	0.36	0.21
				Gamo Gofa	Domma	0.39	0.12	0.06
Average urban (weighted)	0.40	0.16	0.09	Average rural (weighted)		0.31	0.11	0.05

Behind these aggregate figures a substantial variation across rural and urban areas is hidden. For example, in some of the rural areas, the vast majority, even close to three quarters of the population, is not able to consume enough to meet the minimum basic needs, while in other rural areas, this situation only applies to a tenth of the population. Also in urban areas the differences across towns are striking, with especially Addis Ababa having a very high poverty figure, whichever measure is used, while for example the level in Mekele is substantially lower. Interpret this result with caution given the nature of the price data used.

It is not just the price data which affects the results, it is also the use of a separate or a single basket across areas. In rural areas, poverty is higher in enset areas if a single basket is used and lower in that case in cereal areas, in line with the fact that enset is

in fact a low-cost calorie source. In urban areas, the change in the poverty measures for Addis Ababa and Awassa are the source. In urban areas, the change in the poverty measures for Addis Ababa and Awassa are the most striking. A 16 per cent lower poverty line in Addis Ababa resulted in a decline in the head count index by 20 per cent, pointing to the sensitivity of the results to different definitions. It also points to the necessity to have very reliable price data and the need to be able to assess whether 50 per cent higher prices in urban areas and even more in Addis Ababa is a genuine possibility.

Table 4b: Poverty Measures Using Single Food Basket for the Country

URBAN				RURAL				
Urban Centre	Head Count	Poverty Gap	Intensity of Poverty	Region	Site	Head Count	Poverty Gap	Intensity of Poverty
Addis Ababa	0.38	0.16	0.09	Tigray	Haresaw	0.29	0.10	0.05
Awassa	0.33	0.04	0.01	Tigray	Geblen	0.58	0.21	0.10
Bahr Dar	0.13	0.05	0.04	N.Shoa	Dinki	0.39	0.13	0.06
Dessie	0.33	0.14	0.06	N. Shoa	Debre Berhan	0.12	0.03	0.01
Dire Dawa	0.27	0.06	0.02	Gojjam	Yetmen	0.12	0.01	0.00
Jimma	0.22	0.08	0.04	N.Wollo	Shumsha	0.14	0.03	0.01
Mekele	0.18	0.07	0.03	E.Shoa	Sirbana Godeti	0.10	0.02	0.01
				E.Hararge	Adele Keke	0.07	0.03	0.02
				Arsi	Korodegaga	0.64	0.27	0.14
				S.Shoa	Shashemene	0.17	0.05	0.03
				Gurage	Indibir	0.40	0.11	0.05
				Kembata	Aze Deboa	0.16	0.03	0.01
				Sidama	Adado	0.31	0.08	0.04
				Wolayta	Gara Godo	0.78	0.40	0.24
				Gamo Gofa	Domaa	0.49	0.19	0.10
Average urban (weighted)	0.32	0.13	0.07	Average rural (weighted)		0.30	0.11	0.06

To explore these results further, and especially to see whether these results may be an artefact because of methodological problems or whether they are genuine, a few more poverty measures were calculated. First, the consumption data used are consumption inclusive of food aid, which is at present extensively used to support both the rural and urban population in Ethiopia. It may be argued that poverty measures should give situations before intervention. At the same time an evaluation of the aid can be given by calculating poverty before and after aid. Secondly, we repeated the calculation of poverty measures across areas but this time using exactly the same poverty line, set at the weighted average of all poverty lines using the same basket (48.15 birr). Poverty measures calculated in this way assume then that there are no price differences between areas. It provides then a benchmark to compare the consequences of potential mis-measurement off prices in urban relative to rural

areas. Table 5 gives the resulting poverty head count indexes, grouped by rural and urban areas, but by splitting urban areas into Addis Ababa and other cities.

Table 5 first illustrates well the problem of using a single basket or a separate basket: while for rural areas the differences are small, for urban areas the results are much higher poverty if a separate diet is allowed for urban areas. Food aid only seems to result in some difference in poverty in rural areas, although even there the differences are relatively small. The image that a large part of the rural population is surviving on food aid in Ethiopia is clearly not true. Food aid given in urban areas makes little difference on poverty figures, while in rural areas only in a few villages food aid was recorded making a modest but significant difference. When using a single basket and using the consumption data excluding food aid, then we find that poverty before food aid was actually higher in rural areas than in urban areas on average (32 per cent in all urban areas versus 34 per cent in rural areas). This situation is then reversed due to food aid, as could be seen in Table 4b. Nevertheless, whichever measure of consumption is used, poverty remains higher in Addis Ababa than on average in rural areas with 38 per cent being poor.

The last column suggests, however, that one ought to look at this result with care and that it hinges entirely on differences in prices. If one and the same poverty line is used, assuming no price differences, then poverty in all urban areas was found to be 22 per cent, or only two-thirds of the level of poverty in rural areas (33 per cent). In Addis Ababa alone, this measure would suggest 23 per cent poor—only half the amount suggested by the first column, when a separate basket and different prices are used—illustrating the interpretational problem.

Nevertheless, since prices are bound to have been higher in Addis Ababa than in many of the areas supplying cereals to urban areas, the implied estimate of 23 per cent that at least a quarter of the population in Addis Ababa is poor and the proportion is very likely to be higher, and therefore very close to the estimated rural poverty. This is striking and not usually expected in most African countries on the basis of survey evidence (e.g. Boateng et al. (1991) on Ghana).

Table 5: Poverty Head Count Indexesin Rural and Urban Areas

Area	Separate Basket	Single Basket	Separate Basket, Consumption Excluding Aid	Single Basket, Consumption Excluding Aid	Single basket, No Price Differences
Addis Ababa	0.47	0.38	0.47	0.38	0.23
Other Towns	0.29	0.23	0.29	0.23	0.18
Rural Areas	0.31	0.30	0.35	0.34	0.33
Ethiopia	0.32	0.30	0.35	0.34	0.32

5. CONCLUSIONS

We explored a consistent way to calculate poverty lines and indexes for Ethiopia using surveys from 1994. The purpose was to find poverty measures which allow a comparison between rural and urban poverty. We pointed to many methodological problems, related to controlling needs, prices and tastes. We suggested to use a series of poverty lines, using different assumptions about tastes and needs. In particular, building on Ravallion (1994) approach we calculated both a national minimum food basket giving sufficient calories, as well as three separate ones for well-defined areas: two different rural farming systems (cereal and enset) and one for urban areas. They are compared to allow a discussion of the consequences of the different baskets used. Finally, it was noted that the method used does not allow the poverty measures to be interpreted in an international context. As could be suspected, the method resulted in relatively low poverty estimates.

The data used were ideally suited for a comparison, having used closely similar questionnaires, even though they were independently collected. However, we suspect some problems related to the price data used, since different methodologies were used in the surveys to collect them. The suspicion of problems is driven by the finding that the cost of the same basket was 50 per cent more in urban areas on average than in rural areas, which appears too large. At present this problem has not been resolved. We used, however, also a poverty line which assumes that prices were exactly the same in rural and urban areas to assess the consequences of this problems.

The findings suggested that the use of area-specific or single basket did not make a large difference in rural areas on average, although enset areas were much poorer if a single basket was used, supporting the evidence that enset is a low cost calorie source. In urban areas, the use of an urban specific basket confirmed the finding from other countries that in urban areas relatively expensive sources of calories are being consumed. This urban specific basket increased poverty measures by a fifth compared to the use of a single basket.

Generally speaking, differences in poverty between urban and rural areas were on average small, even though, especially in rural areas, some areas were found to be extremely poor. Also Addis Ababa was found to have a large poverty problem. Further exploration suggests that problems with the price data may have caused these very large estimates for poverty in Addis Ababa. However, even using a poverty line with the assumption that prices in Addis Ababa were the same as in rural areas, we find that poverty in Addis Ababa is much lower but still quite high, especially compared to what one usually finds in these types of surveys. Better price data would most likely confirm that poverty in Addis Ababa is not very much behind average rural poverty.

Whether this is a consequence of the changed relative prices in the economy which are at present favouring rural areas compared to urban areas is difficult to assess using these data. Indeed this result could have been obtained from a strong reduction in rural poverty with a stagnation of urban poverty, or from a strong increase in urban poverty without much change in rural poverty. Some evidence exists from a comparison with 1989 rural household survey data in the same areas as the present rural household data that poverty in rural areas has declined (Dercon and Krishnan 1995). Further work on the panel data at present being generated in rural and urban Ethiopia ought to give more clarity on the changes in poverty and the underlying processes.

NOTES

[1] It would also have been possible to expand the Greer and Thorbecke to explicitly account for price differences in a pooled data set and in this way to avoid the main objection to the approach. This is however left to future work.

[2] This is not an ideal approach, but calculating household equivalent directly from the data is cumbersome. Deaton (1995) has suggested that it may not be worth the trouble.

[3] We found that in two other villages, i e Domaa in Gama Gofa and Gara Godo in Wolayta, potatoes and sweet potatoes were quite substantial in the diet compared to other areas. However, the cost of the diet turned out to be virtually the same if one used the general cereal-based diet or if one used a specific representative diet for the two villages.

[4] We tried to reconcile the figures by using data on regional rural retail prices reported by the Central Statistical Authority (CSA 1995). However, using their prices, our poverty line was on average even lower, although not for every village. Each region is of course large; even so, this result was surprising and is not easily explained.

[5] In analyzing the extent of poverty, it would generally be preferred to use individual rather than household data. Clearly, they are not available. In practice, results are often presented by reweighing the data according to household size as an alternative, but this makes the (misleading) assumption that consumption is evenly distributed within households.

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