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

* 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_i 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

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:

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

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.

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

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.

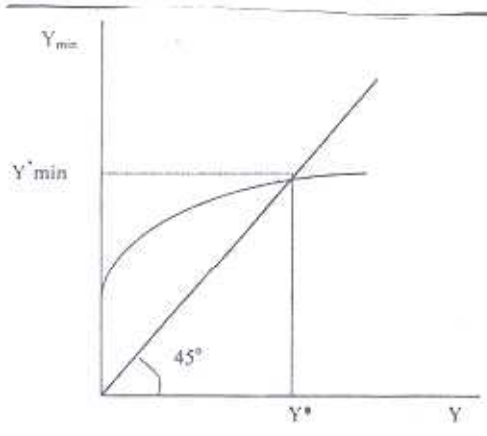

Fig. 1a: Single subjective poverty line

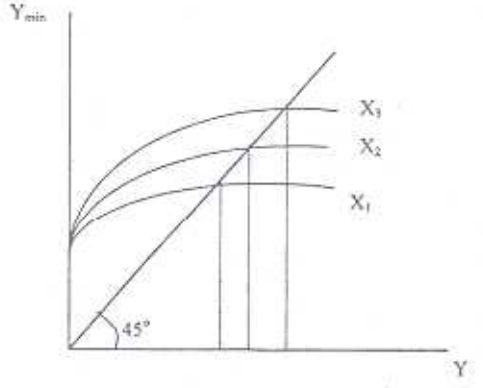

Fig. 1b: Differentiated subjective poverty lines

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.

$$U(y) = \Lambda(y; \mu, \sigma) = N(\ln y : \mu, \sigma) \qquad [3]$$

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:

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

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

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

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

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

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

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

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:

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 i^{th} 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

$$\ln y^5_{it} = \beta_0 + \beta_1 \ln Y_{it} + \beta_2 \ln x_{2it} + \beta_3 x_{3it} + \ldots + \beta_k x_{kit} + \varepsilon_{it} \qquad [9]$$

Where y^5 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].

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:

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

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 Ravaillion (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 008)*
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)*

	1995		1997	
Household Size	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)

	1995			1997
Urban Centre	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

	1995						1997					
	Subjective			Consumption			Subjective			Consumption		
Urban centre	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	0.456	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 10^{th} and 20^{th} 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 Stanovsk (1992) on Slovene data.

[6] 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.

[7] 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).

[8] 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.

[9] 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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