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Measuring Poverty in South Africa

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Abstract

This paper sets out the methodological issues for the measurement of poverty before presenting a poverty profile of South Africa. It tests the sensitivity of the poverty profile to choices around the metric used to measure well-being, the equivalence scale used and the level of the poverty line.

The key finding is that the defining features of South African poverty are so pronounced that the profile of poverty is robust to changes in the underlying measurement assumptions.

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DPRU WORKING PAPER NO 99/33**List of Tables**

Table 1 Incidence of poverty amongst selected groups, by poverty measure (1993 data)*	6
Table 2 Incidence of poverty amongst selected groups, by poverty measure (1995 data)*	6
Table 3 Correlation of alternative definitions of poverty with the per capita consumption definition (1993 data)	7
Table 4 Correlation of alternative definitions of poverty with the per capita consumption definition (1995 data)	8
Table 5 Comparison of Selected Poverty Lines for South Africa - 1993	11
Table 6 Net expenditure required for a household of varying composition to attain a food ratio of 40%	13
Table 7 Net expenditure required for a household of varying composition to attain a food ratio of 50%	13
Table 8 Percentage of poor households "correctly" identified as poor, taking $\alpha = 0.5$ and $\theta = 0.9$ as the reference scale	14
Table 9 Incidence of poverty among selected groups, using a variety of equivalence scales.....	16
Table 10 Measures of inequality using different equivalence scales.....	17
Table 11 Distribution of poor individuals by locational classification	25
Table 12 Distribution of poor individuals by province	29
Table 13 Distribution of poor individuals by racial classification	30
Table 14 Distribution of poor adults (individuals aged 18+) by educational status	33
Table 15 Proportion suffering from each illness (%).....	35
Table 16: Unemployment, participation, and sectoral employment by race, gender, and location (%)	37
Table 17 Access to basic services	39
Table 18 Mode of transport used to get to work.....	40

List of Figures

Figure 1 Incidence of poverty by locational classification	23
Figure 2 Incidence of poverty by province	25
Figure 3 Depth of poverty by province	26
Figure 4 Severity of poverty by province.....	27
Figure 5 Incidence of poverty by race	30
Figure 6 Incidence of adult poverty by educational attainment.....	33

Figure 7 Percentage of children under five whose height for age is below 2 standard deviations of the reference standard..... 36

Figure 8 Sources of income among poor and non-poor households. 39

Introduction

The debate about the meaning of poverty continues. In spite of this, certain basic steps in the analysis of poverty have become quite standard (Hentschel and Lanjouw, 1996:1). First, households or individuals are ranked on the basis of a welfare indicator – usually income or consumption expenditures. Second, a poverty line is selected which separates the poor from the non-poor. Finally the poor, identified in this way, are then examined more closely through the construction of a poverty profile.

In Sen's (1976: 219) terminology, sections 1 and 2 of this paper deal with the "identification problem" of distinguishing which individuals are poor, while section 3 deals with the "aggregation problem" of constructing an index of poverty using the available information on the poor. While most of the more recent theoretical literature is concerned with the aggregation problem (Foster and Shorrocks, 1988: 173), the issue of identification has great bearing on applied work and needs to be carefully examined.

Therefore, we begin by focusing on the critical issue of how "the poor" are to be identified. We review the main methods which have been proposed for the derivation of a poverty line and touch on a range of issues which arise in practice. These include the choice of recipient unit, the welfare concept used and the difficulties associated with comparisons across households that differ in size and age structure.

1. Identifying the poor

Chambers (1988) distinguishes five dimensions of poverty:

- '*poverty proper*' being a lack of adequate income or assets to generate income;
- *physical weakness* due to under-nutrition, sickness or disability;
- physical or social *isolation* due to peripheral location, lack of access to goods and services, ignorance or illiteracy;
- *vulnerability* to crisis and the risk of becoming even poorer; and
- *powerlessness* within existing social, economic, political and cultural structures.

We must stress at the outset that we are concerned here only with "poverty proper". While money-metric poverty measures probably provide the best single 'objective' proxy for poverty status, we are not suggesting that other ways of assessing poverty are unimportant. The poor are *not* concerned exclusively with adequate incomes and consumption. Achieving other goals such as security, independence and societal participation may be just as important as having the means to purchase basic goods and services.

1.1 Measuring "well-being"

Most empirical work on the distribution of welfare is done using either expenditure or income data recorded in household surveys (Glewwe, 1988: 3). This is intuitively appealing and it is not necessary to review here the theoretical framework which allows one to draw the link between the distribution of income/expenditure and the distribution of welfare.

The concept of 'standard of living' can be either welfarist or non-welfarist. The welfarist approach typically emphasises expenditure on all goods and services consumed, including consumption of home

production valued at appropriate prices. By contrast, a common non-welfarist approach emphasises specific commodity forms of deprivation (Ravallion, 1992:7), usually inadequate food consumption.

Either way, a person's standard of living is generally taken to depend only on the consumption of *market* goods. While the limitations of this approach are well documented (Deaton and Muellbauer, 1980: 223), the problems involved in valuing access to public goods are enormous. It is thus to a large extent for pragmatic reasons that current consumption or current income is used as the indicator of well-being.

1.1.1 *Consumption as a measure of poverty*

In this work, we conform to the international norm of using material well-being or "standard of living" as the welfare indicator (Hentschel and Lanjouw, 1996:1). We follow the lead of the World Bank in defining poverty as "the inability to attain a minimal standard of living" measured in terms of basic consumption needs (World Bank, 1990).

To measure material welfare we need to measure what and how much individuals consume (Deaton and Case, 1988:1). We follow the conventional approach of ignoring the consumption of public goods and the value of leisure time (Ravallion, 1992:7). Thus a person's standard of living is taken to depend on the current consumption of privately supplied goods, goods (e.g. crops) from own production and the imputed rents from owner-occupied housing.

Empirical work on the distribution of welfare is sometimes done using income data (Glewwe, 1988:3). There are several conceptual and pragmatic reasons for preferring private consumption expenditure over income as a measure of well-being. The most important of these reasons is that expenditure is usually more reliably reported and more stable than income, especially among the poor (Ravallion, 1992:13).

1.2 **Information Sources**

If the Government is to address poverty and inequality, it requires reliable data on the extent and nature of the problem. The new government faces the problem that the previous regime had little interest in collecting information of this nature. Between 1970 and 1994, official statistics excluded the so-called "independent states" of Transkei, Bophutatswana, Venda and Ciskei, thus automatically excluding a large proportion of the poor from official statistics.

In 1993, Statistics South Africa (SSA) ran the first *October Household Survey* and has continued to do so annually, although only the 1993-1995 surveys have been made public to date. The survey collects a variety of household information, such as housing types and access to services, as well as person-level data about, for example, education, health and work status. A substantial part of past questionnaires has been dedicated to collecting information needed for labour statistics. Birth and death data are also recorded for demographic purposes. Unfortunately, it was only in 1995 that the survey was accompanied by a detailed Income and Expenditure Survey (IES) which collected information about income from sources other than employment and about expenditure. The 1993 and 1994 surveys are thus of little use in analysing income poverty or inequality. The analysis in this paper thus relies largely on the 1995 OHS/IES.

This paper also makes use of the *Project for Statistics on Living Standards and Development* (PSLSD) survey conducted in 1993 by the Southern Africa Labour and Development Research Unit at the University of Cape Town with technical assistance from the World Bank. This survey collected a wider

range of indicators of standard of living, including food intake and anthropometric data for children under six.

Ismail Serageldin aptly describes poverty statistics as 'people with the tears wiped off' (quoted in Moser, 1996). While objective measures are undoubtedly useful, the textured data obtained from exercises such as the South African Participatory Poverty Assessment (SA-PPA) conducted in 1995 (May, 1998) offer useful insights. Qualitative data restores the reality that lies hidden behind the rates and averages that are poverty statistics.

The SA-PPA was undertaken at the request of the RDP office. The purpose of the exercise was to provide a fuller and more integrated understanding of poverty from the perspective of those who are poor and to fill the gaps which the PSLSD could not readily explain.

1.3 Alternative measures of poverty

Our choice of private consumption expenditure (PCE) per adult equivalent as an appropriate welfare measure has a strong theoretical basis as well as intuitive appeal. The question arises whether other popular poverty definitions would select the same individuals as poor. As we do not yet wish to turn to the issue of the equivalence scale, we use *per capita* PCE as our referent. The following poverty definitions were tested:

1. Per capita consumption
2. Household consumption
3. Per capita income
4. Per capita food expenditure
5. Per capita caloric intake
6. Budget share of food expenditure (food ratio)
7. Average educational level of adult household members

We compare the characteristics of the poor selected under each definition. In order to make the comparisons meaningful, we define 40% of households as poor using each definition.

Table 1 Incidence of poverty amongst selected groups, by poverty measure (1993 data)*

	% Africans in poverty	% coloureds in poverty	Incidence of rural poverty	Incidence of urban poverty	Incidence of poverty amongst female headed households
Per capita consumption	51.4	25.3	60.5	20.3	53.4
Total household consumption	51.8	21.1	58.2	22.5	52.1
Per capita income	51.6	19.2	59.5	21.3	52.4
Per capita food expenditure	49.6	35.2	56.3	24.4	49.9
Per capita caloric intake	42.5	57.2	42.4	38.0	44.2
Food ratio	50.9	20.5	57.8	22.0	51.9
Avg. adult education	49.9	27.8	56.5	24.1	43.8

Source: Saldru, 1993.

* assuming that the poorest 40% of households are poor.

Table 2 Incidence of poverty amongst selected groups, by poverty measure (1995 data)*

	% Africans in poverty	% coloureds in poverty	Incidence of rural poverty	Incidence of urban poverty	Incidence of poverty amongst female headed households
Per capita consumption	53.6	35.8	60.6	24.1	52.2
Total household consumption	52.1	36.0	59.2	25.2	52.2
Per capita income	53.4	36.2	59.1	25.3	53.0
Per capita food expenditure	53.2	33.3	56.7	27.2	48.8
Food ratio	49.0	45.3	54.4	28.9	53.0
Avg. adult education	50.8	46.6	59.3	25.2	44.0

Source: IES & OHS, SSA 1995.

* assuming that the poorest 40% of households are poor.

Tables 1 and 2 show the results. It is immediately apparent that when we use per capita caloric intake as our poverty definition we radically alter the face of poverty. Using caloric intake, poverty amongst the coloured population is a more severe problem than amongst Africans, clearly an absurd result. In general, however, the seven definitions of poverty give broadly consistent results.

Tables 3 and 4 show the correlation between poverty as defined by per capita consumption and the alternative definitions of poverty suggested above. The first two columns give the total number of households who are classified by both definitions as poor and non-poor, respectively. (Thus if the two definitions were perfectly correlated these numbers would be 40% and 60% respectively.)

The tables indicate that some definitions of poverty are much more strongly correlated with per capita PCE than others. The poorest measures are adult school attainment and caloric intake. As we show later in this report, school attainment of less than completed secondary education is a poor predictor of finding employment and thus correlates poorly with standard of living. The difficulties associated with caloric intake as a measure of well-being are discussed below.

Table 3 Correlation of alternative definitions of poverty with the per capita consumption definition (1993 data)

Definition	Percentage of population "correctly" identified		
	Poor	Non-poor	Total
Household consumption	70.5	80.3	76.4
Per capita income	77.0	84.7	81.6
Per capita food expenditure	85.8	90.5	88.6
Per capita caloric intake	62.3	74.8	69.8
Food ratio	65.8	77.2	72.6
Adult school attainment	60.5	73.7	68.4

Source: Saldru, 1993.

Table 4 Correlation of alternative definitions of poverty with the per capita consumption definition (1995 data)

Definition	Percentage of population “correctly” identified		
	Poor	Non-poor	Total
Household consumption	75.8	83.8	80.6
Per capita income	90.8	93.8	92.6
Per capita food expenditure	79.3	86.2	83.4
Food ratio	69.0	79.3	75.2
Adult school attainment	64.8	76.5	71.8

Source: IES & OHS, SSA 1995.

2. Deriving a poverty line

Modern interest in poverty can be traced to the concern of social observers such as Booth and Rowntree in Britain in the late 19th century. From those times social policy analysts have found it useful to focus debate through reference to a minimum desirable level of income or a *poverty line* (Johnson, 1996:110).

A poverty line divides the population into two groups on the basis of some measure: below the line a household/individual is considered to be poor, and above the line it is considered non-poor. Clearly, poverty lines are extremely useful for descriptions of poverty. By defining a line that is regarded as some kind of minimum living level, we are able to get a handle on the number of poor people, as well as the depth and severity of poverty.

However, the point at which we draw the line is always somewhat arbitrary and often highly contentious. After all, it is clearly rather crude to assume that a household earning R999 per month is in poverty, while the household earning R1000 is not. A poverty line will always be an imperfect measure, but for purposes of analysis we need to draw the line *somewhere* in order to go forward in understanding the nature of poverty.

Many approaches to identifying the poor begin with the specification of a set of basic needs. If we specify minimum levels for certain consumption items (e.g. food, clothing, housing) then an individual who does not meet these minimum levels for *each* commodity is clearly poor. The difficulty arises that a person may be, for example, “food-poor” but not “energy-poor” making this a cumbersome measurement to use in practice. This can be termed the “direct approach” (Callan and Nolan, 1991: 244).

An alternative to the direct approach is to work out the cost of a minimum basket of goods and use the required expenditure level as the poverty line. This is what Sen (1976: 219) terms the “income approach”. A variant on this approach is to build in a factor for waste and inefficient expenditure – i.e. if it costs Rx to purchase the minimum set of commodities, the poverty line could be set at $Rx(1+y)$ where y represents the proportion in excess of the strict minimum cost budget.

The conceptual distinction between the direct and income approaches is significant. While the direct approach identifies those individuals or households who *fail* to meet some minimum standard of

living, the latter approach identifies those that are *unable* to do so. Out of respect for individual choice and in accordance with convention, we rely on the “income approach”.

Absolute versus relative poverty lines

The literature distinguishes between *absolute* and *relative* poverty lines. An absolute poverty line is not meant to change with the standard of living in society. People are defined as poor when they lack the command over resources to meet some absolute needs. A relative poverty line will move with standards of living (as represented by, say, median income): the poor are then taken to be those persons that are suffering *relative* deprivation.

The question of whether poverty should be seen as a state of absolute or relative deprivation has dominated the literature on the construction of a poverty line (Ravallion, 1995:24). The distinction is important because it affects the way we perceive poverty reduction policies. For example, economic growth will generally result in a reduction in the number of people in absolute poverty, but only a change in the distribution of income will reduce the number of people in relative poverty. As we are only looking at a single survey, these dynamic effects are not relevant to our work. However, we will derive and use an absolute poverty line.

2.1 Deriving an absolute poverty line

It is undeniable that there exist levels of consumption of food, clothing and shelter below which survival is threatened (Ravallion, 1992:25). But in most societies the notion of what constitutes the “minimum” living level is quite a bit higher than what is *essential* to survival. After all, as Beckerman (1984:6) has observed, it does not really make sense to define poverty at some minimum level when people continue to survive below it.

The most common approach in defining an absolute poverty line is to estimate the cost of a bundle of goods deemed to assure that “basic needs” (as determined by the analyst) are met. In developing countries where food expenditure will make up a large part of the basic needs bundle, a poverty line based on the amount of money needed to buy enough food to obtain the minimum intake of kilojoules and a modest allowance for non-food goods is often advocated.

Choosing the food energy requirement is, however, fraught with difficulties. Firstly, the number of kilojoules required is highly variable from one person to another, since people have different metabolisms and activity levels. Secondly, the household’s consumption behaviour is not taken into account. The minimum cost for attaining the necessary energy intake may be less than the expenditure level at which a household normally attains that kilojoule intake. People do not simply consume food in order to stay alive. They have preferences for particular types of food: a diet of maize meal and beans may provide all the necessary nutrients at very low cost, but it may be loathsome to the individual.

There are also problems with determining the allowance for non-food consumption. The “food energy approach” (Ravallion, 1992:27) fixes a food energy intake in kilojoules and then finds the total consumption expenditure or income level at which a person typically attains that food energy intake. This has the appeal that it yields a poverty line which is consistent with local tastes and prices.

A variation on this method is to first find the minimum cost of a minimum-kilojoule food bundle and then divide this by the share of food in total expenditure of some group of households deemed likely to be poor. The immediate difficulty with the method is that it requires a pre-judgement of who is “poor” in order to determine who is poor, thus making the exercise somewhat circular.

Relative poverty lines

The view that poverty has to be seen in the context of the standard of living of the society in question enjoys wide popularity (Callan and Nolan, 1991:252). This has led to the derivation of poverty lines that are explicitly based on relative well-being. The rationale of this is that those falling more than a certain distance below the average welfare level in a particular society are unlikely to be able to participate fully in the community.

The crudest definition of a relative poverty line is that income level which cuts off the poorest p percent of the population in the national income distribution. The choice of p will always be somewhat arbitrary, but 40 percent is often chosen¹. There are two objections to this method. First, the method prejudices the extent of poverty - it is p percent by definition. Second, it necessitates that "the poor are always with us". Even in the event of a massive shift in living standards, the proportion of people in poverty remains unchanged.

Another method is to define poverty in relation to contemporary living standards. For example, many studies for developed countries have used a poverty line which is set at a particular percentage of mean or median consumption. Typically, the poverty line is set at 50 percent of the national mean income. Thus, while the poverty line shifts upwards as the general standard of living rises, it is still possible to eliminate poverty (Atkinson, 1977:189).

For South Africa, the per capita household income level which cuts off the poorest 40 percent of households in 1993 was R228 per month. The percentage of individuals who fall below this poverty line is 54,3%, however, because the poor have larger households on average than the non-poor.

The estimated per capita income in South Africa in 1993 was R472, so a relative poverty line set at 50% of per capita income would be R236 per month, which is very close to the figure of R228 obtained above.

¹ Anand (1983:113) suggests that the popularity of this particular figure has its origins in Robert McNamara's 1972 exhortation that special policies be initiated to increase the incomes of lowest 40 percent in developing countries.

2.2 Dual poverty lines

Ravallion (1992: 34) advocates always considering at least two (and preferably multiple) poverty lines. This has the appeal of testing the sensitivity of measures to small changes in the setting of the poverty line. He further advocates the use of an absolute and a relative poverty line on the same data sets.

2.3 Selecting a poverty line for South Africa

The two most widely used South African poverty lines are the Household Subsistence Level (HSL) calculated by the Institute for Planning Research (Potgieter, 1993) and the Minimum Living Level (MLL) determined by the Bureau for Market Research. Both organisations calculate their poverty lines biannually for the major urban centres of South Africa and irregularly in rural areas.

Table 5 shows several possible definitions of a poverty line, including lines based on both absolute and relative poverty definitions. These lines yield results showing a range in the proportion of the population who are poor from about 24 per cent to 57 per cent. We use the 1993 data for this comparison as its inclusion of caloric consumption allows for a greater variety of poverty lines to be derived.

Table 5 Comparison of Selected Poverty Lines for South Africa - 1993

Types of Poverty Lines	Rands per month cut-off	Percentage of individuals below the poverty line
1. Population cut-off at 40 th percentile of households ranked by adult equivalent expenditure	R301.70 per adult equivalent	52.8
2. Population cut-off at 50% of national per capita expenditure	R201.80 per capita	46.9
3. Amount of money required to achieve a per capita caloric intake of 8500 kJ per day ¹	R149.50 per capita	40.4
4. Minimum and supplemental living levels per capita set by the Bureau of Market Research, University of South Africa ²		
Supplemental Living Level (SLL)	R220.10 per capita	56.7
Minimum Living Level (MLL)	R164.20 per capita	44.7
5. Per adult equivalent household subsistence level (HSL) set by The Institute for Development Planning Research, University of Port Elizabeth ³	R251.10 per adult equivalent	45.7
6. International poverty line of US\$1 (1985 prices) per capita per day ⁴	R105.00 per capita	25.6

Source: Saldru, 1993

Notes:

1. Derived through regression analysis, using the Food Energy Intake Method (Ravallion, 1998) which relates food expenditure per adult equivalent (X) and energy intake per adult equivalent (C) by means of a function of the form $\ln X = a + bC + \mu$.

-
2. For the minimum and supplemental living level, the values given are based on a family of five, converted to an adult equivalence scale.
 3. The HSL is calculated separately for various combinations of geographical location and household composition. The line used here is the average for the metropolitan centres where the minimum level of welfare required by a family of 2 adults and 3 children was set at R 825.10 per month in September 1993.
 4. Deaton (1997:157).

The wide divergence of the poverty lines suggested in table 5 is the rationale for employing a “poverty critical range” in place of a single poverty line. In the rest of our analysis we select a wide poverty critical range in order to establish whether our poverty rankings are robust.

2.4 Adjusting for household size and structure

Households differ in size and demographic make-up. Consequently a straightforward comparison of household consumption may be deceptive. It is thus common practice to use some form of normalisation. The simplest normalisation is simply to divide household consumption by household size and then to compare households on the basis of household per capita consumption. More complex forms of normalisation in which household consumption is converted to consumption per “equivalent adult males” have become fashionable. A household of given size and demographic composition is taken to have the equivalent needs of a given number of adult males.

There exists a vast literature regarding the aggregation of individual living standards into household living standards (Sen, 1987; Nelson, 1993; Lanjouw and Ravallion, 1995). Two broad issues arise in this literature. First, there is the issue of household size. Larger households require more expenditures than smaller households to achieve the same level of consumption. Clearly, this is not a linear relationship as larger households may benefit from economies of scale in consumption of household public goods. The second class of issues relates to household composition. A three adult household is unlikely to have equivalent consumption requirements to a household with one adult and two young children. A household has to be aggregated into a number of adult equivalents. In sum then, in order to account for differences in household size and composition, total household consumption has to be divided by the number of adult equivalents and adjusted to take into account economies of scale (Deaton and Muellbauer, 1980).

Children impose financial costs on the households in which they reside, but it is generally agreed that the cost of a child is smaller than the cost of an additional adult. One standard and widely used procedure is to define children as a fraction of an adult according to nutritional needs. Based on the caloric requirements set down by the World Health Organisation (e.g. a child aged 7-8 requires 64% as many calories as an adult male) it is possible to calculate the number of equivalent males in the household. The difficulty with this approach is that children (and adults) consume non-food items as well and there is no good reason to believe that non-food expenditure is in proportion to caloric needs. Furthermore, the empirical evidence suggests that even individuals with the means to purchase “sufficient” calories do not necessarily do so, making the link between nutrition and welfare very tenuous.

Engel’s (1943) procedure is the most well-known method of measuring child costs and economies of scale. Engel observed that, amongst households of similar size and composition, the budget share devoted to food declined as total consumption increased. Secondly, for households with the same total expenditure, he observed that the larger the household the larger the budget share devoted to food. Finally, he argued that households with the same budget share have the same level of welfare, regardless of the demographic make-up of the household.

We used the Working (1943) - Leser (1963) form of the Engel curve to estimate equivalence scales for African households. A demand model was constructed in which the budget share devoted to food

consumption (the food ratio) was regressed on the log of per capita expenditure and the numbers of persons in various demographic categories living in the household. If we accept that the food ratio is a valid indicator of welfare then, by fixing the referent welfare level (and hence the food ratio), the regression equation tells us by how much total consumption must differ in order that a household be exactly compensated for its different composition relative to another household.

The prime objection to the use of this technique is that it assumes that the food share is a valid indicator of well-being. Ravallion points out that, at the very least, food share is a ‘noisy’ indicator because the relationship between food share and consumption differs across households since their tastes will differ (Ravallion, 1992: 21). A further problem is that the income elasticity of demand for food can be close to 1 for poor households, making the food ratio an unreliable indicator.

We fixed the food ratio at two different levels: 50% and 40%. The “cost” of various household compositions is shown below.

Table 6 Net expenditure required for a household of varying composition to attain a food ratio of 40%

Number of adults	Number of children	Total consumption at a food ratio of 40%
1	0	410
2	0	724
3	0	982
4	0	1100
2	1	970
2	2	1174
2	3	1318
3	1	1159
3	2	1307
3	3	1391

Source: IES & OHS, SSA 1995.

Table 7 Net expenditure required for a household of varying composition to attain a food ratio of 50%

Number of adults	Number of children	Total consumption at a food ratio of 50%
1	0	119
2	0	200
3	0	279
4	0	302
2	1	280
2	2	305
2	3	337
3	1	334
3	2	366
3	3	400

Source: IES & OHS, SSA 1995.

We then fitted an equivalence scale of the form $(A+\alpha K)^\theta$ to the data using (weighted) non-linear least squares. When the food ratio is fixed at 50%, we obtain estimates of α and θ of 0.997 and 0.68 respectively. When the food ratio is fixed at 40%, we obtain estimates of α and θ of 0.812 and 0.62 respectively.

Nicholson (1976) argues that Engel's procedure overstates the cost of children. He reasons as follows. Assume that a couple have a child, who brings with her an endowment that exactly compensates the household for the costs associated with the child. By assumption, the parents are as well off as before and are able to continue to consume in the same pattern as before. However, the consumption patterns of the child are likely to differ: specifically we expect that a higher percentage of the child's total consumption will be on food. Consequently, the food share of the household as a whole has increased, despite perfect compensation. Therefore, had the household been compensated according to the Engel procedure, they would have been given sufficient money to drive the food share down to the level it was at before the birth of the child. Thus, the household would be overcompensated.

In the past, South Africans have followed the lead of May *et al.* (1995) in choosing to set $\alpha = 0.5$ and $\theta = 0.9$. These values were suggested by Angus Deaton in a lecture given in South Africa in 1993, but were simply suggested as plausible values for the purposes of explaining the principle of the equivalence scale.

The only other source of implicit equivalence scales for South Africa can be found in the methodology of the Household Subsistence Level (Potgieter, 1995). First, we note that the amount of money needed to feed and clothe a 10 year old child is 0.68 that of providing for a (male) adult. Then, by comparing the HSLs for 5 and 6 person households where the additional person is assumed to be a child, we find that the implicit value of θ is 0.72.

Of course, if our poverty profile is insensitive to changes in the values of α and θ , then it is unimportant where we fix the equivalence scale parameters. We tested the robustness of the poverty profile to a variety of values of α and θ , namely $\alpha=0.5, 0.75$ and 1 and $\theta = 0.6, 0.75$ and 0.9 . We keep the share of individuals in poverty fixed at 40%.

The results in table 8 are encouraging, for they show that the poverty profile changes very little even when we make large adjustments to the scale parameters. The poverty rate amongst Africans, Coloured and rural and urban dwellers remains astonishingly unchanged.

When we consider particular age categories, the impact of the parameters is more noticeable. By definition, the higher the value of α , the more children are in poverty. Nevertheless, the changes are not dramatic, with the percentage of poor children varying from 45.5 to 48.6%. The flip side of this is that the more heavily we weight children, the fewer elderly are in poverty. The incidence of poverty amongst the elderly varies slightly more, with between 36.1 and 41.3% of the elderly being defined as poor. In addition, the greater the economies of scale, the more elderly are in poverty (because the elderly tend to live in larger households), while the reverse is true for children.

This does not mean, however, that the *same* households are identified as poor using different assumptions about child costs and economies of scale. If we take the May scales of $\alpha = 0.5$ and $\theta = 0.9$ as our reference point, table 9 shows the percentage of households that are "correctly" identified as poor when using the other scales.

Table 8 Percentage of poor households "correctly" identified as poor, taking $\alpha = 0.5$ and $\theta = 0.9$ as the reference scale

Equivalence scale	% of households identified as poor under both scales
$\alpha=0.5, \theta=0.6$	96.1
$\alpha=0.5, \theta=0.75$	98.2
$\alpha=0.75, \theta=0.6$	95.6
$\alpha=0.75, \theta=0.75$	97.1
$\alpha=0.75, \theta=0.9$	95.9
$\alpha=1, \theta=0.6$	94.9
$\alpha=1, \theta=0.75$	95.1
$\alpha=1, \theta=0.9$	93.6

Source: IES & OHS, SSA 1995.

It is evident that the choice of equivalence scale makes a small difference to the identification of poor households. From a policy perspective, however, the robustness of the poverty profile is more important, since government is more likely to identify vulnerable groups rather than specific households.

Table 9 Incidence of poverty among selected groups, using a variety of equivalence scales

	% Africans in poverty	% coloureds in poverty	% of rural residents in poverty	% of urban residents in poverty	% of female headed hh in poverty	% of elderly in poverty	% of children in poverty	Adult equivalent poverty line (annual)	Annual transfer required to eliminate poverty
$\alpha=0.5, \theta=0.6$	51.1	29.8	58.4	24.6	52.5	41.3	45.5	R5089	R14.1 bn
$\alpha=0.5, \theta=0.75$	51.1	29.6	58.4	24.5	52.3	40.0	45.7	R4069	R14.2 bn
$\alpha=0.5, \theta=0.9$	51.0	29.8	58.2	24.5	52.0	38.9	45.9	R3238	R14.4 bn
$\alpha=0.75, \theta=0.6$	51.0	29.9	58.5	24.4	52.9	40.1	46.6	R4740	R14.1 bn
$\alpha=0.75, \theta=0.75$	51.1	29.5	58.6	24.2	52.7	38.5	47.0	R3719	R14.1 bn
$\alpha=0.75, \theta=0.9$	51.0	29.5	58.5	24.1	52.6	37.3	47.4	R2911	R14.5 bn
$\alpha=1, \theta=0.6$	51.0	29.6	58.7	24.1	53.1	39.1	47.3	R4471	R14.2 bn
$\alpha=1, \theta=0.75$	51.0	29.5	58.7	24.0	52.9	37.6	48.0	R3455	R14.4 bn
$\alpha=1, \theta=0.9$	51.0	29.5	58.6	23.9	52.9	36.1	48.6	R2665	R15.0 bn

Source: IES & OHS, SSA 1995.

We also need to consider whether the choice of equivalence scale will alter the picture we paint of inequality.

Table 10 Measures of inequality using different equivalence scales

	Gini coefficient (household income)	Theil-T	Contribution of between group inequality (%)	Theil-L	Contribution of between group inequality (%)
$\alpha=0.5, \theta=0.6$	0.60	0.75	36.7	0.68	35.5
$\alpha=0.5, \theta=0.75$	0.61	0.77	37.5	0.70	35.9
$\alpha=0.5, \theta=0.9$	0.62	0.80	37.9	0.74	36.0
$\alpha=0.75, \theta=0.6$	0.61	0.75	37.2	0.69	35.7
$\alpha=0.75, \theta=0.75$	0.62	0.78	38.0	0.72	36.2
$\alpha=0.75, \theta=0.9$	0.63	0.81	38.2	0.76	36.0
$\alpha=1, \theta=0.6$	0.61	0.76	37.5	0.70	35.9
$\alpha=1, \theta=0.75$	0.62	0.79	38.2	0.73	36.2
$\alpha=1, \theta=0.9$	0.63	0.83	38.4	0.78	35.9

Source: IES & OHS, SSA 1995.

We see that the Gini, the Theil-T and the Theil-L all increase as α or θ increases. In other words, as α or θ increases we “observe” more inequality. The reason for this is not hard to see. When child costs are low or there are substantial economies of scale, we “compress” the income distribution by weighting large households less heavily. Consequently, our measures of inequality will be smaller.

Clearly, we need to select an equivalence scale for consequent empirical work in this paper. Happily, we see that, within a reasonable range, our choice will not have a significant distorting influence on the results. Since the scales of May *et al.* are widely accepted in South Africa, we choose to follow his example of setting the child cost ratio at 0.5 and the economies of scale parameter at 0.9. The small contribution that we have made here is to justify such a choice of parameters prior to use.

2.5 Limitations of the approach

2.5.1 Temporary and chronic poverty

Poverty may be chronic (long-term) or temporary (short-term). Chronic poverty is usually the more difficult to address, and is often associated with persistent inter-generational poverty. Temporary

poverty may result from a one-time decline in living standards (for example following the loss of a job), from which a household gradually emerges. Or it may show itself in fluctuations in well-being that result in frequent declines in living standards. For example, external shocks in the form of policy changes or natural disasters may plunge a household into poverty. In contrast, seasonal variations in food security may result in some households periodically falling in and out of poverty, sometimes quite regularly, over time. Poverty indicators based on cross-sectional household survey data cannot generally differentiate between short- and long-term poverty.

2.5.2 *Poverty and vulnerability*

Although poverty and vulnerability are often related, they are not synonymous. Some groups may be at risk of becoming poor because of inherent vulnerabilities (e.g. different types of discrimination based on class, gender, ethnicity, or factors such as disability or region of residence). Certain combinations of vulnerability may be strongly correlated with poverty, such as female-headed households or families living in deep rural areas. But not all members of a particular *vulnerable* group are necessarily *poor*.

This is an important distinction. In short, poverty relates to deprivation, while vulnerability is a function of external risks, shocks and stresses (Streeten, 1994:17). Creating measures which reflect vulnerability is beyond the scope of the present study.

2.5.3 *Households as units of co-residence and consumption*

The best source of information about living standards comes from household surveys. The first problem that arises in analysing these surveys is what do we mean when we speak of a 'household'? For the purposes of surveys, households are generally defined as a group of people living under the same roof, eating together and sharing their resources.

That sounds simpler than it really is. People may move easily in and out of households at different times and under different circumstances. Moreover, the concept of a household presupposes that resources, food and incomes are somehow shared amongst household members. But we need to be aware that who lives with whom, who provides consumption needs, and who consumes what, are all aspects which impact on the *individual's* experience of poverty.

Since a household survey collects information principally at the *household* level, it cannot tell us much about the inequalities in resource allocations *within* households. When we talk about poor children, for example, we are talking about those children who are living in poor households. In reality, there may be many children who, although they live in non-poor households, should be counted as poor because of the inequalities in intra-household allocations. To truly assess individual well-being, we would require information on the specific consumption of each individual household member. Regrettably, this information is rarely available (Haddad and Kanbur, 1990).

South Africa's history of influx control and migrant labour means that many households are relatively fluid units in terms of who actually lives with whom at any one time. It is not only adult members who may come and go. Children may move, or be moved, between different familial households, especially when there is financial or physical disruption. According to findings based on the PSLSD survey, in 1993 only one-third of African children were growing up with both parents present in the household (le Roux, 1994).

While temporary migration may be a part of economic survival strategies, it has an effect on how households are organised. In many instances women become the *de facto* heads of households, responsible for most aspects of household maintenance. The other side of fragmented households are

the living arrangements of migrant workers. Here too analysis is made more complicated by the fact that migrants living together in hostels are not households constituted by partnerships derived from choice.

These limitations of the data need to be borne in mind. While household surveys are one of the most valuable instruments for telling us about income poverty and inequality, they cannot provide all the answers.

3. A profile of poverty in South Africa

In the discussion above we recognised the many dimensions of poverty but then restricted discussion to one dimension, private consumption expenditure (PCE). We then selected an appropriate equivalence scale with which to normalize PCE so as to take account of differences in household size and demographic structure. We also discussed the issue of selecting a poverty line. This choice has a bearing on consequent empirical results but is essentially arbitrary. We therefore recommended that at least two, and preferably multiple, poverty lines always be considered. In this section we employ a *poverty critical range* in place of a single poverty line. This reduces concern regarding the arbitrariness of the poverty line, since it requires that results hold within a band of welfare levels. At the same time, descriptions of poverty become extremely cumbersome within this framework. Consequently, we tabulate the poverty statistics at two poverty lines as well as graphically presenting the statistics within a range of values. We select as our two poverty lines the Household Subsistence Level and the “dollar a day” international poverty line. The former line is set at R3 509 per adult equivalent per annum and the latter (which can be thought of as an “ultra-poverty” line) is set at R2 200 per adult equivalent per annum in 1995 prices.²

There is one more theoretical concern that we need to deal with before we profile poverty in South Africa. The preceding discussion has focused on the identification of the poor. Having identified the poor we need to be clear about the issues involved in aggregating all of the poor into a national poverty statistic. It is important to focus not only on the number of poor households but also on the depth and severity of the poverty which they experience. Consequently, we employ *distribution sensitive* decomposable poverty measures, which reflect the depth of poverty through sensitivity to the income distribution among the poor.

The following four axioms (Sen, 1976) form the basis of what has become a widely accepted consensus concerning the basic requirements of a good poverty measure:

1. *monotonicity*: if the income of a poor individual falls (rises), the index must rise (fall);
2. *transfer*: if a poor individual transfers income to someone less poor than herself (whether poor or non-poor), the index must rise;
3. *population symmetry*: if two or more identical populations are pooled, the index must not change; and
4. *proportion of poor*: if the proportion of the population which is poor grows (diminishes), the index must rise (fall).

The most commonly quoted measures of poverty are the head-count index and the poverty gap index. The head-count index (H) is simply the proportion of the population that is poor. The poverty gap index (PG) measures the average distance that a poor person is from the poverty line. PG can be considered to reflect the depth of poverty amongst the poor.

The head-count index, while popular, has some flaws. Watts (1968:325), for example, points out that poverty should not be seen as “a discrete condition”. One does not immediately acquire or shed the afflictions we associate with the notion of poverty by crossing any particular income line”.

² To create a poverty line per adult equivalent from the “dollar a day” per capita line, we assumed that the average household consists of two adults and three children.

The poverty gap index has a number of advantages over the head count ratio. Because the head count ratio is discontinuous at the poverty line it violates the principle of transfers. It is possible to *increase* social welfare by taking money from the very poor to lift some of the just-poor out of poverty. The poverty gap index, on the other hand, is continuous and concave. Thus, transfers from the poor to the just-poor in order that they become non-poor will increase PG. PG nevertheless neglects inequality *among* the poor.

These two measures are special cases of the generic class of decomposable measures proposed by Foster, Greer and Thorbecke (1984). The Foster-Greer-Thorbecke (FGT) class of poverty measures can be written:

$$P_{\alpha} = \frac{1}{n} \sum_{i=1}^q \left[\frac{z - y_i}{z} \right]^{\alpha} \quad \text{for } \alpha \geq 0$$

where

z is the poverty line

y_i is the standard of living indicator (e.g. PCE) of the i th household

α is the “aversion to poverty” parameter³

The head count index is obtained by setting $\alpha = 0$ and the poverty gap by setting $\alpha = 1$. P_2 is often calculated as a measure of the severity of poverty. P_2 can be thought of as the sum of two components: an amount due to the poverty gap, and an amount due to inequality amongst the poor (Ravallion, 1992:39), i.e. P_2 can be written as:

$$P_2 = \frac{PG^2}{H} + \frac{(H - PG)^2}{H} CV_p^2$$

(contribution of
the poverty gap)

(contribution of inequality
amongst the poor)

where CV_p^2 denotes the squared coefficient of variation of income among the poor. While this breakdown goes part of the way to explaining the meaning of P_2 , it remains difficult to interpret. In any event, the magnitude of P_2 tells us very little when taken on its own. The value of P_2 is in allowing us to make comparisons over time or space or of different policy options.

The FGT class of measures has several desirable properties. For example, both the poverty gap and P_2 are strictly decreasing in the living standard of the poor (the lower your standard of living, the poorer you are deemed to be). P_2 has the further desirable property that the increase in your measured poverty due to a fall in standard of living will be deemed greater the poorer you are.

In this paper we consider P_0 , P_1 and P_2 in order to obtain measures of the *incidence*, the *depth* and the *severity* of poverty.

³ The higher the value of α , the more sensitive the measure is to the well-being of the poorest person. As α approaches infinity, the measure reflects only the poverty of the poorest person.

One of the most useful properties of the FGT class of measures is that total poverty can be decomposed into additive sub-group poverty shares. If we split the population into m (mutually exclusive and exhaustive) subgroups containing n_i individuals, then we can derive intra-group FGT measures such that:

$$P_a = \sum_{i=1}^m \frac{P_{ai} n_i}{n} \quad \text{where}$$

$$P_{ai} = \frac{1}{n_i} \sum_{j=1}^{q_i} \left(1 - \frac{Y_{ij}}{z}\right)^a$$

3.1 Poverty Critical Range and Partial Poverty Ordering

As discussed in the previous chapter, there is great uncertainty about the setting of an appropriate poverty line. It is easy to construct a theoretical example of two distributions of PCE, A and B , for any poverty measure $P(z, h)$ in which $P_A(z_0, h) < P_B(z_0, h)$ at one poverty line z_0 and $P_A(z_1, h) > P_B(z_1, h)$ at some other reasonable poverty line z_1 (Cushing and Zheng, 1996: 5).⁴ We regard the poverty levels in these two distributions as non-comparable. If, however, the poverty ordering of two distributions holds at every poverty line within a reasonable range, then there is less question over the ordering.

This consideration led to the development of *partial poverty ordering* in contrast to conventional complete ordering at one poverty line (Atkinson (1987), Foster and Shorrocks (1988)). The relationship between the partial poverty ordering of certain measures and *stochastic dominance* was established. The poverty critical range that was used was either the whole income range $[0, \infty)$ or a narrower range $[0, a]$ where $0 < a < \infty$. In practice, it is not necessary to specify very wide poverty critical ranges, since the range of income levels that we would consider reasonable for establishing a poverty line is limited.

If Z is the set of poverty lines, then $P(z, h)$ becomes a curve that we refer to as a *poverty value curve*. Partial poverty ordering is the ranking of different poverty value curves. If the poverty value curve of income distribution A lies below that of B , then we say that A dominates B in poverty level.

(Weak) poverty dominance. For two income distributions A and B , we say that A has a lower poverty level than B (i.e. A poverty dominates B), iff:

$$P_A(z, h) \geq P_B(z, h) \quad \text{for all } z \in Z \quad (1)$$

and

$$P_A(z, h) > P_B(z, h) \quad \text{for at least one } z \quad (2)$$

Thus, after specifying the poverty critical range Z , we simply have to determine whether conditions (1) and (2) are satisfied. There are three possibilities:

⁴ h is the specific poverty value function, such as the head count ratio.

1. the poverty measures of the two income distributions are identical for all $z \in Z$;
2. one poverty curve dominates the other; or
3. the poverty value curves cross, i.e. the poverty measures of one income distribution are greater than those of the other at some poverty lines but smaller at some other poverty lines.

In the first two cases we have no doubt about the poverty ordering, while in the third case we cannot draw any conclusions about the comparison unless we narrow the poverty critical range.

Ravallion and Sen (1996: 776) point out that if we trace out two poverty value curves based on the P_0 measure and one curve dominates the other, then this result automatically holds for the poverty value curves associated with a broad range of poverty measures. Thus, if we obtain an unambiguous poverty ordering based on the head-count index, the result will be the same when we map P_1 or P_2 .

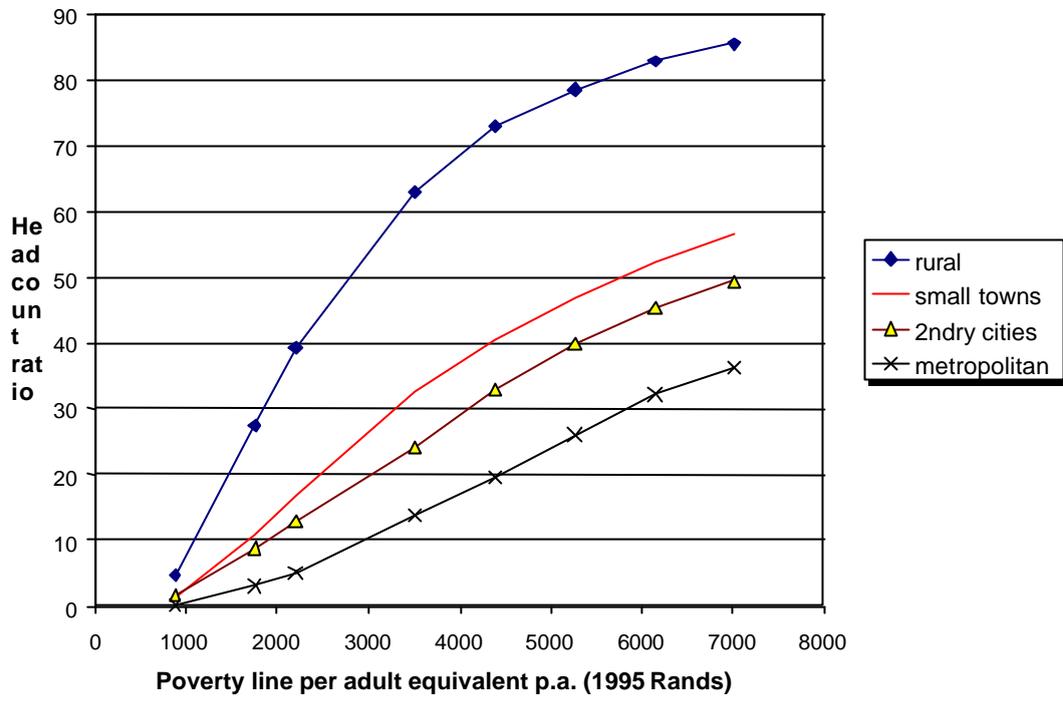
3.2 Where are the Poor?

The poverty value curves in figure 1 below shows the great disparities between rural and urban areas. We divide the urban sample into small towns, secondary cities and metropolitan areas in order to show that there is also differentiation within urban settlement types. For a very wide range of poverty lines, the incidence, depth and severity of poverty are unambiguously highest in rural areas, followed by small towns and secondary cities and considerably lower in metropolitan areas. Since the results are unambiguous, we do not present the curves representing the P_1 and P_2 FGT measures.

At a poverty line of R3509 per adult equivalent per annum, the poverty *rate* in rural areas (i.e. the percentage of individuals classified as poor) is 63%, compared with 22% in urban areas taken together. If we consider the “ultra-poor” (who expend less than half this amount), we find that 27% of rural dwellers fall below this line, in contrast to only 7% of those in urban areas.

Table 11 summarises the results of the analysis at the two selected poverty lines. The *poverty share* of rural areas (i.e. the percentage of poor individuals that live in rural areas) at the higher poverty line is 73%. Moreover, the combination of a high poverty rate and deep poverty among the poor in rural areas means that 75% of the total poverty gap is accounted for by poverty in rural households, although they only make up 49% of the population.

Figure 1 Incidence of poverty by locational classification



Source: IES & OHS, SSA 1995.

Using the P_1 measure (see figure 3 below) we find that the depth of poverty is highest in the Eastern Cape, Northern Province and Free State and lowest in Gauteng, followed by the Western Cape, KwaZulu-Natal and the Northern Cape. While poverty is higher in Mpumalanga than the North-West at low poverty lines, the curves coincide at higher poverty lines.

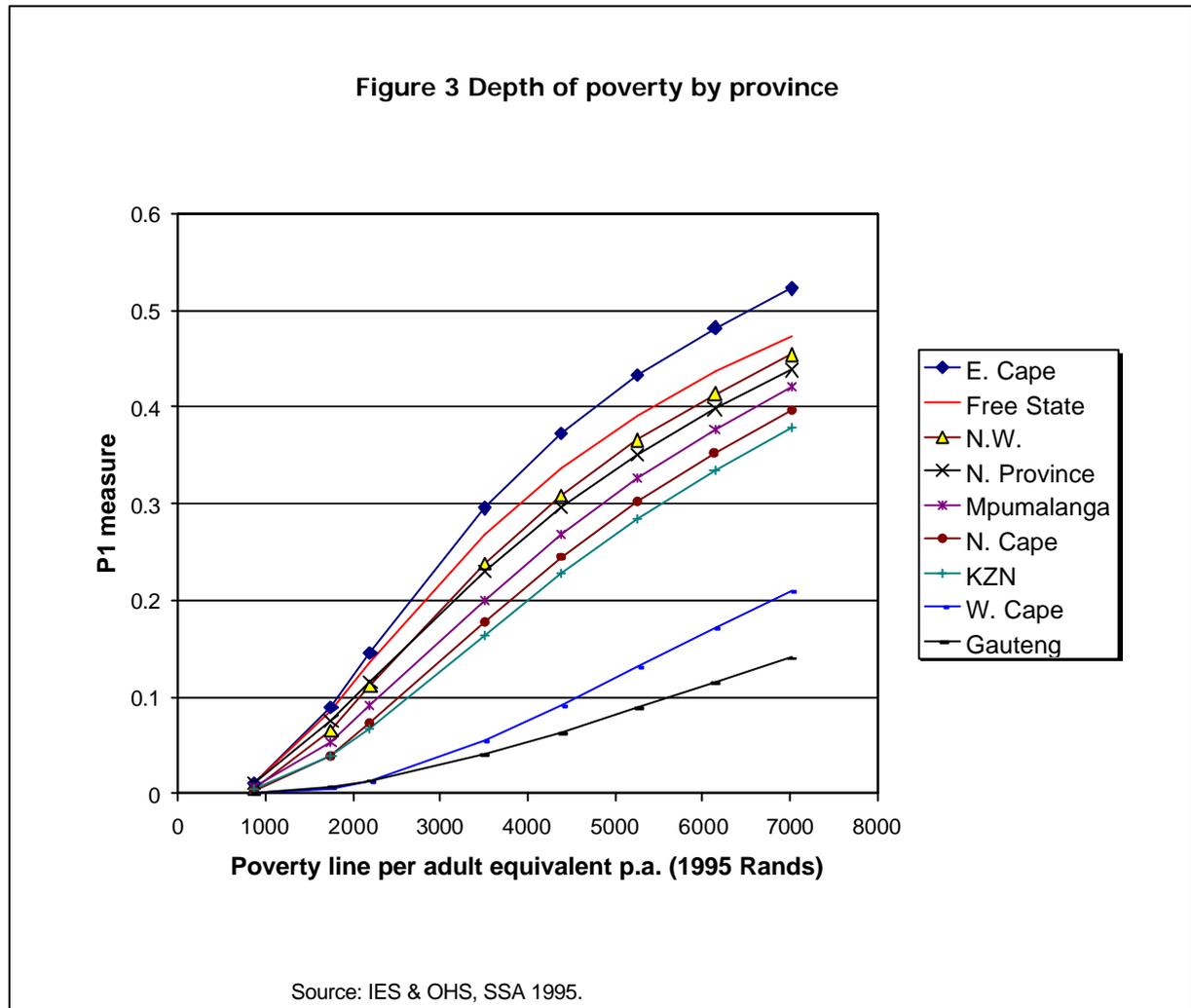
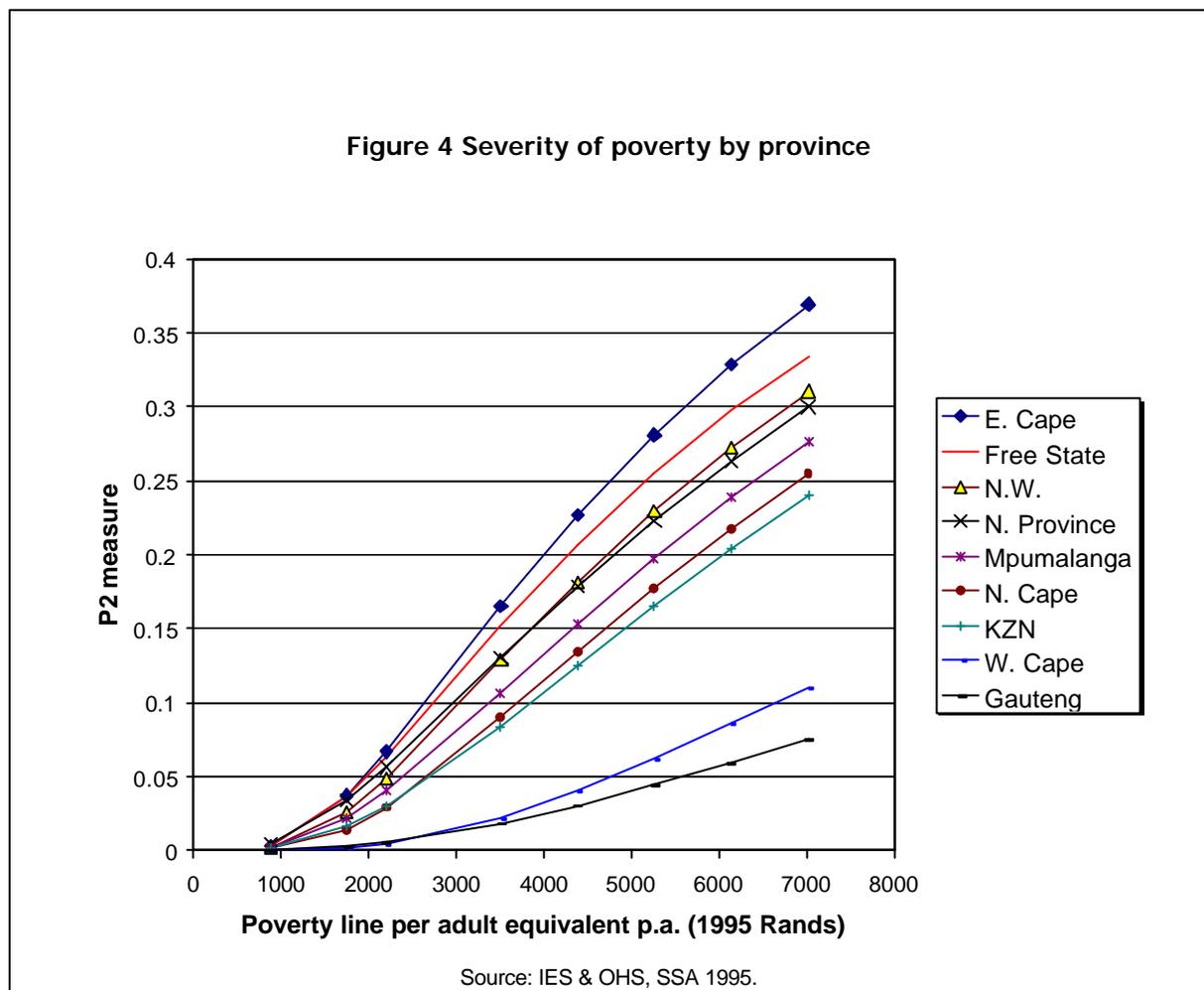


Figure 4 shows that Mpumalanga is consistently poorer than North-West when poverty is measured by the FGT P_2 index. This is easily explained by the fact that Mpumalanga has a higher incidence of poverty at lower poverty lines; thus when we weight the poorest of the poor more heavily, this part of the distribution dominates.



The poverty share analysis of table 12 complements and extends the graphical analysis of figures 2, 3 and 4 by showing the provincial distribution of poverty at two poverty lines and for all three FGT measures. In these share decompositions any reversal in poverty shares could be due to the change in poverty line or the change in poverty measure. With regard to the former, it can be seen that Western Cape and Gauteng increase their shares of poverty with a move from the lower poverty line to the higher line. This reflects the fact that the number of poor individuals in these two provinces rises relative to

other provinces with a move to the higher line. However, at either line, the poverty shares of these two provinces still fall sharply with a move from P0 to P1 and P2. This reflects the decreased weight of these provinces when priority is given to the poorest of the poor.

Table 12 Distribution of poor individuals by province

	Population Shares (%)	Poverty line = R2200 per adult equivalent p.a.						Poverty line = R3509 per adult equivalent p.a.					
		P ₀	P ₁	P ₂	Poverty shares			P ₀	P ₁	P ₂	Poverty shares		
					P ₀	P ₁	P ₂				P ₀	P ₁	P ₂
E. Cape	15.87	42.17	0.145	0.067	27.11	28.22	28.48	64.05	0.295	0.165	24.02	26.28	27.29
Free State	6.72	38.03	0.135	0.063	10.35	11.05	11.46	57.51	0.267	0.152	9.13	10.08	10.60
North-West	8.03	34.02	0.111	0.048	11.07	10.87	10.46	54.34	0.238	0.129	10.31	10.71	10.79
N. Province	13.17	31.73	0.115	0.056	16.93	18.53	19.87	50.77	0.230	0.130	15.80	16.98	17.85
Mpumalanga	7.29	28	0.090	0.041	8.27	8.05	7.96	49.21	0.200	0.107	8.48	8.19	8.09
N. Cape	1.79	26.13	0.072	0.029	1.90	1.58	1.40	45.97	0.178	0.090	1.94	1.78	1.67
KwaZulu-Natal	21.1	22.12	0.068	0.030	18.91	17.46	16.91	42.39	0.164	0.084	21.14	19.40	18.43
W. Cape	9.02	5.74	0.013	0.004	2.10	1.42	1.02	19.08	0.054	0.022	4.07	2.75	2.04
Gauteng	17.02	4.87	0.014	0.005	3.36	2.82	2.45	12.7	0.040	0.018	5.11	3.83	3.25
All	100				100	100					100	100	100

Source: IES & OHS, SSA 1995.

3.3 Poverty and Race

Living standards are closely correlated with race in South Africa. While poverty is not confined to any one racial group in South Africa, it is concentrated among blacks, particularly Africans. Figure 5 below shows the poverty rate by racial breakdown. Regardless of the choice of poverty line, it is clear that Africans and Coloureds experience far higher rates of poverty than amongst Indians and Whites. Table 13 then shows that, for either of the choice of poverty lines and any of the poverty measures, Africans totally dominate the poverty shares.

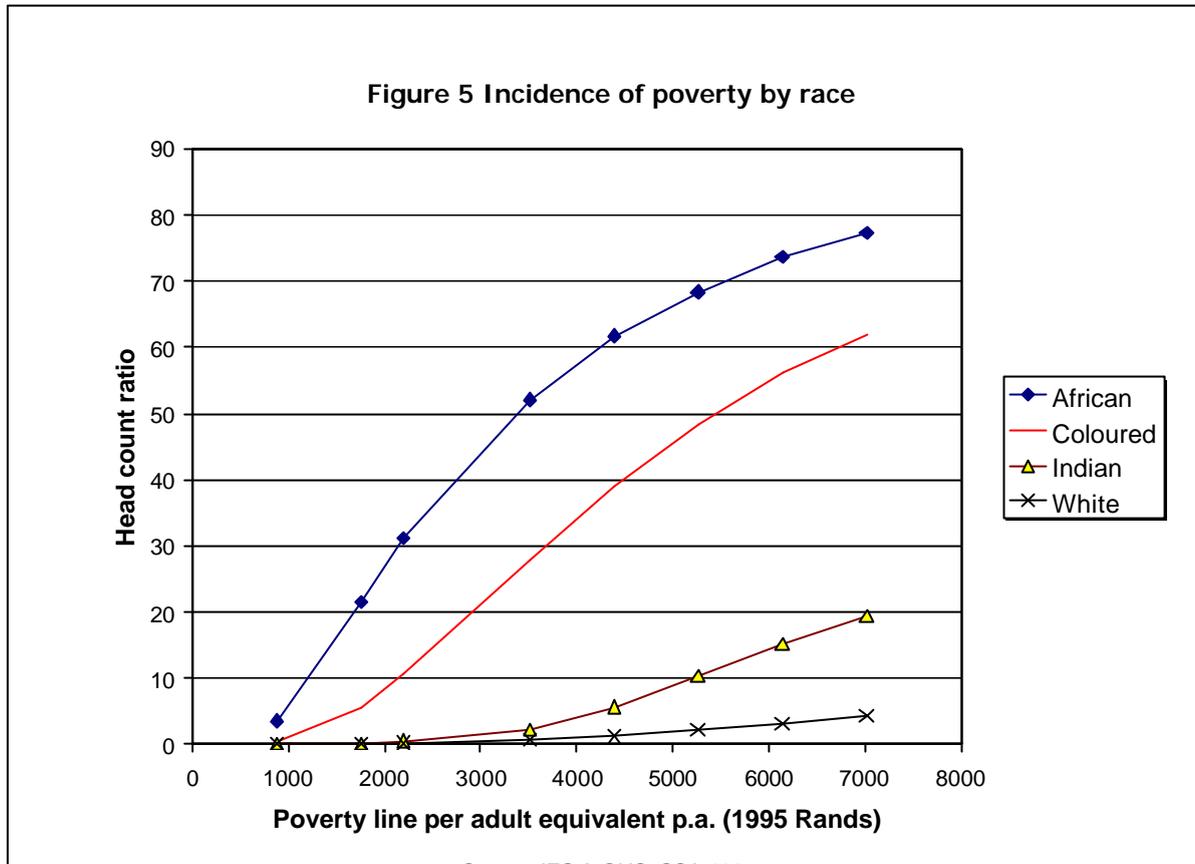


Table 13 Distribution of poor individuals by racial classification

		Poverty line = R2200 per adult equivalent p.a.						Poverty line = R3509 per adult equivalent p.a.					
	Population	P ₀	P ₁	P ₂	Poverty shares			P ₀	P ₁	P ₂	Poverty shares		
	Shares (%)				P ₀	P ₁	P ₂				P ₀	P ₁	P ₂
African	76.3	0.311	0.104	0.048	96.1	97.1	97.8	0.521	0.223	0.121	94.0	95.5	96.4
Coloured	8.6	0.108	0.026	0.009	3.7	2.7	2.1	0.279	0.089	0.039	5.7	4.3	3.5
Indian	2.5	0.005	0.001	0.0003	0.0	0.0	0.0	0.023	0.005	0.002	0.1	0.1	0.0
White	12.6	0.002	0.001	0.0003	0.1	0.1	0.1	0.008	0.002	0.001	0.2	0.1	0.1
All	100				100	100					100	100	100

3.4 Poverty and gender

Since a household survey collects information principally at the *household* level, it cannot tell us much about the inequalities in resource allocations within households. When we talk about poor women, for example, we are talking about those women who are living in poor households. In reality, there may be many women who, although they live in non-poor households, should be counted as poor because of the inequalities in intra-household allocations.

What does emerge clearly from the South African household surveys, however, is that households headed by women are more likely to be poor. For our purposes we regard female-headed households as those where either the *de jure* or *de facto* head of household is a woman. (A household where the head of household was specified to be a woman is *de jure* female-headed, while a household where the head of household is in practice female because the designated male head is absent for most of the year is *de facto* female-headed.)

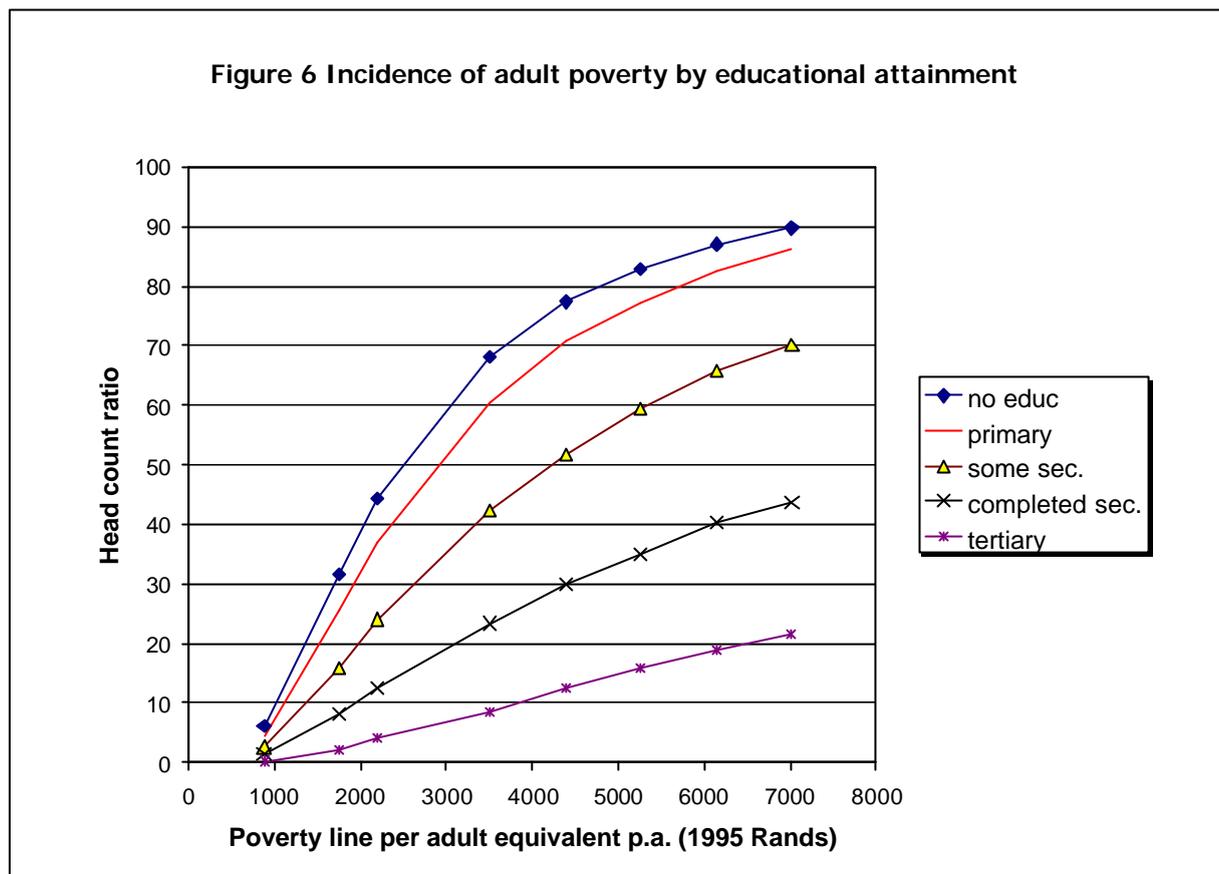
About 65% of households in the PSLSD survey were headed by resident males. In the remaining 35% the *de jure* or *de facto* head is female. The poverty rate at the higher poverty line was 60% amongst female-headed households, considerably higher than the rate of 31% in male-headed households. There are at least four factors at play here: female-headed households are more likely to be in the rural areas where poverty is concentrated, female-headed households tend to have fewer adults of working age, female unemployment rates are higher and the wage gap between male and female earnings persists.

Female-headed households tend to be more heavily reliant on remittance and state transfer income (pensions and grants) than male-headed households. The irregular and uncertain nature of remittance income increases the vulnerability of female-headed households. Average wage income in these households is about one-third of average wage income in male-headed households.

The Participatory Poverty Assessment (SA-PPA) highlighted the amount of time which women spend in unpaid labour. Women are often singly responsible for child-care, cleaning the house, fetching and heating water, washing and ironing, shopping, collecting firewood, cooking and washing dishes. The many household activities which women are expected to perform severely restricts the amount of time available for income-earning activities.

3.5 Poverty and Education

Figure 6 clearly shows the relationship between education and poverty. We map the incidence of poverty amongst adults with differing educational attainments. It is clear that there is a very strong correlation between educational attainment and standard of living. It is interesting to note, however, that there is not a large difference in poverty rates between those individuals that have no education and those that have less than seven years of (primary) education. These two groups together are notably more prone to poverty. However, the poverty share analysis of table 14 shows that the no education group increases its share of poverty with a move from P0 to P2. The severity of poverty is therefore seen to be worse for this group. The incidence of poverty amongst those with some tertiary education is largely accounted for by young adults that are still studying and thus not yet reaping the financial rewards of their education.



Source: IES & OHS, SSA 1995.

Table 14 Distribution of poor adults (individuals aged 18+) by educational status

		Poverty line = R2200 per adult equivalent p.a.						Poverty line = R3509 per adult equivalent p.a.					
	Population	P ₀	P ₁	P ₂	Poverty shares			P ₀	P ₁	P ₂	Poverty shares		
	Shares (%)				P ₀	P ₁	P ₂				P ₀	P ₁	P ₂
No education	16.4	0.443	0.156	0.0743	26.3	27.7	28.5	0.681	0.312	0.177	24.2	26.0	26.9
Primary	26.4	0.370	0.125	0.0575	35.5	35.8	35.6	0.605	0.263	0.145	34.7	35.4	35.6
Incomplete sec.	34.5	0.240	0.077	0.035	30.1	28.9	28.4	0.422	0.173	0.092	31.7	30.3	29.6
Completed sec.	15.8	0.125	0.040	0.018	7.1	6.9	6.8	0.234	0.092	0.048	8.0	7.4	7.1
Tertiary	7.0	0.039	0.010	0.004	1.0	0.8	0.6	0.087	0.030	0.014	1.3	1.1	0.9
All	100				100	100					100	100	100

Priority ranking exercises in many of the communities which participated in the studies for the SA-PPA consistently listed education as a priority area for improved access for the poor. There were two dimensions to this - access to basic schooling for children, and skills training for adults which would improve their access to opportunities for employment and income generation. This illustrates that education is judged by the poor in terms of its *relevance* as well as by issues of access and quality - and that relevance is seen primarily in terms of the likelihood of eventual access to employment. The principal asset of the poor is labour time, and education increases the productivity of this asset.

3.6 Poverty and health

Differences in health status are difficult to measure without a physical examination. Reliance on a respondent's own perception of his or her health status often leads to biases since better educated individuals are typically more concerned about their health status and report being sick even if they suffer from comparatively minor ailments. In contrast, health awareness among poorer groups is often lower and leads to a lower reported incidence of ill health, despite objectively worse health indicators (Sen, 1992).

This problem was encountered in the 1993 PSLSD survey where it was found that the wealthier reported a higher prevalence of ill health than the poor. Despite this, the nature of the health problems listed gave some clue towards the true state of health among the poor (Klasen, 1996). The health problems listed in Table 5 are all related to poverty and demonstrate the higher prevalence of diseases of poverty among lower income groups, including tuberculosis, diarrhoea, and fever. In addition, the much higher rates of mental disability among the poor are an indication of poor mental health facilities as well as the likely influence of violence and trauma on many poor people (Klasen, 1996).

Table 15 Proportion suffering from each illness (%)⁵

	Ultra-Poor	Poor	Non-poor	All
Tuberculosis	4.4	4.2	2.1	2.9
Diarrhoea	11.5	8.2	4.6	6.0
Fever	10.0	8.5	5.9	6.9
Physical disability	5.2	4.5	3.1	3.6
Mental disability	8.3	6.5	2.5	4.0

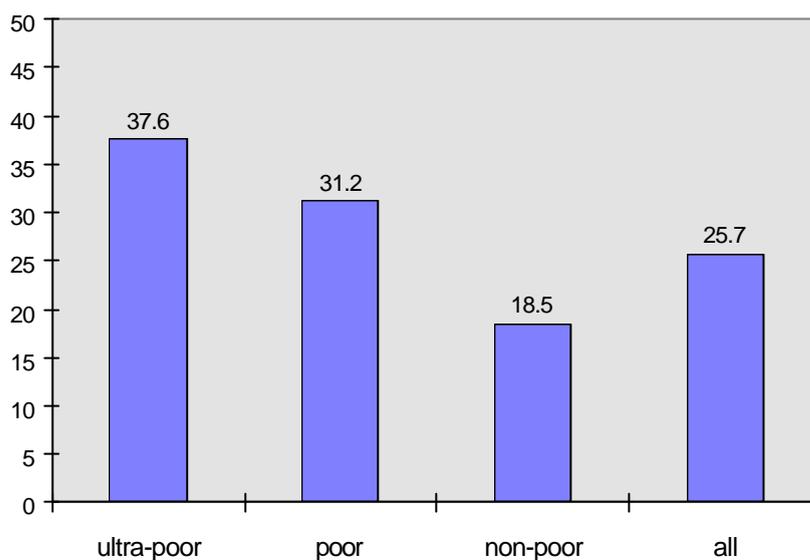
Source: Saldru, 1993

The PSLSD survey included a physical examination of the heights and weights of a sub-sample of children which allows a more objective assessment of their health status. It shows that poor children suffer from much higher rates of chronic undernutrition (i.e. stunting). As can be seen from figure 7, 38% of ultra-poor children below the age of five suffer from stunting.

⁵ The percentage of individuals *reporting an illness* in the two weeks prior to survey, who complained of a particular symptom.

Figure 7 Percentage of children under five whose height for age is below 2 standard deviations of the reference standard

Stunting rates



Source: Saldru, 1993

3.7 Employment and Income among the Poor

Not surprisingly, poverty and unemployment are closely linked. Table 6 shows that the unemployment rate among those from poor households is 52%, in comparison with an overall national rate of 29%. In addition, labour force participation is lower in poor than non-poor households. More than half of the working-age poor are outside of the labour market. As a result, the percentage of working age individuals from households below the poverty line that are actually working is significantly lower than average. Only 29% of individuals aged 16-64 living in households classified as poor are employed, compared with 48% from non-poor households.

Table 16: Unemployment, participation, and sectoral employment by race, gender, and location (%)

	Ultra-poor	Poor	Non-poor	All
(Broad) unemployment rates by:				
Race				
African	59.4	52.7	24.5	36.9
Coloured	46.1	36.7	17.0	21.8
Indian		67.5	12.8	13.7
White		75.0	4.5	4.7
Gender				
Female	65.9	59.1	25.3	37.4
Male	51.6	44.0	12.9	22.4
Location				
Rural	56.3	48.8	22.4	36.7
Urban	65.7	57.5	16.8	24.0
Total broad unemployment rate	58.7	51.5	18.4	29.3
Total Narrow unemployment rate	34.9	30.6	11.0	16.4
Labour force participation rate	43.4	45.8	61.6	55.3
Share of adults 16-64 working	17.7	21.9	48.3	37.9

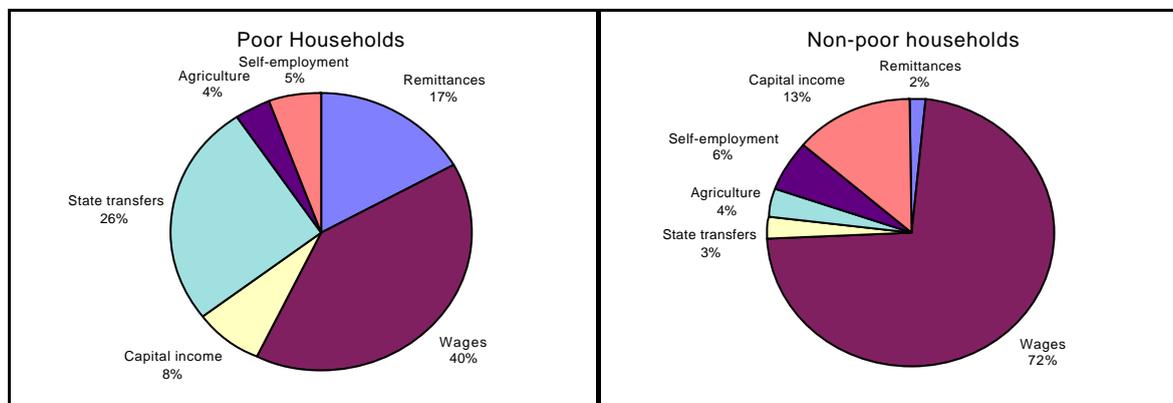
Source: IES & OHS, SSA 1995.

Figure 8 shows the differences between the sources of income for poor and non-poor households⁶. (The Saldru data-set is used for this comparison because this survey was more successful in capturing information about small-scale agriculture and remittances.) It is clear that the poor are far more dependent on remittances and state transfers than the non-poor. What cannot immediately be seen from the graph is that poor households typically rely on multiple sources of income. This reduces risk, as the household is less vulnerable if it should experience a sudden loss of income from a particular source.

⁶ Capital income refers to income from sources such as dividends, interest and imputed rent. Imputed rent is the price attached to the benefit of owning the dwelling in which the household resides. The household is, in effect, renting the dwelling from itself. Thus, imputed rent is regarded as both an income and expenditure.

Figure 8 again highlights the importance of wage income. Poor households are characterised by a lack of wage income, either as a result of unemployment or of low-paid jobs.

Figure 8 Sources of income among poor and non-poor households.



Source: Saldru, 1993

3.8 Poverty and access to services

Access to water, electricity and sanitation impact directly on quality of life. Access to clean water and sanitation has the most obvious and direct consumption benefits in reducing mortality and poor health and increasing the productive capacity of the poor. For example, the poor (especially women) must commit large shares of their income or time to obtaining water and firewood. This time would be better used in child care or income-generating activities.

It can be seen from Table 7 that lack of access to basic services is closely related to poverty.

Table 17 Access to basic services

	Percentage of households with access		
	Ultra-poor households	Poor households	Non-poor households
Electricity	25.9	32.6	76.5
Toilet inside dwelling	5.7	8.5	52.6
Piped water inside dwelling	13.6	17.6	61.2

Source: IES & OHS, SSA 1995.

3.9 Poverty and access to transport

Due to the apartheid policies regarding the spatial segregation of the various racial groups and the lack of an adequate public transport system, transport has become a major constraint for the poorer population. Consequently, the working poor spend a large amount of time and money on transportation (Table 8). This reduces their take-home earnings and increases their cost of living.

Table 18 Mode of transport used to get to work

Types of Transport Used to get to Work (%) :	Ultra-poor	Poor	Non-poor	All
Bus	10.4	11.9	12.0	11.8
Taxi	8.0	11.9	20.1	19.0
Car/Motorbike	3.3	3.4	30.2	27.7
Walk	68.2	60.9	25.1	29.1
Other*	10.1	12.0	12.6	12.4
Total	100.0	100.0	100.0	100.0

Source: IES & OHS, SSA 1995.

"Other" is largely comprised of people that live on their work premises and thus do not require any form of transport. It also includes those who travel by train or bicycle.

4. Conclusion

Poverty reduction is viewed as one of the most important goals of development policy by policy-makers in South Africa. However, it is only recently that researchers have begun to look at the issues around collecting suitable data and developing definitions of poverty that will allow the measurement of poverty, its developments over time, inter-group comparisons of poverty, and the identification of poor households or individuals for targeted poverty-alleviation programmes.

We have highlighted the dramatic differences in the poverty levels of the different race groups and different geographical areas. The poor are more likely to be African and to live in rural areas. In addition to these poverty dimensions, we have also shown the importance of other cross-cutting correlates. The poor also have low levels of education, lack access to wage employment and are likely to be found in female-headed households. The poor also lack access to basic services and to transport. Given all of the above, it is not surprising that the poor are more vulnerable to illness and to stunted growth. Such physical and human capital deprivations are important in perpetuating the cycle of poverty.

Recent international literature has yielded a number of useful methodological developments in terms of the measurement of poverty over the last decade. This paper has attempted to provide a poverty profile that extends the available South African literature by drawing on these recent developments and by explicitly spelling out the assumptions that have to be made in constructing any poverty profile. The key finding of our work is that the defining features of South African poverty are so pronounced that the profile of poverty is robust to changes in the underlying measurement assumptions. This is important because it adds a measure of support to the poverty measurement exercises that have been used as the basis for policy decisions in recent years. Even though this support is *ex post* such an assessment has not been undertaken before.

However, within this broadly supportive outcome, we have shown that specific poverty rankings and poverty shares are sensitive to assumptions concerning household structure, the derivation of the poverty line and the choice of aggregate poverty index. For example, in South Africa the assessment of provincial poverty burdens is an important constituent element in deriving needs-based rules for provincial budgets. Our analysis has shown that provincial poverty rankings and shares can change as one makes very reasonable changes in the way poverty is measured. Thus, our analysis has shown that there is still plenty of room for the re-assessment of the use of poverty information in the South African policy-making process.

5. References

- Atkinson, A.B. 1977. *The Economics of Inequality*. Oxford: Clarendon Press.
- Bausch, R. 1996. "Neglected Trade-offs in Poverty Measurement". *IDS Bulletin* 27:1. Sussex: University of Sussex.
- Beckerman, W. 1984. "Measuring Poverty in rich and poor countries". *Carnegie Conference Paper no. 3*. Cape Town: South African Labour and Development Research Unit.
- Callan, T. and Nolan, B. 1991. "Concepts of Poverty and the Poverty Line". *Journal of Economic Surveys*, 5(3): 243-261.
- Central Statistical Service. 1995. *The October Household Survey*. Pretoria: Government Printer.
- Central Statistical Service. 1997. "Earning and Spending in South Africa: Selected findings of the 1995 Income and Expenditure Survey." Pretoria: CSS.
- Chambers, R. 1988. "Poverty in India: Concepts, Research and Reality." *Discussion Paper 241*, Institute of Development Studies, University of Sussex.
- Deaton, A. and Muellbauer, J. 1980. *Economics and Consumer Behaviour*. New York: Cambridge University Press.
- Deaton, A. 1997. *The Analysis of Household Surveys: Microeconometric Analysis for Development Policy*. Washington DC: World Bank.
- Deaton, A. and Case, A. 1988. "Analysis of Household Expenditures". *Living Standards Measurement Study Working Paper 28*. Washington: World Bank.
- Foster, J.E. and Shorrocks, A.F. 1988. "Poverty Orderings". *Econometrica*, 56: 173-177.
- Glewwe, P. 1988. "The Distribution of Welfare in Côte d'Ivoire in 1985." *Living Standards Measurement Study Working Paper 29*. Washington: World Bank.
- Haddad, L. and Kanbur, R. 1990. "How Serious is the Neglect of Intra-household Inequality?" *The Economic Journal*, September.
- Hentschel, J. and Lanjouw, P. 1996. "Constructing an Indicator of Consumption for the Analysis of Poverty. Principles and Illustrations with Reference to Ecuador". *Living Standards Measurement Study Working Paper 124*. Washington DC: World Bank.
- Johnson, D. 1996. "Poverty lines and the Measurement of Poverty". *Australian Economic Review*, 1: 110-126.
- Klasen, S. 1997. "Poverty, Inequality and Deprivation in South Africa" *Social Indicator Research*.
- Klasen, S. and Woolard, I. 1998. "Unemployment, Household Formation, Poverty and Nutrition in South Africa". Report commissioned by the Department of Finance.
- Lanjouw, P. and Ravallion, M. 1995. "Poverty and Household Size". *The Economic Journal*, 105: 1415-1434.
- Le Roux, P. 1994. "Parental care and family structure: some interesting findings from the South African Living Standards Survey". Unpublished manuscript. Cape Town: University of the Western Cape.

- Leser, C.E.V. 1963. "Forms of Engel Functions". *Econometrica*, 31: 694-703.
- May, J., Carter, M. and Posel, D. 1995. "The Composition and Persistence of Poverty in Rural South Africa: An Entitlements Approach". *Land and Agriculture Policy Centre Policy Paper No. 15*, Land and Agriculture Policy Centre.
- May, J. 1998. *Experiences and Perceptions of Poverty in South Africa*. Durban: Praxis Publishing.
- Moser, C. 1996. "Confronting Crisis: A Comparative Study of Household Responses to Poverty and Vulnerability in Four Poor Urban Communities". *Environmentally Sustainable Development Studies and Monographs Series No. 8*, World Bank.
- Nelson, J.A. 1988. "Household Economies of Scale in Consumption: Theory and Evidence". *Econometrica*, 56:1301-14.
- Ng, K. 1981. "Welfarism: a Defence Against Sen's Attack". *The Economic Journal*, 91: 527-530.
- Nicholson, J.L. 1976. "Appraisal of Different Methods of Estimating Equivalence Scales and Their Results". *Review of Income and Wealth*, 22:1-11.
- Nolan, B. and Whelan, C.T. 1996. "The Relationship Between Income and Deprivation: a Dynamic Perspective". *Revue Economique*, 3: 709-717.
- Potgieter, J.F. 1995. *The Household Subsistence Level in the Major Urban Centres of the Republic of South Africa*. Port Elizabeth: University of Port Elizabeth.
- Ravallion, M. 1992. "Poverty Comparisons: a Guide to Concepts and Methods." *Living Standards Measurement Study Working Paper 88*. Washington DC: World Bank.
- Ravallion, M. 1998. "Poverty Lines in Theory and Practice", *AERC Working Papers CR2-2*.
- Sen, A. 1976. "Poverty: an Ordinal Approach to Measurement", *Econometrica* 44: 219-31.
- Sen, A. 1987. *The Standard of Living*. Cambridge: Cambridge University Press.
- Paul Streeten. 1994. "Poverty concepts and measures", *Poverty Monitoring: An International Concern*. London: St Martin's Press.
- World Bank. 1990. *World Development Report 1990: Poverty*. New York: Oxford University Press.
- Working, H. 1943. "Statistical Laws of Family Expenditure". *Journal of the American Statistical Association*, 38:43-56.