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**Working Paper**

## Measured as poor versus feeling poor: Comparing objective and subjective poverty rates in South Africa

WIDER Working Paper, No. 2014/133

**Provided in Cooperation with:**

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*Suggested Citation:* Posel, Dorrit; Rogan, Michael (2014) : Measured as poor versus feeling poor: Comparing objective and subjective poverty rates in South Africa, WIDER Working Paper, No. 2014/133, ISBN 978-92-9230-854-4, The United Nations University World Institute for Development Economics Research (UNU-WIDER), Helsinki, <https://doi.org/10.35188/UNU-WIDER/2014/854-4>

This Version is available at:

<https://hdl.handle.net/10419/108007>

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WIDER Working Paper 2014/133

## **Measured as poor *versus* feeling poor**

Comparing objective and subjective poverty rates  
in South Africa

Dorrit Posel<sup>1</sup> and Michael Rogan<sup>2</sup>

October 2014

**Abstract:** In this paper, we compare subjective and money-metric measures of poverty in South Africa using data collected in the 2008/09 Living Conditions Survey. In addition to collecting detailed information on expenditure, the survey asked respondents to provide an assessment of the economic status of their household, ranging from ‘very poor’ to ‘wealthy’. We find considerable overlap between per capita expenditure measures of poverty status and subjective poverty status among households. However, we also identify a number of significant characteristics which distinguish households where poverty measures do not overlap. These characteristics highlight not only low dimensionality in expenditure measures of economic status, but also the likely underestimation of economic resources in the household. This underestimation arises both because poverty measures based on per capita expenditure do not recognize scale economies in the household, and because the value of economic activity can be difficult to measure, as in the case of subsistence farming.

**Keywords:** income poverty, subjective poverty, economies of scale, adult equivalence

**JEL classification:** I32, O12

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This paper has been presented at the UNU-WIDER ‘Conference on Inclusive Growth in Africa: Measurement, Causes, and Consequences’, held 20-21 September 2013 in Helsinki, Finland.

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ISSN 1798-7237 ISBN 978-92-9230-854-4

Typescript prepared by Liisa Roponen for UNU-WIDER.

UNU-WIDER gratefully acknowledges the financial contributions to the research programme from the governments of Denmark, Finland, Sweden, and the United Kingdom.

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## 1 Introduction

It is well documented that the extent of money-metric (income or expenditure) poverty remains stubbornly high in post-apartheid South Africa despite the sizeable expansion of the government's social assistance programme and massive pro-poor expenditure on basic services, health, education and housing (van der Berg 2001; Seekings 2007). Not surprisingly, the South African government has challenged these findings, arguing that poverty measures based on income or expenditure ignore the non-income components of living standards (Meth and Dias 2004; Seekings 2007), including in-kind benefits from free or subsidized primary healthcare, education, sanitation and housing (all grouped under the broad term of 'social wage') (Office of the Presidency 2003, 2006; Meth and Dias 2004).

Poverty studies for South Africa have also recognized that measuring poverty is complicated by the possible underestimation of household income or expenditure in the data that are analysed, and by a number of other concerns relating to the comparability of data collected over time (Leibbrandt et al. 2006; Meth 2006; van der Berg et al. 2008; Vermaak 2012). Although most studies in the post-2000 period calculate poverty rates of at least 40 per cent, headcount rates vary considerably, even where the same data source is analysed (see Appendix). These differences reflect the nature of the data used, whether poverty is measured with income or expenditure and relative to which poverty line, as well as how these metrics are adjusted for under-reporting (particularly in the case of 'zero-income' households), missing income or expenditure information, and possible size economies in the household.

In this paper, we explore an alternative way of measuring poverty, using respondents' subjective assessments of the economic well-being of their household. Subjective evaluations of poverty do not require that respondents provide information on their income or expenditure, or that analysts specify a poverty line and make adjustments for differences in household size and composition when identifying a household's resources. They are also likely to reflect the many dimensions of the household's living standards, which may not be captured by current income or expenditure (Ravallion and Lokshin 2001). Although a significant body of research on subjective poverty has emerged in the wider poverty literature (Ravallion and Lokshin 2001; Carletto and Zezza 2006; Lokshin et al. 2006), subjective poverty studies have been largely absent in the South African literature. This is not surprising given that the national household surveys used to measure money-metric poverty have not collected information on subjective economic well-being (although a few have included a question on life satisfaction more generally). In the recently released 2008/09 Living Conditions Survey (LCS), however, respondents were asked to report not only on their income and expenditure, but also on how they would assess the economic status of their household, with options ranging from 'very poor' to 'wealthy'.

We use the LCS data to compare subjective measures of poverty with money-metric or 'objective' measures, and we consider what can be learned about money-metric measures in South Africa when these do not overlap with subjective assessments. In particular, we investigate what characteristics account for differences between money-metric and subjective poverty measures among households with the same level of per capita expenditure. We consider specifically whether differences between subjective and money-metric poverty measures are consistent with the possible underestimation of economic resources in the household when this is measured using average per capita household expenditure (or income) and whether components of the South African government's social wage (access to basic services and state-subsidized housing) affect perceptions of poverty.

In the next section of the paper, we review the broader literature on money-metric and subjective measures of poverty as well as the existing work on income and expenditure poverty in post-

apartheid South Africa. In Section 3, we describe the data used to identify subjective and money-metric poverty and the extent of the overlap between these measures. In Section 4, we compare subjective and expenditure poverty rates across a range of key characteristics, and we estimate the predictors of subjective poverty among households with the same level of per capita expenditure. Section 5 concludes with a brief discussion of the implications of the analysis for the measurement of poverty in post-apartheid South Africa.

## 2 Review and context

### 2.1 Objective and subjective measures of poverty

Poverty studies typically measure poverty by comparing ‘objective’ indicators of economic well-being, commonly expenditure or income, to a money-metric poverty threshold. However, as Ravallion and Lokshin (2001: 338) note, there is ‘scope for debate at virtually every step’ in generating these poverty measures. In addition to questions about the appropriate poverty threshold, there is debate about whether economic well-being should be identified using income or expenditure, how to adjust these indicators for possible under-reporting or non-reporting and for differences in costs-of-living across different regions or countries, what to include in the measurement of income or expenditure (for example, where in-kind transfers and subsidized housing is received), and how to compare the economic status of households of different sizes and composition (Deaton 1997; Ravallion and Lokshin 2001: 338).

One alternative way of measuring poverty is simply to ask people to self-assess whether or not they (or the households in which they live) are poor. While economists and poverty analysts have been somewhat reluctant to embrace this type of subjective data, a growing body of work has identified a number of advantages to using subjective measures of welfare (Ravallion 2012). In particular, self-assessed poverty measures may avoid many of the problems associated with money-metric poverty measures. For example, subjective assessments of poverty do not depend on a pre-determined, expert-derived poverty threshold and they do not require assumptions about how to adjust resources for household size economies in consumption and for the different needs of adults and children (Ravallion and Lokshin 2001).

In addition, subjective assessments are likely to capture longer-term measures of economic status (such as a household’s asset base and accumulated wealth) than current income and expenditure, and they may also reflect anticipated future shocks and opportunities for household members (Singh-Manoux et al. 2005). Subjective measures of poverty are also likely to capture a far wider range of welfare components than can be measured by narrow money-metric indicators (Ravallion and Lokshin 2001, 2002; Singh-Manoux et al. 2005). In the South African context, for example, state-subsidized housing and access to basic services such as electricity and water will not be reflected in income or expenditure measures of poverty, but these may influence subjective assessments of economic well-being. Moreover, these other dimensions of welfare may be particularly important in developing country contexts where income from small-scale activities typically is more difficult to measure (Pradhan and Ravallion 2000; Lokshin et al. 2006).

Unlike information on income or expenditure, which respondents may be reluctant (or unable) to disclose (cf. Juster and Smith 1997), there is also ‘no obvious reason’ why respondents would not be willing to self-assess their poverty status (Ravallion and Lokshin 2001: 337). Nonetheless, a number of concerns with subjective data have been raised in both the psychology and economics literatures. Although respondents may be willing to self-assess their poverty status, they may not provide an authentic self-report (Hagerty et al. 2001), or their self-assessment may reflect their aspirations rather than the real circumstances of their lives (Vogel 2002), and these aspirations or

perceptions may adapt to local circumstances and opportunities (Brickman and Campbell 1971; Case and Deaton 2009). For example, subjective assessments may be influenced not only by the household's own economic well-being but by how this is seen to compare with the economic well-being of other households (Lokshin et al. 2006; Wagle 2007; Fafchamps and Shilpi 2008). Unobservable characteristics, such as the respondent's mood or personality, may also influence subjective assessments, a heterogeneity that leads to measurement error in subjective welfare indicators (Bertrand and Mullainathan 2001).

However, most studies which analyse subjective poverty do not propose that subjective measures replace money-metric poverty measures. Rather, much of the research has investigated how to combine subjective and money-metric indicators to provide a more composite measure of poverty. A key focus of this work has been the estimation of subjective poverty lines, using reported income or expenditure, together with subjective economic welfare questions typically based on the perceived minimum income needs of the household (cf. Goedhard et al. 1977; van Praag and Frijters 1999; Gustafsson et al. 2004; Bishop et al. 2006).<sup>1</sup> A number of studies have also compared subjective and money-metric poverty measures and profiles, testing whether there are systematic differences across a range of characteristics, and what these differences could suggest about the measurement of money-metric poverty (cf. Mangahas 1995, 2001; Ravallion and Lokshin 2002; Carletto and Zezza 2006; Lokshin et al. 2006; Wagle 2007).

In a few studies, most often associated with the annual surveys conducted by the Social Weather Station project in the Philippines (Mangahas 2001), subjective poverty has been identified by an economic welfare question which asks respondents directly whether they or their household are 'poor' or 'non-poor'. For other countries, studies have used an economic ladder-type question, adapted from the psychology literature,<sup>2</sup> where individuals are asked to rank their position on an imagined ladder with rungs labelled from poorest to richest (Ravallion and Lokshin [2002]; Carletto and Zezza [2006]). This is perhaps a less desirable measure of subjective poverty as it requires an assumption about which ladder rungs correspond to poverty (both Carletto and Zezza 2006 and Ravallion and Lokshin 2002 identify those on the bottom two rungs as poor). Moreover, in asking respondents for a relative assessment of their welfare, it is assumed that respondents have relevant information about the welfare of other households (Pradhan and Ravallion 2000).

Irrespective of how subjective poverty is measured, studies which compare money-metric and subjective poverty typically find only a partial correlation between the measures. Ravallion and Lokshin (2002) suggest two main explanations why this could be the case. First, differences will arise if the 'wrong weights' are used when calibrating measures of expenditure or income which adjust for household size, household composition and cost-of-living differences. For example, comparisons of subjective and money-metric poverty profiles find that when objective poverty is measured using per capita household expenditure (with no adjustments for economies of scale or adult equivalence), the divergence between the two measures widens with household size: larger households are far more likely to be identified as money-metric poor than to self-assess their status as poor (Ravallion and Lokshin 2002; Carletto and Zezza 2006; Wagle 2007). A plausible

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<sup>1</sup> Prompted by concerns with how respondents interpret income, more recent work on subjective economic welfare (particularly in developing countries) has instead relied on questions about perceived consumption adequacy (Pradhan and Ravallion 2000; Lokshin et al. 2006; Wagle 2007; Fafchamps and Shilpi 2008). These questions usually ask respondents to indicate whether their household's consumption in domains such as food, healthcare, and housing are 'adequate' or 'less than adequate' (Pradhan and Ravallion 2000).

<sup>2</sup> See, in particular, Cantril (1965). The typical question (adapted from the psychology literature) included in socio-economic surveys is as follows: 'Please imagine a 9-step ladder where on the bottom, the first step, stand the poorest people, and on the highest step, the ninth, stand the rich. On which step are you today?'

explanation for this finding is that, by not adjusting for a lower cost per person of maintaining a given standard of living when individuals live together rather than apart, money-metric poverty rates based on average per capita household consumption (or income) over-state poverty (Lanjouw and Ravallion 1995).

Second, Ravallion and Lokshin (2002) suggest that differences between money-metric and subjective poverty rates may reflect ‘low dimensionality’ in the measurement of objective economic welfare. In assessing their economic status, for example, respondents may take into consideration not only their current expenditure or income, but also their past income, future commitments and opportunities, employment status, education and health, and their access to housing and basic services. These other dimensions (education, employment, assets, and health in particular) have been found consistently to influence the self-assessment of poverty (cf. Ravallion and Lokshin 2002; Carletto and Zezza 2006; Herrera et al. 2006; Fafchamps and Shilpi 2008).

A further explanation for the divergence between the poverty measures, which has not received much attention in the subjective poverty literature specifically, concerns measurement error in reported household expenditure or income. This may be particularly important in developing countries, where small-scale subsistence activities are a central part of households’ livelihood strategies, and where the values of inputs and outputs in subsistence activities are almost the same (Deaton 1997). The underestimation of income particularly from subsistence farming is one explanation of why a large percentage of the self-employed in South Africa report zero earnings in household surveys (Ardington et al. 2006; van der Berg et al. 2008).

## **2.2 The measurement of poverty in South Africa**

An extensive literature on money-metric measures of poverty in post-apartheid South Africa has emerged since nationally representative sources of data on income and expenditure became available to researchers (starting with the 1993 Project for Statistics on Living Standards and Development). This research has consistently found that money-metric poverty has been very high in the post-apartheid period, with most studies estimating that poverty rates changed very little or increased slightly (but not necessarily significantly) between 1995 and 2000, and falling thereafter, particularly following the considerable expansion of the social grant system<sup>3</sup> (Bhorat and Kanbur 2005; Hoogeveen and Özler 2005; Leibbrandt et al. 2006; Seekings 2007; Bhorat and van der Westhuizen 2008; van der Berg et al. 2008).<sup>4</sup> (The main poverty studies published in the post-apartheid period, including how poverty has been measured and estimated poverty rates, are summarized in the Appendix.)

Despite this broad level of agreement about the direction of trends in the poverty rate in the post-apartheid period, there is less agreement on the absolute levels of poverty and on the extent of the recent (post-2000) decline in poverty rates. One reason for the debate is that income or expenditure measures of poverty do not capture (or capture inadequately) the vast improvements during the post-apartheid period in access to basic services such as water, electricity, sanitation, housing and telecommunications (Bhorat et al. 2006; Leibbrandt et al. 2006; Seekings 2007). In the first decade of democracy, for example, the percentage of households with an electricity connection and access to piped water at their dwelling increased considerably (from 54 per cent to

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<sup>3</sup> The effect of the dramatic increase in expenditure on well-targeted, means-tested social assistance on the reduction of poverty has been widely documented (Case and Deaton 1998; Samson et al. 2001; Samson 2002; Woolard 2003; Du Toit and Neves 2006).

<sup>4</sup> van der Berg and Louw (2004), however, find that the poverty headcount rate was stable (or possibly declined very slightly) between 1995 and 2000 (see Table 1).

80 per cent, and from 59 per cent to 68 per cent, respectively) while roughly six million South Africans received government subsidized housing (Office of the Presidency 2003; Seekings 2006).<sup>5</sup>

Another part of the debate, particularly in the academic literature, concerns the choice of which data source to use and whether and how to adjust for missing or incomplete income and expenditure data (see, for example, Meth 2006, 2010; van der Berg et al. 2008). Most of the earlier post-apartheid studies measured money-metric poverty using detailed information on total household consumption collected in the first of South Africa's five-yearly Income and Expenditure Survey (IES 1995). However, partially in response to claims of sampling bias in the subsequent IES in 2000, as well as to changes in the way that expenditure information was captured in the 2005 IES, several studies from the mid-2000s began to estimate poverty trends with other data sources. These datasets included less comprehensive expenditure information, and more studies therefore relied on income information to measure money-metric poverty (Meth and Dias 2004; Meth 2006). In many of the household surveys used, however, income from all sources was not captured, including remittance income and other inter-household transfers, and in-kind or imputed income from subsistence farming and other activities. As a result, sizeable percentages of households in these datasets are reported with no, or missing, income, and studies have adopted different approaches to addressing this problem (cf. Ardington et al. 2006; van der Berg et al. 2008; Posel and Rogan 2012).<sup>6</sup>

Poverty rates for South Africa typically have been reported at the individual level (i.e., the percentage of individuals who live in households that are poor), but those that have also presented household poverty rates have found that these estimates are considerably lower than individual poverty rates (Statistics South Africa 2000; Meth and Dias 2004; Posel and Rogan 2012). The divergence between household and individual headcount ratios is consistent with a widely reported positive relationship between household size and poverty in developing countries (Lanjouw and Ravallion 1995). In the debate over the measurement of poverty, however, studies in post-apartheid South Africa have paid relatively little attention to household size and composition. A few of the earliest post-1993 studies tended to follow May et al. (1995) in assuming an economies of scale parameter of 0.9 and that children consume half the resources of adults<sup>7</sup> (May et al. 1995; May et al. 1998; Woolard and Leibbrandt 2001), but the convention has been to report poverty rates based on per capita income or expenditure.

The only comprehensive work on equivalence scales in the South Africa literature is an earlier study by Woolard and Leibbrandt (2001) which tests the sensitivity of poverty incidence to a range of different assumptions about the consumption needs of children (with adult equivalent parameters ranging from 0.5 to 1) and economies of scale in household consumption (with parameters ranging from 0.6 to 0.9). The study finds that, keeping the poverty rate fixed, the choice of parameters made only a small difference to which households were identified as poor (Woolard and Leibbrandt 2001). The two groups that were most affected by changing the parameters of the household size and composition adjustments were children and the elderly. As child costs were

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<sup>5</sup> This increase in electrification was also largely pro-poor. The proportion of households in the poorest expenditure decile with electricity for lighting and cooking increased by nearly 600 per cent (far more than for any other group) between 1993 and 2004 (Bhorat et al. 2006).

<sup>6</sup> For example, some studies have used information from a single question on total household expenditure to impute income in households where no income is reported (van der Berg et al. 2008; Posel and Rogan 2012); other studies have used multiple imputation methods to address both zero and coarsened income values (cf. Ardington et al. 2006; Vermaak 2012).

<sup>7</sup> May et al. (1995) base these values on a generalized scale for developing countries, suggests in a draft version of Deaton (1997).



decreased and the size of the economy of scale parameter was raised, poverty rates increased for the elderly and decreased for children (Woolard and Leibbrandt [2001]; see also Deaton and Zaidi [2002]). Deaton and Paxson (1998) also find evidence for economies of scale in South African households, even in food consumption, possibly attributable to bulk purchasing or economies of scale in food preparation.

Despite an extensive literature on objective poverty rates in post-apartheid South Africa, there has been little consideration of subjective poverty because subjective data have not been collected in the national household surveys used to measure objective poverty. In this study, we analyse recently available subjective data collected in the first Living Conditions Survey (LCS) for South Africa. The LCS was conducted between September 2008 and August 2009 by the official statistical agency, Statistics South Africa, and covered a nationally representative sample of 97,486 individuals living in 25,075 households. The questionnaire was designed to improve the measurement of 'life circumstances, service delivery and poverty' (Statistics South Africa 2012a: 3) and is the first survey with the explicit intention of measuring both money-metric and subjective poverty in South Africa. Towards this end, the LCS includes comprehensive modules on income and expenditure, as well as a suite of questions on subjective economic welfare.

In order to standardize the measurement of money-metric poverty<sup>8</sup> and with a view to tracking changes in poverty systematically over time, Statistics South Africa (2008) has recently identified three official poverty thresholds<sup>9</sup> based on the conventional cost of basic needs approach.<sup>10</sup> In this study, we make use of the national upper bound poverty line of R577 per capita monthly income (in March 2009 prices) proposed by Statistics South Africa (2008). This poverty threshold is based on expected minimum food and non-food requirements<sup>11</sup> and is comparable to the R322 per capita poverty line (in 2000 prices) that has been dominant in the post-apartheid poverty literature.<sup>12</sup>

We use data on total household expenditure<sup>13</sup> from the LCS to measure money-metric poverty, and similar to most South African poverty studies, we calculate average per capita household expenditure and therefore make no adjustments for household size or household composition. To measure subjective poverty, we use responses to the question: 'Would you say you and your household are at present: wealthy; very comfortable; reasonably comfortable; just getting along; poor; or very poor?' This subjective poverty question offers a number of advantages over the economic ladder question used to identify subjective poverty in other studies (cf. Ravallion and Lokshin 2002; Carletto and Zezza 2006). The question does not require respondents to provide a relative assessment of their economic status and we also do not have to make assumptions about the association between ladder-rank and subjective poverty. Rather, households are identified as

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<sup>8</sup> Most studies have based their headcount estimates on the widely used poverty threshold proposed by Hoogeveen and Özler (2006) (R322 in monthly per capita household income in 2000 prices) but some of the key studies use alternate poverty lines (cf. Statistics South Africa 2000; Woolard and Leibbrandt 2001; van der Berg and Louw 2004; Meth 2006; van der Berg et al. 2008).

<sup>9</sup> These per capita monthly poverty lines include (in March 2009 prices): the food poverty line (R305); the lower bound poverty line (R416); and the upper bound poverty line (R577).

<sup>10</sup> To date, the LCS has been used by Statistics South Africa (2012a) to publish a poverty profile based on these official poverty lines and a descriptive report on three measures of subjective poverty (Statistics South Africa 2012b).

<sup>11</sup> See Statistics South Africa (2008) for details about how the official poverty lines were calculated.

<sup>12</sup> Statistics South Africa (2008, 2012a) estimates that the R577 poverty line is equivalent to R323 in September 2000 prices.

<sup>13</sup> In addition to standard food and non-food components, the measure of expenditure includes information on livestock, subsistence farming, fishing and hunting, gifts, remittances, child maintenance, and in-kind consumption from non-farm activities (including in-kind gifts, remittances and child maintenance).

poor if they self-assessed the economic status of their household as poor or very poor. One caveat, however, is that information on the subjective economic status of the household is provided by only one household member, and therefore there is no possibility of identifying different perceptions of economic status within the same household.

Table 1 identifies the correspondence between money-metric poverty (based on per capita monthly household expenditure relative to the R577 poverty line) and subjective poverty (self-assessed as poor or very poor) in the LCS. The first data row suggests considerable overlap between the two measures: more than two-thirds of all households (69 per cent) have the same money-metric poverty and subjective poverty status. Approximately 20 per cent of all households are identified as both expenditure poor and subjectively poor; while 49 per cent are identified as neither expenditure nor subjectively poor.

Table 1: The relationship between expenditure poverty (EP) and subjective poverty (SP) in South Africa

	EP & SP	EP; not SP	Not EP; SP	Neither SP nor EP
Percentage of all households	20.38 (0.30)	13.44 (0.25)	17.35 (0.29)	48.83 (0.40)
Mean per capita monthly household expenditure	333.72 (2.10)	371.50 (2.35)	1434.13 (52.76)	3874.83 (70.40)
Unweighted number of households	5,573	3,700	4,446	10,973

Note: The data are weighted. Standard errors are in parentheses. Households are identified as expenditure poor if average per capita monthly household expenditure was less than R577, and as subjectively poor if the household's economic status was self-assessed as poor or very poor.

Source: Authors' calculations based on LCS (2008/09).

Among households which are measured as expenditure poor, 60 per cent are also self-assessed as poor. This overlap is considerably higher than that reported in other studies which use the bottom two rungs of the economic ladder question to identify the subjectively poor (50 per cent in Albania (Carletto and Zezza 2006) and 40 per cent in Russia (Ravallion and Lokshin 2002)). Among the 40 per cent of expenditure poor households that are not subjectively poor, the large majority (86 per cent) reported that they were 'just getting along'.

Average per capita household expenditure among expenditure poor households is substantially below the R577 poverty line, and it is slightly but significantly higher among those expenditure poor households which are not also self-assessed as poor. In contrast, average per capita expenditure in households that are subjectively poor but not expenditure poor is more than two-fold the poverty line but almost three-fold lower than that in households that are neither expenditure nor subjectively poor.

Table 2 describes money-metric and subjective poverty rates, at both the level of the household and the level of the individual. Whereas 34 per cent of households in South Africa report an average per capita household expenditure that is below the poverty line, this corresponds to 47 per cent of individuals who live in expenditure poor households. The large divergence between household and individual money-metric poverty rates arises because expenditure poor households are larger on average than non-poor households. However, when using the subjective measure of poverty, the difference between individual and household poverty rates is considerably smaller (38 per cent and 40 per cent, respectively), suggesting that the correspondence between subjective poverty and household size is far less obvious. Consequently, although the proportion of subjectively poor households is larger than the proportion measured as expenditure poor, a significantly smaller share of individuals live in subjectively poor households than in expenditure

poor households. In the remainder of the paper we explore further how money-metric and subjective poverty rates differ by household size and also by household composition and a range of other household characteristics.

Table 2: Expenditure and subjective poverty rates in South Africa

	Expenditure poor	Subjectively poor
Proportion of households	0.338 (0.004)	0.377* (0.004)
Proportion of individuals	0.472 (0.002)	0.395* (0.002)

Note: The data are weighted. Standard errors are in parentheses. \* Proportions are significantly different at the 95% confidence level.

Source: Authors' calculations based on LCS (2008/09).

### 3 Money-metric and subjective poverty profiles in South Africa

In identifying a subjective poverty profile, we begin by comparing money-metric and subjective poverty rates across some key household characteristics. We then use regression analysis to explore more comprehensively the correlates of subjective poverty among households that have the same level of per capita expenditure.

The first part of Table 3 describes how poverty rates vary with changes in household size and the age composition of household members. As is commonly found in a wide range of countries (see Lanjouw and Ravallion 1995), the proportion of households measured as expenditure poor in South Africa increases sharply as household size increases. Money-metric poverty rates are lowest among single-person households, where only 6 per cent of households report a per capita monthly expenditure of less than R577, compared with 35 per cent of four-person households, and 73 per cent of households with nine or more members. In contrast, the share of households which are self-assessed as poor or very poor is initially high (42 per cent of single-person households), but declines as household size increases to four members, and then rises as household size increases further, although far less steeply than expenditure poverty rates. Households that are smaller than four members, therefore, are significantly more likely to be subjectively poor than expenditure poor, whereas this is reversed among households consisting of five or more members.

Subjective and money-metric poverty rates also differ significantly according to the age composition of household members. When the share of young children (younger than 11 years) in the household is zero, households are twice as likely to be self-assessed as poor than to be identified as poor in terms of per capita household expenditure. As the share of young children increases, both subjective and money-metric poverty rates increase, but again this is far more marked for the expenditure measure, leading to significantly higher proportions of households with children that are measured as expenditure poor, than as subjectively poor. A similar pattern emerges when considering the share of older children (11 to 15 years), although poverty rates are not significantly different when more than half of the household consists of older children (because of the small sample of households in this category, and therefore high standard errors).

Table 3: Expenditure and subjective poverty rates by household characteristics, South Africa

Proportion of households poor by:	Expenditure poor		Subjectively poor	
<b>Household size:</b>				
1	0.064	(0.004)	0.415	(0.009)*
2	0.157	(0.006)	0.344	(0.009)*
3	0.300	(0.009)	0.348	(0.009)*
4	0.349	(0.009)	0.325	(0.009)
5	0.450	(0.011)	0.359	(0.011)*
6	0.560	(0.014)	0.404	(0.014)*
7	0.570	(0.017)	0.433	(0.017)*
8	0.641	(0.021)	0.468	(0.021)*
9+	0.725	(0.015)	0.508	(0.016)*
<b>Share of children:</b>				
Young children: 0	0.170	(0.004)	0.352	(0.005)*
Young children: > 0 & <=0.5	0.498	(0.006)	0.393	(0.005)*
Young children: > 0.5	0.673	(0.020)	0.536	(0.020)*
Older children: 0	0.294	(0.004)	0.368	(0.004)*
Older children: > 0 & <=0.5	0.573	(0.010)	0.426	(0.009)*
Older children: > 0.5	0.531	(0.140)	0.653	(0.134)
<b>Geography type (location):</b>				
Urban formal	0.186	(0.004)	0.272	(0.005)*
Urban informal	0.479	(0.013)	0.516	(0.013)*
Rural formal	0.385	(0.019)	0.482	(0.020)*
Tribal	0.607	(0.006)	0.537	(0.006)*
<b>Land for farming:</b>				
Yes	0.567	(0.014)	0.452	(0.014)*
No	0.325	(0.004)	0.373	(0.004)*
<b>Owns the dwelling:</b>				
Yes	0.438	(0.004)	0.383	(0.004)*
No	0.210	(0.007)	0.361	(0.008)*

Note: The data are weighted. Standard errors are in parentheses. Young children are younger than 11 years; older children are aged 11 to 14. \* Proportions are significantly different at the 95 per cent confidence level.

Source: Authors' calculations based on LCS (2008/09).

The ways in which subjective and money-metric poverty rates diverge by household size and the share of children is consistent with scale economies and the different consumption needs of adults and children, which are not recognized in the measurement of objective poverty. It is also possible that households with more members, and more children specifically, feel 'richer', or that there are other household characteristics, which are correlated with both household type and perceptions of poverty (for example, anticipated future opportunities or vulnerability and unobserved personality traits) (Carletto and Zezza 2006: 746).

The proportion of households which are self-assessed as poor is significantly higher than the proportion measured as expenditure poor across all geography types in South Africa, with the exception of 'tribal' areas (the rural former Bantustan regions in apartheid South Africa) where the relationship is reversed. Households in tribal areas may be significantly less likely to be subjectively poor than expenditure poor because these areas are more geographically isolated and poverty is more extensive. Consequently, people may have more limited horizons and adapt their expectations or perceptions to these circumstances. A further possible explanation is that households in these areas are the most likely to have access to land for farming. Much of this farming is small-scale or for own-account and not for market production, and Table 3 shows that households with access to land for farming are significantly more likely than other households to be both subjectively poor and expenditure poor. However, households with farming land are significantly less likely to be self-assessed as poor than to be measured as expenditure poor, whereas the relationship is reversed for households without farming land. The difference between subjective and money-metric poverty rates across geography types therefore may arise because the

value of home production has been underestimated in the measure of household consumption, or because access to land for farming reduces households' perceptions of vulnerability.

The risk of poverty also differs according to home ownership. Households that report owning their main dwelling are more than twice as likely to be expenditure poor than households that do not (44 per cent and 21 per cent, respectively). At first glance, this appears counter-intuitive but it is explained by increased access to state-subsidized housing (or 'RDP houses') among low-income households,<sup>14</sup> and high levels of reported ownership of both shacks in informal settlements and traditional dwellings in tribal areas.<sup>15</sup> However, households which own their dwellings are significantly less likely to be self-assessed as poor than to be identified as expenditure poor, whereas the relationship is reversed for households which do not report home ownership.

To explore these differences between money-metric and subjective poverty rates further, we estimate probit regressions of the general form:

$$SP = \beta_y \ln(y_h) + \beta_x X_h + \varepsilon$$

where SP equals 1 if the household ( $h$ ) is self-assessed as poor, and 0 otherwise,  $y_h$  is per capita household expenditure normalized by the poverty line and  $X_h$  is a vector of other variables. The regressions allow us to estimate the significant correlates of subjective poverty among households that have the same level of per capita expenditure, and therefore the same money-metric poverty status (Carletto and Zezza 2006). If subjective poverty is perfectly predicted by average per capita household expenditure, then all the variables in  $X_h$  would not be significant.

We include in  $X_h$  the demographic characteristics of the household (household size, composition, if female-headed, race, and average self-reported health of household members); income-generating characteristics (access to land for farming and the employment status of household members); and asset information (whether the dwelling place is owned, and if the household owns kitchen and/or dining-room furniture). To capture the household's access to what has been termed the 'social wage', the regressions also include binary variables equal to 1 if the household reported piped water on site, access to electricity, and if the housing structure is built from either brick or block walls. Because home ownership and access to basic services and farming land are highly correlated with geography type, we exclude the latter set of variables from the estimation, but we add controls for the household's province of residence. Two further variables are included which capture living standards in a relatively geographically proximate reference group (average per capita expenditure in the district, and the district-specific Gini coefficient for expenditure).

We estimate two regressions (reported in Table 4): the first (I) includes only household-level variables in  $X_h$ ; and the second (II) controls for the characteristics of the individual who provided the assessment of the household's economic well-being (the respondent's age, education, self-reported physical and emotional health status, and employment status). The estimated coefficients all remain robust in the second specification (no coefficients change sign and no significant variables in I become insignificant in II).

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<sup>14</sup> Approximately 18 per cent of all owners of formal houses in urban areas are identified as objectively poor, and of these, almost half are not self-assessed as poor.

<sup>15</sup> The majority of households in urban formal areas (67 per cent) report owning their home, and this is even higher in urban informal (78 per cent) and tribal authority areas (93 per cent), whereas only 35 per cent of households in rural formal areas report home ownership.

Table 4: Probit regressions of subjective poverty (marginal effects)

	I		II	
Log (pc household expenditure/poverty line)	-0.756***	(0.030)	-0.667***	(0.032)
Household size	-0.019***	(0.006)	-0.015**	(0.007)
Share of young children (<11 years)	-0.364***	(0.071)	-0.243***	(0.076)
Share of older children (11-15)	-0.301**	(0.144)	-0.313**	(0.146)
Share of pensioners (60+)	-0.106*	(0.064)	-0.203**	(0.081)
Female-headed household	0.037	(0.023)	0.099***	(0.031)
Average self-reported health	-0.162***	(0.015)	-0.094***	(0.025)
African	0.530***	(0.073)	0.557***	(0.086)
Indian	-0.002	(0.118)	-0.046	(0.135)
Coloured	0.090	(0.086)	0.022	(0.098)
Access to farming land	-0.104**	(0.042)	-0.148***	(0.048)
Number of employed in the household	-0.148***	(0.014)	-0.171***	(0.021)
Owens kitchen and/or dining-room furniture	-0.281***	(0.024)	-0.304***	(0.029)
House is owned	-0.138***	(0.030)	-0.176***	(0.035)
House has brick walls	-0.144***	(0.029)	-0.155***	(0.033)
House has block walls	-0.131***	(0.036)	-0.144***	(0.042)
Piped water on site	-0.186***	(0.029)	-0.200***	(0.034)
Access to electricity	-0.075**	(0.032)	-0.073**	(0.037)
Log (average per capita district income)	0.157***	(0.044)	0.208***	(0.051)
Gini (average per capita district income)	0.274	(0.347)	0.370	(0.402)
Respondent characteristics				
Male			0.134***	(0.034)
Age			0.019***	(0.004)
Age2			-0.000***	(0.000)
No schooling			0.246***	(0.042)
Matric (grade 12)			-0.303***	(0.040)
Diploma or degree			-0.498***	(0.062)
Self-reported health			-0.082***	(0.021)
Disability (emotional or physical)			0.129**	(0.057)
Employed			0.060*	(0.036)
Pseudo R-squared	0.221		0.234	
Wald chi-squared	3197.54		3530.07	
Sample size n	24424		24133	

Notes: The data are weighted. Standard errors are in parentheses. The estimations also control for the household's province of residence. \*\*\*  $p < 0.01$  \*\*  $p < 0.05$  \*  $p < 0.10$

Source: Authors' calculations based on LCS (2008/09).

Although average per capita household expenditure is a large, negative and significant predictor of subjective poverty, most of the other variables in the estimations are also significant. At a given level of per capita expenditure relative to the poverty line, the probability that a household is self-assessed as poor decreases significantly as household size and the shares of both younger and older children in the household increase. One possible explanation for these findings, as noted earlier, is that the average costs of maintaining a certain standard of living decrease in larger households and in households that include relatively more children, reflecting economies of scale in consumption and the lower consumption needs of children.

To estimate the possible size of these effects, we re-estimated the probit regressions (not shown in the table) excluding all the variables in  $X_i$ , except household size and the share of children (see also Carletto and Zezza 2006). Instead of average per capita household expenditure, we recalculated average resources in the household adjusting for different economies of scale and adult equivalent parameters. We find that in the reduced regressions, household size and the share of

children variables become insignificant predictors of subjective poverty when household expenditure is normalized by household size adjusted for economies of scale with a parameter of 0.42, and with adult equivalence parameters of 0.5 and 0.9 for younger and older children, respectively. This rough estimate for size economies is considerably larger than that assumed in the early poverty studies for post-apartheid South Africa (which adjusted household size using a parameter of only 0.9). But the estimated adult equivalence scales are closely aligned (among the few studies which have adopted adult equivalence scales, adjustments were made typically for younger children only, who were assumed to consume half the resources of adults) (Woolard and Leibbrandt 2001; Posel and Rogan 2012).

The share of pensioners in the household is also a significant and negative predictor of subjective poverty. The contribution of the widely received social pension (valued at R940 per month in 2008) to objective poverty reduction has been well documented in South Africa (cf. Case and Deaton 1998; van der Berg and Louw 2004; Posel and Rogan 2012). However, controlling for household expenditure, households which include more pensioners are significantly less likely to be self-assessed as poor, a finding which perhaps signals the protective effect afforded by a regular monthly source of income provided through the social pension. The probability that a household is self-assessed as poor further declines as the average self-reported health status of household members increases, possibly because morbidity in the household increases the demands on current and future household resources.

Having access to farming land remains a negative, significant predictor of subjective poverty after controlling for household expenditure and a range of other household characteristics. As suggested earlier, this finding may indicate that the imputed value of home production has been underestimated in the measure of household expenditure, or that access to land for farming reduces the household's perceptions of vulnerability. Similar reasoning may account for why the number of employed household members negatively predicts subjective poverty beyond what is explained by measured household expenditure and other characteristics.

Otherwise identical households are significantly less likely to be self-assessed as poor if the household has access to assets, both the relatively modest asset of kitchen or dining-room furniture, and ownership of the home or dwelling place. In the South African context, these homes comprise not only formal houses (made from bricks or blocks) but also shacks (typically made from corrugated iron) and traditional dwellings (of clay and stones). However, the probability of subjective poverty is further lowered when the housing structure has brick or block walls, and there is access to piped water on site and to electricity. The protective effects of these household characteristics on subjective poverty suggest the contribution of large increases in pro-poor government expenditure to the household's economic well-being, in ways that are not captured adequately by money-metric poverty measures.

Perceptions of poverty also differ by race, with Africans significantly more likely than whites, Indians and coloureds in households with the same expenditure and other characteristics, to report subjective poverty. One plausible explanation for this finding is that in the context of large historical inequalities in access to resources, current monthly expenditure is not a good predictor of permanent income, and particularly among Africans. Moreover, home and furniture ownership may not control adequately for differences in assets accumulated over time. However, the positive coefficient for race (i.e. on being African) remains significant even when we include a larger array of asset information in the regressions (although the coefficient on electricity becomes insignificant because it is so highly correlated with the asset data available in the LCS). An alternative explanation is that given the legacy of apartheid, Africans perceive their economic status in comparison to others in South Africa, as inferior (see also Posel and Casale 2011). In support of the role of relative assessments in the perception of poverty, households in districts with higher average per capita

household income are significantly more likely than other households with the same observable characteristics to be subjectively poor, a finding also documented in subjective poverty studies for other countries (cf. Carletto and Zezza 2006; Fafchamps and Shilpi 2008).

One of the concerns with subjective poverty data (and with subjective assessments more generally) is that the characteristics (both observed and unobserved) of the respondent providing the assessment may influence both perceptions of poverty and the other observable household characteristics included in the estimation (Ravallion and Lokshin 2002). Without panel data, we are not able to control directly for the unobserved attributes of the respondent, but in the second regression we include information on the respondent's age and gender, as well as employment status and self-reported physical and emotional health status. The household-level correlates of subjective poverty retain their significance; and all the individual-level variables are significant and largely conform to findings reported in other studies of subjective welfare (cf. Ravallion and Lokshin 2002; Carletto and Zezza 2006). The probability that households are self-assessed as poor increases as the age of the respondent increases before a turning point is reached, and among respondents who are male, have lower levels of education and self-reported health status and who report an emotional or physical disability.

#### **4 Conclusion**

There is considerable overlap between money-metric and subjective measures of poverty in South Africa: three-fifths of all households which are identified as poor in terms of per capita household expenditure are also self-assessed as poor. However, our analysis also identifies a number of significant characteristics which distinguish households with poverty measures that do not overlap. Differences in poverty status arise partly because subjective assessments of poverty are influenced by a range of factors in addition to the household's current economic resources, including the ability of the household to generate resources in the past and in the future; the household's access to basic services; and the average health status of household members. But the differences are also consistent with the underestimation of economic resources in the measure of expenditure poverty. This underestimation occurs partly because the relatively lower consumption needs of children and people living in larger households are not recognized in per capita measures, and also because the value of economic activity can be difficult to measure, as in the case of subsistence farming.

Money-metric poverty rates in South Africa have remained high during the post-apartheid period, with only relatively modest declines in the recent decade notwithstanding the considerable expansion in the provision of basic services, subsidized housing and healthcare. However, the findings in this study suggest that the social wage is highly protective of subjective poverty among households with the same 'objective' economic resources. Furthermore, although the contribution of social grant income to poverty reduction in South Africa is widely acknowledged, the effects on the household's perception of not being poor may be even larger than the relatively small effects shown by objective poverty measures. Our findings on the relationship between subjective poverty, and household size and composition, also suggest that measures of economies of scale and adult equivalence deserve more attention than they have received in the measurement of poverty in South Africa in the past decade.



## Appendix

Appendix Table A1: Poverty estimates in post-apartheid South Africa (headcount rates)

Study	Data source	'Income' measure	Adjustments for EOS ( $\theta$ ) and AE( $\alpha$ )	Headcount rates
May et al. (1995)	1993 PSLSD	Per adult equivalent expenditure	$\alpha = 0.5$ $\theta = 0.9$ (Child < 15)	49.0†
May et al. (1998) (z=R488)	1995 IES	Per adult equivalent expenditure	Yes, but methods not reported	49.0
Statistics South Africa (2000) (z= R800 per household and R250 pc)	1995 IES & 1996 Census	IES per capita expenditure and census per capita income	None	48.4† & 60.8
Carter and May (2001) (z=Household subsistence line)	KwaZulu-Natal Income Dynamic Study 1993-98	Per capita expenditure	( $\theta = 0.72?$ )	26.8-42.5 (Households)
Woolard and Leibbrandt (2001) (z=R330)	1993 PSLSD & 1995 IES	Per adult equivalent expenditure	$\alpha = 0.5$ $\theta = 0.9$ (Child < 11)	46.9
Meth and Dias (2004) (z=HSL-based PL of R467 in 2002 prices)	1999 OHS & 2002 LFS	Per adult equivalent expenditure	$\alpha = 0.5$ $\theta = 0.9$ (Child < 18)	2 million increase in the headcount
van der Berg and Louw (2004) (z=R250)	1995 & 2005 IES	Per capita expenditure (adjusted in line with national accounts data)	None	38.8-38.6
Hoogeveen and Özler (2006) (z=R322)	1995 & 2000 IES	Per capita expenditure	None	58.0-58.0
Ardington et al. (2006) (z=R322)	1996 & 2001 Censuses	Per capita monthly income data, multiple imputation	None	59.8-65.1
Leibbrandt et al. (2006) (z=R322)	1996 & 2001 Censuses	Per capita income data	None	50.0-55.0
Meth (2006) (z=R250)	LFS 2001 and 2004	Income data- zero incomes augmented with expenditure data	None	43.3-39.9†
Bhorat and van der Westhuizen (2008) (z=R322)	1995 & 2005 IES	Per capita expenditure	None	52.5-47.9
van der Berg et al. (2008) (z=R250)	All Media Products Survey, 1995, 2000 and 2004	Income data- zero incomes augmented with expenditure data	None	51.7-50.8-46.9

Argent et al. (2009)				
(z=R322)	2008 NIDS	Per capita monthly income and expenditure	None	47.3 (income) & 53.3 (expenditure)
Armstrong and Burger (2009)				
(z=R322)	2005 IES	Per capita expenditure	None	47.1
Leibbrandt et al. (2010)				
(z=R322)	1993 PSLSD, 2000 IES & 2008 NIDS	Per capita income	Footnoted but not presented: 'Dividing by the square root of household size, rather than the unadjusted size'	56.0-54.0-54.0
UNDP (2010)				
(z= US\$2,50 PPP)	2000 & 2005 IES	Per capita expenditure	None	42.2 – 34.8
Posel and Rogan (2012)				
(z=R322)	OHSs and GHSs 1997-2006	Per capita income; zero incomes augmented with expenditure	$\theta = 0.9$ $\alpha = 0.5$ (Child < 11)	59.5-55.9†
Statistics SA (2012a)				
(z=577 in 2008 prices)	IES 2000, and the 2008/9 Living Conditions Survey	Pc expenditure	None	57.0 - 52.3

Note: All poverty lines (z) expressed in 2000 prices unless otherwise noted. Headcount rates are for individuals unless specified otherwise. †The study also provides estimates of the percentage of households below the poverty line.

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