

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

Dorrit Posel and Michael Rogan
posel@ukzn.ac.za and rogan@ukzn.ac.za

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Abstract

In this study, we compare subjective and objective measures of poverty in South Africa using data collected in the 2008/2009 Living Conditions Survey (LCS). In addition to detailed questions on income and expenditure, the LCS asked respondents to provide an assessment of the economic status of their household, ranging from 'very poor' to 'wealthy'. Although we find considerable overlap in subjective and objective poverty status among households, we also identify a number of significant characteristics which distinguish households where poverty measures are not consistent. These characteristics highlight the low dimensionality in the measurement of objective economic welfare, as well as the likely underestimation of objective economic resources in the household. This underestimation may arise both because per capita measures do not recognise scale economies in the household, and because the value of economic activity can be difficult to measure, as in the case of subsistence farming.

Key words: income poverty; subjective poverty; economies of scale; adult equivalence

JEL classification: I32; O12

1. Introduction

It is well documented that the extent of objective (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 subsidised primary health care, education, sanitation and housing (all grouped under the broad term the 'social wage') (Office of the Presidency, 2003; Meth and Dias, 2004; Office of the Presidency, 2006).

Poverty studies for South Africa have also recognised 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 forty percent, 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 objective 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 2008/2009 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 objective (expenditure) measures, and we consider what can be learned about objective poverty measures in South Africa when these do not overlap with subjective assessments. In particular, we investigate what characteristics account for differences between objective and subjective poverty rates among households with the same level of per capita expenditure. We consider specifically whether differences between subjective and objective poverty rates 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-subsidised housing) affect perceptions of poverty.

In the next section of the paper, we review the broader literature on objective and subjective poverty as well as the existing work on income and expenditure poverty in post-apartheid South Africa. In section three, we describe the data used to identify subjective and objective poverty and the extent of the overlap between these measures. In section four, we compare subjective and objective 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 five 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 subsidised 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 objective 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-subsidised housing and access to basic services such as electricity and water

will not be reflected in income or expenditure rates 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 objective poverty measures. Rather, much of the research has investigated how to combine subjective and objective 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).¹ A number of studies have also compared subjective and objective 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 objective 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,² where individuals are asked to rank their position on an

¹ 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, health care and housing are 'adequate' or 'less than adequate' (Pradhan and Ravallion, 2000).

² 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?'

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 objective and subjective poverty typically find only a partial correlation between the measures. Ravallion and Lokshin (2002) suggest two main explanations for 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 objective 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 objectively poor than to self-assess their status as poor (Ravallion and Lokshin, 2002; Carletto and Zezza, 2006; Wagle, 2007). A plausible 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, objective 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 objective 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 value of inputs and outputs in subsistence activities are almost the same (Deaton, 1997). The underestimation of income particularly from subsistence farming is one explanation for 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 objective 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 objective 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 system³ (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).⁴ (The main poverty studies published in the post-apartheid period, including how poverty has been measured and the estimated poverty rates, are summarised 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 percent to 80 percent, and from 59 percent to 68 percent, respectively) while roughly six million South Africans received government subsidised housing (Office of the Presidency, 2003; Seekings, 2006).⁵

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; van der Berg et al., 2008; Meth, 2010). Most of the earlier post-apartheid studies measured objective 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 objective 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

³ 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)

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

⁵ 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 percent (far more than for any other group) between 1993 and 2004 (Bhorat et al., 2006).

have adopted different approaches to addressing this problem (cf. Ardington et al., 2006; van der Berg et al., 2008; Posel and Rogan, 2012).⁶

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 and colleagues (1995) in assuming an economies of scale parameter of 0.9 and that children consume half the resources of adults⁷ (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 tested 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 found 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 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 found 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 objective and

⁶ 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).

⁷ May et al (1995) based these values on a generalised scale for developing countries, suggested in a draft version of Deaton (1997).

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 standardise the measurement of objective poverty⁸ and with a view to tracking changes in poverty systematically over time, Statistics South Africa (2008) has recently identified three official poverty thresholds⁹ based on the conventional cost of basic needs approach.¹⁰ 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 requirements¹¹ and is comparable to the R322 per capita poverty line (in 2000 prices) that has been dominant in the post-apartheid poverty literature.¹²

We use data on total household expenditure¹³ from the LCS to measure objective 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 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.

⁸ 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 have used 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).

⁹ 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).

¹⁰ 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).

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

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

¹³ 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).

Table 1 identifies the correspondence between objective 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 percent) have the same income poverty and subjective poverty status. Approximately 20 percent of all households are identified as both objectively and subjectively poor; while 49 percent are identified as neither objectively nor subjectively poor.

Among households which are measured as objectively poor, 60 percent 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 percent in Albania (Carletto and Zezza, 2006) and 40 percent in Russia (Ravallion and Lokshin, 2002)). Among the 40 percent of objectively poor households that are not subjectively poor, the large majority (86 percent) reported that they were 'just getting along'.

Table 1: The relationship between objective poverty (OP) and subjective poverty (SP) in South Africa

	OP & SP	OP; not SP	Not OP; SP	Neither SP nor OP
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

Source: LCS 2008/2009

Note: The data are weighted. Standard errors are in parentheses. Households are identified as objectively 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.

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

Table 2 describes objective and subjective poverty rates, at both the level of the household and the level of the individual. Whereas 34 percent of households in South Africa report an average per capita household expenditure that is below the poverty line, this corresponds to 47 percent of individuals who live in objectively poor households. The large divergence between household and individual objective poverty rates arises because objectively 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 percent and 40 percent, 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 objectively poor, a significantly smaller share of individuals lives in subjectively poor households than in objectively poor households. In the remainder of the paper we explore further how objective and subjective poverty rates differ by household size and also by household composition and a range of other household characteristics.

Table 2: Objective and subjective poverty rates in South Africa

	Objectively 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)

Source: LCS 2008/2009

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

4. Objective and subjective poverty profiles in South Africa

In identifying a subjective poverty profile, we begin by comparing objective 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 objectively poor in South Africa increases sharply as household size increases. Objective poverty rates are lowest among single-person households, where only six percent of households report a per capita monthly expenditure of less than R577, compared with 35 percent of four-person households, and 73 percent 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 percent 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 objective poverty rates. Households that are smaller than four members therefore are significantly more likely to be subjectively poor than objectively poor, whereas this is reversed among households consisting of five or more members.

Subjective and objective poverty rates also differ significantly according to the age composition of household members. When the share of young children (younger than 11) 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 objective poverty rates increase, but again this is far more marked for the

objective measure, leading to significantly higher proportions of households with children that are measured as objectively 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: Objective and subjective poverty rates by household characteristics, South Africa

Proportion of households poor by:	Objectively poor	Subjectively poor
Household size:		
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)*
Share of children:		
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)
Geography type (location):		
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)*
Land for farming:		
Yes	0.567 (0.014)	0.452 (0.014)*
No	0.325 (0.004)	0.373 (0.004)*
Owns the dwelling:		
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; older children are aged 11 to 14. * Proportions are significantly different at the 95% confidence level.

The ways in which subjective and objective poverty rates diverge by household size and the share of children would be consistent with scale economies and the different consumption needs of adults and children, which are not recognised 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 objectively 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 objectively 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 and objectively poor. However, households with farming land are significantly less likely to be self-assessed as poor than to be measured as objectively poor, whereas the relationship is reversed for households without farming land. The difference between subjective and objective 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 objectively poor than households that do not (44 percent and 21 percent, respectively). At first glance, this appears counter-intuitive but it is explained by increased access to state-subsidised housing (or "RDP houses") among low-income households¹⁴, and high levels of reported ownership of both shacks in informal settlements and traditional dwellings in tribal areas.¹⁵ However, households which own their dwellings are significantly less likely to be self-assessed as poor than to be identified as objectively poor, whereas the relationship is reversed for households which do not report home ownership.

To explore these differences between objective 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 normalised 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 objective

¹⁴ Approximately 18 percent 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.

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

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).

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 share 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_h 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 normalised 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).

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

	I	II
Log (per capita 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)
Age ²		-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

Source: Living Conditions Survey (LCS) 2009/2009.

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

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 objective 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 on 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 poverty, 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.

Conclusion

There is considerable overlap between objective and subjective measures of poverty in South Africa: three-fifths of all households which are identified as objectively poor 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 objective poverty. This underestimation occurs partly because the relatively lower consumption needs of children and

people living in larger households are not recognised in per capita measures, and also because the value of economic activity can be difficult to measure, as in the case of subsistence farming.

Objective 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, subsidised 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 objective poverty in South Africa in the past decade.

Appendix

Table: 5 Poverty estimates in post-apartheid South Africa (headcount rates)

Study	Data source	'Income' measure	Adjustments for EOS (θ) and AE(α)	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
Stats SA 2000 (z= R800 per household and R250 per capita)	1995 IES & 1996 Census	IES per capita expenditure and Census per capita income	None	48.4† & 60.8
Carter & May, 2001 (z=Household subsistence line)	KwaZulu-Natal Income Dynamic Study 1993-1998	Per capita expenditure	($\theta = 0.72?$)	26.8-42.5 (Households)
Woolard & Leibbrandt, 2001 (z=R330)	1993 PSLSD & 1995 IES	Per adult equivalent expenditure	$\alpha = 0.5$ $\theta = 0.9$ (Child < 11)	46.9
Meth & 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 & Louw, 2004 (z=250)	1995 & 2005 IES	Per capita expenditure (adjusted in line with national accounts data)	None	38.8-38.6
Hoogeveen & 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	None	43.3-39.9†

		augmented with expenditure data		
Bhorat & 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 (R322)	2008 NIDS	Per capita monthly income AND expenditure	None	47.3 (income) & 53.3 (expenditure)
Armstrong & 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= \$2,50 ppp)	2000 & 2005 IES	Per capita expenditure	None	42.2 – 34.8
Posel & Rogan 2012 (z=322)	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†
Stats SA 2012 (z=577 in 2008 prices)	IES 2000, and the 2008/9 Living Conditions Survey	Per capita 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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