



NONINCOME WELFARE AND INCLUSIVE GROWTH IN SOUTH AFRICA

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INTRODUCTION

A number of wide-ranging economic reforms were introduced in South Africa after the demise of apartheid. These reforms aimed at, among other things, macroeconomic stability, economic growth, job creation and poverty reduction. The new democratic government repeatedly emphasized that the provision of free basic services-such as water, electricity, sanitation and housing-to previously disadvantaged groups was a key policy objective. In addition, Section 2 of the country's constitution identifies a set of socioeconomic rights that include housing, water and education. Nonetheless, most of the attempts to measure broad changes in the welfare of South Africans since 1994 have understandably focused on the private returns to economic growth, and in doing so attention remains primarily on income- or expenditure-based measures of well-being. Studies focused on these money-metric measures find that income poverty worsened over the period between South Africa's transition to democracy until about 2000 and 2001, and that since then a continuous but slow downward trend has been observed. Such findings are consistent regardless of the datasets used (Ardington, Leibbrandt, and Welch 2005; Hoogeveen and Özler 2006; Leibbrandt et al. 2006; Van der Berg, Louw, and Du Toit 2008).

In contrast to the valuable work on money-metric measures of economic progress, only a limited number of studies have focused on well-being in terms of access to assets and services over a similar period. Yet this is an important component in understanding the extent to which economic growth in South Africa has been inclusive, or pro-poor. Burger and colleagues (2004), Bhorat, Naidoo, and Van der Westhuizen (2006), and Bhorat and Van der Westhuizen (2009) attempted the first non-money-metric assessments of welfare for the post-apartheid period. Using a variety of empirical approaches, these researchers find significant declines in the levels of nonincome poverty. Two recent additions to the South African literature are Schiel (2012) and Finn, Leibbrandt, and Woolard (2013). Schiel (2012), in a dissertation, examines poverty levels using both money-metric and non-money-metric techniques to assess welfare gains, while Finn, Leibbrandt, and Woolard (2013) construct a measure of multidimensional poverty, based on the work of Alkire and Foster (2011) and Alkire and Santos (2011), and analyze changes between 1993 and 2010. Their index includes information on health, education and a variety of measures of living standards, and they find strong declines in multidimensional poverty.

Building on previous work, this paper seeks to contribute to a more comprehensive understanding of changes in nonincome welfare over an 18-year period in South Africa, from 1993 to 2010. While the existing literature reveals increased delivery of basic services by the government since 1994, there has been a fairly narrow focus on so-called public assets, such as the state's provision of housing, water and electricity. Most studies exclude information on private assets, such as whether a household has a stove, a refrigerator, a television set, a vehicle and so on. We believe that these are relevant indicators of economic welfare. In addition, most of the studies mentioned here do not address the contribution that increased access to education makes to overall well-being. Hence, in an attempt to extend the reach of existing research, this paper seeks to offer a more nuanced understanding of the role that assets-both public and private—and services have played in postapartheid welfare in South Africa. Specifically,

using information on both public and private assets, as well as education, we create a welfare measure to investigate shifts in nonincome poverty between 1993 and 2010. In addition to analyzing aggregate shifts, we examine changes across different income quintiles in the distribution. To construct a nonincome welfare index, we use the technique of principal components analysis (PCA), which allows us to aggregate over our set of chosen variables.

The paper is structured as follows. The second section provides a brief overview of the data we use and the PCA methodology. The third section presents a descriptive summary of the various changes in access to assets and services during the period being considered. The fourth section explains the results of the PCA that was undertaken. The fifth section then examines the major changes in nonincome welfare that have taken place, and finally the sixth section offers brief conclusions.

DATA AND METHODOLOGY Data

Two sources of data were used in the analysis: the 1993 South African Integrated Household Survey, from the Project for Statistics on Living Standards and Development (PSLSD), and the 2008 and 2010/11 reports from the National Income Dynamics Study (NIDS). Both surveys were conducted by the Southern Africa Labour and Development Research Unit (SALDRU), based at the University of Cape Town's School of Economics.

The PSLSD collected information on the conditions under which South Africans lived in 1993 and was intended to provide policymakers with the data required for planning strategies to implement the goals outlined in the government's Reconstruction and Development Programme. The survey data, which were released in 1994, cover a wide range of indicators on standards of living. Households taking part in the survey submitted detailed information on demographics, employment status, income (from employment and nonemployment sources), spending (food and nonfood), health and perceived quality of life. In addition, a community questionnaire was run in each geographical cluster of the sample to capture information on the availability of facilities to the community in each cluster, such as infrastructure, education, health and recreational amenities. A total of 8,809 households took part in the PSLSD, and when the survey weights are applied, this amounts to approximately 7.82 million households. All the data presented in this paper are weighted at the household level.

The NIDS is South Africa's first national panel study of individuals across all ages. The main objective of NIDS is to measure and understand who is getting ahead and who is falling behind in South Africa, and to do this, the survey has five main focus areas: the incomes and expenditures of households and individuals, the assets owned by the household and the household's access to services, individual educational attainment and health status, labor market status, and membership of community groups. In terms of coverage, 7,301 and 6,809 households, respectively, took part in NIDS 2008 and NIDS 2010/11. When weighted, these numbers are 12.80 million (2008) and 13.26 million (2010/11), and again, the weighted numbers are used in this analysis.

There are several reasons for using these two surveys in order to analyze nonincome poverty, as opposed to surveys such as the General Household Surveys, the Income and Expenditure Surveys, and the National Censuses. The first reason is that both the PSLSD and the NIDS include comprehensive questions on public assets and private asset ownership, which are critical for our paper. Second, these surveys contain detailed asset information that goes beyond a simple summation of public and household assets—extending to, for example, the type of material used for housing, the kind of toilet to which household members have access and the source of fuel used for cooking. Third, the 18-year gap that these surveys allow us to analyze is a sufficiently lengthy time frame within which to explore whether there have been substantial changes in economic welfare. Finally, in the case of South Africa, the 1993 PSLSD serves as a snapshot of the nonincome welfare of South African households just before the democratic transition, while the 2008 and 2010/11 NIDS are fairly reliable benchmarks for contemporary households after almost two decades of democracy.

As in any empirical inquiry of this nature, potential data problems must be noted at the outset. In our case, in the NIDS 2010/11 data, there is a problem of racial representativeness due to a significantly decreased sample of white-headed households, which fell from 550 in the 2008 survey to 300 in 2010/11. While we rely on the household weights to adjust for this, it does decrease the precision of our estimates for this group.

Methodology

There are several possible approaches that allow one to aggregate over a range of different variables and derive a unidimensional measure of socioeconomic welfare. When dealing with asset ownership, one such approach— and the most basic one—is to simply add up the number of assets that a household owns by giving equal weight to each asset. However, despite its simplicity, this method masks the fact that the imposition of equal weights for each asset is completely arbitrary. For example, should having a car be comparable to having electricity? Equal weighting also makes it more difficult to include measures of quality, for assets or services, when there are more than two quality options (McKenzie 2005). Therefore, more complex statistical approaches are usually adopted to determine the most appropriate weight for each variable, the most common being PCA, factor analysis and multiple correspondence analysis.

Among these options, PCA is an appealing method—for several reasons. First, it is relatively intuitive as a way to extract shared information from a set of variables that are interrelated. As Filmer and Pritchett (2001, 116) explain, "The first principal component of a set of variables is the linear index of all the variables that captures the largest amount of information that is common to all the variables." The technique used is, in fact, similar to a regression analysis in terms of "minimizing residuals"; but in the case of PCA, the residuals are measured against all the variables instead of just one dependent variable. Second, the weights assigned to each component in the analysis have a fairly simple interpretation, since the weight given to any variable is related to how much information it provides about the other variables. For example, if ownership of one type of asset is highly indicative of ownership of other assets for a given population, these assets receive a positive weight and vice versa. Moreover, assets that are more unequally distributed across households would be given greater weight in PCA. An asset that all households own or no households own (i.e., zero standard deviations) would be given zero weight when deriving the index, since it explains none of the variation across households. Finally, in terms of interpretation, a variable with a positive weight is associated with higher socioeconomic status (SES).

Our choice of PCA also follows from the fact that this method has been used in numerous South African and international studies. Van der Berg, Nieftagodien, and Burger (2003) construct an index using PCA from the 2000 Income and Expenditure Survey to investigate whether consumption in black households was systematically different from consumption in white households due to an asset deficit. As noted, Schiel (2012) use PCA to create a non-money-metric index from the 1993 PSLSD and 2008 NIDS data. In the international literature, the PCA approach has often been used to create a proxy for the level of SES based on access to, or ownership of, various public and private assets (Schroeder, Kaplowitz, and Martorell 1992; Pollitt et al. 1993). PCA has also been used by Filmer and Pritchett (2001) and McKenzie (2005) to examine the relationship between

household wealth and children's school enrollment, while Paxson and Schady (2005) use PCA to derive an SES index to investigate the relationship between a household's socioeconomic status and language ability of children in Ecuador. Vyas and Kumaranayake (2006) also adopt PCA to investigate nonincome welfare differences across geographic regions in Brazil and Ethiopia.

Specifically, PCA is a multivariate technique first used by Karl Pearson in 1901 and can be explained as follows:¹ Let $x = (x_1, x_2, ..., x_n)'$ be a vector of asset indicators. It is expected that ownership of different assets or access to various services will be highly correlated across households, so that a single summary measure should account for a reasonable amount of the cross-household variation in nonincome welfare. Hence, PCA solicits a linear combination of variables such that the maximum variance is extracted from these variables. This method is applied several times, with each application extracting variation from the data that were unexplained by the previous application, and forming the eigenvectors of the covariance matrix, or principal components. The components are ordered so that the first component explains the largest possible amount of variation in the data, subject to the constraint that the sum of the squared weights is equal to 1. The second component, being completely uncorrelated with the first component, explains additional but smaller variation than the first component, subject to the same constraint. This is repeated until all the variation is explained by the "principal components." The higher the degree of correlation among the variables, the fewer the components required to explain the variation.

In equation terms, the first principal component, λ , stands for the linear combination of the asset vector, such that

$$\lambda = \alpha_1 \times \left(\frac{x_1 - x_1}{\sigma_1}\right) + \alpha_2 \times \left(\frac{x_2 - x_2}{\sigma_2}\right) + \dots + \alpha_n \left(\frac{x_n - x_n}{s_n}\right)$$

subject to the constraint that $\alpha' \alpha = 1$, where α_i is a vector of scoring coefficients or weights, and σ_i is the sample standard deviation of the asset x_i with mean of $\overline{x_i}$. Furthermore, data in categorical form are not suitable for PCA, as "the categories are converted into a quantitative scale which does not have any meaning," (Vyas and Kumaranayake 2006, 463). Hence, qualitative categorical variables are recoded into binary variables, before PCA is conducted to derive an asset index. As a result of the standardization of the variable, λ has a 0 mean and a variance of σ^2 , which is the largest eigenvalue of the correlation matrix between the various assets. In case the assets are indicated in the form of a dummy variable, α_i / σ_i captures the effect of ownership of asset x_i on the asset index λ .

In this study, three categories of variables were used to construct the nonincome welfare index: household characteristics and access to services, household private assets and the educational attainment of household head. Regarding access to service, there are seven household characteristics variables: 1. Type of dwelling (formal, traditional, informal), 2. Type of roof material (bricks, tile, asbestos, corrugated, thatch, other inferior-quality material²), 3. Type of wall material (high-quality,³ medium-quality,⁴ and low-quality materials⁵), 4. Source of water (piped water, public tap, borehole, and surface water), 5. Sanitation facility (flush or chemical toilet, pit latrine with ventilation, pit latrine without ventilation, bucket latrine, none), 6. Fuel source for cooking (electricity, gas, paraffin or coal, wood or dung), and 7. Fuel source for lighting (electricity, paraffin, candles, other). The household private asset variables consist of a vehicle (including a car, *bakkie* [light delivery vehicle], truck, motorcycle and scooter), radio (including a hi-fi stereo, CD player and MP3 player), television, telecommunications (including both landline telephones and cellular phones), refrigerator (including a freezer) and stoves (including an electric stove, gas stove, primus cooker and paraffin stove). The educational attainment of the household head is simply measured by the years of schooling completed.

One common drawback of using asset measures is that the ownership of assets, or access to the services mentioned, does not always accurately indicate quality. For example, public access to piped water that only runs for a few hours a day is appreciably different from consistent access to water in a private home. The data we have do not capture these differences. However, the variation in each type of asset/service that we do have does allow for some measure of quality, albeit a cruder one than we would like. Moreover, Falkingham and Namazie (2002) point out that in many countries the problem of quality does not significantly alter the overall picture of wealth, which is our overarching focus here. A related concern in this paper is the classification of dwelling categories from the survey data into three distinct dimensions: formal, traditional and informal. In some cases, for example, dwellings were classified into a category called "combination of buildings," which makes it difficult to assign a measure of quality. Here we decided that households staying in combination buildings that had highquality or medium-quality wall materials were most likely formal and traditional dwellings, respectively; the remaining households (made from low-quality materials) were assumed to be informal dwellings.

DESCRIPTIVE OVERVIEW OF CHANGES IN ACCESS TO SERVICES AND ASSETS Changes in the Ownership of Private Assets

For our analysis, households have been divided into five guintiles based on their per capita income in each survey; table A1 in the appendix shows the currency values (in 2010 prices) for these quintile boundaries in all three survey years. Before discussing the results of the PCA, we examine how access to various assets and services has changed between the surveys.⁶ First, the proportion of households with access to each private asset is presented in table 1 (the absolute numbers are shown in table A2 in the appendix). This table reveals some large and important shifts over time; and when reading the percentage changes in the table, it is also crucial to note that in absolute terms, there was an increase in the number of households with access to all private assets. Put differently, in the years 2010/11, for each private asset, access increased in absolute terms.

Table 1 reveals that the most common asset owned among all households in the 1993 PSLSD was a stove (over 80 percent of households had a stove, even in quintile 5, the poorest quintile). However, in the 2010/11 NIDS, telephones had become the most common asset. In fact, the largest increase in asset access was in telecommunications, in both absolute terms (an increase of 9.39 million households) and relative terms (an increase of 59.65 percentage points). The proliferation of cellular phones is surely the major driver of this growth. In contrast to this trend, there were slight decreases in the proportion of households with vehicles, radios and stoves between the two surveys. The greatest decrease here was in radio ownership (-10.05 percent), but this finding could be due to the fact that in many households, stand-alone radios have been replaced with cellular phones, computers or other devices that perform the same function. The decrease in access to vehicles and stoves, however, is less easily explained.

Changes in Access to Household Services

Table 2 shows the proportional changes in access to high-quality household assets and services in each category (e.g., formal housing in the "dwelling type" category), while table A3 in the appendix shows the number of households for the full quality range in every asset and service. First, table 2 reveals a relatively rapid increase in the proportion of households using electricity as their fuel source for cooking (from 45.77 to 80.05 percent) and as their source for lighting (from 52.65 to 87.01 percent) between 1993 and 2010/11. Moreover, the proportion of households with access to piped water and a flush/chemical toilet increased by approximately 20 percent and 15 percent, respectively. In all categories, the greatest shifts are evident in the lower income quintiles.

These trends are to be expected and largely reflect the impact of government efforts to ensure the provision of basic services, particularly for poorer areas, since the mid-1990s. For instance, the government aims to provide electrification to all households in the country and to provide free basic electricity (50 kilowatt-hours per household) to poor households (Department of Minerals and Energy 2003; National Treasury 2003). The Housing Subsidy Programme identified the provision of low-cost housing as one of the government's core pro-poor programs since 1994 (National Treasury 2003). Finally, the government has also prioritized free access to water, of up to 6 kilolitres per household, alongside access to toilets (National Treasury 2003). While these are, of course, only aspirational policy objectives, the data suggest that much progress has indeed been made on these fronts.

Quintile	Vehicle	Radio	TV Set	Telephone	Refrigerator	Stove				
PSLSD 1993 (%)										
1	5.27	68.96	15.68	2.09	10.10	80.05				
2	7.11	75.01	29.83	5.84	21.25	82.93				
3	14.56	78.43	48.59	17.45	39.92	87.31				
4	34.31	79.85	59.14	35.94	54.37	85.60				
5	77.33	92.79	84.16	74.93	83.02	91.09				
All households	27.72	79.01	47.48	27.25	41.73	85.40				
		Ν	IIDS 2008 (%	b)						
1	4.54	63.02	48.70	80.85	33.26	67.79				
2	7.18	77.72	61.74	83.95	51.35	78.91				
3	12.75	78.16	63.44	83.29	51.22	80.62				
4	27.09	82.58	74.11	90.92	65.68	85.81				
5	70.40	92.75	88.58	97.75	86.68	90.70				
All households	24.38	78.84	67.31	87.35	57.63	80.76				
		NI	DS 2010/11 (9	%)						
1	3.44	61.64	57.72	80.23	46.46	72.33				
2	6.88	62.44	63.51	82.72	52.80	77.45				
3	10.22	66.76	68.93	82.80	60.15	81.67				
4	29.85	72.46	74.04	91.14	66.85	81.59				
5	63.37	81.48	85.66	97.63	82.51	85.34				
All households	22.75	68.96	69.97	86.90	61.75	79.68				
D	oifference bet	ween PSLSD 19	993 and NIDS	5 2010/11 (per	centage points))				
1	-1.83	-7.32	42.04	78.14	36.36	-7.72				
2	-0.23	-12.57	33.68	76.88	31.55	-5.48				
3	-4.34	-11.67	20.34	65.35	20.23	-5.64				
4	-4.46	-7.39	14.90	55.20	12.48	-4.01				
5	-13.96	-11.31	1.50	22.70	-0.51	-5.75				
All households	-4.96	-10.05	22.49	59.65	20.02	-5.72				

Table 1. Proportional Changes in Ownership of Private Assets by Quintile, 1993-2010/11

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.

Table A4 in the appendix shows the changes in access to education over the same period. The table shows the proportion of households in each educational attainment category by quintile, where the household head is used a proxy.⁷ It can be seen that overall education levels rose, and the propor-

tion with no or primary education declined in all quintiles across the two surveys. However, it is also clear that households in the upper income quintiles saw the biggest gains in terms of those who finished high school and those who went on to achieve a tertiary qualification.

Quintile	Dwelling Type: Formal	Water Source: Piped Water	Sanitation Facility: Flush or Chemical Toilet	Fuel Source for Cooking: Electricity	Fuel Source for Lighting: Electricity				
PSLSD 1993 (%)									
1	48.67	21.68	13.51	7.37	14.99				
2	57.78	35.46	23.68	16.92	27.77				
3	71.85	61.05	49.05	40.17	47.11				
4	87.34	83.38	82.18	72.04	78.92				
5	96.95	96.48	96.83	92.39	94.51				
All households	72.51	59.60	53.04	45.77	52.65				
		NIDS	2008						
1	55.33	49.87	32.25	50.88	68.14				
2	70.41	62.73	41.60	62.09	76.85				
3	75.07	71.71	55.55	69.77	78.48				
4	86.55	87.60	78.13	83.26	89.93				
5	96.67	95.88	94.60	92.19	98.34				
All households	76.80	73.55	60.42	71.63	82.34				
		NIDS 20	010/11 (%)						
1	62.83	59.97	45.35	63.30	77.30				
2	67.59	67.69	54.49	69.74	79.64				
3	76.16	81.68	67.92	81.46	86.54				
4	84.87	88.95	81.46	90.20	93.52				
5	95.54	95.88	93.60	95.61	98.09				
All households	77.38	78.82	68.54	80.05	87.01				
D	ifference betwee	n PSLSD 1993 ai	nd NIDS 2010/11	(percentage poir	its)				
1	14.16	38.29	31.84	55.93	62.31				
2	9.81	32.23	30.81	52.82	51.87				
3	4.31	20.63	18.87	41.29	39.43				
4	-2.47	5.57	-0.72	18.16	14.60				
5	-1.41	-0.60	-3.23	3.22	3.58				
All households	4.87	19.22	15.50	34.28	34.36				

Table 2. Proportional Changes in Ownership of Household Services by Quintile, 1993-2010/11

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.

DERIVATION OF THE ASSET INDEX Results from the Principal Components Analysis Methodology

As noted above, the PCA provides more insight into overall changes in nonmonetary welfare by creating a welfare index based on our three asset classes. The analysis uses a pooled sample of the data sets, and table A6 in the appendix presents the scoring factors or weights for the index produced by the PCA, based on the first principal component. The signs of the weights are all as expected, with positive signs indicating that the ownership of assets, or access to services, is associated with higher nonincome welfare. Relatively large positive weights were derived for access to electricity, piped water, a flush or chemical toilet, high-quality wall material for a dwelling, residence in a formal dwelling, and ownership of a refrigerator and television set. In contrast, large negative weights were derived for the use of candles for lighting, wood or dung for cooking, and a medium-quality material of the dwelling.

The above-mentioned weights were applied to the three data sets to calculate nonincome welfare index values for all households. Table 3 presents the mean values of the welfare index for each income quintile by survey. It is evident that the changes in the poorest four quintiles, in both the periods 1993–2008 and 1993–2010, were statistically significant and large, while there was no statistically significant change in the richest quintile. Hence, the initial evidence here points toward a story of inclusive growth in nonincome welfare over the period, where growth has had a relatively greater impact for households in the poorer income quintiles.

Table 4 examines the changes in income and nonincome welfare over the period for each quintile. Here, households are divided into quintiles based on income measures (shown in the rows in the table) and nonincome measures (shown in columns), and the cells contain the percentage share of households in each overlapping category. For example, in 1993, 47.5 percent of households from the poorest income quintile also fell into the lowest nonincome quintile. However, this proportion decreased to 41.79 percent in 2008 and 38.34 percent in 2010/11, as asset ownership for income-poor households increased. Reinforcing this point, the proportion of households that fall into income quintile 2, but belong to a higher nonincome quintile, increased from 35.6 percent in 1993 to 41.7 percent in 2010/11. Hence, the results from the table suggest that nonincome welfare growth was more rapid than income growth over the period.

Quintile	PSLSD 1993	NIDS	2008	NIDS 2	2010/11
	Mean	Mean	<i>t</i> -statistic	Mean	<i>t</i> -statistic
1	-4.39	-1.80	-26.70 [*]	-0.98	-38.52 [*]
2	-3.35	-0.73	-24.74 [*]	-0.45	-30.64*
3	-1.55	-0.15	-11.78 [*]	0.43	-17.60 [*]
4	0.59	1.16	-6.24*	1.38	-8.85*
5	2.33	2.51	-1.61	2.40	0.99
All households	-1.28	0.20	-19.82 [*]	0.56	-25.86 [*]

Table 3. Mean Value of the Nonincome Welfare Index by Income Quintile

Notes: 'The 2008 estimate is significantly different at the 5% level from the 1993 estimate. "The 2010/2011 estimate is significantly different at the 5% level from the 1993 estimate.

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/2011 data.

Table 4. Overlap between Nonincome Welfare Index Quintiles and Real Per Capita Income Quintiles (percent)

		Nonincome Welfare Index Household Quintile						
PSLSD 1993		1	2	3	4	5		
	1	47.50	33.07	14.28	4.81	0.34		
	2	32.57	31.81	23.33	10.93	1.35		
	3	16.24	23.80	26.39	27.49	6.08		
Real per capita	4	3.99	10.30	26.71	35.00	24.00		
income quintile	5	0.80	1.70	10.78	21.58	65.13		
		Nonincome Welfare Index Household Quintile						
NIDS 2008		1	2	3	4	5		
	1	41.79	29.22	19.46	9.01	0.52		
	2	26.41	29.00	23.68	17.81	3.10		
	3	21.69	24.61	24.53	23.35	5.82		
Real per capita	4	8.95	12.33	23.82	33.78	21.11		
income quintile	5	1.19	4.77	9.25	20.50	64.30		
			Nonincome We	lfare Index Hou	sehold Quintile			
NIDS 2010/2011		1	2	3	4	5		
	1	38.34	29.47	19.19	11.74	1.26		
	2	30.13	28.16	20.62	17.56	3.54		
	3	18.36	24.91	25.95	22.46	8.31		
Real per capita	4	10.57	12.84	24.56	25.44	26.59		
income quintile	5	2.67	7.7	12.85	19.18	57.59%		

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/2011 data.

CHANGES IN NONINCOME WELFARE, 1993-2010/11

In this section, the results derived after applying standard poverty analyses to the nonincome welfare index are presented, for each survey. We evaluate the extent to which households' nonincome welfare has changed in more detail and across different strata (e.g., race, province, gender). For our poverty analysis, the index values at the 20th and 40th percentiles in 1993 are used as relative poverty lines, where the 20th percentile is the "lower" poverty line and the 40th percentile is the "upper" poverty line.

Changes in Nonincome Poverty

Table 5 presents the Foster-Greer-Thorbecke poverty headcount rates and poverty gap ratios by various demographic characteristics at the two selected poverty lines. Overall, asset poverty has fallen by almost 17 percent, according to the lower poverty line. Put differently, if we take the level of asset ownership in 1993 as a benchmark and classify all households below the 20th percentile as poor, we find that in 2011, only 3.5 percent of households remained poor by that standard. Similarly, if we use the 40th percentile as an upper poverty line, the total household poverty rate fell by 27.5 percentage points (from 40 to 12.5 percent). These decreases are both statistically significant.⁸

If we examine nonincome poverty by gender, it is again clear that the decrease in the poverty headcount ratio between the two surveys was large and statistically significant, for both male- and femaleheaded households. In particular, the decrease was greater for female-headed households. As a result of this sharper decline, the difference in poverty rates between female- and male-headed households narrowed from 9.7 percentage points in 1993 to only 1.6 points in 2010/11 at the lower poverty line, and from 14.9 to 2.6 points at the upper poverty line.

When we review nonincome poverty by race, the initial estimates are startling: Only African-headed households were poor under the lower poverty line in 1993, and this situation persisted in 2011, with the poor being exclusively those living in African-headed households. If we use the upper poverty line, African-headed households were joined by a very small percentage of so-called Coloured-headed* households in both 1993 and 2011. However, the changes in poverty by race of the household head do reveal substantial improvement. Both the poverty headcount rates and poverty gap ratios decrease dramatically for African-headed households over the period-there was a 23.7 percentage point decrease under the lower poverty line and a 40 point decrease under the upper line. In other words, African-headed households, since they were virtually the only nonincome poor households, benefited considerably from the aggregate decrease in nonincome poverty over the period. This trend again suggests that service delivery efforts have been a success, in addition to the private asset gains made by these households. Table 5 also reports the different poverty estimates by geographic region (urban/rural) and shows that

^{*} Racial terminology in South Africa is a sensitive matter and in this paper we follow the most recent and widely used terminology. For example, the national statistics service Statistics South Africa also classifies people by population group with the options of Black African, Coloured, Indian or Asian, White, and Other. In this paper, "African" is used to refer to people classified by the apartheid state as "native," "Bantu," or "black". "Coloured" refers mainly to people in the Western Cape province, and is an ethnic label for people of mixed ethnic origin who possess ancestry from Europe, Asia, and various Khoisan and Bantu tribes of Southern Africa.

Table 5.	Nonincome	Poverty S	Shifts by R	ace, Gender	of Household	Head and O	Geographic Re	egion,
1993-20	010/11							

	Headcount	t Rate (%)		Poverty Gap Ratio (%)		
	PSLSD 1993	NIDS 2008	NIDS 2010/11	PSLSD 1993	NIDS 2008	NIDS 2010/11
Characteristic		P	overty line at	20th percenti	ile	
All households	20.0	6.6*	3.5**	8.5	2.2	1.2
By gender of household head						
Male	17.4	5.3 [*]	2.8**	7.3	1.8	1.0
Female	27.1	8.3 [*]	4.4**	11.8	2.8	1.4
By race of household head						
African	28.2	8.6 [*]	4.5**	11.9	2.9	1.5
Geographic region						
Urban	5.9	1.7*	0.7**	1.1	0.2	0.0
Rural	36.4	16.0*	8.1**	17.1	6.0	2.9

	Poverty line at 40th percentile							
All households	40.0	17.2 [*]	12.5**	18.9	6.9	2.3		
By gender of household head								
Male	36.0	14.5 [*]	11.3**	16.6	5.6	4.0		
Female	50.9	20.9*	13.9**	25.2	8.6	5.2		
By race of household head								
African	56.0	22.2 [*]	16.0**	26.5	8.9	5.8		
Geographic region								
Urban	15.4	7.7*	6.1**	5.4	2.6	1.8		
Rural	68.9	35.5*	23.2**	34.6	15.2	9.1		

Notes: 'The 2008 estimate is significantly different at the 5% level from the 1993 estimate. 'The 2010/11 estimate is significantly different at the 5% level from the 1993 estimate. We only show the results for "African" household head, the full results are available from the authors.

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.

poverty headcount ratios decreased continuously in both urban and rural areas, but the extent of this decline was more rapid in rural areas. All the declines in headcount poverty were statistically significant, under both the upper and lower lines.

Cumulative Distribution Functions

The attraction of using cumulative distribution functions (CDFs) is that they do not rely on selected poverty lines. In the figures below, the two vertical lines represent the lower and upper poverty lines, set at the 20th and 40th percentiles, respectively. Figures 1 and 2 compare the changes in income poverty to those of nonincome poverty using real per capita income and the nonincome welfare index, respectively. The proportion of households is represented on the vertical axis (ranked by income/nonincome welfare), and this is then plotted against income/ nonincome welfare on the x-axis. Both figures show that poverty declined continuously across the three surveys, but it is obvious that the decrease in nonincome poverty was more rapid, as shown by the movements downward and to the right of the curves in figure 2. The CDFs in figure 1 also provide a more robust account of the slow growth in incomes that are presented in table A1.

Concerning nonincome poverty, Figure 2 shows that, with the exception of the top 20 percent of households, the poverty headcount ratio declined significantly between 1993 and 2010/11, irrespective of the poverty line chosen. Moreover, the gap between the two lines is greatest for households in the lower-middle section of the distribution compared with the top 50 percent or the bottom 10 percent of households. This implies that the nonincome poverty decline was





Note: The two vertical lines represent the lower and upper poverty lines, set at the 20th and 40th percentiles, respectively. Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.

most rapid for households in the bottom 50 percent of the distribution, while for the poorest 10 percent and the richest 50 percent of households, more modest changes have taken place. CDFs that illustrate the welfare changes by gender and race over the period can be found in the appendix (figures A1 and A2). The results provide support for the trends identified in the previous section.

Figure 3 presents the CDFs for each income quintile over time to examine how the distribution of nonincome welfare has changed for households with different levels of income. Here we are interested in whether those households that were the poorest in income terms in 1993 saw the largest improvement in asset welfare over the period and how this change has been spread across the distribution. The results indicate that pro-poor nonincome welfare gains were in fact most rapid for the poorest income quintile where the gap between the 1993 and 2010/11 CDFs is the greatest. The extent of this poverty decline diminishes when moving from quintile 1 to quintile 4, while for the richest quintile there has been almost no change at all.



Figure 2. Cumulative Distribution Functions for All Households, Using Nonincome Welfare

Note: The two vertical lines represent the lower and upper poverty lines, set at the 20th and 40th percentiles, respectively. Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.



Figure 3. Cumulative Distribution Functions by Per Capita Income Household Quintile

Note: The two vertical lines represent the lower and upper poverty lines, set at the 20th and 40th percentiles, respectively. Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.

CONCLUSION

This paper has examined the changing nature of nonincome welfare in postapartheid South Africa over an 18-year period, from 1993 to 2010. It serves as a supplement to the majority of South African studies on poverty, which have focused predominantly on changes in income welfare as the most important marker of economic progress. Our paper is also an extension of the few studies that focus on nonincome welfare, which have generally not addressed the role of private assets in the welfare calculation. We include public and private assets as well as educational attainment in our PCA approach to derive a nonincome welfare index.

We find that poverty declined significantly over the period, and this result holds for virtually all households, regardless of the gender or race of the household head, and whether it was in a rural or urban area. The important exceptions are that in terms of race, poverty declines were almost exclusively found for African-headed households, the reason being that these households constituted virtually the entire population of households living in poverty in 1993. We also found that poverty declines were relatively more rapid for female-headed households and in rural areas. Comparing the declines in income and nonincome poverty over the same period revealed that nonincome poverty fell much more rapidly than income poverty. Finally, we note that poverty decreases were relatively well targeted toward poor households, and it was shown that in terms of both income and nonincome poverty, poorer households experienced the largest decreases in nonincome poverty.

In conclusion, the results are encouraging as South Africa nears the end of its second decade of democratic rule. However, the changes that have taken place must be understood in the context of the socioeconomic situation at the end of apartheid, with the majority of the nonwhite population living in extreme poverty, in both income and nonincome terms. The substantial progress that we observe has built on an exceptionally low base of initial nonincome welfare, and the levels of poverty in South Africa, however one chooses to measure them, remain high.

APPENDIX

Quintile	PSLSD 1993	NIDS 2008	NIDS 2010/11	Annualized Percentage Growth, 1993-2010 (%)
1	133	210	227	3.2
2	387	506	544	2.0
3	846	976	1,095	1.5
4	2,030	2,232	2,577	1.4
5	7,591	9,722	19,465	5.7
All households	2,197	2,727	4,768	4.7

Table A1. Mean Real Per Capita Monthly Income in Rand (2010 prices), by Quintile

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.

Number									
	Vehicle	Radio	TV Set	Telephone	Refrigerator	Stove			
PSLSD 1993									
1	82,451	1,079,427	245,425	32,722	158,146	1,252,958			
2	111,226	1,173,791	466,787	91,397	332,545	1,297,757			
3	227,996	1,227,822	760,728	273,246	624,941	1,366,907			
4	536,442	1,248,595	924,729	561,962	850,190	1,338,500			
5	1,209,628	1,451,507	1,316,435	1,172,135	1,298,595	1,424,945			
All households	2,167,743	6,181,142	3,714,104	2,131,462	3,264,417	6,681,067			
			NIDS 2008						
1	116,231	1,614,736	1,247,898	2,071,704	852,157	1,737,017			
2	183,557	1,987,401	1,578,821	2,146,686	1,312,978	2,017,877			
3	326,352	2,001,202	1,624,218	2,132,508	1,311,428	2,064,014			
4	694,421	2,116,573	1,899,475	2,330,277	1,683,336	2,199,245			
5	1,799,422	2,370,496	2,264,012	2,498,335	2,215,495	2,318,259			
All households	3,119,983	10,090,408	8,614,424	11,179,510	7,375,394	10,336,412			
		1	NIDS 2010/11						
1	91,375	1,635,836	1,531,685	2,129,158	1,232,996	1,919,473			
2	182,879	1,659,127	1,687,296	2,197,790	1,402,851	2,057,791			
3	271,104	1,770,672	1,828,164	2,195,985	1,595,432	2,165,985			
4	793,097	1,925,338	1,967,495	2,421,840	1,776,478	2,168,015			
5	1,674,780	2,153,208	2,263,679	2,579,898	2,180,582	2,255,132			
All households	3,013,235	9,144,181	9,278,319	11,524,671	8,188,339	10,566,396			
	Differ	ence betweer	n PSLSD 1993	and NIDS 201	0/11				
1	8,924	556,409	1,286,260	2,096,436	1,074,850	666,515			
2	71,653	485,336	1,220,509	2,106,393	1,070,306	760,034			
3	43,108	542,850	1,067,436	1,922,739	970,491	799,078			
4	256,655	676,743	1,042,766	1,859,878	926,288	829,515			
5	465,152	701,701	947,244	1,407,763	881,987	830,187			
All households	845,492	2,963,039	5,564,215	9,393,209	4,923,922	3,885,329			

Table A2. Number of Households Owning Each Private Asset, 1993–20/11

Source: Authors' calculations using PSLSD 1993 and NIDS 2010/11 data.

Number							
			PSLSD 1993				
Characteristic	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	All households	
Dwelling type							
Formal	761,763	904,205	1,124,837	1,365,735	1,516,574	5,673,114	
Traditional	399,007	276,110	120,207	22,500	3,679	821,503	
Informal	404,502	384,540	320,506	175,469	44,031	1,329,048	
All households	1,565,272	1,564,855	1,565,550	1,563,704	1,564,284	7,823,665	
Roof material of d	welling						
Bricks	17,756	15,496	15,738	43,686	46,865	139,541	
Tile	8,329	30,759	144,591	358,402	796,683	1,338,764	
Asbestos	106,503	202,992	357,347	477,850	194,092	1,338,784	
Corrugated	1,142,267	1,146,971	931,843	630,283	490,977	4,342,341	
Thatch	263,620	134,001	77,469	16,289	16,731	508,110	
Inferior quality	26,797	34,636	38,562	37,194	18,936	156,125	
All households	1,565,272	1,564,855	1,565,550	1,563,704	1,564,284	7,823,665	
Wall material of d	welling	`					
High quality	599,533	770,025	992,252	1,298,998	1,484,439	5,145,247	
Medium quality	780,789	559,167	317,449	95,957	28,060	1,781,422	
Low quality	184,950	235,663	255,849	168,749	51,785	896,996	
All households	1,565,272	1,564,855	1,565,550	1,563,704	1,564,284	7,823,665]
Water source							
Piped water	339,378	554,959	955,693	1,303,843	1,509,242	4,663,115	
Public tap	454,155	428,250	328,179	127,874	25,428	1,363,886	
Borehole	301,169	249,113	122,488	49,354	5,352	727,476	
Surface water	470,570	332,533	159,190	82,633	24,262	1,069,188]
All households	1,565,272	1,564,855	1,565,550	1,563,704	1,564,284	7,823,665	

Table A3. Number of Households in Each Household Asset Category by Quintile, 1993-2010/11

Source: Authors' calculations using PSLSD 1993 and NIDS 2010/2011 data.

Number							
		NIDS 20	010/2011				
Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	All households		
1,667,460	1,795,830	2,019,931	2,255,135	2,524,908	10,263,264		
561,954	393,969	194,778	92,359	38,713	1,281,773		
424,376	467,146	437,535	309,779	79,032	1,717,868		
2,653,790	2,656,945	2,652,244	2,657,273	2,642,653	13,262,905		
158,170	194,929	340,350	372,104	474,554	1,540,107		
101,064	142,460	338,239	676,858	1,140,082	2,398,703		
145,821	249,887	251,007	248,905	218,866	1,114,486		
2,019,108	1,866,933	1,607,868	1,331,159	789,653	7,614,721		
96,989	70,675	30,577	4,772	5,308	208,321		
132,638	132,061	84,203	23,475	14,190	386,567		
2,653,790	2,656,945	2,652,244	2,657,273	2,642,653	13,262,905		
1,652,859	1,775,287	1,940,135	2,243,362	2,486,294	10,097,937		
547,935	400,779	228,408	58,687	35,739	1,271,548		
452,996	480,879	483,701	355,224	120,620	1,893,420		
2,653,790	2,656,945	2,652,244	2,657,273	2,642,653	13,262,905		
1,591,449	1,798,378	2,166,377	2,363,551	2,533,787	10,453,542		
731,964	624,983	370,628	222,108	85,212	2,034,895		
36,365	40,785	17,873	23,287	8,065	126,375		
294,012	192,799	97,366	48,327	15,589	648,093		
 2,653,790	2,656,945	2,652,244	2,657,273	2,642,653	13,262,905		

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Table A3. Cor	ntinued
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Number							
			PSLSD 1993				
	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	All households	
Sanitation facility							
Flush/chemical	211,406	370,529	767,910	1,285,047	1,514,688	4,149,580	
Pit with vent.	20,834	23,842	29,587	12,041	4,590	90,894	
Pit without vent.	768,778	768,210	515,662	172,442	29,576	2,254,668	
Bucket latrine	100,606	124,779	122,564	63,385	10,725	422,059	
None	463,648	277,495	129,827	30,789	4,705	906,464	
All households	1,565,272	1,564,855	1,565,550	1,563,704	1,564,284	7,823,665	
Fuel source for co	ooking						
Electricity	115,284	264,765	628,910	1,126,512	1,445,221	3,580,692	
Gas	18,486	49,462	70,647	51,452	25,268	215,315	
Paraffin/coal	469,310	598,250	564,681	312,857	89,212	2,034,310	
Wood/dung	962,192	652,378	301,312	72,883	4,583	1,993,348	
All households	1,565,272	1,564,855	1,565,550	1,563,704	1,564,284	7,823,665	
Fuel source for lig	Ihting						
Electricity	234,692	434,637	737,597	1,234,064	1,478,343	4,119,333	
Paraffin	497,477	409,125	344,468	128,466	25,580	1,405,116	
Candles	832,227	714,717	477,730	197,343	59,465	2,281,482	
Other	876	6,376	5,755	3,831	896	17,734	
All households	1,565,272	1,564,855	1,565,550	1,563,704	1,564,284	7,823,665	

Source: Authors' calculations using PSLSD 1993 and NIDS 2010/2011 data.

Number							
NIDS 2010/2011							
Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5	All households		
1,203,403	1,447,680	1,801,407	2,164,621	2,473,411	9,090,522		
408,308	319,354	251,097	129,243	28,173	1,136,175		
646,803	624,766	446,008	252,809	120,634	2,091,020		
209,803	158,958	89,479	66,149	16,715	541,104		
185,473	106,187	64,253	44,451	3,720	404,084		
2,653,790	2,656,945	2,652,244	2,657,273	2,642,653	13,262,905		
1,679,836	1,853,086	2,160,455	2,396,758	2,526,526	10,616,661		
47,269	31,669	34,882	44,835	56,183	214,838		
318,855	401,131	299,524	156,537	47,522	1,223,569		
607,830	371,059	157,383	59,143	12,422	1,207,837		
2,653,790	2,656,945	2,652,244	2,657,273	2,642,653	13,262,905		
2,051,489	2,116,076	2,295,175	2,484,997	2,592,112	11,539,849		
131,237	120,933	113,356	48,876	14,989	429,391		
 461,753	417,980	241,756	112,831	34,651	1,268,971		
 9,311	1,956	1,957	10,569	901	24,694		
 2,653,790	2,656,945	2,652,244	2,657,273	2,642,653	13,262,905		

Quintile	None	Primary	Incomplete secondary	Metric	Metric + Cert./Dip.	Degree		
		PS	LSD 1993 (%)			'		
1	41.32	40.22	16.72	1.32	0.35	0.07		
2	35.65	40.00	21.36	2.41	0.51	0.07		
3	21.37	34.30	35.72	6.53	1.70	0.39		
4	9.90	27.59	41.62	13.11	6.69	1.09		
5	4.50	9.21	24.07	26.56	21.99	13.67		
All households	22.55	30.26	27.89	9.98	6.25	3.06		
		NI	DS 2008 (%)					
1	22.45	35.96	32.81	8.19	0.59	0.00		
2	21.33	33.17	30.81	12.59	1.54	0.56		
3	15.98	27.63	38.02	16.45	1.44	0.48		
4	5.23	15.47	38.23	30.09	7.34	3.64		
5	0.68	5.06	19.63	36.44	21.88	16.31		
All households	13.14	23.46	31.91	20.75	6.55	4.19		
		NIE	os 2010/11 (%))				
1	22.75	32.58	33.59	9.45	1.57	0.05		
2	18.80	32.18	37.23	9.24	2.39	0.16		
3	14.01	21.57	43.11	16.18	4.79	0.35		
4	3.32	15.22	37.60	28.60	12.03	3.23		
5	0.97	4.73	22.31	30.60	21.97	19.42		
All households	11.98	21.27	34.78	18.81	8.54	4.63		
Dif	Difference between PSLSD 1993 and NIDS 2010/11 (percentage points)							
1	-18.57	-7.64	16.87	8.13	1.22	-0.02		
2	-16.85	-7.82	15.87	6.83	1.88	0.09		
3	-7.36	-12.73	7.39	9.65	3.09	-0.04		
4	-6.58	-12.37	-4.02	15.49	5.34	2.14		
5	-3.53	-4.48	-1.76	4.04	-0.02	5.75		
All households	-10.57	-8.99	6.89	8.83	2.29	1.57		

Table A4. Proportional Changes in Highest Educational Attainment of Household Heads by Quintile, 1993-2010/11

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.

	Number							
	None	Primarv	Incomplete secondarv	Metric	Metric + Cert./Dip.	Dearee		
		Í	PSLSD 1993					
1	646,837	629,527	261,688	20,660	5,539	1,021		
2	557,874	625,883	334,297	37,745	8,035	1,021		
3	334,500	536,932	559,137	102,163	26,637	6,181		
4	154,774	431,487	650,736	205,039	104,650	17,018		
5	70,423	144,000	376,516	415,428	344,012	213,905		
All households	1,764,408	2,367,829	2,182,374	781,035	488,873	239,146		
			NIDS 2008					
1	575,262	921,380	840,803	209,810	15,066	0		
2	545,379	848,266	787,821	321,980	39,457	14,203		
3	409,221	707,486	973,418	421,063	36,828	12,282		
4	133,953	396,529	979,864	771,121	188,172	93,331		
5	17,349	129,258	501,743	931,341	559,219	416,947		
All households	1,681,164	3,002,919	4,083,649	2,655,315	838,742	536,763		
		١	NDS 2010/11					
1	603,848	864,681	891,522	250,810	41,647	1,282		
2	499,634	855,045	989,074	245,480	63,517	4,195		
3	371,580	571,963	1,143,255	429,130	126,924	9,392		
4	88,290	404,461	999,087	760,092	319,641	85,702		
5	25,583	125,080	589,610	808,610	580,610	513,160		
All households	1,588,935	2,821,230	4,612,548	2,494,122	1,132,339	613,731		
	Differe	ence between	PSLSD 1993	and NIDS 201	0/11			
1	-42,989	235,154	629,834	230,150	36,108	261		
2	-58,240	229,162	654,777	207,735	55,482	3,174		
3	37,080	35,031	584,118	326,967	100,287	3,211		
4	-66,484	-27,026	348,351	555,053	214,991	68,684		
5	-44,840	-18,920	213,094	393,182	236,598	299,255		
All households	-175,473	453,401	2,430,174	1,713,087	643,466	374,585		

Table A5. Number of Households in Each Educational Attainment Category, 1993-2010/11

Source: Authors' calculations using PSLSD 1993 and NIDS 2010/11 data.

Variable	Scoring Factor	Mean	Standard Deviation
Vehicle	0.1647	0.2063	0.4046
Radio	0.0899	0.7454	0.4357
Television set	0.2130	0.5740	0.4945
Telephone	0.1619	0.6042	0.4890
Refrigerator	0.2246	0.5042	0.5000
Stove	0.0904	0.8107	0.3918
Dwelling: formal	0.2311	0.7292	0.4444
Dwelling: traditional	-0.1705	0.1406	0.3476
Dwelling: informal	-0.1373	0.1302	0.3365
Roof material: bricks	0.0491	0.0402	0.1964
Roof material: tile	0.1542	0.1340	0.3406
Roof material: asbestos	0.0576	0.1313	0.3378
Roof material: corrugated	-0.1331	0.6169	0.4861
Roof material: thatch	-0.1055	0.0507	0.2194
Roof material: inferior quality	-0.0354	0.0269	0.1617
Wall material: high quality	0.2367	0.6884	0.4632
Wall material: medium quality	-0.1986	0.1916	0.3936
Wall material: low quality	-0.1097	0.1200	0.3250
Water source: piped water	0.2568	0.6271	0.4836
Water source: public tap	-0.1610	0.2021	0.4016
Water source: borehole	-0.0817	0.0519	0.2218
Water source: surface water	-0.1503	0.1165	0.3208
Sanitation: flush or chemical toilet	0.2546	0.5363	0.4987
Sanitation: pit latrine with ventilation	-0.0458	0.0726	0.2596
Sanitation: pit latrine without ventilation	-0.1588	0.2563	0.4366
Sanitation: bucket latrine	-0.0661	0.0467	0.2110
Sanitation: none	-0.1416	0.0877	0.2828
Energy source for cooking: electricity	0.2778	0.5962	0.4907
Energy source for cooking: gas	-0.0091	0.0248	0.1557
Energy source for cooking: paraffin/coal	-0.1637	0.1691	0.3748
Energy source for cooking: wood/dung	-0.1998	0.2099	0.4072
Energy source for lighting: electricity	0.2743	0.6861	0.4641
Energy source for lighting: paraffin	-0.1362	0.0940	0.2919
Energy source for lighting: candles	-0.2203	0.2172	0.4124

Table A6. Scoring Coefficients and Summary Statistics for Variables included in the Nonincome Welfare Index

Table A6. Scoring Coefficients and Summary Statistics for Variables included in the Nonincome Welfare Index *continued*

Variable	Scoring Factor	Mean	Standard Deviation
Energy source for lighting: other inferior sources	-0.0118	0.0026	0.0512
Educational attainment of head: none	-0.1207	0.2235	0.4166
Educational attainment of head: primary	-0.0903	0.2938	0.4555
Educational attainment of head: incomplete secondary	0.0323	0.2821	0.4500
Educational attainment of head: metric	0.0866	0.1235	0.3290
Educational attainment of head: metric + cert./dip.	0.0757	0.0519	0.2219
Educational attainment of household head: degree	0.0704	0.0251	0.1565

Note: The first eigenvalue is 8.54 and 21% of the covariance is explained by the first principal component. Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/2011 data.

Table A7. Share of the Poor by Race, Gender of Household Head, Area Type of Residence and Income Quintile, 1993-2010/11

	Poverty Line at 20th Percentile		Poverty Line at 40th Percentile			
Characteristic	PSLSD 1993	NIDS 2008	NIDS 2010/11	PSLSD 1993	NIDS 2008	NIDS 2010/11
By gender of househo	ld head					
Male	63.8	46.3	44.2	66.1	48.6	50.0
Female	36.2	53.7	55.8	33.9	51.4	50.0
By race of household	head					
African	100.0	99.7	99.2	99.3	98.3	98.1
Coloured	0.0	0.3	0.8	0.6	1.7	1.9
Asian	0.0	0.0	0.0	0.0	0.0	0.0
White	0.0	0.0	0.0	0.1	0.0	0.0
By area type of reside	nce			` 		`
Urban	16.1	17.0	13.8	20.7	29.6	31.0
Rural	83.9	83.0	86.2	79.3	70.4	69.0
By income quintile						
1	47.0	51.5	49.3	39.9	42.2	39.4
2	32.2	25.0	35.5	31.9	27.2	32.7
3	16.1	15.8	13.4	19.8	20.4	18.5
4	4.0	7.2	1.8	7.1	8.9	7.9
5	0.8	0.6	0.1	1.2	1.3	1.4

Source: Authors' calculations using PSLSD 1993, NIDS 2008 and NIDS 2010/11 data.



Figure A1. Cumulative Distribution Functions by Gender of Household Head

Note: The two vertical lines represent the lower and upper poverty lines, set at the 20th and 40th percentiles, respectively. Source: Authors' calculations using PSLSD 1993 and NIDS 2010/11 data.





Note: The two vertical lines represent the lower and upper poverty lines, set at the 20th and 40th percentiles, respectively. Source: Authors' calculations using PSLSD 1993 and NIDS 2010/11 data.

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ENDNOTES

- This section draws on Filmer and Pritchett (2001), McKenzie (2005) and Vyas and Kumaranayake (2006).
- 2. This includes wood, plastic, cardboard, a mixture of mud and cement, wattle and daub, mud bricks, and stones and rocks.
- 3. Bricks and cement blocks are distinguished as high-quality wall materials.
- A mixture of mud and cement, wattle and daub, and mud bricks are distinguished as medium-quality materials.
- Corrugated iron or zinc, wood, plastic, cardboard, tile, thatching, asbestos, and stones and rocks are regarded are low-quality materials.
- We focus our discussion on the changes between 1993 and 2010/11, given that the changes between 2008 and 2010/11 are very small.
- 7. Table A5 shows the absolute numbers.
- Table A7 disaggregates poverty by race, gender of household head, area type of residence and income quintile.

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