

Assessing Wellbeing and Deprivation in Later Life in Brazil and South Africa*

Armando BARRIENTOS & Cassilda LASSO DE LA VEGA**

Abstract: The paper develops and applies a multidimensional counting approach to rank order wellbeing and deprivation distributions among a panel of older people in Brazil and South Africa. Using data collected in 2002 and 2008 among low-income households in urban and rural locations in Brazil and South Africa, the analysis in the paper throws light upon (i) changes in multidimensional deprivation associated with individual ageing and (ii) the effects of differential access to pension provision on wellbeing and deprivation. The paper finds that individual ageing is not necessarily associated with a decline in multidimensional wellbeing. The findings also lend support to the view that social policy, and especially inclusive pension provision, has an important role in addressing the effects of rapid population ageing in developing countries.

Keywords: Multidimensional deprivation, Pensions, South Africa, Brazil

* This is an open-access article distributed under the terms of the Creative Commons license Attribution-Noncommercial-NoDerivs 3.0 Unported. Distribution and reproduction are permitted, provided that the original authors and JPAID as the source are credited. Armando Barrientos gratefully acknowledges support from the cross-UK Funding Council Research Programme on 'New Dynamics of Ageing'.

** Armando Barrientos, Global Development Institute, University of Manchester, UK; Cassilda Lasso de la Vega, Department of Applied Economics IV, University of the Basque Country, Bilbao, Spain. Email: a.barrientos@manchester.ac.uk*

Rapid population ageing in developing countries is a strong indicator of economic and social development, but the speed of demographic change poses significant policy challenges. A doubling of the share of a country's population aged 65 and over, from seven percent to 14 percent, took 115 years in France, 69 years in the USA and 45 years in the UK; but it will take 19 years in Singapore, 21 years in Brazil, and 26 years in China (Kinsella and He 2009). Building a knowledge base capable of supporting effective policies addressing rapid population ageing in the South is urgent. The paper aims to contribute to this knowledge base by developing and applying a multidimensional approach to assess the distribution of wellbeing and deprivation in later life. Using comparable panel datasets for Brazil and South Africa, it is shown that this approach can provide substantive findings on the dynamics of wellbeing and deprivation, on stratification, and on the impact of social policy addressing ageing in the two countries.

Measuring wellbeing in a multidimensional framework draws on a long tradition of social research greatly enriched by Sen's capability approach (Sen 1985). From his perspective, wellbeing describes people's capacity to achieve the beings and doings they value. However, consensus over methodologies appropriate to assessing wellbeing using multidimensional indicators lags behind that for single-dimensioned indicators. A rapidly growing literature has emerged addressing the methodological challenges (Atkinson, Cantillon, Marlier et al. 2002; Atkinson 2003; Bourguignon & Chakravarty 2003; Chakravarty & D'Ambrosio 2006; Bossert, D'Ambrosio & Peragrino 2007; Chakravarty & Silber 2008; Alkire & Foster 2011; Bossert, Chakravarty & D'Ambrosio 2013). This literature has focused on identifying the properties of multidimensional indicators, their aggregation, and the evaluation of partial orderings. Atkinson (2003) contrasts the social welfare and counting approaches to multidimensional wellbeing measurement. The social welfare approach focuses on assessing multidimensional wellbeing by measuring the impact of changes in wellbeing on a social welfare function. The counting approach examines

each dimension of wellbeing before aggregating them based on some counting exercise. The social welfare approach is used extensively in theoretical work, while the counting approach dominates applied work. Recent developments have greatly strengthened the analytical basis of the counting approach (Lasso de la Vega 2010; Alkire & Foster 2011; Bossert, Chakravarty & D'Ambrosio 2013). The paper develops a multidimensional counting approach to the assessment of wellbeing, and applies this approach to the study of wellbeing and deprivations among older people.

The paper argues that a multidimensional counting approach is particularly relevant, and useful, in assessing the wellbeing of older people. Research on the relationship between ageing and wellbeing has often noted an apparent divergence in the evolution of subjective and objective wellbeing indicators in later life (Diener & Suh 1997). A majority of studies finds that self-reported life satisfaction is stable for older groups, just as their conditions of daily living appear to deteriorate (Kunzmann, Little & Smith 2000; Pinquart & Sorensen 2000). In cross-section studies, this paradox can be attributed to the confounding effect of cohort differences (Schilling 2006). Less is known about the relationship between ageing and wellbeing in developing countries (Deaton 2007).

Using comparative panel data collected from older people in Brazil and South Africa covering objective and subjective indicators, the analysis in this paper throws light on the relationship existing between individual ageing, wellbeing, and deprivation. The multidimensional counting approach can also be deployed to assess the effectiveness of social policy addressing ageing. Pensions are the main policy instrument addressing the impact of individual ageing on wellbeing. In developing countries, and especially among low-income countries, non-contributory pension schemes are in practice social transfers to households in poverty channeled through older persons (Barrientos 2008). Diversity in intrahousehold allocation of resources could potentially introduce a wedge between pension receipt and older people's wellbeing, with the

implication that pension benefits might be less effective in improving wellbeing in old age than the financial transfer would suggest (Heslop & Gorman 2000). A multidimensional approach proves effective in identifying a range of deprivation and wellbeing across pension status groups, and it demonstrates that concerns over potential “crowding out” of the benefits of pension receipt for older people are unwarranted.

South Africa and Brazil provide a fertile context in which to consider these issues. They are middle-income countries with high and persistent inequality and high poverty incidence. Landmark political change resulting from the fall of apartheid in South Africa and the restoration of democratic institutions in Brazil led to a renewal of their social contract, a commitment to inclusion and an extension of social policies directed at disadvantaged groups (Barrientos et al. 2013). In both countries, budget financed pension schemes reaching a significant proportion of poorer households are at the core of inclusive social policies (Lloyd-Sherlock et al. 2012; Moller & Radloff 2013; Schatz 2007). The analysis finds that, on average, measured deprivation falls for a sample of older people between 2002 and 2008. However, racial stratification in South Africa leads to significant differentials in observed improvements in wellbeing over time for older people.

The rest of the paper divides into four sections. Section 1 introduces the multidimensional counting approach. Section 2 describes the data and the wellbeing and deprivation indicators. Section 3 applies this approach to the assessment of wellbeing and deprivation among a panel of older people in South Africa and Brazil, and assesses stratification and the effectiveness of pension provision. A final section summarizes the main findings.

The Multidimensional Counting Approach

This section develops a multidimensional counting approach to wellbeing measurement to be applied to the study of wellbeing changes in a sample of older people in Brazil and South Africa. As noted in the

introduction above, recent work has improved our understanding of the analytical basis of a multidimensional counting approach in the context of the study of wellbeing (Atkinson 2003; Lasso de la Vega 2010; Alkire and Foster 2011; Bossert, Chakravarty and D'Ambrosio 2013). For the specific purposes of this paper, a multidimensional counting approach has two additional advantages. First, a non-parametric approach to estimating changes in wellbeing mitigates the limitations of our data. Second, the discussion below demonstrates that a multidimensional counting approach can be usefully deployed to assess the effectiveness of policy. A multidimensional counting approach provides an appropriate, rigorous, and useful methodology to assess change in wellbeing and deprivation among older people.

Counting deprivations at the level of the individual or household

A multidimensional approach to wellbeing implies that for a population n , the wellbeing of person i can be described by a J -row vector x_i of non-negative attributes $j, j \in J$, with x_i being the i th row of an $n \times J$ matrix X . The (i, j) cell in this matrix describes the quantity of an attribute j observed for person i . The j th column of this matrix describes the distribution of attribute j in the population. The approach adopted in the paper aggregates attributes at the individual level, and then combines these across the population. According to Pattanaik et al. (2007) this strategy is alone able to produce indices satisfying desirable properties, for example sensitivity to possible correlation between dimensions. For a critical perspective on synthetic multidimensional indexes of wellbeing see Ravallion (2011).

The analysis in the paper focuses on deprivations understood as deficits in basic functionings. Deprivation d_{ij} is a function of individual i 's observed level of a particular attribute j , or $d_{ij} = f(x_{ij})$. An individual i is considered to be deprived with respect to an attribute j providing that the quantity of an observed attribute is at or below a minimum level z_j established for that attribute. In the simple case where $f(\cdot)$ is a binary

function, $d_{ij}=1$ if $x_{ij} \leq z_j$, and 0 if $x_{ij} > z_j$. Brandolini and d'Alessio(2009) discuss in some detail alternative specifications for this function and for the determination of the deprivation threshold z_j . The identification of valuable attributes and their minimum level is critical to the empirical analysis and will be taken up below.

A key issue is the aggregation of the different deprivations. Two alternative strategies are followed in the literature, the social welfare approach and the counting approach. The social welfare approach links the aggregation of indicators to the properties of a social welfare function (Bourguignon & Chakravarty 2003; Duclos, Sahn & Younger 2007). The implementation of this approach to aggregation requires cardinal variables. The applied work mainly follows the counting approach, focusing on the number of dimensions in which a person shows deprivation. The counting approach is appropriate when deprivation is measured by cardinal and/or ordinal variables (Townsend 1979; Atkinson 2003). This paper follows the latter approach.

In this paper, we are concerned *inter alia* that individuals may have insufficient levels of consumption *and* that they feel insecure *and* have little control over their finances. The aggregation strategy adopted in the paper will be to count the binary indicators of deprivation at the level of the individual, summarized in an individual's deprivation score $D_i = \sum_{j \in J} d_{ij}$. This strategy assumes that the indicators have equal weighting, and by implication, can be substituted for one another. Equal weighting has obvious drawbacks, including the possibility that highly correlated variables could lead to bias in the counting. Across individuals, deprivation scores could be interpreted on an ordinal scale. An individual showing a higher number of deprivations than another can be considered to be more acutely deprived. This is sufficient to generate a ranking of individuals according to their deprivation $D_1 < D_2 < \dots < D_J$, from least to most deprived.

Aggregating individual counts at a group/population level

A further step of aggregating individual deprivations will need to be considered and implemented to enable comparisons across groups or populations. It will be helpful to use the term “poverty” to indicate deprivations above a particular threshold. In the union approach, an individual is in poverty if she is deprived in at least one dimension ($D_i > 1$), whereas in the intersection approach an individual is in poverty if she is deprived in all dimensions ($D_i = J$). An alternative is to adopt a threshold of deprivations m such that a person can be considered to be in poverty if she is experiencing deprivations equal to or greater than this threshold ($D_i \geq m$).

We are now in a position to generate summary measures of deprivation for a group or population. The analysis will focus on two multidimensional counting poverty measures developed in Alkire and Foster (2011).

The “multidimensional headcount deprivation rate” $P_m(\mathbf{D})$ describes poverty in a population by identifying the share of the population with deprivation scores equal or greater than m . This counting measure captures the incidence of poverty in multidimensional space. Denoting Q_m as the set of people in poverty and q_m as the cardinality of Q_m , it can be written as:

$$P_m(\mathbf{D}) = q_m / n \quad (1)$$

The second measure, $M_m(\mathbf{D})$ captures instead the “multidimensional deprivation shortfall ratio,” defined as the ratio of the average number of deprivations among those in poverty to the maximum possible deprivations the entire population could experience. This measure suggests a multidimensional version of the poverty gap ratio in single-dimensioned poverty measures. It provides an indication of the depth of deprivation experienced by those below the threshold m .

It can be written as:

$$Mm(\mathbf{D}) = \left(\sum_{i \in n} D_m / q_m J \right) (q_m / n) = \sum_{i \in n} D_m / nJ \quad (2)$$

The first argument on the right hand side measures the ratio of average deprivations among the poor to the maximal number of deprivations they can experience. This is weighted by the share of the population in poverty, $P_m(\mathbf{D})$.

It is possible to conceive of several other multidimensional poverty measures, perhaps generating different multidimensional poverty scores. Looking into the axiomatic properties of the poverty measures helps to assess the impact on measured poverty of selecting one or other poverty measures. Lasso de la Vega (2010) develops dominance criteria based on these two counting poverty measures in order to obtain unanimous rankings in a wide set of counting measures, and for a set of identification cut-offs. Both these measures satisfy the Poverty Focus, Symmetry and Replication Invariance axioms. Poverty focus requires that the index remains unchanged if the poverty score of a non-poor person decreases. Symmetry requires that no characteristics other than the number of weighted deprivations in which a person is deprived matters for the counting poverty measure. Replication Invariance allows comparisons of populations of different sizes. Although the $P_m(\mathbf{D})$ measure violates Monotonicity, requiring that the index decreases if the deprivation scores of any poor person decreases, the corresponding ordering is equivalent to agreement over all counting measures satisfying Monotonicity regardless of the identification cut-off. The $M_m(\mathbf{D})$ measure also satisfies Monotonicity, but violates Distribution Sensitivity. Distribution Sensitivity requires that a decrease in the poverty score of a poorer person should count for more than the same decrease experienced by a less poor person. However the ordering obtained from $M_m(\mathbf{D})$ guarantees that all poverty counting measures satisfying Distribution Sensitivity will rank order distributions in the

same way. This is significant because alternative poverty measures sharing the same axiomatic characterization will rank order wellbeing and deprivation outcomes in the same way.

Multidimensional comparisons: a graphical approach

As the poverty threshold m is set by the researcher, it is possible that different settings of the threshold could reverse the rankings of vectors of deprivation counts. Focusing on partial ordering of the vectors of deprivation counts with respect to the counting poverty measures in the equations above (1) (2) enables robust comparisons for all feasible thresholds m . The partial ordering of the vectors of deprivations fixes the set of dimensional weights and deprivation cut-offs, with the implication that the orderings are themselves sensitive to the choice of weights and deprivation thresholds. This can be facilitated with a graphical representation (Lasso de la Vega 2010). Defining the partial orderings of deprivation counts with respect to P_m as $\mathbf{T}$, the rule is

$$\mathbf{D}'\mathbf{T}\mathbf{D} \text{ iff } P_m(\mathbf{D}') \geq P_m(\mathbf{D}) \text{ for all } m \in (0, J]. \quad (3)$$

For any vector of deprivation counts, it is possible to graph $P_m(\mathbf{D})$ as a function of m ranked in decreasing order; this will be referred to as an FD curve and defined as:

$$FD(\mathbf{D}; P_m) = P_{J-m}(\mathbf{D}) \text{ , } m \in (0, J]. \quad (4)$$

For vectors of deprivation counts $\mathbf{D}$ and $\mathbf{D}'$, say for the same population at different points in time, if a curve $F(\mathbf{D}')$ is everywhere to the left and above $F(\mathbf{D})$, then it can be concluded that $\mathbf{D}$ has lower deprivation than $\mathbf{D}'$ for any multidimensional deprivation measure satisfying Focus, Symmetry, Replication Invariance and Monotonicity.

If $F(\mathbf{D})$ and $F(\mathbf{D}')$ intersect, it is not possible to maintain the rank

order these two vectors of deprivation. In this situation, two options can be explored. First, a threshold $m^* \in (0, J]$ can be defined, corresponding to the threshold after the intersection, and dominance can be established for $m \in (m^*, J]$. This result is particularly useful, because not all admissible thresholds are equally meaningful in the context of assessing deprivation. Second, a more restricted set of measures of deprivation fulfilling Distribution Sensitivity could be applied to the deprivation vectors. In the analysis below an SD curve is defined as

$$SD(\mathbf{D}; q) = (1/nJ) \left(\sum_{1 \leq i \leq n} D_i \right) \quad (5)$$

Recall that the deprivation vectors for the individual observations have been ranked from most to least deprived. Starting from $SD(0,0)$, successive individual observations are added and the ratio of their cumulative deprivations to the maximal number of deprivations is plotted. Note that when observations with zero deprivations are added, the ratio does not change and the curve becomes horizontal. The average number of deprivations among the poor can be shown by the slope of a ray from $(0,0)$ to a point in the SD curve. Note that alternatively this curve can be constructed plotting the adjusted headcount ratio against the headcount ratio for all possible cut-off values.

To establish dominance conditions for vectors of deprivation counts $\mathbf{D}$ and $\mathbf{D}'$, if a curve $S(\mathbf{D}')$ is everywhere to the left and above $S(\mathbf{D})$, then it can be concluded that $\mathbf{D}$ has lower deprivation than $\mathbf{D}'$ for any multidimensional deprivation measure fulfilling Focus, Symmetry, Replication Invariance, Monotonicity, and Distribution Sensitivity.

To summarize, the methodological strategy to be followed in the analysis below will start by identifying deprivation counts for individuals and their households, along several dimensions of wellbeing, each producing a binary index. The individual deprivation scores will then be aggregated across individuals. The individual and

their households will be identified as poor according to their deprivation count and a threshold m . Two aggregate multidimensional measures will be used: the share of the population considered to be in poverty, and the ratio of the deprivations of the poor to the maximal number of deprivations the entire population could experience. The FD curves will help assess the scope and robustness of comparisons across groups or over time. If these intersect, the SD curves will be employed.

Data and Wellbeing Indicators

The analysis below will employ a comparable panel dataset of older people and their households collected as part of a survey on a sample of older people and their households in selected locations in South Africa and Brazil in 2002. Participant households were re-visited in 2008. The survey instrument contains two parts: a household survey and a supplementary survey collected from every household member aged 55 and over. The study samples rural and urban low-income communities in metropolitan Rio and Ilheus in Brazil and Cape Town and the Eastern Cape in South Africa. The study samples are not nationally representative and are focused on low-income households. In South Africa, for example, the samples exclude Whites and Indians. The sampling is proportionate to size for the locations selected. The findings from the analysis of these data reported below cannot be extrapolated to the whole population in these countries. On the other hand, the panel data collected with a common instrument in the two countries provide a unique comparative and longitudinal perspective on the wellbeing of the sampled households.

Longitudinal household surveys are affected by attrition, as households fragment or migrate or disappear over time. This applies to our dataset. The focus on older households in low-income locations in 2002 contributed to attrition. Communities containing informal settlements added to the challenge of tracing the 2002 participant households in 2008. In rural areas, economic transformation encouraged

migration and therefore led to relatively higher attrition rates among rural respondents. In the rural location in Ilheus, for example, a pest affected the local crop, cocoa, leading to extensive out-migration. However, detailed tests implemented on the data concluded that poverty estimates, among others, are not biased by attrition (Barrientos & Mase 2012). The analysis below will focus on the panel sample. The number of households captured in the study by panel status is listed in Table 1 below.

Table 1.
Household Sample and Attrition

	Brazil	South Africa
2002 households sample, of which:	1006	1107
Matched (2002 and 2008) households	615	719
Attrited (2002 only) households	391	388
Replacements (2008 only) households	391	254

The selection of indicators of wellbeing is a strongly contested territory within an emerging, largely theoretical, literature (Doyel & Gough 1991; Sen 1993). The approach adopted was to identify variables providing information on dimensions of wellbeing especially relevant to older people. The indicators selected reflect the theoretical and empirical literature on multidimensional measures of wellbeing and deprivation (Bossert et al. 2007). A description of the wellbeing indicators, their construction, and threshold values, is in Table 2 below.

A self-reported indicator of *health* status is included, and deprivation is associated with very poor and poor health.¹ *Life satisfaction* reflects a self-reported assessment of household wellbeing, deprivation is given by the dissatisfied and very dissatisfied categories. *Safety* indicates perceptions of changes in personal security from crime and violence in the last two years. This is a particularly important issue for urban older groups. Deprivation can be associated with worsening personal security.

¹ On the advantages and validity of using self-reported health status measures, see Easterlin (2003).

Table 2.
Wellbeing Indicators

Label	Description	Values Deprivation	
Health	Self-reported health status	1 very poor 2 poor 3 average 4 good 5 very good	1,2
Life satisfaction	Self-reported assessment “Taking everything into account, how satisfied is this household with the way it lives these days?”	1 very dissatisfied 2 dissatisfied 3 neither satisfied not dissatisfied 4 satisfied 5 very satisfied	1,2
Safety	Change in perception of safety from two years before	1 worse 2 same 3 better	1
Social participation	Number of social organizations the respondent belongs to	0-8 (Brazil) and 0-10 (South Africa). Brazil: senior center, church group, community organization, sports club, school organization, political party, trade union. South Africa as Brazil plus: women’s club, stokvel, burial society.	0
Financial control	Responses to the question: “How much of own money are you able to keep for yourself?”	1 none 2 very little 3 some 4 a reasonable amount 5 all	1
Debt service	Monthly debt repayments as proportion of total debt	1 if $x \geq 0.5$; 2 if $0.5 > x \geq 0.2$; 3 if $0.2 > x \geq 0.1$; 4 if $0.1 > x \geq 0.001$; 5 if $0.001 < x$	1,2
Durables	Number of durables in household	0-11 (phone, stove electric or gas, stove paraffin or wood, electricity, TV, radio or stereo, fridge or freezer, sewing machine, car, bicycle, motorcycle)	1-5
Water	Main source of drinking water	1 other (river, dam, rainwater) 2 borehole 3 public tap/water carrier 4 piped water on site, neighbor 5 piped water in dwelling	1
Expenditure	Quintiles of equivalized per capita household expenditure	1-5	1,2

The *social participation* indicator registers participation in local organizations. Here deprivation is assessed as not participating in any of the social organizations listed. The *financial control* indicator captures the extent to which older people are able to use their income, largely pension benefits, for themselves. Deprivation is associated with older people not being able to keep any of their own money for themselves. Financial indicators are relevant in the context of evaluating the impact of cash transfers. The *debt service* indicator is constructed to capture access to financial services as well as financial stress. It measures monthly debt repayments as a proportion of total debt. This indicator is included in response to the concerns with personal debt raised by older respondents in semi-structured interviews. A low value for this indicator is associated with low financial stress. After an examination of the distribution of this indicator, deprivation is associated with a ratio greater than 0.2.

Durables and water are resource indicators with direct and important implications for functionings. The *durables* indicator measures the number of durables in the household from a list of 11. Deprivation is associated with households reporting five durables or less. A household's source of *water* has important implications for wellbeing, and deprivation is associated with sourcing from a river or rainwater. Finally, the *expenditure* indicator represents quintiles of adult equivalent per capita household expenditure, and deprivation is associated with the lowest two quintiles. Reported per capita household expenditure captures command over commodities and services.

Wellbeing and Deprivation among a Sample of Older People in South Africa and Brazil

This section compares the distribution of multidimensional deprivation among the panel of older people in 2002 and 2008 in Brazil and South Africa. The analysis focuses first on changes in multidimensional deprivation over time; second on the effects of

stratification on the distribution of multidimensional welfare among older people in the South Africa panel; and third, on the influence of pension provision on the distribution of multidimensional deprivation in the South Africa and Brazil panels.

Ageing and multidimensional deprivation

The first issue of interest is the direction of changes in the distribution of multidimensional wellbeing and deprivation for the panel between 2002 and 2008. Comparing the distribution of multidimensional deprivation over time for respondents aged 55 and over in 2002 provides clues as to the association between individual ageing, wellbeing, and deprivation.

The FD curves plot the cumulative share of the sample against the observed number of deprivations. Each point in the curve links up on the vertical axis the share of the population experiencing at least # number of deprivations (where # stands for a given number of deprivations) in the horizontal axis. It tells us the proportion of the sample considered to be in poverty if the poverty threshold was set at # deprivations. The curves show multidimensional headcount poverty rates at all possible poverty thresholds. We are interested in whether the FD curve for the distribution of deprivations in 2008 can be said to show higher or lower poverty compared to 2002 in the two panels.

Figures 1 and 2 show the FD curves for the South Africa and Brazil samples. The figures also show confidence intervals constructed using a bootstrap procedure, as a test of robustness of the estimates. Estimated errors are represented in all the figures. We estimate 95% confidence intervals via a bootstrapping procedure. We draw samples with replacement from the observed dataset with the sizes of the drawn samples equal to the size of the original sample. The poverty headcount and the poverty gap are computed for each bootstrap sample. The process is repeated $J = 1,000$ times. The standard deviation of a poverty measure over the 1,000 bootstrap replications is an estimator of the standard error

of that poverty measure. The point estimates of the poverty measures are calculated from the original, non-bootstrapped sample (Efron 1979; Efron & Tinshirani 1993).

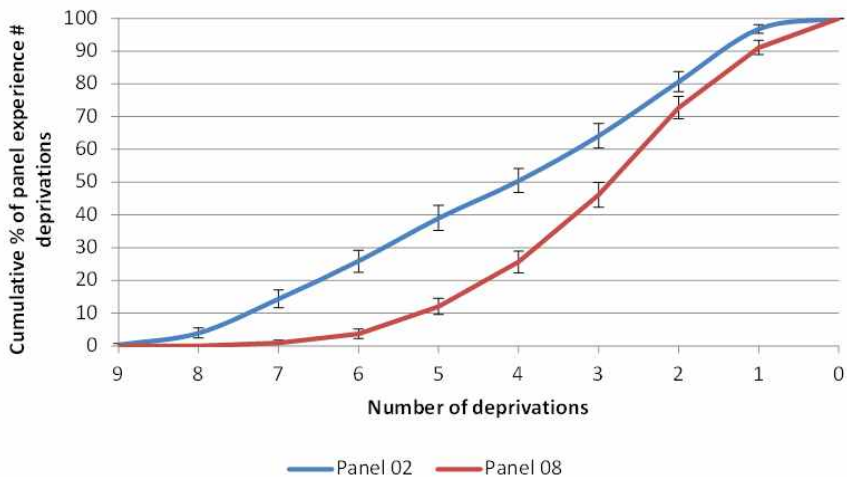


Figure 1. FD curves for the South Africa panel 2002-2008.

As Figure 1 shows, the cumulative share of the sample in poverty for the South Africa panel is lower in 2008 for all possible poverty thresholds. The figure confirms that the distribution of multidimensional deprivation in 2008 is below and to the right of the curve from the 2002 survey at all possible poverty thresholds. Deprivation levels (wellbeing levels) among older people in the South Africa panels decreased (increased) over time, and the estimates are statistically significant.

Figure 2 shows the same information for the Brazil sample of older people. Here, the 2008 curve is to the right and below the 2002 curve, indicating a reduction in deprivation over time. However, the confidence intervals built around the estimates for 2002 and 2008 show an overlap at 1 and at 6 deprivations. This suggests it is not possible to rank order the two vectors of deprivation. There are two options to take the analysis forward. One option is to restrict the ranking of the two vectors to the range 2 to 5 deprivations, where a ranking would be valid. A second

option is to attempt to rank the SD curves. This is done in Figure 3. It shows a statistically significant decline in in the distribution of deprivations for the sample between 2002 and 2008.

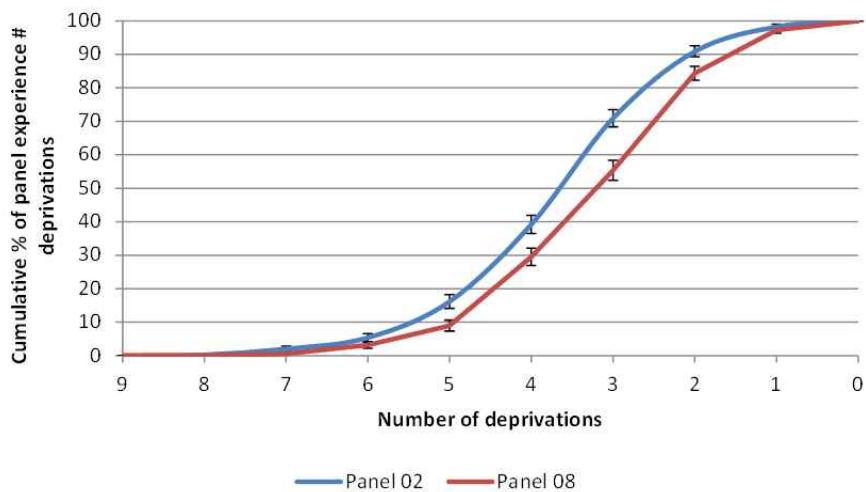


Figure 2. FD curves for the Brazil panel 2002-2008.

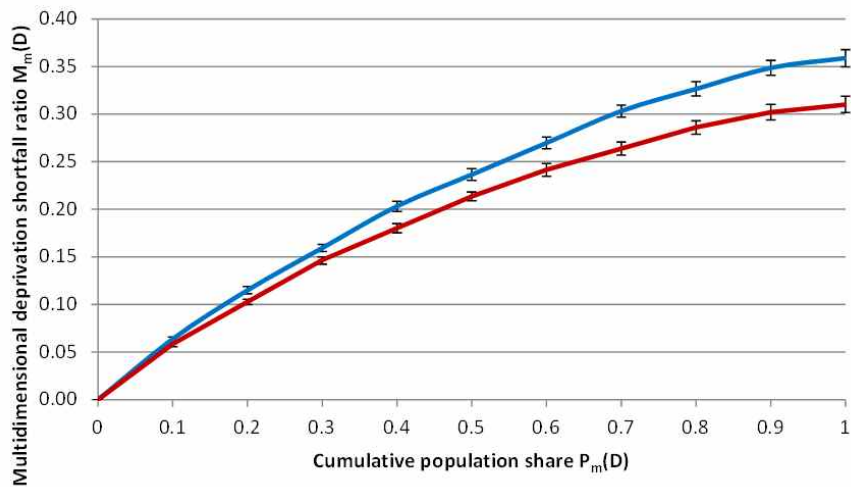


Figure 3. SD curves for the Brazil panel 2002-2008.

The analysis confirms a statistically significant reduction in the distribution of deprivations among the Brazil and South Africa samples. The methodological discussion in the previous section concluded that alternative multidimensional deprivation measures satisfying Focus, Symmetry, Replication Invariance, and Monotonicity would rank order the distribution of deprivations in the same way.

These findings are important because they illuminate the relationship between individual ageing and wellbeing in developing countries. As noted in the introduction, there are conflictive accounts of the effects of individual ageing on wellbeing in the literature. Using cross-section attitudinal data, Deaton (2007) finds that the relationship between wellbeing and ageing is mediated by a country's level of development. Whereas reported life satisfaction does not decline with age in developed countries, he finds it shows a decline for later ages in Sub-Saharan Africa and especially among Former Soviet Union (FSU) countries. On the other hand, self-reported health indicators all show a significant decline with age independently of level of development. Reliance on cross-section data is problematic for linking ageing and wellbeing, because of cohort effects. Deaton acknowledges that cohort effects associated with the transition in FSU countries are likely a major reason for the decline in life satisfaction among older groups in the countries affected. Longitudinal studies for developed countries generally find stable life satisfaction trends in old age. Schilling (2006) focuses on panel data for Germany and finds that, in general, reported life satisfaction is stable across adult life including at later age. His study finds a marginal decline at very late ages, but sample attrition makes it difficult to attach significance to this trend.

To our knowledge, analysis of longitudinal data in developing countries on this issue is sorely lacking. The analysis of multidimensional wellbeing and deprivation reported here for the Brazil and South Africa panels finds that, using a mix of objective and subjective wellbeing indicators of older people and their households, individual ageing does not necessarily result in reduced levels of

wellbeing/ increased deprivation. In fact, measured deprivation declines for the two samples between 2002 and 2008, taking into account the restrictions applying to the Brazil estimates.

It is important to consider potential confounding effects. First, improvements in the economy or in social policy could have had acted as a “tide that lifts all boats” and masked an otherwise negative relationship between individual ageing and wellbeing. The comparative nature of the analysis is helpful on this point. Rates of economic growth have been moderate in the two countries over the past two decades. This is particularly the case for South Africa. Brazil’s growth performance lifted during the 2002-2008 period. Yet the observed improvements in wellbeing apply to both countries, and if anything the observed improvements in the multidimensional distribution of wellbeing appear to have been stronger in South Africa. Second, over the last decade both countries have strengthened social assistance programs focused on households in poverty, but in the 2002 to 2008 period, the thrust of improvements in social assistance focused on households with children. Social assistance programs supporting older people have been reasonably steady in the relevant period. As regards changes in the generosity of non-contributory pension programs, the level of non-contributory pension benefits has risen faster in Brazil as the value of the pension benefit is tied to the minimum wage, which has risen by over 50 percent in real terms during the Lula administrations. By contrast, changes in the level of pension benefit have been moderate in South Africa: around a five percent increase in real terms in the period in question.² Although it is not possible to rule out all confounding effects, the finding that individual ageing does not necessarily lead to deterioration in multidimensional wellbeing is strengthened by cross-country comparison.

² In US\$ purchasing power parity terms (domestic currency), the Brazilian non-contributory pension benefits at US\$318 (BRL545) in 2010 is more generous than South Africa’s Old People Grant at US\$230 (ZAR=1800).

How can we explain an improvement in multidimensional wellbeing associated with individual ageing? And how can we explain a stronger trend in the South Africa sample? In a developed country context, the stability of life satisfaction in old age has been explained by the influence of adaptive responses to environmental factors affecting age. Adaptive explanations would suggest that better than expected life experiences in old age could have resulted in self-reported wellbeing indicators showing stability or even rising with time. As Schilling puts it, “common perceptions of old age as a period of decline could cause positive satisfaction for individuals growing old without encountering expectable losses” (Schilling 2006: 247). Deaton (2007) finds it surprising that life satisfaction for countries in Southern Africa does not appear to have been affected by the impact of HIV/Aids, particularly on life expectancy. In this context, our findings indicating reductions (increases) in deprivation (wellbeing) in late age could be explained by objective improvements in living conditions in part brought about by supportive social policies, especially basic pensions. The stronger outcomes for the South African sample fit in with the main findings of research on poverty in South Africa. This suggests that antipoverty policies there have had limited effectiveness in addressing income poverty and generating employment. In contrast antipoverty policies have shown greater effectiveness in improving basic service infrastructure, especially housing, electricity provision, water and sanitation (Leibbrandt et al. 2010). At the same time, the impact of HIV/Aids on life expectancy could have led to positive adaptive assessments of old age. Further research will be needed to determine the relative strengths of these explanations.

Stratification and multidimensional wellbeing

Analysis of the 2002 data found significant differences across three groups of older people and their households in South Africa: rural blacks, urban blacks, and urban coloreds. Ferreira (2006) concludes that

multidimensional deprivation levels were significantly higher among rural blacks than among urban blacks, and also higher among blacks than among urban coloreds. It is informative to update this analysis by considering changes in the distribution of multidimensional deprivation over time. Figure 4 shows FD curves for the three groups in 2002 and 2008. There is no change in stratification when focusing on multidimensional deprivation counts, as the FD curves for urban coloreds, urban blacks, and rural blacks are rank ordered for all possible poverty thresholds in both 2002 and 2008 taken separately.

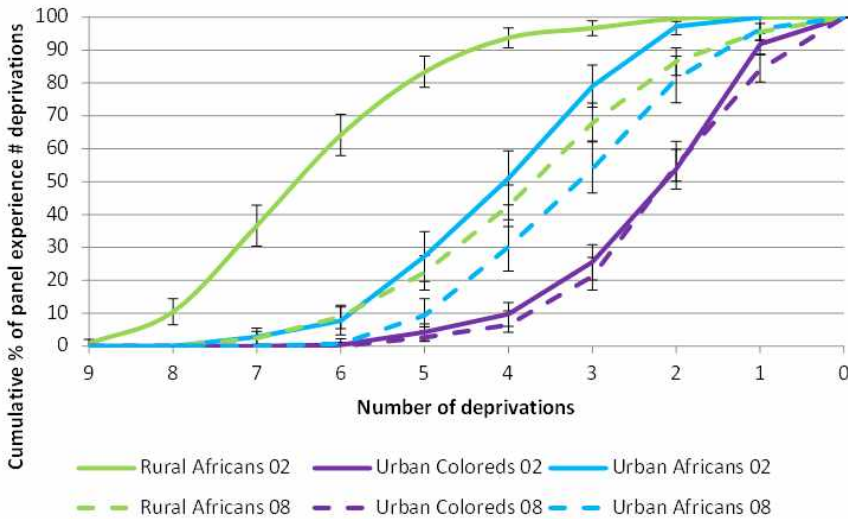


Figure 4. FD curves for the South Africa panel by race/location 2002-2008.

The figure also demonstrates that urban and rural black groups experienced statistically significant improvements (decline) in wellbeing (deprivation) levels over time. The curves constructed from the 2008 survey data are consistently to the right and below those constructed from the 2002 data for these two groups. The situation is more complex for urban coloreds, as their 2002 and 2008 FD curves intersect at lower levels of deprivation. In line with the discussion in the previous section,

it is not possible to unambiguously rank order the multidimensional headcount derivation rate for the urban coloreds group between 2002 and 2008. The analysis can support the claim that extreme deprivation has declined for urban coloreds over time only up to a poverty threshold of 3 deprivations, but not below. An option is to rank order deprivation counts by using SD curves. Figure 5 shows the SD curves for the South Africa panel by race/location groups. This shows an unambiguous decline in deprivation from 2002 to 2008 for all three groups, including urban coloreds. However, the fact remains that multidimensional deprivation counts have declined less markedly for urban coloreds in the panel. This is consistent with findings from other studies based on single-dimensioned wellbeing indicators (Leibbrandt et al. 2010). The multidimensional counting approach can be effective in studying stratification in later age.

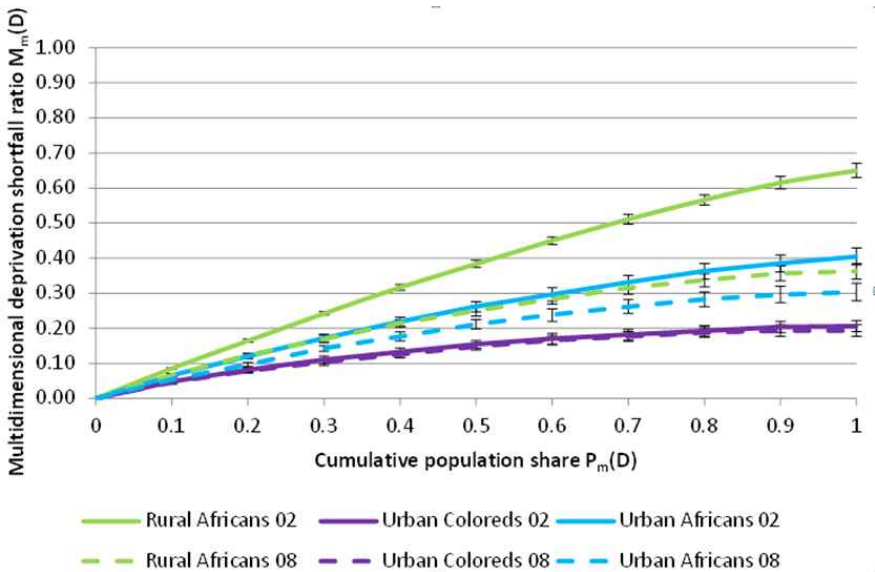


Figure 5. SD curves for the South Africa panel by race/location 2002-2008.

Multidimensional deprivation and pension status

Here, the focus is on exploring the distribution of multidimensional deprivation across sub-groups defined by pension status in Brazil and South Africa. There are important advantages arising from an evaluation of social policy in multidimensional space. They apply particularly to the assessment of non-contributory pensions. It is reasonably straightforward to evaluate the effects of pension receipt on household income (Case & Deaton 1998; Barrientos & Mase 2012). It is harder to establish the effects of pension receipt on older people's wellbeing. A high proportion of older people in developing countries live in extended households, and there is evidence of widespread pension sharing across the household. Altruistic grandmothers or grandfathers may use their pensions to improve the wellbeing of other household members before their own. There is also a concern that pension entitlements, while improving the wellbeing of co-residents, could impose a heavy burden on recipients in terms of increased responsibility and exposure to mistreatment and crime (Møller & Sotshongaye 1996; Sagner & Mtati 1999). Household composition responses to pension receipt are also an important issue (Edmonds, Mammen & Miller 2001; Bertrand, Mullainathan & Miller 2003). Where pension income flows lead to increases in household size, or in the proportion of dependents, cash transfers may not result in significant improvements in the wellbeing of older people (Ardington, Case & Hosegood 2009; Case & Deaton 1998). It has been suggested that pension entitlements may simply "crowd out" informal networks of support for the elderly, including private transfers, reducing the net impact of cash transfer programs on wellbeing (Jensen 2004). To the extent that these issues are empirically significant, evaluating the effects of non-contributory pensions on the wellbeing of older people using single indicators of wellbeing, particularly income, may well provide useful, but partial, information. A number of studies evaluating non-contributory pensions in Brazil and South Africa have identified positive secondary effects associated with pension

entitlements, some of which apply to non-monetary variables. These show that pension entitlement is associated with an improved distribution of income (Case & Deaton 1998; Delgado & Cardoso 2000; Committee of Inquiry into a Comprehensive System of Social Security for South Africa 2002); improved health status of recipients and their households (Case & Menendez 2007); improved health and nutritional status of children (Duflo 2003); improved housing (Schwarzer 2000); improved status and participation of elders within their households and communities (Ardington & Lund 1995; Møller & Sotshongaye 1996; Camarano 1999; Sagner & Mtati 1999); and improved access to credit (Delgado & Cardoso 2000).

The analysis below compares the distribution of multidimensional deprivation across pension status groups. Three distinct groups of people aged 55 and over are identified in the Brazil sample: those who are not receiving a pension (non-pensioners or *np*); those who are receiving a non-contributory pension (social assistance or SA); and those who are receiving a contributory pension (social insurance or SI). The non-pensioner category includes those aged 55 and over (in 2002) who reported not receiving a pension (in 2002 or in 2008). In 2002, entitlement to a contributory pension in Brazil was based on age and a contribution record. Some workers were able to retire early if they had a long contribution record. Most low-income workers only managed access to the minimum guaranteed pension equivalent to one minimum wage. In rural areas of Brazil, informal workers were able to draw a pension at 60 for men and 55 for women providing they could validate having worked informally. This was meant to take account of the specific nature of employment in rural areas. In urban areas, people living in households with a per capita household income below a quarter of the minimum wage were entitled to a social assistance pension. Social assistance pensions and pensions for rural informal workers are also equivalent to one minimum wage.

In the South Africa sample, two groups can be distinguished: those who are not receiving a pension (*np*); and those who are receiving

a non-contributory pension (*n-cp*).³ The respondents are classified into these groups according to their current pension status. In 2002, pensions were available for women aged 60 and over and men aged 65 and over. Entitlement to a non-contributory pension in South Africa is based on combined means and asset tests applied to the applicant and his/her spouse. Because of the presence of large income and wealth inequalities across racial groups in South Africa, the vast majority of black older people qualify for the social pension. The bulk of individuals not receiving a pension in 2002 were under the minimum age of entitlement. Given 2002 respondents are close to six years older in 2008, some non-pensioners in 2002 will have qualified for the receipt of the pension by 2008.

Figures 6 and 7 show the FD curves for pension status groups in South Africa and Brazil, respectively.

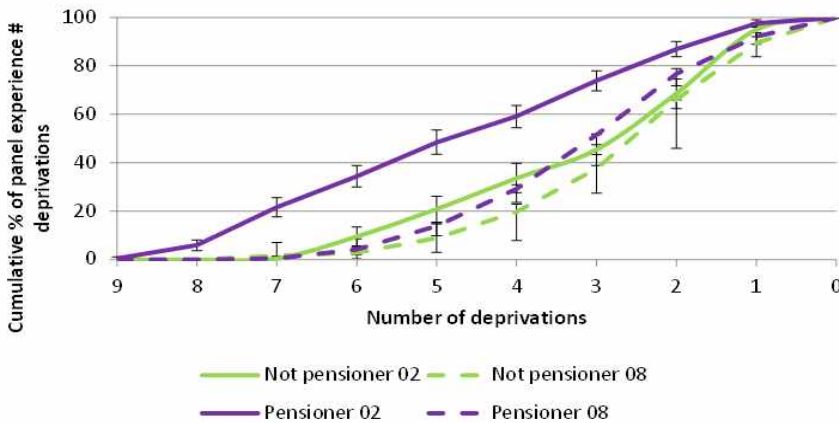


Figure 6. FD curves for the South Africa panel by pension status 2002-2008.

³ The survey asked whether respondents received occupational or private pensions, but very few reported receiving one in South Africa. Employer and private pension plans in South Africa are limited to public servants and formal employees. Many plans pay a lump sum benefit on retirement (van der Berg, Siebrits & Lekezwa 2010).

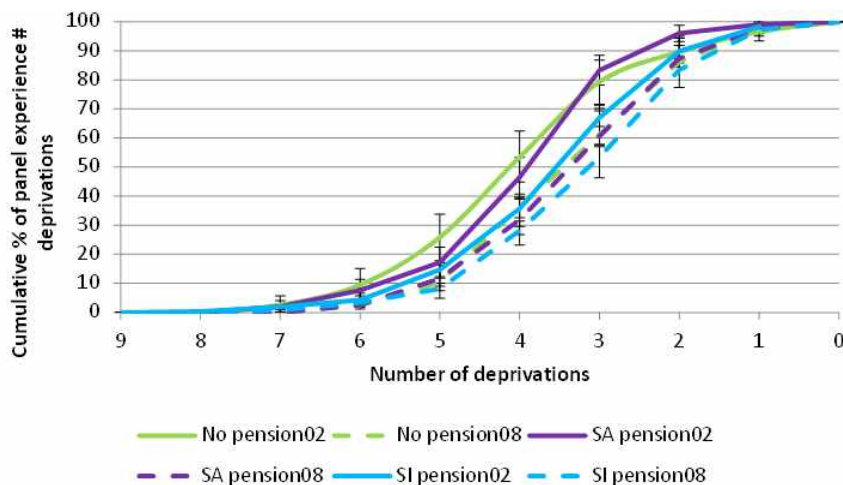


Figure 7. FD curves for the Brazil panel by pension status 2002-2008.

Turning to the FD curves for the South Africa panel of older people in Figure 6, these show that non-contributory pensioners have statistically significant lower deprivation than non-pensioners in 2002 and the rank order is maintained in 2008.

Focusing on the Brazil panel sample, and on the FD curves for 2002, deprivation counts among social insurance beneficiaries are lower than among social assistance pensioners and non-beneficiaries. This reflects the improved income security support provided by the contributory social insurance system. Social insurance pensions are accessed earlier than social assistance pensions and their level is related to pensioners' contribution history. The greater generosity of social insurance pensions is likely to be attenuated by the fact that over 60 percent of social insurance beneficiaries only qualify for the minimum pension equivalent to one minimum wage (Schwarzer & Querino 2002), which is the benefit level for social assistance pensions.

Social assistance pensions are only available to older people who fail to qualify for a social insurance pension and have per capita household income below one-quarter of the minimum wage. The curves for social assistance pensioners and non-pensioners intersect. As

discussed in the previous section, where FD curves intersect, it is not possible to rank order the relevant distribution of multidimensional deprivation. Two options are available. Firstly, it might be feasible to rank order distributions up to the threshold before the intersection. Social assistance pensioners have lower levels of extreme deprivation than non-pensioners, but this does not apply to moderate deprivation. The second option is to focus on the multidimensional deprivation shortfall ratio. SD curves for the 2002 and 2008 Brazil panel provide a clear rank order for 2002, but in 2008 they can only rank social insurance pension recipients below social assistance and non-pension recipients, but cannot rank the distribution of deprivations for the last latter groups.

Overall, the analysis shows that the multidimensional wellbeing (deprivation) of each of the pension status groups improves (declines) between 2002 and 2008, but the differences in multidimensional wellbeing across groups are more difficult to observe in 2008. The passage of time enabled some of the non-pensioners in 2002 to access pension provision by meeting the age requirement for pension support. At the same time, the expansion of *Bolsa Familia* channeled transfers to households in poverty without pension qualified members. The convergence in multidimensional wellbeing across poorer older people in a country with deep inequality as Brazil is noteworthy.

The main finding is that pension provision has an observable effect on the wellbeing of older people in Brazil and South Africa. In Brazil, the extension of the coverage and generosity of pension provision has narrowed down the differences in the distribution of wellbeing and deprivation among older people and their households. The analysis in this section has also shown the appropriateness and usefulness of the multidimensional counting approach to assessing the wellbeing of older people and their household, its distribution and changes across groups and over time. The approach can also throw light on stratification outcomes, and on the impact and effectiveness of policies addressing ageing.

Conclusions

The paper developed and applied a multidimensional counting approach to study the distribution of wellbeing and deprivation in later life. Using a panel dataset of older people in South Africa and Brazil this approach proved capable of generating substantive findings on the relationship existing between individual ageing and wellbeing and deprivation in the two countries, the influence of stratification, and the role of social policy addressing population ageing.

The analysis focused on two measures of multidimensional deprivation developed in the literature: (i) the share of population with deprivations below a particular poverty threshold, and (ii) the deprivation shortfall ratio. The first is a multidimensional equivalent of the poverty headcount ratio in single dimensional evaluations, while the second one is a multidimensional equivalent of the poverty gap ratio. The axiomatic bases for these two measures were noted. The paper developed a graphical approach to the ordering of the distributions across time and strata.

Comparing a vector of deprivations for a panel sample of older people in Brazil and South Africa, the paper finds a statistically significant decline in deprivation from 2002 to 2008, especially among the South Africa panel sample. For the Brazil samples, the vectors of deprivation could only be unambiguously ordered for 2 to 5 deprivations, but focusing on the multidimensional deprivation shortfall ratio, there is a statistically significant decline in the deprivation shortfall between 2002 and 2008. The paper then considered the influence of stratification on older people's wellbeing and deprivation outcomes. Focusing on South Africa, the analysis concluded that while all racial/location groups of older people show statistically significant reductions in deprivation, stratification persists over time. Finally, comparison of the distribution of deprivation counts across pension status groups confirms the findings from other studies concerning the important role of pension provision, and especially non-contributory pensions, in sustaining improvements in

wellbeing among older people in both panels. In the context of the Brazil panel, some convergence in multidimensional wellbeing can be observed among older people receiving social insurance and social assistance pensions, but also non-pensioners, in 2008.

These findings lend support to the view that individual ageing is not necessarily associated with a decline in wellbeing. This is a significant finding because the literature on this issue registered a paradox in the fact that older people's self-reported life satisfaction showing stability belied the effects of ageing on objective conditions in later life. Combining subjective and objective indicators of wellbeing and deprivation, the analysis in the paper suggests that population ageing has not resulted in greater deprivation among the samples of older people studied. This finding applies to the sample as a whole, but it is important to take account of whether stratification can modify this finding. The findings also lend support to the view that social policy has a very significant role in addressing rapid population ageing in developing countries. The extensive non-contributory pension programs in Brazil and South Africa are a key factor in ensuring ageing does not lead to increased deprivation.

The paper also demonstrated the appropriateness of the multidimensional counting approach in generating knowledge on wellbeing and deprivation in later life. The limitations of the approach and data employed need to be taken together with the findings. The multidimensional counting approach adopted involved identifying and measuring wellbeing indicators in use in the literature, but the selection of indicators and the deprivation thresholds remain contested. A core issue in the analysis of multidimensional deprivation is how to aggregate the different indicators. The counting approach has an advantage in laying bare the social judgments involved, but legitimate dissension remains over the options taken. Further research on alternative multidimensional measures and their axiomatic structure will pave the way for broader consensus. The panel data proved effective in supporting the analysis, but the datasets are regionally bound and care must be taken in extrapolating these results to the two countries involved, and, beyond

these, to other developing countries.

References

- Alkire, S. & Foster, J. (2011). Counting and multidimensional poverty measurement. *Journal of Public Economics*, 95(7-8), 476-487.
- Ardington, C., Case, A. & Hosegood, V. (2009). Labour supply responses to large social transfers: Longitudinal evidence from South Africa. *American Economic Journal: Applied Economics*, 1(1), 22-48.
- Ardington, E. & Lund, F. (1995). Pensions and development: Social security as complementary to programmes of reconstruction and development. *Development Southern Africa*, 12(4), 557-577.
- Atkinson, A. B. (2003). Multidimensional Deprivation: Contrasting Social Welfare and Counting Approaches, *Journal of Economic Inequality*, 1(1), 51-65.
- Atkinson, A. B., Cantillon, B., Marlier, E., & Nolan, B. (2002). *Social Indicators. The EU and Social Exclusion*. Oxford: Oxford University Press.
- Barrientos, A. (2008). Cash transfers for older people reduce poverty and inequality. In Bebbington, A. J., Dani, A. A., De Haan, A. & Walton, M. (Eds.) *Institutional Pathways to Equity. Addressing Inequality Traps* (pp. 169-192). Washington, DC: The World Bank.
- Barrientos, A. & Mase, J. (2012). Poverty transitions among older households in South Africa and Brazil. *European Journal of Development Research*, 24(40), 570-588.
- Barrientos, A., Møller, V., Saboia, J., Lloyd-Sherlock, P., & Mase, J. (2013). "Growing" social protection in developing countries: Lessons from Brazil and South Africa. *Development Southern Africa*, 30(1), 54-68.
- Bertrand, M., Mullainathan, S. & Miller, D. (2003). Public policy and extended families: Evidence from pensions in South Africa. *World Bank Economic Review*, 17(1), 27-50.
- Bossert, W., Chakravarty, S. R. & D'Ambrosio, C. (2013). Multidimensional Poverty and Material Deprivation. *Review of Income and Wealth*, 59(1), 29-43.
- Bossert, W., D'Ambrosio, C. & Peragine, P. (2007). Deprivation and Social Exclusion. *Economica*, 74(296), 777-803.

- Bourguignon, F. & Chakravarty, S. R. (2003). The measurement of multidimensional poverty. *Journal of Economic Inequality*, 1(1), 25-49.
- Brandolini, A. & D'Alessio, G. (2009). Measuring well being in the functioning space. In E. Chiappero-Martinetti (Ed.), *Debating global society: Reach and limits of the capability approach* (pp. 91-156). Roma: Fondazione Feltrinelli.
- Camarano, A. A. (1999). *Como vai o idoso Brasileiro?* (Discussion Paper 681). Rio de Janeiro: IPEA.
- Case, A. & Deaton, A. (1998). Large Scale Transfers to the Elderly in South Africa. *Economic Journal*, 108(450), 1330-1361.
- Case, A. & Menendez, A. (2007). Does money empower the elderly? Evidence from the Agincourt demographic surveillance site, South Africa. *Scandinavian Journal of Public Health*, 35(Suppl 69), 157-164.
- Chakravarty, S. R. & D'Ambrosio, C. (2006). The Measurement of Social Exclusion. *Review of Income and Wealth*, 52(3), 377-398.
- Chakravarty, S. R. & Silber, J. (2008). Measuring Multidimensional Poverty: The Axiomatic Approach. In N. Kakwani & J. Silber (Eds.), *Quantitative Approaches to Multidimensional Poverty Measurement* (pp. 192-209). Basingstoke: Palgrave Macmillan.
- Committee of Inquiry into a Comprehensive System of Social Security for South Africa. (2002). *Transforming the present- Protecting the future, Draft Consolidated Report*. Pretoria: Author.
- Deaton, A. (2007). *Income, aging, health and wellbeing around the world: Evidence from the Gallup World Poll* (NBER Working Paper 13317). Cambridge, MA: NBER.
- Delgado, G. C. & Cardoso, J. C. (Eds.) (2000). *A Universalização de Direitos Sociais no Brasil: a Previdência Rural nos anos 90*. Brasília, IPEA.
- Diener, E. & Suh, E. (1997). Subjective well-being and age: An international analysis. *Annual Review of Gerontology and Geriatrics*, 17, 304-324.
- Doyal, L. & Gough, I. (1991). *A Theory of Human Need*. London: Macmillan.
- Duclos, J.-Y., Sahn, D. & Younger, S. D. (2007). Robust Multidimensional Poverty Comparisons with Discrete Indicators of Well-being. In S. P.

- Jenkins & J. Micklewright (Eds.), *Inequality and Poverty Re-examined* (pp. 185-206). Oxford: Oxford University Press.
- Duflo, E. (2003). Grandmothers and granddaughters: Old age pensions and intrahousehold allocation in South Africa. *World Bank Economic Review*, 17(1), 1-25.
- Easterlin, R. A. (2003). *Building a Better Theory of Well-Being* (Discussion Paper 742). Bonn: IZA.
- Edmonds, E., Mammen, K. & Miller, D. (2001). Rearranging the family? Household composition responses to large pension receipts. *Journal of Human Resources*, 40(1), 186-207.
- Efron, B. (1979), Bootstrap Methods: Another Look at the Jackknife, *Annals of Statistics*, 7(1), 1-26.
- Efron, B. & Tibshirani, R. (1993). *An Introduction to the Bootstrap*. New York: Chapman and Hall.
- Ferreira, M. (2006). The differential impact of social-pension income on household poverty alleviation in three South African ethnic groups. *Ageing and Society*, 26(3), 337-354.
- Heslop, A. & Gorman, M. (2000). *Chronic Poverty and Older People in the Developing World*, Mimeo. Manchester: IDPM.
- Jensen, R. (2004). Do private transfers "displace" the benefits of public transfers? Evidence from South Africa. *Journal of Public Economics*, 88(1-2), 89-112.
- Kinsella, K. & He, W. (2009). *An Ageing World: 2008* (Report). Washington, DC: US Census Bureau.
- Kunzmann, U., Little, T. D. & Smith, J. (2000). Is age-related stability of subjective well-being a paradox? Cross-sectional and longitudinal evidence from the Berlin Aging Study. *Psychology and Aging*, 15(3), 511-526.
- Lasso de la Vega, C. (2010). Counting Poverty Orderings and Deprivation Curves. *Research on Economic Inequality*, 18, 153-172.
- Leibbrandt, M., Woolard, I., Finn, A. & Argent, J. (2010). *Trends in South African Income Distribution and Poverty since the fall of Apartheid* (OECD Social, Employment and Migration Working Paper 101). Paris: OECD.

- Lloyd-Sherlock, P., Barrientos, A., Møller, V. & Saboia, J. (2012). Pensions, poverty and wellbeing in later life: Comparative research from South Africa and Brazil. *Journal of Aging Studies*, 26, 243–252.
- Møller, V. & Sotshongaye, A. (1996). "My family eats this money too": Pension sharing and self-respect among Zulu grandmothers. *Southern African Journal of Gerontology*, 5(2), 9-19.
- Møller, V. & Radloff, S. (2013). Perceptions of Fortune and Misfortune in Older South African Households: Social Assistance and the “Good Life.” *Social Indicators Research*, 111(3), 633–664.
- Pattanaik, P. K., Reddy, S. G. & Xu, Y. (2007). *On procedures for measuring deprivation and living standards of societies in a multi-attribute framework* (Working Paper 08-02). Georgia: Andrew Young School of Policy Studies, Georgia State University.
- Pinquart, M. & Sorensen, S. (2000). Influences of socio-economic status, social network, and competence on subjective well-being in later life: A meta-analysis. *Psychology and Aging*, 15(2), 187-224.
- Ravallion, M. (2011). *On multidimensional indices of poverty* (Policy Research Working Paper 5580). Washington, DC: The World Bank.
- Sagner, A. & Mtati, R. (1999). Politics of pension sharing in urban South Africa. *Ageing and Society*, 19(4), 393-416.
- Schilling, O. (2006). Development of life satisfaction in old age: Another view of the 'paradox'. *Social Indicators Research*, 75(2), 241-271.
- Schatz, E. J. (2007). “Taking care of my own blood”: Older women’s relationships to their households in rural South Africa. *Scandinavian Journal of Public Health*, 35(Supp 69), 147–154.
- Schwarzer, H. (2000). *Impactos socioeconômicos do sistema de aposentadorias rurais no Brasil - Evidências empíricas de un estudio de caso no estado de Pará* (Discussion Paper 729). Rio de Janeiro: IPEA.
- Schwarzer, H. & Querino, A. C. (2002). *Non-contributory pensions in Brazil: The impact on poverty reduction*. ESS Paper 11. Geneva: Social Security Policy and Development Branch, ILO.
- Sen, A. (1985). *Commodities and Capabilities*. Amsterdam: North-Holland.
- Sen, A. (1993). Capability and Well-Being. In M. Nussbaum & A. Sen (Eds.), *The Quality of Life* (pp. 30-53.) Oxford: Oxford University Press.

- Townsend, P. (1979). *Poverty in the United Kingdom*. Harmondsworth: Allen Lane.
- van der Berg, S., Siebrits, K. & Lekezwa, B. (2010). *Efficiency and equity effects of social grants in South Africa* (Stellenbosch Economic Working Paper 15/10). Stellenbosch: University of Stellenbosch, Department of Economics.

Appendix

Table 1A.

Descriptive Statistics for Individuals aged 55 and over in Brazil and South Africa Samples (2002)

	Brazil 2002	South Africa 2002
Number of observations	1745	1409
Household size	3.5	5.2
Relationship to household head		
Head	65.44	72.1
Spouse	23.61	19.3
Top generation – parent/grandparent	4.39	7.5
Middle generation – adult child	1.09	.6
Bottom generation – grandchild	0.23	-
Other	5.24	.5
Gender		
Male	41.38	39.8
Female	58.62	60.2
Age group		
55 – 64 years	28.54	51.9
65 – 74 years	43.04	34.9
75 + years	28.02	13.2
Mean age in years	69.43	65.49
Marital status		
Married	40.20	52.6
Single	12.10	8.9
Widowed	32.58	32.8
Divorced / separated	5.29	5.7
Education level achieved		
Cannot read or write	50.6	20.2
No schooling – can read and write		3.7
Primary school	41.61	44.2
Secondary school	6.99	27.2
Matriculation		2.7
Higher education	0.80	1.9
% Social old-age pensioner in household	30.2	74.0
% Social insurance pensioner in household	69.4	0.06