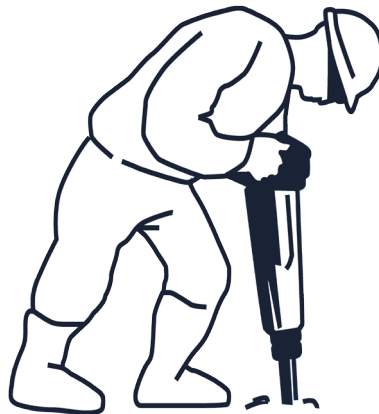# Southern Africa Labour and Development Research Unit

How not to present poverty research results:
The South African case

by

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Working Paper Series
Number 61

Recommended citation

Meth, C, (2011). How not to present poverty research results: The South African case, South Africa . A Southern Africa Labour and Development Research Unit Working Paper Number 61. Cape Town: SALDRU, University of Cape Town

How not to present poverty research results: The South African Case

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Abstract

Because of their vital role in charting progress (or the lack thereof) in the pursuit of the poverty reduction, statistics are of obvious importance. In South Africa, these leave much to be desired. Disagreements among academics on the severity of poverty, the result of the failure of Statistics South Africa to conduct the appropriate surveys, are the inevitable result. Far from losing money (or sleep) as a result, some in the profession resort to further research, some of it quite highly paid, to squeeze new results out of old, often unreliable data. This could have serious consequences for the poor – policy failure caused by faulty monitoring can easily damage the vulnerable.

Regardless of the reliability or otherwise of their findings, it is argued in the present paper that researchers would do well to offer them in a way that minimises the possibility of their being misinterpreted and/or misrepresented, and that maximises the likelihood that the non-specialist reader will be able to understand them. It is common practice to give poverty estimates in the form of the (FGT) ratios suggested by Foster, Greer and Thorbecke (1984), often without accompanying estimates of the absolute magnitudes involved. This, the present paper claims, allows overly optimistic conclusions to be drawn, making possible the concealment of rising misery behind a veil of aggregate improvement.

Commencing with a glance in the abstract at the FGT ratios, the paper concludes that in order for poverty statistics not to convey a misleading impression of changes in the phenomenon they seek to represent, the ratios have to be augmented with sufficient information of concurrent changes in the income distribution. Most poverty studies look at changes in inequality. Often, however, the inequality results are not linked directly to the changes in poverty. As far as income poverty is concerned, the present piece of research suggests that doing so is the only appropriate way to present results.

Having sketched a conceptual foundation, the paper looks at the regurgitation by government, without comment, of poverty statistics that directly contradict each other. After that, the strange case of an undeserved accolade government awards its anti-poverty policies, is found to be based upon a misinterpretation of their own findings by the authors of a recent poverty and inequality study (Bhorat and van der Westhuizen, 2008).

A new set of poverty and inequality estimates (Leibbrandt *et al*, 2010), although it does not conform to the mode of presentation suggested above as necessary, points (as do the Bhorat and van der Westhuizen findings) to the strong likelihood that although the poverty headcount ratio may have fallen since the advent of democracy in the country, the poverty headcount is likely to have risen by several million between 1993 and 2008.

An appendix at the end of the paper offers a little speculation on what poverty levels might have been had the AIDS epidemic not killed so many people.

Abbreviations and acronyms

AIDS	Acquired Immune Deficiency Syndrome
AMPS	All Media and Products Survey
ANC	African National Congress
APS	Anti-Poverty Strategy
AsgiSA	Accelerated and Shared Growth Initiative for South Africa
CASASP	Centre for South African Social Policy Analysis
CDF	Cumulative distribution function
CPI	Consumer Price Index
CSR	Comprehensive Spending Review
DHS	Demographic and Health Survey
DPRU	Development Policy Research Unit
EPWP	Expanded Public Works Programme
FGT	Foster, Greer and Thorbecke
GDP	Gross Domestic Product
HDI	Human Development Index
HIV	Human immunodeficiency virus
IES	Income and Expenditure Survey
IMD	Index of Multiple Deprivation
LFS	Labour Force Survey
MICS	Multiple Indicators Cluster Survey
MPI	Multidimensional Poverty Index
Nedlac	National Economic Development and Labour Council
NIDS	National Income Dynamics Study
NGO	Non-governmental Organisation
OECD	Organisation for Economic Co-operation and Development
PCAS	Policy Co-ordination and Advisory Services
SASSA	South African Social Security Agency
WHS	World Health Survey

Introduction

In 2004, the South African government committed itself to the halving of unemployment and poverty by the year 2014. There is little possibility that (income) poverty will be halved by 2014, and even if it were, government would probably be unable to detect it, having had only the vaguest idea of what the level of poverty was in the year in which the halving mandate was issued. Both the unemployment and poverty halving goals were specified in a manner so vague as to make it difficult to understand what, exactly, was intended (Meth, 2009). One place where the poverty goal is spelled out, doubtless there are others, is in the Asgisa[1] Summary document, which notes that the intention is to reduce the poverty rate "to less than one sixth of households" (Presidency, 2006, p.3). During an era when substantial increases in the numbers of households were taking place, the use of 'proportion of households' as a poverty indicator is of questionable wisdom. As it so happens, few if any of the poverty estimates presented by government have reported in that way – nearly all have furnished poverty rates for individuals. This is but one of the veils obscuring the view of the progress (or otherwise) being made in the battle against poverty.

Presentation and interpretation of poverty statistics in official publications may not have improved much over the years, but there signs that government is becoming more aware of its inability to make much of an impact on poverty and inequality. In one of the most candid auto-critiques yet offered by a senior South African politician, the Minister in the Presidency responsible for National Planning, the Hon. Trevor Manuel, acknowledges in the Preface to the Green Paper on National Strategic Planning (Presidency, 2009) that after 15 years in power:

> "Our efforts to massively reduce poverty and roll back the extreme inequalities of the apartheid era have only begun to take effect." (Presidency, 2009, p.1)

While the weight of the apartheid legacy explains in part, why progress in the struggle against these twin evils has been so slow, the Minister's unstinting criticism leaves little room for doubting that government weakness must shoulder some substantial share of the blame. In his words:

> "Lack of a coherent long term plan has weakened our ability to provide clear and consistent policies. It has limited our capacity to mobilise all of society in pursuit of our developmental objectives. It has hampered our efforts to prioritise resource allocations and to drive the implementation of government's objectives and priorities. In addition, weaknesses in coordination of government have led to policy inconsistencies and, in several cases, poor service delivery outcomes." (Presidency, 2009, p.1)

Coming to grips with the matter, the Green Paper's authors commence with a spot of self-congratulation, before conceding that in the face of the massive problems confronting the country, government weakness has been profound. They say that:

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[1] Accelerated and Shared Growth Initiative for South Africa.

"A stable economic platform has enabled rising investment, rising employment and a steady reduction in the proportion of people living in poverty. Nevertheless, the challenges remain monumental. Unemployment remains unacceptably high, poverty is rife and opportunities are still skewed. Two striking weaknesses in government are the lack of a coherent plan and poor coordination." (Presidency, 2009, p.4)

The acknowledgement of 'the lack of a coherent plan and poor coordination' is not controversial. As will be shown in the present paper, however, the claim about 'steady reduction in the proportion of people living in poverty' is of dubious validity. That apart, the Green Paper's authors admit with refreshing honesty, that:

"There are … substantial weaknesses in the capabilities of the state, and state failures are as harmful to poverty-reduction as are market failures." (Presidency, 2009, p.8)

Weaknesses in the state's capabilities are not solely to be explained by a 'lack of a coherent long term plan' and 'weaknesses in coordination'. Nonetheless, it is good to see the authorities facing up to reality.

How far the willingness to do so will extend, may become known when government finally makes up its mind about its Anti-Poverty Strategy (APS). Work on the APS, carried out by the office of the Presidency, started in 2008. After more than a year's efforts (including consultation with the 'social partners'), and having progressed through several drafts, there is not much more to show for the endeavour than a glorified shopping list, lacking conceptual and strategic coherence (Presidency, 2010a).

Particularly weak is the situational analysis of South Africa's poverty problem. There are a few possible explanations for this, one of them being the confused and hotly contested nature of poverty statistics in the country, a state of affairs for which Statistics South Africa must take some large share of the blame because of its failure to conduct surveys fit for the purpose of measuring poverty. Another strong contender is the quality and quantity of human resources devoted by the Presidency to the task – with all due respect to those who have put their names to the latest document, and to some of those known to have worked on it in the past, it has to be said that one would expect better workmanship from a good final year under-graduate student, let alone a post-graduate.

As far as the poverty statistics themselves are concerned, it is not clear that even if an authoritative set of poverty estimates existed, that these would make their way into the analysis, especially if they painted an unflattering picture of the efforts of the authorities. The temptation to use statistics (if they exist) that offer kinder assessments, far from being a South African peculiarity, is widespread among policy making elites (Prewitt, 1985). Fascinating though the question of how national statistics enter into policy decision-making processes undoubtedly is, it is not the intention here to address that particular issue. Rather, the present paper contents itself with the lesser task of trying to expose weaknesses in the mode of presentation of poverty statistics, which weaknesses, it is argued, widen the space within which it is possible to produce from a particular study differing (and possibly conflicting) accounts of progress in the struggle to address mass (income) poverty.

What this paper *is not* about

Although it is unusual to commence a paper with a statement spelling out what it is not about, it would perhaps be useful if more work in highly contentious areas like poverty measurement, did so. Certainly in the present paper, the case for adding to the density of a set of poverty measures held by some to be so abstracted from the reality of poverty as to have little meaning, can only be sustained if reasonable answers to the question of why it is necessary to the defend the apparently indefensible, can be provided.

Writing in this day and age about poverty solely in terms of an income or expenditure measure is likely to attract criticisms like 'the author has not considered the arbitrary nature of poverty lines', or 'the author ignores the multi-dimensional nature of poverty' or 'the author does not do justice to the conceptual problems of measuring poverty'. All this is true, but, it will be argued, not of relevance here. Research into poverty has a long history; that of critiques of the attempts to do is almost as long. It is not the intention here to delve in any depth into that history. It is worth noting, however, that in recent times, efforts to fill some of the bigger gaps have redoubled. One of the fruits of this flurry of activity is a collection of papers published under the title *Poverty Dynamics: Interdisciplinary Perspectives* (Addison *et al*, 2009). Several of them offer comprehensive critiques of existing measures – one that caught my eye was the paper by du Toit (2009). Although it is possible to take issue with him at some points, it is difficult to deny that the concern he expresses over the failings of conventional poverty measures is well-founded.[2] Those that he discusses are severe enough to render much of the information created for the design, implementation and monitoring of anti-poverty policy, if not useless, then at least seriously compromised. High on the list of failings are the static nature of most measures, and the associated inability to distinguish adequately between (the much-defined state of) chronic poverty and its less harmful cousin, transitory or transient poverty. In addition, du Toit argues:

> "… the discipline of poverty measurement is caught on the horns of a dilemma, a double bind that arises out of the 'optics' of modern government …. This way of looking at poverty is partly driven by the need to make society 'legible' in a regular, homogeneous and universalizing way. In order to be useful for the process of government and planning at all, technologies of measurement and assessment have to be developed that can be formalized and routinized, and which can be de-linked from the complexity and intransparency of local context. Economies of scale in government, in decision making, in judgement and assessment require the development of embodied techniques of knowing and decision making that can be 'ported' from one context to another, that make it possible to compare one individual (or household or region) with another against a homogeneous calibrated scale, that allow them to be ranked, that can inform decisions about the allocation of resources – and that allow all these operations to be done in the shadow or the authority of 'science': *apparently* free of bias, objective, and incontrovertible." (2009, pp.240-241, emphasis in original)

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[2] du Toit's paper is replete with references to researchers to whose critical insights his own work owes a debt.

Paging through the incompetently executed situation analyses in the Anti-Poverty Strategy documents referred to above; the string of volumes of *Development Indicators* published by the Presidency, and the innumerable official pronouncements on poverty (and inequality), one sees how complete the reliance is on measures of the sort criticised by du Toit. As if that were not bad enough, the indicators, chiefly the ubiquitous Foster, Greer and Thorbecke (FGT) poverty measures (1984), where they are not incorrect, are often presented in such a partial manner as to encourage misinterpretation.

It is these errors and misrepresentations that provide the rationale for a critical review of government's use of the numbers. They prompt, as well, a glance at the workmanship of the researchers on whom government relies for the production of such figures. The fact that at a personal level, forensic work such as this is intensely interesting, does not detract from importance of challenging government's attempt to place itself in a dominant position in the poverty debate by selective use of research findings. The abuses this entails provide the rationale for the present paper.

It is as well to acknowledge, before commencing, that doing justice to questions of the nature of poverty and its extent, depth, severity and as well as its causes, would be more than the work of a lifetime. That, however, is not a reason to be discouraged from trying to suggest incremental improvements, if not by the development of better indicators, then at least by suggesting ways of bringing a modicum of rigour to the manner in which existing measures are presented. Ideally, one would like to have an adequate conceptual foundation on which to build. In its absence, one does what one can. Within the confines of a paper like the present one, that may not be very much. That little is necessarily worthless.

Yet another cautionary note is in order. Having agreed that the FGT indexes with which issue is taken below are but poor measures of poverty, it would be perverse to imagine that augmenting them in the manner proposed could eliminate their fundamental weaknesses. The proposed augmentations do, however, reduce to a minimum, the scope for placing a positive 'spin' on otherwise disappointing results.

Given the status of aggregate poverty estimates in the present paper, the question arises of the way in which one talks about them. Some may feel that it would be proper to remind the reader at regular intervals of the frailty of the measures. Such a position seems to me to be unduly apologetic. Let it be acknowledged at the outset that the estimates are beset by several well-known frailties, then let us say no more of the matter. All of us who work in the field, know, or should know what these frailties are. Henceforth, the 'poverty' estimates below will be treated like any other social indicator – they are far from perfect, but if nothing else, they show us how very little income those in the bottom half of the distribution have to spend on basic necessities.

What this paper *is* about

Its length notwithstanding, the paper has a few, limited objectives. One of them is to promote the idea that the use of parsimonious or 'stripped-down' indicators to measure income poverty can lead to serious misrepresentations of the extent and severity of the phenomenon. Given this,

the paper seeks to find ways of forestalling such eventualities. If it is the case (as is assumed here), that the limited number of poverty measures in common use, chief among them, the FGT ratios, will continue to enjoy popularity among researchers for the foreseeable future, then the only practical course of action is to show how the measures may be augmented to make misrepresentation of research findings less easy. That is the task the paper sets itself.

The starting point of the analysis is a critique of the popular habit of publishing poverty statistics primarily in the form of the three FGT (Foster, Greer and Thorbecke, 1984) ratios, the first of which shows the extent of poverty, the second its depth, and the third its severity. It is shown that unless they are augmented by figures that disclose absolute numbers of people in poverty at different income levels at different times, changes in the first of the FGT ratios may be meaningless. Ironically, as far as the third of the ratios is concerned, the results generated in the inequality analyses invariably conducted with poverty studies, provide precisely the kind of information necessary to prevent misunderstandings from arising. All that is required is a repackaging of results.

Having established an abstract basis for the recommendations made, the paper turns to the evidence. The first blot on the landscape is the publication by government (with no guidance to the reader), of mutually contradictory estimates of poverty. Adding weight to the perception of confusion rampant at the Presidency,[3] is the misinterpretation by government (led on by Bhorat and van der Westhuizen) of what poverty gap ratios imply about mean incomes of the poor. If professionals can be bamboozled by these ratios, what hope do 'ordinary' users have? Greater prominence, it is argued, should be given to descriptive statistics that enable all and sundry to grasp the significance of reported results. By the admittedly crude method of scaling results off a cumulative distribution function (CDF) in the Bhorat and van der Westhuizen paper to obtain poverty headcounts at various income levels below the poverty line, an attempt is made to show how poverty gap ratios can be made more user-friendly.

Next, we take a look at a recently published study on poverty and inequality (Leibbrandt *et al*, 2010), one on whose results government has apparently not yet had (or taken) the opportunity to comment. Lurking behind a minor improvement in the poverty headcount ratio is a substantial increase in the headcount, not brought to the attention of readers. Despite the CDFs charted in the Leibbrandt *et al* paper being a little rough, they are clear enough to allow for a repeat performance of the augmentation done on the Bhorat and van der Westhuizen CDFs. There is such an abundance of information on inequality in their paper, that it would not take the authors much time to furnish all of the numbers required to make their results comprehensible to a wider audience.

A critical innovation in the Leibbrandt *et al* paper is the presentation of results showing what poverty outcomes might have been had the social grant system not been expanded in the way that it has. Because the most widely distributed grant (the child support grant, 9.4 million out of a

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[3] No particular incumbent of the Presidency can lay sole claim to the right to be confused about the nature and extent of poverty in South Africa. Former President Mbeki, ably assisted by Dr Vusi Gumede, sometimes made a fine job of showing that he did not know what he was talking about. The proceedings of one especially splendid example of his doing so are recounted in Meth (2008).

total of 14 million grants) is small (R240 in 2009/10 and R250 in 2010/11),[4] the aggregate effect of grants on poverty is limited. In the absence of the grants, however, there would have been many more poor, and what is as bad, or possibly worse, many more chronic poor. Given the constant carping about social grants, and notwithstanding the fraught nature of the business of writing counterfactuals, it is useful to be able to point to welfare improvements that almost certainly could not have been made by any other means.

Finally, in an appendix, the paper raises questions about the absence of the likely poverty-reducing effects of the AIDS epidemic in South Africa. If, as may be the case, AIDS kills many more poor people than non-poor, then AIDS itself, in a grim, almost Malthusian fashion, may have served to limit the magnitude of the poverty problem (but not, of course, of the misery of the bereaved).

More informative poverty measures?

At issue in the present paper is the problem of income poverty, and aspects of the way in which its extent and severity is measured and reported. It may be useful to begin with the rather obvious point that in the real world, income poverty reduction policies and processes work by reducing the amount by which the incomes (or expenditure) of some (or all) individuals in poverty are below some income level known as a poverty line. The benefits of poverty reduction policies are unevenly spread. Clearly, the distribution of such changes as occur has to be taken into account when assessing the performance of these policies. To state the obvious, unless appropriate measures are to hand, adequate measurement of the extent and severity of poverty is not possible. What is not obvious, however, is that those who toss poverty estimates into the arena, and those who pick them up, have given careful consideration to the criteria such measures must satisfy in order to be judged 'appropriate'. Those who know about such things, point to the two, sometimes conflicting criteria, that express the tension involved in constructing appropriate measures. That tension is laid bare in the following passage from the United Nations *Handbook on Poverty Statistics:*[5]

> "Measures used for monitoring and targeting need to be trusted and require rigorous underpinning. The measures will function well as long as everyone agrees that when poverty numbers rise, conditions have indeed worsened (and conversely, when poverty measures fall, that progress has been made). The first question in judging measures is how well does each index reflect basic properties desirable on philosophical grounds.
>
> A second important use for poverty measures is descriptive. Poverty statistics play critical roles in summarizing complex social and economic conditions that inform conversations around economic and social priorities. For this purpose, effective measures need not completely capture all (or even most) morally relevant aspects of poverty. But the limits of measures need to be understood, and transparency and ease of interpretation are critical here.

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[4] See *Budget Review 2010*, pp.103 and 105 (National Treasury, 2010).
[5] The reader's indulgence is craved for the citation of such a large chunk of text. Each point raised is central to the arguments that follow below – attempting to paraphrase Morduch's work seems pointless.

These two notions – the need for rigor balanced against a desire for ease of interpretation – run through the discussion below."

Warming to the topic, the author (Morduch, 2005) continues:

"Economists have sharpened discussions by identifying a set of desirable normative characteristics of poverty measures (often stated mathematically as axioms) around which consensus can be built. The search focuses not on identifying descriptively useful measures in the sense above; instead, the focus is on moral relevance – even if the outcome is a set of measures that yield numbers with little intuitive meaning.

If we can agree that acceptable poverty measures must satisfy a given set of axioms or must have certain characteristics, it is possible to sharply narrow the number of potential candidates for poverty measures. In the most desirable case, a single, unique measure[6] would emerge that would be fully "characterized" – that is, there would be only one possible candidate that satisfies all of the axioms on which we agree. So far, though, the search has left a long list of possible poverty measures still on the table, and the task for analysts remains to understand the basic properties of the chief contenders." (Morduch, 2005, p.54-55)

In the absence of 'a single unique measure', one of the more popular ways of measuring poverty (either as it changes over time, or at any instant for which survey data are available), is to estimate the set of decomposable poverty measures proposed by Foster, Greer and Thorbecke in their seminal 1984 paper.[7] Despite their widespread acceptance by the economics profession, poor compliance with the second of the criteria spelled out above, namely, ease of interpretation, leaves one wondering why they have not attracted more critical attention. The FGT indexes take the following form:

$$P_\alpha = (1 / N) \, \Sigma_i \, (G_n / z)^\alpha, \, G_n = (z - y_i) \, . \, I(y_i \leq z) \; \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots(1)^{[8]}$$

where $I(.)$ is an indicator function that equals 1 if the bracketed expression is true, and 0 otherwise. N is the total population. The exponent α typically takes the values 0, 1 and 2 to generate respectively the headcount ratio, poverty gap ratio and poverty gap squared ratio, referred to respectively as P_0, P_1 and P_2. G_n is the difference between the poverty line (z) and income or consumption for those who are poor. The non-poor do not meet the condition $y_i \leq z$. P_0 (the headcount ratio) is the proportion of the total population N, below some poverty line. When $\alpha = 0$, the term $\Sigma_i \, (G_n / z)^\alpha$ gives the poverty headcount. Let us label this H. Rather

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[6] The coincidence in terms of which researchers and politicians, qua policy-makers are impelled in the direction of parsimonious indicators is discussed briefly, further below.

[7] May (2010, p.11) salutes them thus: "A tremendous step in the measurement of poverty must be acknowledged. Following the publication of the well known paper by James Foster, Joel Greer and Erik Thorbecke in 1984, most measurers now report what have become known as the p-alpha poverty measures (Foster, Greer et al. 1984)". This elegant suite of measures allow for the measurement of three important dimensions of income poverty: its incidence, depth and severity."

[8] There are slight differences in the ways in which expression (1) is presented. The formulation above was downloaded on 15 July 2010 from http://mdgs.un.org/unsd/mdg/Metadata.aspx?IndicatorId=2,

obviously, to convert a set of estimates of P_0 into headcounts, one simply multiplies them by N.[9] Setting $\alpha = 1$ to obtain the measure P_1, simplifies expression (1) to $(\Sigma_i (G_n / z)) / N$. P_2 does something similar with the squared gaps between the incomes of those below the poverty line and the poverty line, thus giving the poverty of the poorest greater weight.[10]

Apart from their appealing technical properties, the Foster-Greer-Thorbecke (FGT) ratios have the attractive characteristic of reducing the dimensions of a complex problem to three simple indicators. Although the authors make no claim that poverty measurement can be compressed into such a compact bundle without disregarding many aspects of the phenomenon, there is no shortage of economists who are willing to talk about poverty using FGTs in their most basic (ratio) form. Politicians too, seem not to be averse to resorting to the ratios when the indicators seem to tell the 'right' story. It will be shown below that although simplicity is desirable, it can also mislead.

Constructed as they usually are from survey data, there is no rule prescribing the manner in which researchers ought to present their poverty estimates, and certainly not one which suggests they should limit themselves to FGTs in ratio form. Although there are instances where this is not done, there are nonetheless many where it is, as the work of two groups of the prominent South African researchers discussed below clearly demonstrates. The Foster, Greer and Thorbecke paper (all four pages of it!) offers no warrant for confining the presentation of results to ratio form only – to illustrate the usefulness of their approach, they present a table decomposing poverty in Nairobi in 1970 by number of years the household head had lived in that city. In addition to the ratios, the table gives numbers of individuals in each category and their mean incomes (1984, p.764).

In this age of the free flow of information, it is possible for anyone interested in augmenting the bare ratios to gain access to the relevant databases, and having done so, to replicate the results in question, and then to augment them to their heart's content. A moment's reflection suggests, however, that this is likely to be a colossal waste of time. Unless access is gained to the datasets in their final form i.e., after all adjustments and imputations have been made, replication is difficult. The question then becomes one of whether or not researchers are willing to hand over their cleaned datasets. Easier it is, by far, if the originators themselves take the trouble to perform what for them, would be a simple task.

Let us now devote space to a few comments on the three indicators, P_0, P_1 and P_2. The first of them, P_0, the headcount ratio, with its associated absolute indicator, the headcount, "violates" the following two axioms:

> "**Monotonicity Axiom**: Given other things, a reduction in income of a person below the poverty line must increase the poverty measure.

Transfer Axiom: Given other things, a pure transfer of income from a person below the poverty line to anyone who is richer must increase the poverty measure" (Sen, 1976, p.219)

This leads Sen to dismiss the poverty headcount (H) as a "very crude index", one that is "completely insensitive to the distribution of income among the poor" (p.219). Useful as his observations are for criticising anyone so crass as to think that poverty can adequately be measured by a single 'crude' indicator, they are of little relevance in circumstances where the FGT indicators are presented as they ought to be – as a set of linked measures, each highlighting one aspect of income poverty.

Despite its undeniable crudity, the headcount has its uses.[11] Population growth rates can readily outstrip rates of poverty reduction, in which case, the absolute number of poor will rise. The ability of headcounts to stop politicians and careless economists from claiming that poverty has fallen because the headcount ratio P_0, has fallen (Kanbur, 2004; 2008), is thus an important characteristic of the measure. In addition to that, it is useful for giving perspective to the 'poverty gap', understood as "the aggregate short-fall of the income of all the poor taken together from the poverty line… " (Sen, 1976, p.220). To estimate the income of the 'average' poor person (to produce a variable we shall label $\hat{Y}$), we subtract from the value of the poverty line z, the result of dividing the 'aggregate short-fall' by the headcount. The latter gives a rough indication of how far the average poor person is below the poverty line (the indication is 'rough' because it is silent on the distribution of the poor).

With that, let us turn to poverty gaps. The non-specialist reader,[12] were they ever to be confronted by poverty gap ratios such as those to be considered below, say, in the financial press, would have difficulty in extracting from them, any meaningful information. Be that as it may, the first thing to note about P_1 is that it complies with the monotonicity axiom, but not with the transfer axiom (Sen, 1976, p.223). Among the implications of the failure of the poverty gap measure to comply with the transfer axiom is the fact that for any two distributions of the poor that have the same mean, $\hat{Y}$, changes in the dispersion of income around that mean will have no effect on the poverty gap P_1 Morduch, 2005, p.63).

Occasionally one comes across estimates of the sum required to 'eradicate' income poverty in any particular year.[13] Morduch (2005, p.61) refers to it as the 'shortfall' – using the nomenclature above it is expressed as:

Shortfall = Σ_i (z − y_i). I($y_i \leq$ z) ……………………..………………….(2)[14]

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[11] Morduch (2005, p.60) concludes that: "The headcount remains a highly valuable measure, even if, when used on its own, it is a poor guide for resource allocation."

[12] Among whom I count myself – the departure point of my exploration of the FGT ratios is a long-standing inability to arrive at any intuitive understanding of what significance to attach to changes in the ratio P_2.

[13] To be more precise, it is the sum of the gaps between the income of each poor person and the official poverty line (if poverty is considered in per capita income terms, rather than, say, adult-equivalents). Because of leakages, eradicating poverty (by means of grants) would require greater sums than are yielded by this calculation.

[14] This, obviously, is the same as "… the aggregate short-fall of the income of all the poor taken together from the poverty line… " to which Sen was referring in the passage quoted above.

In place of such a readily comprehensible (and politically sensitive) measure (let us label it S), it is common to find the poverty gap expressed in ratio form only. One reason given for this is that in ratio form, estimates of P_1 have the advantage of being readily slotted into time series estimates for domestic and international consumption.

As such, however, these measures suffer from a similar weakness to the headcount ratios – unless they are normalised for population growth, they may contribute to unmerited satisfaction among politicians and policy-makers with the rate of poverty reduction.[15] While this may spare sensitive politicians the exposure to estimates of the invariably massive sums required year after year to eradicate income poverty, it can also dull the sense of perpetual urgency necessary to address this social scourge.

This is easily remedied – in the many cases where researchers do not translate their estimates of P_1 into measures of the 'Shortfall', normalised for population growth, interested readers can estimate the magnitude of the latter from published estimates of P_0 and P_1. It is not possible to do so directly, rather, it is necessary to approach via $\hat{Y}$, the mean income of the poor. Reference was made above to the variable $\hat{Y}$ in connection with the failure of the poverty gap measure to comply with the transfer axiom. $\hat{Y}$ is a bit of an oddity, so much so that its use is not really recommended.[16] In the present paper it cannot, however, be avoided – one of the papers at which we shall be glancing critically below (Bhorat and van der Westhuizen, 2008) does so, and in the process leads government to make an incorrect claim about the progress made in the struggle against poverty.

If, in expression (1), $\alpha = 1$, then at any point in time t, for those individuals for whom the condition ($y_i \leq z$) holds:

$$P_1 = (1 / N) \, \Sigma_i \, ((z – y_i) / z)$$

Although researchers working with survey data can estimate the value of $\Sigma_i \, . \, (z - y_i)$ directly from the data, those without access to the data cannot do so. We do know, however, that:

$$\Sigma_i \, (y_i) = H \, . \, \hat{Y}, \text{ where } H = N \, . \, P_0, \text{ so we may say that:}$$

$$P_1 = (H / N) \, . \, (1 – \hat{Y} / z)$$

Re-arranging the terms gives us:

$$\hat{Y} = z.(((P_1 \, . \, N) - H) / -H) \ \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots\dots.(3)$$

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[15] Sen comments that: "The head-count ratio is completely insensitive to the *extent* of the poverty short-fall per person, the income-gap ratio is completely insensitive to the *numbers* involved. Both should have some role in the index of poverty." (1976, p.223, emphasis in original)

[16] Although it is insensitive to income distributions among the poor in some circumstances, it is not universally so. Suppose (perversely) that a social grant were introduced which benefits only those with incomes close to the poverty line. Lifting them out of poverty would cause P_0, P_1 and P_2 to fall. The poverty of those left behind would, however, not have changed. This would be hinted at by the fact that $\hat{Y}$ would fall as well.

Rewriting expression (2) we obtain:

Shortfall (S) = (H . z) - (H . Ŷ) ……………………………………..(4)

Having been obliged to estimate the values of Ŷ in order to highlight an error, and to enable estimates of the shortfall (S) to be made, it is of some consolation to discover that, as we do below, to show that it can be of further use.

So much, for the moment, for the poverty gap – it is now the turn of the measure P_2 to step into the limelight. It is there because of a normative consensus that inequality has somehow to be integrated into poverty measures (Morduch, 2005, p.59). To the two major criteria of rigour and ease of interpretation, one may thus add as a proviso, the stipulation that poverty measures must be capable of providing some indication of the extent of income inequality among the poor. The P_2 could be regarded as the FGT team's contender. Even though P_2 is not primarily an inequality measure, and, when pressed into service to function as such, may not always to do very well, the inability of the other components of the FGT measures to deal with inequality means that it cannot avoid that duty.

Equity considerations dominate the 1976 Sen paper. There are two axioms dealing with the concept. The Relative Equity Axiom requires that the weight on the income shortfall of poor individuals be greater as the shortfall rises. This he describes as a "very mild requirement" (p.221). A "substantially more demanding" axiom (Ordinal Rank Weights) requires that the "weight … on the income gap of person i equals the rank order of i in the interpersonal welfare ordering of the poor." (p.221). Given the well-known difficulties with ranking, what Sen ends up with in his poverty measure (p.227), is a Gini index measuring the distribution of income among the poor (ranking the poor by income). The P_2 complies with the first, but not the second of these axioms.

In the P_2 measure, the poverty of an individual is given greater weight in the index as the shortfall between their income and the poverty line z increases. This is achieved, as noted above, by squaring each individual shortfall (G_n / z) in expression 1. The resulting measure complies with the requirements of the transfer axiom.

There is a related, more stringent test, in terms of which the poverty measure is required to comply with the 'transfer sensitivity' axiom. It may be illustrated by means of the following example drawn from the United Nations *Handbook on Poverty Statistics*:

> "Consider a population where the poverty line is set at $1,000. Next, imagine that $10 is taken from someone earning $600 and given to a neighbor earning $500. Any poverty measure that satisfies the transfer axiom will fall. Measured poverty should also fall (for such indices) when $10 is taken from someone earning $300 and given to someone earning $200. The transfer-sensitivity axiom says that the reduction in the second case (in which a very poor person is made better off relative to her neighbor) should be greater than the reduction in the first case (in which the recipient is less poor)." (Morduch, 2005, pp.56-57)

The FGT P_2 measure does not meet the requirements of this axiom (Morduch, 2005, p.67). As he points out, the measure can be made to comply by raising α to any level greater than 2. Those who have experimented, have displayed a preference for integers, cubing being one of them. Doing so, however, puts:

> "… very heavy weight on the well-being of the poorest, perhaps weight that would be judged too great in a social calculus." (Morduch, 2005, p.67)

The P_2 measure meets the requirements of the 'focus' axiom. Morduch (2005, p.56) refers to:

> "A second building block [that] focuses on the well-being of those below the poverty line – so that changes among better-off people do not affect measured poverty. This focus axiom rules out measures based on relative notions of poverty (i.e., where poverty is not measured by absolute deprivations relative to a fixed poverty line but instead the poor are identified relative to a shifting statistic like the median income of the whole population)."

Like Morduch's concern, the focus in the present paper is on absolute poverty, a requirement that gives rise to problems. These are best approached in a somewhat roundabout manner, one that begins with a lesson learned from Groucho Marx's quip: "You are the most beautiful woman I've ever seen and that's not saying much for you." One finds, having burrowed a little into the FGT P_2 measure, that despite its pre-eminence in the world of poverty measurement, an acceptance resting on compliance with the relevant axioms, it is capable of giving a misleading impression of progress in the fight against poverty. This is not the sort of quality one wants to find in a measure that has at least some pretensions to acting as a guide to policy (Morduch, 2005).

It is not hard to grasp the notion that when $((z - y_i) / z)$ is squared, more weight will be given in the index P_2 to the poverty of the poorest. Faced, however, with a set of estimates of the way in which P_2 has changed over time, only the most clairvoyant of economists could say that they can grasp what changes in the ratio really mean. Of course, it is a simple matter to say that when the size of the ratio in some year exceeds that in a subsequent year that poverty is less severe, and if the difference is substantial, that it is much less severe. Beyond such platitudes, however, the profession is probably no better informed than the laity (for whose benefit they do not produce the FGT ratios anyway). Some of the peculiarities of these indexes will now be illustrated by reference to the results of a simulation exercise.

Augmenting the FGT ratios

If they are doing their job properly, the measures P_0, P_1 and P_2, read in conjunction with one another, should enable statistics users to construct an informed view of the conditions of the poor. Attention was drawn above to the fact that the P_1 measure does not comply with the transfer axiom (i.e., for any given mean, the measure is insensitive to changes in income distribution). If it 'works' well, the P_2 measure should compensate for this. Using hypothetical income distributions (the distributions are improbable, but not impossibly so), the exploration that follows, shows that the two measures, jointly and severally, may, on occasion, not discharge

this duty very well. This is a consequence of the failure of the P_2 measure to meet the transfer sensitivity axiom.

In Table 1 below the results were produced using as a starting point, the poverty line (z) of R515 per capita per month, a headcount of 22.88 million in the year 2000 in a total population of 42.36 million, and one of 29.22 million among a total population of 48.69 million (in 2008). These correspond with poverty headcount ratios in both years of 0.54. The poverty line and the total population figures are taken from a paper by Leibbrandt *et al* (2010), while the headcounts are estimated from the headcount ratios they supply (see Tables 2.10 and 2.17 on pp.36 and 46 respectively). Their Table 2.17 presents poverty estimates including and excluding income from social grants, a useful feature on which we comment further below. Making use, as they do, of entirely hypothetical income distributions, the scenarios in Table 1 below have no need to take any account of such niceties.

Table 1 Testing and augmenting the FGT measures P_0, P_1 and P_2

Variable	2000	2008
1. Y_b (base income for distribution)	430	480
2. ΔY_i (increment for linear distribution)	17	21
3. P_0 (poverty headcount ratio)	0.54	0.54
4. Headcount (millions)	22.9	26.3
5. P_1 (poverty gap ratio)	0.250	0.235
6. Shortfall (R billion per annum)	65	71
7. P_2 (poverty gap squared ratio)	0.129	0.124
8. $\hat{Y}$ (mean income)	277	291
9. Y_1 (highest income, if different from z)	413	459
10. Y_{17} (lowest income)	141	123
11. Y_1/Y_{17}	2.9	3.7
12. No of income categories where category mean income in 2000 > than in 2008	5	
13. Standard deviation	85.8	106.0
14. Gini coefficient among poor	0.16	0.19
15. Crossover period (years)	±120	

Note: All Y variables are in R/month per capita (in 2008 prices).

The crossover period is the estimated time it would take for the 'average' poor person to exit from poverty observed income growth over the period continues into the future.

The simple linear distributions (each with 17 observations) were constructed using slightly different base incomes (Y_b) to anchor income ranges. By varying the amount by which each base income is reduced (ΔY_i), distributions of differing degrees of inequality are created. With a little suspension of disbelief, these figures could be imagined to reflect the growth experience in South Africa over the period 2000-2008. Such an outcome could have arisen because with the exception of a spurt between 2005 and 2008, growth was relatively slow, while official unemployment hovered around the 4.1 million mark (a 23-25 per cent rate).

Although the poverty headcount ratio is roughly constant over the period, population growth pushes up the number below the poverty line by more than three million. The poverty gap ratio falls, but the shortfall (the sum required, assuming perfect targeting, to be transferred each year to eradicate poverty), driven by the population increase, rises by about R6 billion (in 2008 prices). It is clear that if researchers converted at least P_0 (the poverty headcount ratio) and P_1 (the poverty gap ratio) to numbers that have meaning for a non-specialist audience, they would be doing all and sundry (themselves not excluded) a favour. The poverty gap squared ratio falls, suggesting a slight decline in the severity of poverty, a tendency reinforced by the rise in the mean income of the poor. Mean income (row 8) rises, but only by R14 per capita per month over the eight-year period.

The three variables in rows 9, 10 and 11 would not be required in a study based on actual survey data – they are there only to help explain how the scenarios were constructed.[17] Real-life surveys are likely to find respondents spread across the full income range from zero up to the poverty line. In Table 1, however, artifice is called upon to allow the detailed income figures to begin to tell a story about poverty in which rising inequality, (reflected in a widening income range) undoes the positive P_1 and P_2 results. Looking at a summary measure of mean incomes in each of the 17 categories (row 12), one finds that incomes fell over the period in the bottom five categories – the decline in category 17 was almost 13 per cent. This constitutes a failure to comply with the transfer sensitivity axiom. It would be interesting to know how frequently this occurs in the real, as opposed to a make-believe world like that constructed here.

As substitute for the row 9, 10 and 11 figures (unnecessary when survey data are used), standard deviations have been roped in to provide a measure of dispersion (row 13). As may be seen, they increase over the period. Precisely what measure to use here is a matter of some debate. Foster and Sen show that there is an explicit relationship between the coefficient of variation (another possible candidate?) and the P_2 measurement (1997, p.179) noting that it is this relationship that ensures that P_2 "has a transfer neutrality property" (p.179n).

Of course, as noted above, most poverty studies worth their salt consider inequality as well. Among the most popular measures are the Gini coefficients (which are not without weaknesses) and the Theil measures. It appears not to be common practice to estimate Gini coefficients for the poor only in the inequality part of a poverty and inequality study. The estimation of 'poor only' Ginis seems, however, an obvious and necessary thing to do. In Table 1 above, the Gini coefficient for the poor rises. The use of the Gini is not meant to indicate a firm preference for this measure – it is there because some measure of inequality or indicator of the impact of inequality other than that built into the P_2 is required to fill in the gaps in the poverty story. (It is also there because it was easy to estimate in the calculating engine used to produce the simulation results).

Attaching a meaning to a change in a particular social or economic indicator is, to some extent, inescapably subjective. In forming a judgement of how good or bad any change is, we draw upon past experience, both in our own and in other countries; we draw upon related indicators,

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[17] The first two variables, those in rows 1 and 2, would also not be required, serving as they do a similar purpose to those in rows 9, 10 and 11.

and we draw on 'common sense'. Not many would dissent from the view that an increase in the Gini coefficient in South Africa from, say, 0.64 to 0.69 is a bad thing, whereas a rise from 0.64 to 0.65, while not a good thing, is probably otherwise insignificant because the change is barely distinguishable from noise in the data. By comparison with the Gini coefficient, understanding the significance of changes in the P_2 is much less straightforward. The increase in inequality to which attention is directed above (by the Gini coefficient), is unlikely to escape attention – not so an improvement in the P_2 that masks a fall in the wellbeing of the poorest. If, in addition to the fulsome treatment that inequality usually gets, poverty estimates were presented in a form something like that shown above, wriggle-room for politicians and policy-makers anxious to put the best possible spin on the results, would be severely constrained. Confronted by the hard reality of an increase in both the headcount and the shortfall, boasts about the fact that the headcount ratio and the poverty gap ratio had both fallen, would sound much less convincing. If, in addition, a contradiction between the behaviour of the poverty gap squared ratio and the Gini coefficient arose, the scope for celebration would be reduced still further.

Finally, in row 15, a measure has been introduced that is not a statistic proper, but is rather a speculation on the time it would take for the poor person whose income is equal to the mean income of all the poor at the end of the period, to reach the poverty line income. This (unrealistic) projection is based on the assumption that observed growth of the mean income of the poor over the period 2000-2008 continues into the future. The usefulness of the number lies not in the likelihood of its being achieved – it rests instead in the shock value of the finding that if things were to continue as they have done, then this is how long it could take for (some fraction of) the poverty problem to be addressed. In the case of the scenarios in Table 1, the very low growth in income of the poor causes the crossover period to extend to more than a century. This sounds, and is extreme (nearly all of the poor would long since have died). If the income figures implied by the Bhorat and van der Westhuizen (2008) paper are to be believed, then, as will be shown below, crossover periods could well exceed 50 years, a result that makes the century-plus figure above seem a little less wild.

Crossover periods, which conceptually, are only slightly more unrealistic than poverty gaps (Morduch, 2005, p.72), have long been around as poverty measures. In his seminal 1987 paper, for example, Kanbur takes a hypothetical set of poverty and growth figures "…that do not seem to be far off the mark for many developing countries… " and estimates crossover periods, noting that:

"… it will take *more than twenty years* for the average poor person to be lifted out of poverty." (his emphasis)

Playing around with the figures, he manages to get the crossover period down to fifteen years, observing after doing so that:

"It is in this context that the urgency of poverty alleviation measures has to be seen. Waiting for three or four five-year plan periods for poverty alleviation (which does not take into account the poorest of the poor) may be too long given the objectives of some governments. Explicit redistributive strategies may well be introduced in response to

slowness in "trickle down" – it is simply a matter of political arithmetic." (Kanbur, 1987, pp.70ff)

As a contribution to the policy debate on poverty eradication, crossover period estimates would have the virtue, if propelled by sufficient popular energy, of compelling the growth fundamentalists who currently predominate, to be more honest (specific) about how long the poor are going to have to wait.[18]

A variant of the approach described above, takes the material used to generate the poverty results, and using a clutch of assumed income growth rates, produces a chart that allows the exit time from poverty for any poor individual to be estimated. Morduch devotes half-a-dozen pages (2005, pp.71-77) to the dissection of the 'exit time' approach. One of its charms is the fact that it allows the simulator to look not just at the exit time of the individual at the mean income level of the poor (it appears to be customary for to look at crossover periods only for this individual), but of any individual anywhere in the distribution.[19] Although it is not suggested here that a set of results from a device of this sort be included in the poverty template that is presented Table 1 above, it is certainly a powerful tool to use in a seminar or workshop setting. To avoid information overload, however, it is probably best to stick with a single crossover estimate as is done above.

Had understanding the significance of changes in the P_2 been more straightforward, the scratching around above in search of a means to illustrate changes in poverty linked and the associated changes in inequality, would not have been necessary. It is not just the P_2 that resists easy interpretation – other poverty measures that attempt to take inequality into account also do so at the expense of comprehensibility to the very audience (politicians and policymakers) at which they are aimed.

Reference has already been made above to one of these measures, the Sen poverty index. Another candidate is the Watts measure, which is of even earlier vintage than the Sen (1968 vs. 1976). Like Sen's, it is recognised as having many desirable features. While the Sen measure uses an ordinal yardstick for weight (rank on a Lorenz map), the Watts measure's use of the logarithm of the poverty gap for weighting ensures that it meets the transfer sensitivity axiom's requirements. It is not the intention here to enter into any examination of the technical details of either the Sen or the Watts measures – the discussion in Morduch (2005) provides a comprehensive overview of the desirable properties of a poverty index; a point-by-point

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[18] Rates of poverty reduction in South Africa have been driven by rapid growth of the social grant system. One implication for crossover period estimates as cover approaches 100 per cent, is a possible slowing down in the rate of poverty reduction, unless it is offset by job creation. In other words, simple extrapolation of observed trends is problematic.

[19] In Meth (2007a), a set of results from a model called PIG (poverty, inequality, growth) were presented. The model was built by Chris Woolard of the University of Cape Town. At its heart was a hypothetical log-normal distribution. By varying means and standard deviations, it could be calibrated to observed outcomes in South Africa. Once that had been done, it was used to consider the probability of the country's poverty-halving goal by the year 2014 being met. Its crudeness notwithstanding (in the version of the model used, only distribution-neutral growth was possible), it should have been capable of creating the appropriate level of alarm among policymakers and politicians at the high levels of income growth required to address poverty, had they been confronted by it.

comparison of the features of the measures referred to here, as well as a discussion of possible policy implications of the choice of one or the other of them.

These measures, of course, by no means exhaust the list of possible indicators. Nor, however, does the fact that the FGT P_2 fails the transfer sensitivity test mean that any other measures that exist are beyond criticism.[20] As Sen and Foster point out, an:

> "… enormous – and often formidable – technical literature has grown and flourished in the pure theory of the measurement and evaluation of economic inequality." (1997, p.x)

It has grown up around problems thrown up by, amongst others, Sen's 1973 work *On Economic Inequality*, and the article that followed it in 1976. The pursuit of distribution-corrected poverty measures has benefited from this, with measures developed from the Sen 1976 measure like the Sen-Shorrock-Thon index (Xu and Osberg, 1999) being a case in point. A major intervention was the collaboration between Foster and Sen (1997) that made use of advances in the theory to revisit Sen's 1973 work.

Reading some of this material, especially the Foster and Sen contribution, drives home the point that measures of poverty and of inequality rest uneasily in a quagmire of quite well understood problems, most capable of being addressed, in whole or part, by some group of measures.[21] Different measures may yield differing conclusions, implying different policy measures or policy focal points. Most of the argument, however, is in realms that are as remote as the farthest reaches of space from the political discourse of anti-poverty (and inequality) in most countries.

How then, should economists who wish to place policy-relevant research material before policymakers, in the hope that it may find its way into policy, proceed? One answer to this question seems to be that they confine the selection of indicators, and the form of their presentation, to measures they believe to be well understood, hence the popularity of the FGT poverty measures and the Gini to measure inequality. The perception and capability boundaries within which these gobbets of information are taken up (if indeed, they are taken up) in South Africa are both narrow and rigid.[22] To say so is not to single out the South African authorities as being especially incapable – in these straitened fiscal times, their counterparts in government elsewhere seem to be equally unable to understand the poverty problems in their own countries. The savage and, many argue, unnecessary cuts to government expenditure in UK, likely to affect the already vulnerable,[23] pay lip service to the kind of poverty statistics we are talking about here, but ignore other crucial indicators.

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[20] Given the fact that in South Africa at least, the FGT measures are currently the most frequently used of all poverty measures, we are relieved, in this paper, of any need to delve further into the problems of measures that satisfy the transfer sensitivity axiom.

[21] Some groups may consist only of a single indicator.

[22] It will, for example, have taken the South African authorities a full decade to do something as relatively simple as produce a nationally acceptable set of poverty lines, the magnitudes of which were not yet known when the final draft of the paper was being revised (January 2011)

[23] See any of the barrage of articles in recent times on the cuts proposed by the UK coalition government. In the run-up to the 2010 Comprehensive Spending Review (CSR), for example, there were dozens of articles in the UK papers exploring the differences between estimates of the incidence of cuts announced prior to the CSR, made respectively by the Treasury and the Institute of Fiscal Studies, with the former insisting that the poor were being

Despite the eloquence and impressive technical skills of the likes of say, Morduch or Foster and Sen, in demonstrating the policy implications of the choice of different poverty and inequality, when push comes to shove, these fine distinctions matter little. It is unlikely that many politicians could understand the arguments, even if they had time to plough through them. They rely on technical advisors whose policy briefs reflect not only their skills, but also their ideologies. Perennial struggles (Kanbur, 2004) between the Treasury (fiscally disciplined, and of neo-classical economic bent) versus the department of welfare or social development (sociologists?) have all too often seen the Treasury vanquishing the latter. In this struggle, statistics are a battering ram, often used against civil society, to carry the argument for parsimony. Other than by violent protest (such as has been seen in South Africa for several years, and recently in the UK[24]), one of the most important ways that sections of the poor the poor can make known their suffering, is through civil society organisations. If those staffing these organisations are starved of proper (reliable but comprehensible) aggregate poverty and inequality statistics within which to frame their research and advocacy work, that work must inevitably suffer.

A pressing need at this point is thus to develop a template that would offer users of poverty statistics a less fragmentary picture without over-burdening them with too much information. The set of variables offered in Table 1 represent a first attempt at trying to create such a template. There is room for debate over what the most appropriate inequality measures should be. If it did not cause too much clutter, I would favour statistics that describe income conditions in each decile below the poverty line (means and standard deviations?)[25]

Opinions differ on what constitutes an adequate set of poverty measures. In his recommended list of basic indicators Morduch (2005, p.64) includes:

- the headcount (not the headcount ratio);
- a poverty gap measure in which the shortfall is divided by the poverty line income;
- the median income of the poor, and
- the squared poverty gap (the FGT P_2 measure)

My reading of the literature (and I think that Morduch's chapter in the UN *Handbook on Poverty Statistics* should be compulsory reading for all of us) is that the current crop of poverty

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fairly treated, and the latter claiming the opposite. The headline (in 84-point type) in the *Guardian* the day after the Chancellor (George Osborne) tabled the CSR, read "Axe falls on the poor". See the article by Patrick Wintour and Larry Elliott, 21 October 2010). Now that the magnitudes of the cuts are known (December 2010), the disagreement over their impact on the poor has intensified, while the number of government and quasi-government employees dismissed as a result of the cuts has started to climb.

[24] The extent of violence in the recent student protests against rises in fees (caused by cuts in grants to universities, and heralded as the first of many in the future as cuts bite more deeply) took the authorities by surprise. See, for example, the article by Paul Lewis and Adam Gabbat "Hi-tech shape of future protests: There may be more unruly demonstrations to come as austerity measures start to bite", in the *Guardian*, 10 November 2010.

[25] Another way of tackling the need for information on changes in inequality among the poor would be for researchers to make it a rule to furnish with the poverty estimates, cumulative distribution function (CDF) charts with complementary tables showing incomes at various percentiles, so that changes in income levels could be seen, especially among the poor.

measures, dominated by the FGTs, is far from ideal. It is possible to remedy some of the defects caused by the penchant for presenting the measures in relative (ratio) form only, but that still leaves the issue of the incorporation of information on income (expenditure) distribution among the poor into poverty measures, unsolved.

One makes of this what one will – my preference is for something like the items in the list in Table 1, excluding, obviously, those described as necessary only for the creation of the various scenarios, supplemented by measures that show how incomes have changed among the poor. A set of indicators that could meet these requirements appears below in Table 2. Not, by any means, thought of as being set in stone, the indicators are offered as a starting point for discussion about what minimum amount of information is required to allow for a reasonable understanding of changes in income poverty. Alternative ways of examining income changes are given in the table. The first option gives mean incomes by decile, going far enough up the distribution to cover all of the poor. To highlight aggregate inequality, mean incomes in the top decile may be included.

The second option shows cumulative proportions of the population below various income levels, and the cumulative numbers of people involved at each level. These extend as far as the poverty line, or as far as the upper of two poverty lines, if a poverty-critical range is being used. As in the first option, an indication of the degree of inequality may be hinted at by including some figures on the numbers of people above some high income level. It is not clear which of the two sets of distributional information is more useful – they shed light on different aspects of the poverty stricken, with one showing how incomes change among different cohorts of the poor, while the other offers a glimpse of movements between income classes.

Whichever of the two is chosen (if either is chosen), one is likely to hear complaints that the proposed set of indicators is too bulky. There is a whole industry devoted to the production of single-figure indicators like the GDP, the CPI, or the HDI. The list is large, and so too, is the literature critical of such measures. At least part of the impetus behind the continued production of such indicators is probably an attachment, conscious or otherwise, to a perceived need to shave hypotheses (and social indicators) with Occam's razor.[26]

Whatever the case, the desirability of parsimony among researchers, often on defensible methodological grounds,[27] coincides with the demand by politicians for information in bite-size chunks. Motivation among the latter is almost certainly far less estimable, arising as it probably does in part from a desire (need?) to pander to a perceived or imagined inability of most 'consumers' of media information to concentrate on a subject as mundane (dull? arcane?) as poverty and inequality, for longer than the time it takes to deliver a soundbite. Although there are gifted interpreters who can capture the essence of an argument in a few elegant sentences (or

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[26] Recall here, the statement by Morduch to the effect that "In the most desirable case, a single, unique measure would emerge that would be fully "characterized… " " (2005, p.54-55)

[27] Recall, for example, the comment by Morduch (2005, p.55) cited above, to the effect that: "If we can agree that acceptable poverty measures must satisfy a given set of axioms or must have certain characteristics, it is possible to sharply narrow the number of potential candidates for poverty measures. In the most desirable case, a single, unique measure would emerge that would be fully "characterized" – that is, there would be only one possible candidate that satisfies all of the axioms on which we agree."

graphs), many social problems are too complex to survive distillation into a 'two-pager' at the hands of the ordinary practitioner.

Table 2 Pro-forma template of income poverty statistics

Variable	Year t		Year t+n	
1. P_0 (poverty headcount ratio)				
2. Headcount (millions)				
3. P_1 (poverty gap ratio)				
4. Shortfall (R billion per annum)				
5. P_2 (poverty gap squared ratio)				
Distributional data (aggregate)				
6. $\hat{Y}$ (mean income of all poor)				
7. Standard deviation				
8. Gini coefficient among poor				
9. Crossover period (years)				
Distributional data (by decile)				
10. $\hat{Y}_1$ (mean income in bottom decile)				
11. $\hat{Y}_2$ (mean income in 2nd decile)				
12. $\hat{Y}_3$ (mean income in 3rd decile)				
13. $\hat{Y}_4$ (mean income in 4th decile)				
14. $\hat{Y}_5$ (mean income in 5th decile)				
15. $\hat{Y}_{10}$ (mean income in top decile)				
	Cumulative total		Cumulative total	
Distributional data (by income level)	%	Number	%	Number
10. <R100				
11. <R200				
12. <R273 Lower poverty line				
13. <R300				
14. <R400				
15. <R500				
16. <R561 Upper poverty line				
17. Income >R10 000 (non-cumulative)				

Note: Income levels and poverty lines are Rands per capita per month in constant 20?? prices. Other monetary magnitudes, e.g., the Shortfall are in Year 20?? prices. The poverty lines in the table are arbitrary.

Occasionally, the results of such pressures become visible in publications like South Africa's annual *Development Indicators*, which, after inviting readers to contemplate the 'facts' by laying before them screeds of figures, most of which do not 'speak for themselves', offer the misleading 'analyses' their skimpy statistics suggest.   My argument is that one cannot even begin to understand income poverty without something like the information given in Table 2 above.

When policy initiatives result in significant redistributions of income to the poor, special measures are required, particularly if the period during which change takes place is relatively short. South Africa's social grant programme is a case in point. The counterfactual estimates by Leibbrandt *et al* (2010) of the effects of these grants on the income of the poor (to be considered further below) are an example of the sort of the thing that can be done, the difficulties of constructing counterfactuals notwithstanding.

Regardless of the quality of the poverty statistics produced by this or that researcher, government has a strong incentive to make use of the most optimistic reports of the progress made in fighting poverty. Even if provided with comprehensive estimates along the lines of those suggested in Table 2, it is not obvious that such figures would enter into policy formation. That, however, does not relieve researchers of the responsibility for ensuring that their work tells a full story, using numbers and language that policymakers can understand. Crude poverty statistics, like the three FGT three ratios, P_0, P_1 and P_2, purporting to show success in the struggle against poverty, when presented without complementary information, can easily smother, in a reassuring fug, deteriorations in the conditions of large numbers of the poor, providing a screen behind which policymakers may take shelter. It seems that only by the sacrifice of the brevity and the parsimony exemplified by the likes of the Watts, the Sen or the FGT measures, will it be possible to tell a poverty story that cannot be spun into a tale of success when it is not. Making more accurate information widely available would not necessarily mean, as noted above, that those in power would feel obliged to act upon it. It would, however, make it more difficult to engage in the denialism that appears to be the kneejerk response of many governments.

In what follows, a few of the more prominent recent estimates of poverty (and the manner in which some of them have been taken up by government), will be considered, using the analysis above as a guide.

Attempts by the Presidency to make sense of poverty

Poverty and inequality statistics from a few sources are reproduced in a number of government documents.[28] One place where they are prominently displayed is in the roundup of performance summaries called *Development Indicators*.[29] Collated and published annually by the Presidency, the compendium presents statistics on a wide variety of areas. Wedded to the belief that income poverty has been reduced, government has seen fit, on several occasions, to attempt to make this

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[28] *Budget Review 2008*, for example, citing the 2007 van der Berg *et al* paper "What we know [about poverty trends]", claims that the research re-confirms that grants are well targeted and "significantly reduces[s] the extent and severity of income poverty." (National Treasury, 2008, p.93)

[29] This is the fourth compendium of development statistics published by the Presidency, the first having been published in 2007, while that for 2009 was launched on 25th September 2009. *Development Indicators 2010* was published on 14 December 2010, under the stewardship of Minister Trevor Manuel (Presidency, 2010b). On p.26 we find a set of national poverty estimates that look similar to the figures criticised in the present paper – Minister Manuel should know better. The statement preceding the figures informs us that: "Using a R524 poverty line poverty headcount index decreased from 58% in 2000 to 49% in 2008. Using a R283 poverty line poverty headcount decreased from 38% in 2000 to 22% in 2008. The decline in poverty headcount is largely due to an increase in social grant uptake." The poverty lines are in 2008 prices.

known to all and sundry. Thus in *Development Indicators 2008*, one comes across the claim that:

> "Using various income poverty measures, the number of people living in poverty has declined especially between 1999 to 2007." (PCAS, 2008a, p.26)

This conclusion is presented at the head of a page that offers estimates of poverty headcount ratios, as well as estimates of the headcount at the lowest of the three poverty lines used (on which, more below). The first table on the page in question contains three sets of estimates of the "Percentage of population living below various poverty lines (in constant 2007 Rand)." The first and third of these are from a paper commissioned from Bhorat and van der Westhuizen (2008), of the Development Policy Research Unit (DPRU) in the University of Cape Town. The second is also from a piece of commissioned work, this one from van der Berg and his colleagues in the University of Stellenbosch.

As primary data source, the Bhorat and van der Westhuizen paper makes use of the Income and Expenditure Surveys (IESs) conducted by Statistics South Africa in 1995, 2000, and 2005/2006. The van der Berg *et al* paper uses their standard source – the All Media and Products Survey (AMPS) data sets. For van der Berg *et al*, a strength of the AMPS data sets, is the fact that they appear on an annual (or semi-annual) basis, thereby (allegedly) making the tracking of poverty and the identification of " "irregular" survey results" a relatively simple matter (van der Berg *et al*, 2007a, p.3). The Stellenbosch paper for the Presidency (unpublished) makes use of the poverty estimates in van der Berg *et al* 2007a and 2008, extending them from 2004 to 2007.

According to *Development Indicators 2008*, the Bhorat and van der Westhuizen paper uses poverty lines of R462 and R250 per capita per month, while the van der Berg *et al* piece uses R367. These are all in 2007 prices (PCAS, 2008, p.26). The first of the lines used by Bhorat and van der Westhuizen is the R322 per capita per month (in 2000 prices) line used in the seminal Hoogeveen and Özler (2004) paper. The R250 per capita per month in 2007 prices (R174 in 2000 prices), although significantly lower than their preferred poverty line, has been declared to be useful for international comparisons because of its proximity to the $2/day line (Hoogeveen and Özler, 2004, p.9). [30] The R367 line in 2007 prices, (roughly the equivalent of R250 per capita per month in 2000 prices) is used in most of the van der Berg *et al* poverty

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[30] R174 per capita per month is not sufficient to meet subsistence (food) needs, let alone anything else, required by an 'average' individual. The poverty lines of R174 (approximately $2/day in 2000) and R322 per capita per month in 2000 prices, derive from an attempt by Statistics South Africa to specify national poverty lines, an enterprise possibly (probably?) spurred on by the need for all countries committed to the Millennium Development Goals to do so. The original estimates are in an unpublished paper by Babita *et al* (2003). Until recently, Statistics South Africa, with assistance from Treasury, were still dithering over the question of publication. It is to Berk Özler, a World Bank economist who was a member of the research team assembled by Statistics South Africa to estimate poverty lines, that we owe our knowledge of these lines. In the face of an official unwillingness to publish the paper prepared by the team (Babita *et al*, 2003), Özler went ahead with Hoogeveen and published a set of poverty and inequality estimates (Hoogeveen and Özler, 2004) using the poverty lines established by the team. The South African authorities were furious. On p.9 Hoogeveen and Özler inform us that the $2/day (R174 per month) poverty line is "… reasonably close to our food poverty line of 211 Rand". It is not inappropriate, therefore, to dub the R174 line, a starvation measure. The poverty lines they prefer demarcate a range with a lower bound of R322 and an upper bound of R593 per month (in 2000 prices).

estimates, starting with their path-breaking but seriously flawed 2005 paper, and floating through various incarnations between that year and 2008.[31]

Of the two tables on p.26 of *Development Indicators 2008*, the first contains poverty headcount ratios estimated using the three poverty lines referred to above (R462, R367 and R250 per capita per month in 2007 prices). For the R462 and R250 poverty lines (the Bhorat and van der Westhuizen paper), there can only be results for three years, 1995, 2000 and 2005, because those were the only years in which IESs were conducted. For the R367 line (the van der Berg *et al* work), there are results for each year between 1993 and 2007. It is from this material that conclusion about 'poverty declining between 1999 and 2007' is drawn. Since the headcount ratios are not transformed into headcounts, unless the reader makes their own estimates, they have no way of knowing whether or not the claim is true. As it so happens, the fall in the headcount ratio from 1999 to 2007 (52 per cent to 41 per cent) reported by van der Berg *et al*, is so large that if the 1999 population was in the region of 43 million,[32] while that for 2007 was about 47.9 million,[33] then the headcount would have fallen by about 2.8 million.[34] Clearly, establishing whether or not the van der Berg *et al* results are to be relied upon is a task of some importance.[35]

The second table on p.26 of *Development Indicators 2008* contains a set of poverty headcounts broken down by province for the years 1995/1996 and 2005/2007. The headcount ratios are from the 1995 and 2005 IESs, while the population estimates are respectively from the 1996 Population Census and the 2007 Community Survey. The poverty line, R250 per capita per month in 2007 prices, is the starvation line used by Bhorat and van der Westhuizen. At this low level a fall in the headcount from 12.6 million in 1995/1996 to 11 million in 2005/2007 is registered.

Scanning the three sets of estimates presented in the first of the two tables on p.26 of *Development Indicators 2008*, one cannot but be struck by the fact that according to van der Berg *et al*, using the R367 poverty line, the poverty rate (the proportion of the population below the poverty line), was 52 per cent in 1995, 51 per cent in 2000 and 45 per cent in 2005, whereas

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[31] van der Berg *et al* present their poverty estimates in two forms. Both are incorrect. One approach uses official survey estimates not adjusted for under-reporting of income – by their own admission, the results are wrong (see Meth, 2010). The other approach takes income data from the All Media and Products Survey (AMPS) and raises it to national accounts income levels to compensate for survey under-reporting. The problem with this is that social grant incomes cannot be identified in the AMPS data, so the adjustments made to income estimates in poor households are too large (see Meth, 2007b). According to Leibbrandt et al (2010, p.71), in 2006 about half of the households in the bottom two quintiles reported that grants were their main source of income.
[32] The figure given in *South African Statistics 2000*, p.1.2, is 43.054 million.
[33] The mid-year estimate for 2007 in Statistical release P0302, 3 July 2007, p.1.
[34] There is a little sleight of hand in the *Development Indicators 2008* work, involving judicious selection of end-points. According to the van der Berg *et al* figures, the poverty headcount rate hovered in the 50-52 per cent range from 1993 to 2001. If the 1994 population was about 38.6 million, then the poverty headcount would have been roughly the same in 2007 as it was in 1994 (about 19.7 million).
[35] *Development Indicators 2008* (p.25) gives the source of their R367 per month poverty estimates as an (unpublished) paper by van der Berg *et al*. Although I cannot find a published version of it, its results appear to be an extension of those in van der Berg *et al*, 2007, p.14. None of the van der Berg *et al* estimates, I have argued (convincingly, I hope), is to be trusted (Meth, 2006, 2007, 2010). My 2010 paper is an exhaustive (and exhausting) examination of the poverty estimates of theirs sponsored or adopted by government in recent years. It looks in some detail at most of the papers on poverty and inequality published by van der Berg *et al* between 2004 and 2008.

the corresponding figures from Bhorat and van der Westhuizen, using the R462 line are 53, 58 and 48 per cent respectively (PCAS, 2008a, p.26). Disregarding the 2000 IES-derived estimate because the survey is widely believed to contain grave errors, we have a situation in which two poverty lines separated by nearly R100 generate poverty rates that are disturbingly similar.[36]

More telling are the similarities between the estimates of the poverty gap (the proportion of the poverty line income by which the income of the average poor person falls below that poverty line) estimates made by the van der Berg *et al*, and Bhorat and van der Westhuizen, respectively. Ignoring the erratic 2000 figures once more, we are presented with poverty gap ratios for 1995 of 26 per cent by latter, and 27 per cent by the former. For 2005, they both report poverty gaps of 21 per cent (PCAS, 2008a, p.27). It is not possible for both sets of figures to be correct – the Bhorat and van der Westhuizen figures may or may not be reliable, but the van der Berg *et al* figures are definitely incorrect.

Not long after *Development Indicators 2008* was published, the Presidency followed it up with the *Fifteen Year Review* (PCAS, 2008b). Despite the alleged 'desirability' of the AMPS-based figures, with their ability to provide time-series estimates of poverty levels, when it came to writing the *Fifteen Year Review* the Presidency omitted the van der Berg *et al* poverty estimates. One would not expect an explanation to be given for what seemed like a fall from grace (none is offered). My conclusion was that by dropping the estimates, the Presidency had, for once, treated the van der Berg *et al* figures appropriately. As will be seen, however, the figures are not defunct at all – they were revived in *Development Indicators 2009*.

Thoroughly misleading poverty gap estimates

Before getting there, let us turn to the Bhorat and van der Westhuizen figures used in the *Fifteen Year Review*. Table 3 below is reproduced from Table 2 on p.18 of the *Fifteen Year Review* (PCAS, 2008b),[37] which, in turn, comes from Table 1 on p.3 of the Bhorat and van der Westhuizen (2008) paper.[38] Poverty lines are in 2007 prices.

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[36] In their 2005 paper, van der Berg *et al* use two poverty lines, R250 and R281 per capita per month in 2000 prices (2005, p.17). The first of these is the R367 (in 2007 prices) referred to immediately above, while the second is approximately R403 in 2007 prices. Their estimate of the poverty rate in 2004 at the R250 line was 0.332, and at R281 line, 0.366. So, decreasing the poverty line by about R40 (in 2007 prices) raises the poverty rate by 3.4 percentage points. The headcount in 2004 goes from 15.4 to 18 million, an increase of 2.6 million.
Turning to the figures in *Development Indicators 2008*, if the population in 2005 was about 47 million, then the van der Berg *et al* poverty line of R367 per month with its poverty rate of 45 per cent would yield a headcount of about 21.2 million. The Bhorat and van der Westhuizen line of R462 finds a poverty rate of 48 per cent, which translates into a headcount of about 22.6 million. So, a R40 difference in poverty line levels (in 2007 prices) sees the headcount rise by 2.6 million in the van der Berg *et al* estimates for 2004, whereas a R100 (in 2007 prices) poverty line difference in the Bhorat and van der Westhuizen paper corresponds to a headcount difference of only 1.4 million. This means that the 2005 poverty rates of 45 and 48 per cent are actually quite close.
[37] Results for 2000 are not given in the *Fifteen Year Review*.
[38] The results in Table 3 are estimates of P_0 and P_1. The table is reproduced as it is in the original, with results given to two decimal places, a practice that may mislead innocent readers into treating the figures with greater respect than they deserve.

Table 3 Poverty Shifts by Race: 1995 – 2005

Category	Headcount Rate [P_0]		Poverty Gap Ratio [P_1]	
Year	1995	2005	1995	2005
R322 a month poverty line				
African	63.04%	56.34%	31.86%	24.44%
Coloured	39.00%	34.19%	14.66%	12.98%
Asian	4.71%	8.43%	1.03%	2.17%
White	0.53%	0.38%	0.22%	0.11%
Total	**52.54%**	**47.99%**	**26.04%**	**20.61%**
R174 a month poverty line				
African	38.18%	27.15%	14.71%	8.55%
Coloured	14.62%	12.30%	4.09%	3.88%
Asian	0.82%	1.60%	0.14%	1.07%
White	0.23%	0.01%	0.09%	0.00%
Total	**30.92%**	**22.68%**	**11.77%**	**7.15%**
Source: Bhorat and van der Westhuizen, 2008, Table 1, p.3.				

If one restricts oneself, when commenting on poverty, as the Presidency did, to presenting these figures in the form of rates (percentages), there is room for some celebration – at the higher poverty line, the headcount ratio falls by nine per cent (4.6 percentage points), and the poverty gap ratio by 21 per cent (5.4 percentage points). At the lower line (roughly $2/day), the percentage falls are even larger – 27 per cent (8.2 percentage points) and 39 per cent (4.6 percentage points) respectively.

When, however, one converts the headcount rates into headcounts,[39] the picture is a little less rosy – at the R174 poverty line it falls by 1.5-1.6 million (from 12.2 in 1995 to 10.6 in 2005),[40] whereas at the R322 line, it rises from 20.7 to 22.5 million, an increase of 1.8 million over the period 1995-2005.[41] These results are a little sensitive to the population estimates one uses (on which, more below), but not so much so as to alter the headcounts by much more than 100 000 or so, each way.

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[39] In neither the original paper by Bhorat and van der Westhuizen, nor the *Fifteen Year Review* are the poverty headcount ratios converted into poverty headcounts. Similar reticence was not in evidence when it came to a discussion in the *Fifteen Year Review* of the 'Key drivers of decline in poverty' – for that occasion out came the big, impressive-sounding numbers, for example, '7.8 million child support grant beneficiaries in 2007 as opposed to 34 000 in 1999' (PCAS, 2008b, p.19).

[40] In a second table on p.26 of *Development Indicators 2008* a set of estimates of provincial headcounts at the lowest of the poverty lines (R250 per month in 2007 prices is given). Population figures are given in the table. Apparently to make it possible to prepare the set of provincial poverty estimates, the 1995 poverty headcount rate (31 per cent) is applied to the 1996 Population Census estimates, while the 2005 rate (23 per cent) is applied to the 2007 Community Survey population estimates. This yields a headcount reduction of 1.6 million – from 12.6 to 11.0 million (PCAS, 2008a, p.26).

[41] It is important to note that discovering an increase in the poverty headcount between 1995-2005, is not inconsistent with the decline (of disputed magnitude) widely thought to have taken place after 2000-2001 – all that is necessary is that the increase between 1995-2000/2001 be sufficiently large.

Hairsplitting aside, it seems likely that the number of people living in poverty as measured by a poverty line of R462 per capita per month (in 2007 prices) rose over the decade 1995-2005, possibly by something approaching two million. It is also possible, of course, that the figures are garbage, but if the compiler of *Development Indicators 2008* suspected that they were, he or she gave no hint of it.

Why, in view of this, does the Presidency attempt to persuade its audience that 'the number of people living in poverty has declined'? In one instance where poverty is demonstrated as having fallen, it does so at a poverty line so low, that people whose incomes are in that region can barely survive. At the poverty line nominated by Hoogeveen and Özler (2004, p.9) as the lower bound of the poverty range they sought to identify, R322 per capita per month in 2000 prices (the upper bound was set at R593 per capita per month in 2000 prices), 'the number of people living in poverty has *not* declined'. In the other case, the van der Berg *et al* R250 poverty line estimates, the results are wholly unreliable.[42]

Since the discussion on poverty in the *Fifteen Year Review* is conducted entirely in terms of percentages (PCAS, 2008b, pp.18-19), it is possible for the *Review's* author to claim that:

> "In the absence of an official poverty line, two lines were used in research for the review: a lower poverty line of R174 per person per month; and an upper line of R322 per person per month, in 2000 prices.

> There was reduction in both absolute income poverty (the income of poor people) and relative income poverty (the poverty gap, that is, the gap between the average income of poor people and the poverty line)." (PCAS, 2008b, p.18)

Because the results are presented in percentage terms, it is difficult to adopt an informed position on their significance. The guidance offered, however, leads only to confusion. The compilers of *Development Indicators 2008* report that the poverty gap results at the R174 poverty line (R250 in 2007 prices) duplicated in Table 3 above, show that:

> "Using a R250 per month poverty line [the starvation line, CM], the IES data shows that in 1995 the average poor person's income was 12% below the poverty line, while in 2005 the depth of poverty had been reduced almost by half." (PCAS, 2008, p.27)

In making this claim, they are clearly drawing on Bhorat's and van der Westhuizen's conclusion that:

> "… on the lower poverty line, while the average poor individual lived about 12% below the poverty line, a decade later the person was 7% below the poverty line." (2008, p.2)

This claim amounts to the assertion that $\hat{Y}$ in 1995 was about R220 and R233 in 2005 (in 2007 prices). Converted to 2000 prices, these would be about R153 and R162 per capita per month respectively. 'Reduced by half' sounds impressive – unfortunately, it almost certainly rests on

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[42] See footnote 35 above.

an incorrect interpretation of the concept of the poverty gap. The suggestion in the passages cited above, is that the mean income of the poor, which has been labeled $\hat{Y}$, can be read straight off the values for P_1. For such an interpretation to be true, when $\alpha = 1$ in expression (1), the term $\Sigma_i (G_n / z)$, in its $H ((z - \hat{Y}) / z)$ form, would need to be divided by H, the headcount, rather than N, the total population.[43]

Total population is known, as is the poverty headcount ratio; the poverty gap ratio and the poverty line level, so, armed with the relevant mathematical skills (well below rocket science level, as has been demonstrated in the previous section of the paper), it is a relatively simple matter to solve for $\hat{Y}$ from the information provided. It is also possible to create a small calculating engine that enables one to find, by trial and error, the values of $\hat{Y}$ that yield P_1 estimates equal to those in Table 3 above. By either method, these values turn out (as they should) to be R118.8 and R107.7 in 2005 and 1995 respectively (in 2000 prices).[44] What Bhorat and van der Westhuizen should have said is that:

"… on the lower poverty line, while the average poor individual lived about 38% below the poverty line, a decade later the person was 32% below the poverty line."

This does rather take the shine off the claim. It is not the first time such an error has been made, nor is it likely to be the last. As Morduch points out:

"The measure is often misinterpreted as giving the average income shortfall of the poor, …. Dividing by the total population sacrifices simple interpretations – the measure no longer gives a quick sense of deprivation of poor individuals since data on non-poor people are also included. The measure points up tensions between descriptively-useful measures and measures that can best serve as guides for monitoring and targeting." (2005, p.62)

Reference to services that poverty estimates are required to provide, brings to the fore the issue of the identity of the intended users. It goes without saying that researchers need to be clear about the target audience, which ranges from highly-trained economists, through policy-makers, politicians, activists and NGO workers of widely varying degrees of economic fluency.[45] Acknowledgement of this reality does not mean that researchers have to patronise those not in the high-skill category – rather, it means ensuring that poverty indicators are offered that are both as comprehensible and as little open to misinterpretation as possible. It would be a great advantage if users could sense it when results go awry, but that is probably asking too much.

If the statement by Bhorat and van der Westhuizen to the effect that 'while the average poor individual lived about 12% below the poverty line, a decade later the person was 7% below the poverty line' formed part of an attempt to translate FGT poverty gap ratios into something the non-specialist reader could understand, that attempt must be acknowledged to have backfired

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[43] Obviously, if $\alpha = 0$, then $\Sigma_i (G_n / z)^{\alpha} = H$. Attempting to make the numerator equal to H rather than N, would mean that every value of P_0 would equal 1.

[44] The magnitudes of P_1 implied by the $\hat{Y}$ values of R152 in 1995 and R162 in 2005, are respectively 0.016 and 0.091. These are miles away from the values in Table 3.

[45] In the present paper, the potential users I have in mind are not other academics, but rather NGOs and activists, like those who do battle with government in forums such as Nedlac (the National Economic Development and Labour Council).

rather badly. Representing as they do, significant over-estimates of the mean incomes of the average poor person in South Africa, the figures understate an important aspect of the poverty problem.

When something of this nature occurs, a question that presents itself, is that of whether users without the relevant theoretical background could draw on any information in the paper to detect such errors? Assuming that our critical non-specialist user is able to negotiate their way through the obstacle course created by the fact that poverty lines are given in the constant prices of different years, they would then need to be able to estimate, from the information given, the two mean income figures of R153 and R162 per capita per month in 2000 prices (R220 and R233 respectively in 2007 prices). If then, they turned to the set of cumulative distribution functions (CDFs) that Bhorat and van der Westhuizen provide in their paper, they should at least be able to discover, by inspection, that the means are too high.[46]

The relevant CDFs (for the population as a whole) are reproduced below in Figure 1.[47] Expenditure estimates are in 2000 prices, so the vertical line slightly to the left of the 200 mark is the R174 poverty line (R250 in 2007 prices). Although tightly curved at the lower end, neither CDF looks as though it could plausibly have a mean so close to the R174 poverty line. On this occasion, therefore, it is possible that our critical non-specialist user , unable to perform (or uninterested in performing) the calculations necessary to ascertain the mean incomes of the poor for the years in question, may be able to detect the error simply by casting an eye over the information on income distribution provided with the poverty estimates. It has, however, to be admitted that the chances of such a discovery being made are quite slender.

Figure 1 Cumulative Distribution Functions, 1995 and 2005

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[46] The likelihood of such a critical non-specialist reader existing is admittedly slight.
[47] They have been copied from Figure 1 in Bhorat and van der Westhuizen, 2008, p.8.
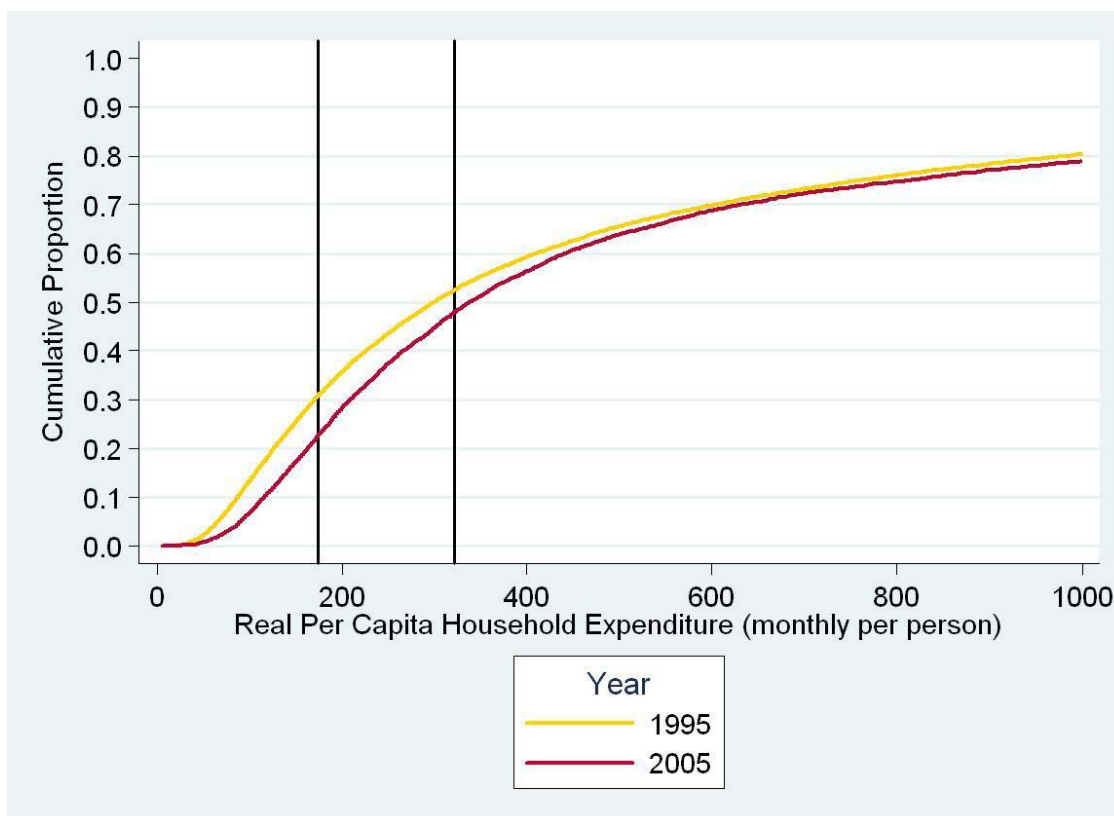
If that is the case, the argument that fairly comprehensive information on income distribution among the poor, attached to the poverty estimates, instead of living in splendid isolation elsewhere in academics tracts, gains extra support. The failure of the great and good to solve the problem of how to package poverty estimates so that they deal adequately with equity issues points to an urgent need to develop a template on which all who measure income (or expenditure) poverty, may hang their results.

When the quality (of the graphics) of such CDFs as are presented in a paper is sufficiently good, a great deal more than approximate mean incomes of the poor may be extracted from them. Rather than using them to check suspicious looking figures, a bit of old-fashioned technology (a straight-edge and a pencil) used to rule a grid onto the CDF chart, allows the reading off of cumulative population proportions at various expenditure levels. Applied to population estimates,[48] these generate the relevant headcounts. The results of exercise of this sort are collected in Table 4. Anchored around the two poverty lines of R174 and R322 per month used in the Bhorat and van der Westhuizen paper, the figures supply the distributional data called for in variables 10-15 in Table 2. The effects of population growth are plainly visible in the table – as expenditure levels rise, population growth gradually swamps poverty reduction.

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[48] To produce the figures in Table 4 population estimates of 39.56 million in 1995 and 46.89 million in 2005 were used. As noted above, the poor quality of South Africa's population statistics make the business of estimating total populations a little tricky. The errors involved are, however, not likely to be significant.

If the figures in Table 4 are to be relied upon, then what they suggest is a substantial reduction in the number of unfortunates (about 2.1 million), whose monthly expenditure was less than R100. By the time the R174 mark is reached, the reduction in the number of poor is reduced to 1.6 million.

Table 4 Milking the CDFs: Headcounts at various expenditure levels, 1995-2005

Expend. level	Cumulative proportion of population		Cumulative headcount (millions)		Percentage change 1995-2005	
	1995	2005	1995	2005	Proportion	Headcount
100	0.15	0.08	5.9	3.8	-88	-55
125	0.21	0.13	8.3	6.1	-62	-36
150	0.27	0.18	10.7	8.4	-50	-27
174	0.3092	0.2268	12.2	10.6	-36	-15
200	0.36	0.29	14.2	13.6	-24	-4
250	0.44	0.38	17.4	17.8	-16	2
300	0.51	0.46	20.2	21.6	-11	6
322	0.5254	0.4799	20.8	22.5	-9	8
350	0.56	0.52	22.2	24.4	-8	9

Source: Estimated from the CDFs in Figure 1, p.8 in Bhorat and van der Westhuizen, 2008

Note: Expenditure levels and poverty lines (shaded) are in R/month per capita in 2000 prices

Since, as we note above, R174 per capita per was said to be not enough to meet basic food needs, let us move a little higher up the scale, to the R322 per month line, there to see what happens to poverty over the period. As we ascend the ladder in Table 3[49] we see the 2005 headcount catching up with, and then surpassing the 1995 total. This happens somewhere between R200 and R250 per month. If this were simply a consequence of people being hoist up the ladder by expenditure (income)[50] improvements, there would not be much cause for concern. Movement up the income ladder is not, however, the whole explanation – population growth among the poor has added to their ranks – at the R322 income level, the growth in the number of poor exceeds the decline in the numbers below R174. The finding that there are fewer poor at the R174 line (about 1.6 million fewer) is good – the news that there were 1.7 million more poor

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[49] Squaring the results in Table 4 with reported increases in real income as measured by the AMPS data used to produce the results presented in *Development Indicators 2008* (or 2009) is impossible. In the 2008 report, for example, per capita income (Rands per month in constant 2007 prices) in the bottom decile is reported to have increased from R676 in 1995 to R924 in 2005, while that of the bottom 20 per cent reportedly increased over the same period from R1010 to R1324. These figures are almost certainly wrong. On the same page as they are given, estimates of the means and medians from the Bhorat paper are also given. In 1995, the mean for Africans was R615 per capita per month in 2007 prices, and the median was R333. By 2005 these had risen to R775 and R407 respectively. The medians and means for the total population in 2005 were R484 and R1515 (PCAS, 2008a, p.23).

[50] Although they are not synonymous, income and expenditure are sometimes treated as such in the present paper. If the findings in Statistics South Africa's survey on *Income & expenditure of households 2005/2006* are to be believed, doing so may understate the extent of income inequality. Mean and median consumption (expenditure) levels in the bottom two household deciles are higher than the income levels. In household decile 1, mean income is said to be R4 314 per annum, while the median is R4 509. Corresponding expenditure figures were R5 775 and R5 995 per annum. See Statistics South Africa (2008, p.31).

people at the R322 poverty line in 2005 than there were in 1995, is not, more particularly so as all but 300 000 of them had consumption levels equal to or lower than R300 per month.[51]

Without access to the data sets from which the poverty estimates are constructed, the way to estimate the magnitude of the shortfall (the net size of the annual transfer, perfectly targeted, required to eradicate poverty as defined by any poverty line) in any year, is laid out in expressions (3) and (4). These are reproduced below. The first step is to estimate the mean income ($\hat{Y}$) of those below the poverty line, thus:

$$\hat{Y} = z.(((P_1 . N) - H) / -H)$$

Once that has been done, the shortfall (S) may be estimated, thus:

$$S = (H . z) - (H . \hat{Y})$$

Multiplying the difference between the figures of R108 in 1995 and R119 in 2005 obtained above, and the poverty line z, by the headcounts, discloses a shortfall of R9.7 billion in 1995, and of R7.0 billion in 2005 at the R174 poverty line (in 2000 prices). Given the fall in both headcount rates and headcounts, this result makes sense. For the poor below the R174 poverty line, mean income $\hat{Y}$ in 2005 was R11 (or about 10.3 per cent) greater than it had been in 1995. Poverty reduction in South Africa proceeding at that rate, would mean that it would take almost half-a-century for the average poor person to climb over the R174 barrier. If, for some reason, it were thought appropriate to adopt such a miserly poverty line, then the country could have been said to have been making snail-like progress in the task of reducing it.

For the poor below the R322 poverty line, mean income $\hat{Y}$ in 1995 was R162.5 per capita per month in 2000 prices. By 2005, this had risen by R21.1 to R183.7. At this rate, a person whose income was equal to the mean in 2005, would take more than 60 years to reach the poverty line income. Shortfalls at the R322 line were R39.8 billion in 1995 and R37.3 billion in 2005 (in 2000 prices). In 2010 prices,[52] these shortfalls would have been roughly R66 and R62 billion. The upshot of about five years of rapid growth in the social grant system in which billions of rand were aimed at the poor (R51 billion went to about ten million recipients in 2005/2006),[53] was that the net annual cost of eliminating poverty (by a perfectly targeted grant) fell by about six or seven per cent.

After the announcement above to the effect that in 2005, mean incomes of the (ultra) poor were about seven per cent below the poverty line, as opposed to about 12 per cent below a decade earlier, Bhorat and van der Westhuizen say that:

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[51] There is likely to have been a substantial amount of churning among the ranks of the poor, with people moving up and down as their circumstances changed. The rapid spread of child support grants would have contributed to these movements, with households containing no workers and no grant recipients left behind to constitute a somewhat different chronic poor.

[52] A CPI for 2010 was estimated from the monthly values for January - October 2010 in the *South African Reserve Bank Quarterly Bulletin*, December 2010, p.S-137.

[53] See National Treasury 2009, p.90.

"Ultimately however, the key result, based on this preliminary analysis of the IES2005 data is that both absolute and relative poverty (on both the upper- and lower-bound poverty lines) have declined significantly in the first decade of democracy in South Africa." (2008, p.2)

Pity the poor word 'significantly' – its lack of an objective scale sees it pressed into all manner of uses (an abuse of which I, along with many others, am also guilty). It is, however, inappropriate to deploy an adjective which conjures up images of important changes in people's lives, only to have it made known on closer analysis, that the improvements are quite modest. One expects government to amplify every achievement by as much as it can – one does not expect academics to provide them with the raw material for doing so.

In South Africa, it looks as though the poor are clustered relatively densely around quite a low mean income – possibly about 12 million people with incomes (expenditure levels) between R174 and R322 per capita per month in 2005. Further down the distribution, the clustering may be even more dense – roughly ten million people in the R100-174 band. Estimates of the poverty headcount ratio in this range must be very sensitive to relatively small changes in the poverty line, or the mean income of the poor. Looking at the results in Tables 3 and 4 together, a change in the mean monthly income of those at the bottom of the heap of possibly in the region of R15-20 per month, is capable of pushing the headcount ratio from 30.9 per cent in 1995 to 22.7 per cent in 2005 at the R174 poverty, a fairly respectable fall. For those directly concerned (as opposed to those who make political capital out of them), the change is much less impressive.

Worsening inequality

It has been insisted above that inequality statistics, in a form that shows clearly how the distribution of income among the poor changes over time, must be added to popular poverty measures, like the FGT. To do so is not to limit, in any way, discussions about inequality that all too often take place at one remove from the poverty analysis. Prying into the causes of this intellectual apartheid would be interesting, but this is not the appropriate place to undertake such an exploration. In any case, as has been noted above, inequality has certainly not been neglected in the measurement of poverty – the most common measures all incorporate, with varying degrees of success, inequality data. Not surprisingly, given the difficulties of producing distribution-corrected poverty measures, attempts to do so have generated a huge literature. Having addressed this matter at some length above, it is now not inappropriate to address inequality in isolation.

If one places faith in simple indicators like (pre-tax) Gini coefficients, then the results that Bhorat and van der Westhuizen offer are not encouraging. These suggest that the coefficient rose from 0.64 to 0.69[54] over the period 1995-2005: This leads them to observe that:

"This is a disturbing result for a number of reasons: Firstly measures of income inequality by international experience, do not alter significantly over time in either direction. It takes large shifts in economic growth for example, to change an economy's income distribution or a very

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[54] According to the results in *Development Indicators 2009*, the Gini coefficient eased to 0.68 in 2008 (PCAS, 2009, p.25). Whether such tiny movements mean anything is moot.

particular pattern of growth …. Secondly, the result is disturbing within the context of South Africa being historically ranked as the most unequal society in the world with Brazil. This new result would suggest that South Africa is now the most consistently unequal country in the world. Simply put, while the democratic period has delivered declining poverty levels, it has also been marked by a significant rise in aggregate income inequality." (2008, p.11)

Read in conjunction with the re-interpretation offered above of the Presidency's optimistic analysis of progress in the struggle to at least reduce poverty, the findings on inequality make for depressing reading. Yet much, although not all of what has been concluded above, depends on whether or not the Bhorat and van der Westhuizen estimates are trustworthy.

If their results are to be relied upon, then one of their tentative conclusions, namely that it is between-race income changes rather than within-race changes, that is driving inequality, would constitute an important challenge to the received wisdom (Bhorat and van der Westhuizen, 2008, p.14). That conventional wisdom holds that the high incomes of a growing black middle class, coupled with high unemployment whose burden falls mainly on young black people, is responsible for rising within-group inequality that has contributed to the rise in overall inequality. Bhorat and van der Westhuizen challenge this finding, arguing that:

"While all race groups apart from Asians experienced a decline in their poverty levels as measured by the headcount rate and the poverty gap ratio [during the period 1995-2005], the evidence …. suggests that all population groups except Africans experienced increases in inequality." (2008, p.11)

They continue thus:

"In the South African context, the strong inequality between racial groups as a result of *apartheid* has always been a significant driver of aggregate inequality …. Studies using either the 1996 and 2001 Census data or the 1995 and 2000 IES data have found an increase in the contribution of within-group inequality driven to a large extent by increasing inequality within the African population …. The …. Theil-T coefficients for 1995 and 2005 by race run completely counter to these trends. Specifically then, the result here suggests that over the 1995-2005 period, the share of inequality driven by within-group dynamics in fact declined over this period. In turn then, the key driver of income inequality since 1995 has in fact been between-group inequality. In fact, by 2005, within-group and between-group inequality contributed in almost equal measure to total inequality." (2008, p.13)

In short, they conclude:

"… it is primarily income differences between the race groups – rather than those within – which have contributed to South Africa's growing inequality levels." (2008, p.14)

Leibbrandt *et al* (2010, p.33), by contrast, find in the period 1993-2008 that:

"There have been significant changes in the composition of racial inequality in that income inequality within racial groups has become increasingly more significant than inequality between racial groups."

Their Table 2.6 gives a Gini coefficient for the African population group of 0.54 in 1993. This reportedly rises to 0.62 in 2008 (Leibbrandt *et al*, 2010, p.32). A little further down on p.33, in confirmation of the claim about the increasing significance of within-group inequality, they report that:

"South African inequality between racial groups stood at almost 69% of its maximum possible level while maintaining the same underlying population structure and distribution of income. By 2000 this figure had fallen to about 50% and the measure stood at 48% in 2008."

It is not obvious how these conflicting sets of findings can be reconciled. We are left with the finding that inequality overall has increased. The dynamics of this increase are, however, disputed. What is not in contention is that despite the emergence of a significant Black middle class, inequality retains its racial character. Extreme inequalities are bad in and of themselves – the dominance of a racial dimension as driver of that inequality makes them even worse.

Unlike the van der Berg *et al* figures, which are demonstrably untrustworthy, we have no way at present of ascertaining how good the Bhorat and van der Westhuizen results are. Despite raised eyebrows about a paper on asset poverty (Bhorat *et al*, 2006), the DPRU has a good reputation, so we must assume, until it is demonstrated otherwise, that they have managed to 'tame' the primary data sources, the 1995 and 2005/2006 Income and Expenditure Surveys. The former of these is, however, beset by some serious problems, and they warn readers that since the full data set for the latter was not available at the time they undertook the research, the results should be treated as "preliminary only".[55] Predictably, this warning, despite its prominence in the Bhorat and van der Westhuizen paper, is nowhere to be seen in the *Fifteen Year Review*.

Digging into *Development Indicators 2009*

It is time now for a peep at the poverty results in *Development Indicators 2009* (PCAS, 2009). The layout of the tables reporting poverty headcount indices is the same as that in *Development Indicators 2008* – even the page numbering is the same. The headcount ratio estimates have been extended through to the year 2008. Apart from the 2008 estimates, all the headcount ratios are the same as their counterparts in *Development Indicators 2008*. Poverty lines have been expressed in 2008 prices – the R467 line goes to R524 (which looks a little steep, implying inflation of about 13 per cent); the R367 line grows to R388 (about five per cent inflation), while the R250 line jumps to R288 (13 per cent inflation once more).[56] The downward trend detected by the (incorrect) van der Berg *et al* results continues – an updated paper of theirs (2009) has the

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[55] The warning appears in the very first footnote in the paper (2008, p.2n).
[56] Most of the difference between these inflation estimates is probably accounted for by the fact that the Bhorat approach attempts to compensate for the bias in CPIs caused by 'plutocratic' weighting, i.e., weighting by share of expenditure rather than population shares (PCAS, 2009, p.23).

poverty headcount ratio falling from 41 per cent in 2007 to 39 per cent in 2008 (PCAS, 2009, p.26).

A recent paper by Bhorat (2009)[57] applies an interesting technique to the Consumer Price Index (CPI) data to estimate a headcount ratio for 2008. It is described on p.23 of *Development Indicators 2009*. How robust this is cannot readily be determined. Whatever the case, Bhorat now estimates that at the R467/524 line, the headcount ratio goes from 48 per cent in 2005 to 49 per cent in 2008 (PCAS, 2009, p.26). The overview at the head of the page, less upbeat than the previous year's comment, reads as follows:

> "Using various income poverty measures, the *number* of people living in poverty has declined especially between 1999 and 2007, although the rate of this decline is slow. In other words, although poverty has reduced over time, more worrying is the fact that the rate of eliminating poverty is slow." (PCAS, 2009, p.26, emphasis added)

How is it possible, one is bound to ask, for the Presidency to confuse number with rate or proportion, year after year? What would it take to encourage them to multiply Bhorat's estimates of headcount ratios by the population estimates? What would they say if after doing so, they discovered that the headcount rose from 20.7 million in 1995, to 22.5 million in 2005, and to 23.9 million in 2008?[58]

In view of what has been shown above to be the most recent information on poverty and inequality used in a publication from the Presidency, how are we to respond when the Minister in the Presidency responsible for National Strategic Planning (Trevor Manuel), informs readers of the recent Green Paper that:

> "Ours is a society in which poverty levels have declined but inequality has not significantly decreased." (Presidency, 2009, p.7)

In my opinion, we should protest vociferously, and for several reasons: one of them, as we have seen above, according to the Bhorat and van der Westhuizen, not only did inequality 'not decrease significantly', it is estimated to have increased.[59] Another is that while according to

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[57] Presumably commissioned by the PCAS for *Development Indicators 2009*, the Bhorat paper is referred to on p.26 of the publication. I do not even know its title, having been unable to download the last pages of *Development Indicators 2009* from the Presidency's website.

[58] According to Statistical release P0302, 31 July 2008, p.3, the mid-year population in 2008 was 48.687 million.

[59] Bhorat's estimates attracted criticism from on high. Joel Netshitenzhe (not long before he resigned) said that the Gini coefficients failed to take into account the difference that the 'social wage' made to inequality, an argument backed by Minister Manuel, who is reported to have said that he "… was not sure how relevant the Gini coefficient data (*sic*) was "any longer" ". See the article "South Africa has widest gap between rich and poor: Study finds SA now falls below Brazil", by Donwald Pressly in *Business Report*, 28 September 2009. Netshitenze, who had long beaten that drum, was not entirely wrong to do so. An attempt made by Bosch *et al* (2010), to estimate an after-tax, after benefits (in cash and kind) Gini coefficient, makes some headway in this field. Unfortunately, the paper is deeply flawed, containing as it does, results for only one year. Its weaknesses notwithstanding, the paper soon came to the attention of the press. An article in the *Financial Mail*, "Inequality: Policies narrow the gap" by Claire Bisseker (Thursday, 3 Jun 2010), points out that the aim of the authors is to "influence political debate on income and wealth distribution". An indication of the sort of influence they have in mind is given by Bisseker's regurgitation of the paper's claim that "SA spends about 3,5% of GDP on social grants and assistance, making it one

one measure, the poverty headcount ratio fell for a while, the poverty headcounts implied by the headcount ratios at that poverty line have not. Also, even though the poverty gap ratio has fallen, the effect of this fall on mean incomes of the average poor person over ten long years is likely to have been minuscule.

Although government acknowledges that poverty is still rife, persistent attempts to talk up what little has been achieved, to paper over unpleasing results, or to distort figures so as to make improvements seem more significant than they are, speak to an inability to confront reality. Government uses research in a shabby manner – boasting about poverty headcount ratios while ignoring the possibility that the poverty headcount could have risen by an estimated 1.8 million between 1995 and 2005 (or by 3.1 million between 1995 and 2008), is inappropriate, to say the very least. What makes it worse is the fact that the piece of research in question was commissioned specially for the Presidency. There can be no excuse for those who have to work with poverty figures being unaware of the debate in the literature (Kanbur, 2004; 2008) over what is to be said about poverty when the headcount rate falls, while at the same time the headcount rises, a phenomenon usually caused by population increases. Boasting about poverty gap ratios falling, while ignoring the likelihood that the increase in the income of the 'average' poor person was quite small (if we are to believe the Bhorat and van der Westhuizen results), is equally shabby.

NIDS: Finally, a reliable time series on poverty?

In recent times, another set of poverty and inequality estimates has made its appearance. There is some, but not much comfort in them for the authorities, so the question of whether or not they will make their way into a publication such as *Development Indicators* remains to be answered.[60] The paper in question was written for the OECD's Directorate for Employment, Labour and Social Affairs by Leibbrandt *et al* (2010). Given the intensely political nature of estimates of poverty and inequality, my immediate response to the paper was to scrutinize its results for potential use[61] in the ongoing debate over the topic in South Africa, a debate that is dominated by what I believe to be hopelessly over-optimistic estimates of progress in the struggle against poverty.

Having become sensitive to the presentation of the standard Foster-Greer-Thorbecke (1984) poverty estimates in ratio form only (a sensitivity on view above), my first step was to convert the P_0 estimates in the Leibbrandt *et al* paper to headcounts, and to attempt to estimate the cost of eradicating poverty (a task requiring our old friend $\hat{Y}$ to be estimated).

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of the most generous welfare states in the world." Similarly misleading articles appeared in the Afrikaans press – see, for example, the article headed "Regering doen dalk meer vir hervedeling as wat mense besef" by René Vollgraaff in *Rapport Sake24*, May 16 2010, *Nuusfokus* p.3. [Government perhaps does more for redistribution than people realise.] Woolard and Leibbrandt (2010, p.1) make the point about South Africa's social spending more soberly by pointing out that it "is more than twice the median spending of 1.4 percent of GDP across developing and transition economies…" The idea that this makes it 'one of the most generous welfare states in the world' is bizarre.
[60] There is no reference to any work by Leibbrandt or Woolard, both distinguished poverty researchers, in *Development Indicators 2010*.
[61] Recall from the discussion above that the potential users I have in mind 'are not other academics, but rather NGOs and activists, like those who do battle with government in forums such as Nedlac'.

The results of that exercise, along with the relevant results from the Leibbrandt *et al* paper are reproduced below in Table 5. The vast increases in headcounts make for uncomfortable reading. On the basis of the figures, one can say, however, that had the social grant system had not been extended in the way that it has, the poor would today have been even more numerous. Instead of an increase in the poverty headcount between 1993-2008 of 3.8 million, 5.1 million may have joined the ranks of the poor. In addition, the mean incomes of many of those below the poverty line would have been a lot lower.

Before commenting in any detail on the results, it is necessary to clear up some confusion over the population estimates. As those who have worked with South Africa's demographic statistics well know, there is no authoritative population series. The figures given in the Leibbrandt *et al* paper (those in the shaded cells in Table 5 below), show signs of the difficulty of finding firm footing in this morass. The 2008 estimate is the mid-year figure given by Statistics South Africa (Statistical release P0302, 31 July 2008, p.1). Let us accept that.

There appears, however, to be something wrong either with the 2000 figure and/or its 1993 counterpart. The increase in population over the seven year-period 1993-2000 is about two million, or a bit over 300 000 annually. For the eight-year period 2000-2008, the population increase is reportedly 6.3 million, just under 800 000 per annum. Both results are implausible. The fault could lie with either the 1993 or the 2000 values – one possibility is that either or both are merely typographical errors.

One way to construct a series is to back-cast Statistics South Africa's most recent estimates of the population growth rate. One needs to be aware though, that back-casts based on mid-year population estimates from different years yield estimates totals, because in the face of the AIDS epidemic, Statistics South Africa keeps changing its collective mind about population growth rates.[62] It is also necessary to be aware of the fact that back-casting can only go as far as 2001-2002 – for earlier years, especially in the pre-democratic period, use of the apartheid-era numbers, with all of their problems, is obligatory.

Digging into past estimates helps, but there are limits to what this can tell us. *South African Statistics 2002* reports, for example, that the 1993 population was 37 802 000, and that the 2000 population was 43 686 000 (p.1.1). This yields average annual increments to the population of about 840 000 in the period 1993-2000, and about 625 000 in the period 2000-2008. Given that in the latter period, AIDS tightens its grip, the estimates do not seem implausible. Back-casting based on the growth rates given in 2009 mid-year population estimates[63] (and using an extrapolated rate for the year 2000-2001) gives a population for the year 2000 of about 44 100 000. Although comfortingly close to the estimate of 43 686 000 above, this cannot be taken to mean that either estimate is correct.

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[62] Statistics South Africa's mid-year population estimates disclose frequent changes in estimated population growth rates, many of them unexplained. There is no coherent official population time series.
[63] See Statistical release P0302, 27 July 2009, p.8.

Headcounts are as important as headcount ratios

Table 5 presents the population estimates and estimates of the FGT P_0, P_1 and P_2 measures as they stand in the Leibbrandt *et al* paper.

Table 5 Poverty headcounts and poverty gaps in 1993, 2000 and 2008

		Poverty when income includes government grants									
Year		**Poverty line = R949**					**Poverty line = R515**				
	Population	P_0	Headcount	P_1	$\hat{Y}$	P_2	P_0	Headcount	P_1	$\hat{Y}$	P_2
1993	40 150 000	0.72	28 910 000	0.47	330	0.36	0.56	22 490 000	0.32	221	0.22
2000	42 360 000	0.71	30 080 000	0.45	348	0.33	0.54	22 880 000	0.29	238	0.19
2008	48 690 000	0.70	34 090 000	0.44	353	0.32	0.54	26 300 000	0.28	248	0.18
1993a	38 000 000	0.76	28 910 000				0.59	22 490 000			

		Poverty when income excludes government grants									
Year		**Poverty line = R949**					**Poverty line = R515**				
	Population	P_0	Headcount	P_1	$\hat{Y}$	P_2	P_0	Headcount	P_1	$\hat{Y}$	P_2
1993	40 150 000	0.73	29 310 000	0.53	260	0.43	0.60	24 090 000	0.40	172	0.32
2000	42 360 000	0.72	30 500 000	0.50	290	0.40	0.57	24 150 000	0.37	181	0.29
2008	48 690 000	0.71	34 570 000	0.54	227	0.46	0.60	29 220 000	0.44	137	0.37
1993a	38 000 000	0.77	29 310 000				0.63	24 090 000			

Increase in headcount 1993-2008

Including grants		5 180 000		3 810 000
Not including grants		5 260 000		5 130 000

Source: Values in the shaded areas are drawn from Leibbrandt *et al*, 2010, Table 2.10 and 2.17, pp.36 and 46. Other sources are described below.

Below the upper two panels of the table is a set of estimates in rows marked '1993a', with total population rounded up from the 37.8 million above to 38 million. From the headcounts estimated in the top two panels of the table – the upper of which includes grants in the total income estimates, the lower of which does not – estimates of the changes in poverty headcount over the period 1993-2008 are offered in bottom-most panel of the table.

Based on their results, they argue that:

> "Looking at the headcount ratio for both poverty lines it seems clear that poverty has fallen slightly over the 15 year period. The changes in the mean poverty gap and the squared mean poverty gap ratios suggest that when taking the depth and severity of poverty into account, the gains over the period have been slightly higher than indicated by the headcount ratio." (2010, p.36)

Use of the lower population estimate for the year 1993 would have removed the need to make use of the word 'slightly' – a fall in the headcount ratio from 0.76 to 0.70 or from 0.59 to 0.54, although not large, is not 'slight'. Waiting in the wings for results of that sort is a government ever eager for news of the success of its policies. The smaller population figure would certainly have made that news seem better than the present figures would lead them to believe. Yet as will be shown below by reference to the headcounts, it is difficult to draw much comfort from the Leibbrandt *et al* results – even their modest finding that:

> "… poverty levels have decreased only slightly over the period under review …" (2010, p.10)

can only be justified by adopting the narrow view that a fall in the headcount ratio, regardless of what happens to the actual headcount, qualifies as a 'decrease'.

The truth of the latter claim may be demonstrated by showing that although headcount ratios may have fallen, headcounts have risen, thus foreclosing on any possibly of drawing unambiguous conclusions about whether or not poverty has worsened (a subject to be addressed at greater length in the next section of the paper). Since the number of poor individuals (those with income $y_i \leq z$) in any year is unaffected by the size of the population, the use of a smaller population figure must cause P_0 to rise. Thus in Table 5 we see that if the population of South Africa in 1993 had been 38 million, instead of 40.1 million as suggested by Leibbrandt *et al*, the headcount ratios in 1993, instead of being 0.72 and 0.56 respectively at the R949 and R515 poverty lines would have been 0.76 and 0.59.

At the R949 poverty line (which is high by comparison with the very low incomes of the many millions below the R515 poverty line) the headcount over the period 1993-2008 increases by 5.18 million when income including grants is taken into account, and by 5.26 million when it is not. That finding makes sense – if the poverty line is pushed high enough then the headcount will not be affected much by the payment of social grants.

When some very large proportion of a population falls below a poverty line (in the present case, more than 70 per cent of the population), the addition of relatively small grants to the incomes of those who are located mainly in the bottom five or six deciles of the population will obviously have little effect on headcounts.

Things are more interesting at the R515 poverty line. Using the 1993 population estimate results in an increase in the headcount over the period 1993-2008 of 3.8 million when grants are taken into account, and 5.1 million when they are not. Both figures are highly significant. The first of them says that despite the massive expansion of the social grants system, the poverty headcount still rose by nearly four million. The second of them informs us that had it not been for the grants, the poverty problem is likely to have been even worse – it is possible that the headcount could have risen by more than five million.

A poverty gap deserves more than a P$_1$ ratio

As was the case with the Bhorat and van der Westhuizen paper through which we have meandered above, the estimates in Table 5 suggest that lurking behind the FGT ratios are some interesting figures – none perhaps more so than estimates of the mean income levels of the poor. In the first section of the present paper it was argued that several augmentations to the poverty gap ratios one has become accustomed to seeing in poverty studies, were required. They may be seen in Tables 1 and 2 above. One of them tells us what the mean income was of the average poor person ($\hat{Y}$). Another takes this mean and multiplies it by the poverty headcount to obtain an estimate of the size of the transfer that would be required to eliminate income poverty, i.e., to raise the income of all of those in poverty to the level of the poverty line. Yet another use for estimates of the mean income of the poor is in the production of estimates of crossover periods: the length of time it would take for average poor per person to achieve an income equal to z, the poverty line (or one of the poverty lines). Accordingly, in addition to the headcounts argued to be essential for any understanding of income poverty, the Leibbrandt *et al* Tables 2.10 and 2.17 reproduced above in Table 5, have had added to them estimates of $\hat{Y}$.

One wonders whether, in all the fuss made about poverty and poverty statistics, anyone has tried to use the implied mean income estimates in the Bhorat and van der Westhuizen paper, as a means of assessing government progress in tackling poverty? If they had, they would have discovered, as I did, that growth in the mean incomes of the poor ($\hat{Y}$) was very slow. In view of the massive increase in social grants over the period, this finding seemed a bit puzzling. It was only when I looked carefully at the Leibbrandt *et al* (2010) results that I saw clearly, what a mistake it was to attempt to answer the 'progress in tackling poverty' by comparing post-benefit incomes. The appropriate incomes to compare are those actually received in any year, and those that would have been received had social grants not been received by the poor.

Like most counterfactuals, those presented in Table 5 are contentious. It could, for example, be argued, possibly not very persuasively, that in the absence of grants, the poor

would have pulled themselves up by their bootstraps. No doubt other, maybe more plausible scenarios, could be put forward. None of this could, however, detract from the fact that the idea of presenting poverty gap estimates in a form that both includes and excludes grants from total income is an excellent one.

The estimates of $\hat{Y}$ in Table 5 given in the form required to make such a comparison, show that instead of concluding from the estimates of income including social grants, that the mean income of the average poor person below the R515 poverty line increased by R27 per month (all figures cited from the Leibbrandt *et al* paper are in 2008 prices) between 1993 and 2008, we could say that in the absence of grants, mean incomes of the poor without grants would have been about R172 per capita per month in 1993. With the provision of grants, income rises to R221 in the same year. In that year, most of the income increase would have come from state old age pensions. Mean income including grants reaches R248 by 2008. There is modest growth in the numbers of pensioners, many more join the ranks of the disabled, and the number of child support grants tops eight million.[64] The fact that despite the flood of new beneficiaries, mean income grows by so little (R27) over the 15 years, is partly explained by the modest size of the child support grant.[65]

To be able to see what the gap may have been (and, as noted above, we can argue about counterfactuals) had government not made the grants available, is extremely useful indeed – Leibbrandt *et al* are to be congratulated. Although government intervention has not been able to make much of an impression on inequality, and has had only a marginal impact on headcount ratios, we obtain a more optimistic account when we look at what may have happened had it not intervened.

Not only should poverty gap ratios be augmented by estimates of the mean poverty gap $(z - \hat{Y})$, they should always be presented side-by-side with estimates of the shortfall, viz., the size of the annual transfer, perfectly targeted and costlessly delivered, that would eliminate poverty. Although objections may be raised against a 'shock' statistic of this sort, it does have the merit of focusing the mind on the absolute scale of the poverty problem. Based on the mean income figures in Table 5 of R221 and R238 in 1993 and 2000, respectively, the estimated shortfall in 1993 would have been about R79 billion. Dipping slightly to R76 billion in the year 2000, it rises to R84 billion in 2008 (all in 2008 prices). To set the figure of R84 billion in perspective, in 2008/09, the main budget called for expenditure of about R611 billion, R71 billion of which took the form of social expenditure.[66]

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[64] Among 3.2 million social grant recipients in South Africa in March 2000, there were 1.9 state old age pensioners (R540 per month); 600 000 people receiving disability benefits (R540 per month), and 320 000 beneficiaries of the child grant of R100 per month (National Treasury, 2001, pp.65 and 67). By April 2008, these numbers had climbed to 2.2 million (R940 per month); 1.4 million (R940 per month); and 8.2 million (R210 per month) respectively. The total number of grant recipients was 12.4 million, (see *Budget Review 2009*, National Treasury, 2009, p.90).

[65] If my arithmetic is correct, there is, however, something decidedly odd about the 2008 mean income estimate when social grants are excluded – R137 per capita per month – a fall of R44 over the eight years from 2000 to 2008.

[66] See *Budget Review 2008*, National Treasury 2008, Ch 1, p.11 and Ch. 6, p.95.

Confronted by figures like these, even the most ardent redistributionist would be compelled to acknowledge, if they had not already done so, that without the helping hand of growth, poverty cannot easily be eradicated through the fiscus. Knowing, as they must do, that the capacity to distribute the 'correct' amount of social assistance (in the form of grants) to each individual or household, does not exist and cannot be created in the South African government,[67] and indeed, in most other governments, they would be aware that the actual size of the transfer required to eradicate poverty would be much larger. Unfortunately, the fact that redistribution through the fiscus cannot eradicate poverty without major dislocation, has been used to shut down the debate on the desirability or otherwise of further redistribution in South Africa as a means of addressing both poverty and inequality.

Information of the sort presented above could help to change this. Recast in terms of the minimum politically acceptable rate of poverty reduction; a set of sensible estimates of feasible job creation rates that identify potential new workers by income status, and an open-ended exploration of the limits to redistribution, there is a possibility of softening the hard-line (ideological) stance of 'growth fundamentalists' in the Treasury and elsewhere.

How does P_2 help *you* to grasp the severity of poverty?

Changes in all three FGT ratios over the period 1993-2008 were slight – as Table 5 shows, using the post-transfer income figures at the R515 poverty line, the value of P_0 in 1993 was 0.56; it declined a little to 0.54 in 2008. P_1 was found to be 0.32 in 1993 and 0.28 in 2008, while the P_2 ratio fell from 0.22 in 1993 to 0.18 in 2008. Given that the P_2 measure does not satisfy the requirements of the transfer sensitivity axiom, without supplementary information we are unable even to guess at what has happened to the distribution of income among the poor. So, while the fall in P_2 is possibly to be celebrated, we cannot assume that such changes in the distribution as have taken place, would meet, say, a Rawlsian criterion. The observed fall in P_2 could, for example, have been caused by a substantial transfer among the poor fairly close to the poverty line, or by a smaller transfer further down the distribution.

The Leibbrandt *et al* piece, like the Bhorat and van der Westhuizen (2008) paper, contains information that can make the P_2 ratio a little less mysterious. This is used to generate the figures in Table 6 below.

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[67] The travails of the South African Social Security Agency (SASSA) illustrate how difficult it is to create a benefit-dispensing institution with a relatively modest, albeit large-scale set of goals (that of distributing, or organising the distribution) of the social grants. A recent newspaper article describes how, a scant five years after being set up, SASSA had to fire it chief executive officer for procurement irregularities, while the National Treasury is currently engaged in developed a 'turnaround strategy' for SASSA because of an unfunded deficit of R1.2 billion, not to mention the overpayment each year of an estimated R1 billion to firms delivery benefits. See "Social grant agency R1,2 billion in the red", by Linda Ensor, *Business Day*, 21 July 2010.

Using a rule and pencil to read off income and cumulative population figures from the CDFs plotted in Figure 2.7 page on p.40 of the Leibbrandt *et al* paper, the necessary information may be extracted.[68] Although the quality of the graphics leaves a little to be desired, (the CDFs for 2000 and 2008, for example, cannot easily be separated at many points), with the result that the readings are only rough approximations, they are adequate for the exercise conducted here.

Table 6 Milking the CDFs: Changes in headcounts at various incomes, 1993-2008

Income level	Cumulative proportion of population		Cumulative headcount (millions)		Percentage change 1993-2008	
	1993	2008	1993	2008	Proportion	Headcount
R100	0.12	0.08	4.9	3.9	-53	-26
R200	0.28	0.23	11.0	11.2	-20	1
R300	0.40	0.35	15.9	17.2	-12	8
R400	0.49	0.46	19.6	22.3	-6	12
R500	0.55	0.53	22.2	25.8	-5	14
R515	0.56	0.54	22.5	26.3	-4	14

Source: Estimated from the CDFs in Figure 2.7, p.40 in Leibbrandt *et al* (2010).

Note: Income levels and poverty line (shaded) are in R/month per capita in 2008 prices. Income includes government grants. Population figures are those given in Table 5 above.

If falls in P_2 over time are not caused by 'perverse' income transfers (among the wealthier poor, for example), we would expect inequality among the poor to fall. The figures in the table suggest such a fall – the proportional change in the cumulative share of the population below the poverty line is greatest at the lowest income in the table. Accompanying the large proportional change in P_0 at R100 per month, is a proportionately large drop in the headcount (26 per cent). That, though, is almost the end of the good news in this set of results. For those with incomes equal to or less than R200 per month, the cumulative proportion falls quite substantially, but population growth converts this into a small increase in the number of poor. The fall in the cumulative proportion of the population below the poverty line continues, but at a decreasing rate as the income level rises. Percentages changes in cumulative headcounts, by contrast, grow steadily as income rises. All in all, the ratios suggest that the changes are in the right direction. The problem is that the rate of poverty reduction is so slow that it cannot prevent the headcount from rising.

Approaching the problem by estimating mean incomes in the different population deciles is not possible with the information available in the paper. It looks as being able to do so would be an enlightening experience. Figure 2.3 on p.25 in the Leibbrandt *et al* paper presents a distribution of income by decile which shows the bottom decile barely scraping

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[68] It would be interesting to see the plots of the cumulative distribution functions for income with and without grants for the three years. Figures A.3.2-A.3.6 (Leibbrandt *et al*, 2010, pp.83-85) offer a series of CDFs, but none looks at the 'without grant' distribution.

itself off the base line, while by the year 2008 those in the top decile come to enjoy almost 60 per cent of all income. The numbers on which the chart is based are given in Table A.3.3 on p.78 – they make interesting reading. The share of income of the bottom decile rose from 0.27 per cent of the total in 1993 to 0.40 per cent in 2008. The share in each decile from 2 to 9 fell, while the share of the 10th decile rose from 53.9 per cent in 1993 to 58.1 per cent in 2008. Since these measures are relative rather than absolute we do not know what has happened to income levels at various points in the distribution. It is almost certain that incomes rose in decile1, but what about decile 5, where the share fell from 3.15 per cent in 1993 to 2.78 per cent in 2008?

It would be a simple matter for the authors to provide this information.[69] Certainly, one would hope that an appeal to them (and to authors of similar pieces of work) to make their own estimates widely available, would be favourably received. The preferred form for such a release could be a short paper, offering selected findings, something along the lines of those proposed in Table 2 of the present paper.

Despite its limitations,[70] as a statement about the state of poverty and inequality in South Africa since the advent of democracy, the Leibbrandt *et al* 2010 paper has at present no peers. It is more than a little surprising that its results have not yet made the waves they ought to have done. If its shocking findings are to be relied upon, then income poverty deserves to enjoy a little more attention in the development debate. To suggest this is not in any way to deny the multi-dimensional nature of poverty, and the consequent need for a multi-pronged attack on it. Rather, it is to remind those who objected (reasonably) to past domination of the poverty debate by income poverty estimates, that to downplay them too much is to throw out one of the babies with the bath water. People who lack sufficient income are forced into making terrible choices – reducing food consumption, for example, to purchase other necessities.[71]

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[69] Obtaining access to the National Income Dynamics Study (NIDS) data on which Leibbrandt *et al* base their 2008 findings, would, presumably, not be difficult – extracting the desired results from it would, however, require much more work than is required to make the argument offered here.

[70] The paper's most important weakness is a failure to take taxes into account when presenting income estimates. On this issue, see the reference in footnote 57 above to the paper by Bosch *et al* (2010), and the brief discussion of the weaknesses of the approach adopted by the authors. A less significant weakness in the Leibbrandt *et al* paper is their treatment of the Expanded Public Works Programme (EPWP), based largely on data of indifferent quality collected by Statistics South Africa's Labour Force Surveys (LFSs).

[71] Firm support for the protagonists of the multi-dimensional approach may be found in the work of Alkire and Santos (2010). They have developed a Multidimensional Poverty Index (MPI) that purports to offer a far more comprehensive view of poverty than do simple measures like the FGT poverty indexes. Their estimates for almost 100 countries worldwide reveal some startling discrepancies between the two. In Ethiopia, for example, the proportion of the population falling below the $1.25/day poverty line was about 39 per cent, whereas the MPI registers 90 per cent of the population as experiencing multi-dimensional poverty. In South Africa, by contrast, the proportion of the population below the $1.25 line was about 27 per cent, while the MPI was a mere three or four per cent (Alkire and Santos, 2010, p.32). The year is not given, but is presumably that for the most recent Demographic and Health Survey (DHS), Multiple Indicators Cluster Survey (MICS), or the World Health Survey (WHS), whichever was available (see Alkire and Santos, 2010, p.21). Somebody should bring these results to government's attention – their delight at having been vindicated would know no bounds. Unfortunately, the Alkire/Santos index is flawed – education and health, each of which account for one-third of the total value of the index (p.20), are likely to be of much less value in ameliorating the effects of poverty in South Africa than the MPI suggests. This

A few limited criticisms of the paper have been offered in the present work – what the Leibbrandt *et al* paper requires now is rigorous scrutiny by the scholarly community. If it survives that, its findings could be distributed in a more user friendly form, in order to make its results accessible to those whose knowledge of such delights as generalised entropy measures is possibly not all it should be.

The publication of Statistics South Africa's Living Conditions Survey is imminent. There had been no indication that the results would not be ready by the scheduled release date of the last quarter of 2010. At the time of writing this final draft, however, they had not yet appeared. If the Living Conditions Survey poverty estimates are close to the Leibbrandt *et al* figures for the current period (2008/2009), and the 1993 Leibbrandt *et al* estimates survive critical scrutiny, the first reliable picture of the trajectory of income poverty in democratic South Africa may emerge.

Conclusion

On the basis of the information presently at our disposal, it must be concluded that although the poverty headcount rate may have fallen somewhat since the advent of democracy in 1994, the number of those below any reasonable poverty line has risen by several million. Views on how large the poverty problem is may change when the results of the Living Conditions Survey conducted by Statistics South Africa become available. For the meanwhile, however, we cannot ignore the possibility that in absolute terms, there are more poor people than ever. But for the fact that HIV/AIDS has carried off many hundreds of thousands, lowering population growth rates in the process, the number of poor may have been greater still. The only consolation is that the number of very poor people has probably fallen – it looks now as though those at the bottom of the heap, are those who are not in receipt of, or not eligible for a social grant of some sort.

Despite the efforts of some the best poverty researchers in South Africa, government seems unwilling to, or incapable of coming to terms with the possibility, outlined above, that poverty may now be a bigger problem than it was in 1994. Part of the explanation for this lies in the fact that researchers disagree among themselves as to what has happened. One research team, that of van der Berg *et al*, has regularly produced good news on poverty for the South African government. Their findings are contradicted, however, by two other groups (Bhorat and van der Westhuizen, and Leibbrandt *et al*), both of whom detect substantial increases in the poverty headcount.

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is an area of investigation that simply cries out for further investigation. Unless the MPI can be adjusted for quality, its results are suspect. I am grateful to Gemma Wright of the Centre for South African Social Policy Analysis (CASASP) in the University of Oxford, who brought this work to my attention. Dr Wright has done extensive work under the leadership of Prof Michael Noble, the director of CASASP, on the development of an index of multiple deprivation (IMD). Used first in England, estimates of the IMD at a variety of levels in South Africa have been made. These may be viewed on the CASASP website www.casasp.ox.ac.uk.

Reflex defensiveness, and an apparent unwillingness to acknowledge that the headcount may actually have risen, leads government to continue asserting the contrary, as the passage from *Development Indicators 2009* cited above made clear. There, it may be recalled, it was claimed that:

> "Using various income poverty measures, the number of people living in poverty has declined especially between 1999 to 2007… "

They did, however, condescend to acknowledge that:

> "… the rate of this decline is slow. In other words, although poverty has reduced over time, more worrying is the fact that the rate of eliminating poverty is slow." (PCAS, 2009, p.26)

It seems to me that one reason why government can continue to claim that the number of people living in poverty has fallen, is the mode of presentation of results of those who suggest that this is not so. Here, the finger of accusation points chiefly in the direction of Bhorat and van der Westhuizen, who present their findings in such a way that government is able to draw unmerited comfort from them. Packed full of information on trends in inequality as the Bhorat and van der Westhuizen paper is, the publication of their poverty results in a form like Table 2 above (i.e., giving headcounts at various income levels below the poverty lines) should have made it impossible for government to claim too much credit for its anti-poverty policies.

Although tentative, the Bhorat and van der Westhuizen findings deserve close attention. When the headcount ratios are converted into headcounts, the numbers in poverty at the R322 per capita per month poverty line (in 2000 prices) rise from 20.8 million in 1995 to 22.5 million in 2005, and then to 23.9 million in 2008, an increase of 3.1 million over the period 1995-2008.

As may be seen in Table 5 above, the Leibbrandt *et al* findings suggest that the poverty headcount went from 22.5 million in 1993, to 26.3 million in 2008, a similar increase to that reported by Bhorat and van der Westhuizen, and based on completely separate data sources. The Leibbrandt *et al* findings are also not reported in headcount form, nor is advantage taken of the comprehensive information they generate on inequality to create a poverty report that is free from ambiguity. This, I would argue, is not the best way to place before the public the fruits of their diligence. My suggestions for setting about that task are contained in Table 2 above and the accompanying discussion. In essence, they propose that absolute numbers of the poor (headcounts) should always be given with headcount ratios, along with estimates of the magnitude of $\hat{Y}$, the mean income of the poor (medians are useful too). The means should, if possible, be presented in the form used by Leibbrandt *et al*, i.e., including and excluding government grants (with a warning about the problems of counterfactuals). Estimates of the size of the shortfall should be given, accompanied, of course, by warnings about the speculative nature of such numbers.

Crossover periods, which are even more speculative, based as they often are on extrapolations of past performance, should be presented, if only for their shock value. The commentary on estimated crossover periods needs to spell out carefully the assumptions used. When, as has happened in South Africa, the social grant system is expanded rapidly over a relatively short period, one cannot simply project the experience of the period into the future, because with grant take-up approaching saturation levels, future poverty reduction rates will slow down unless employment creation rises. That means that labour market predictions have also to be taken into account. In truth, like all speculations about the future, crossover periods are fragile creations. Fragile they may be: that does not, however, detract from their ability to spark lively debate about poverty reduction policies.

Inequality studies tend to have as their main focus, inequality among the population as a whole. Decomposable measures like the Theil lend themselves, of course, to analysis of any group in the population one can identify, so there is no inevitability as to what enjoys close scrutiny and what does not. While there is no denying the importance of inequality among the wider population, it is also true that changes in poverty levels among the poor are important as well. Accordingly, it is proposed that a table recording changes in mean incomes among the various categories of poor (they could be sorted by percentile, or by income category), be provided, along with some simple inequality indicator like the Gini coefficient. Depending on the extent of poverty, somewhere between four and six categories could be a reasonable compromise between comprehensiveness and clutter. Brief discussion of distributional changes within and between the different categories of poor, would help to fill in some of the missing pieces in poverty's jigsaw puzzle.

It should be taken as read that almost without exception, governments will seek to extract as much good news as possible from studies that chart the progress (or lack thereof) in the struggle against poverty and inequality. As a matter of course, governments can also be expected to downplay as much of the bad as possible, unless it can be laid at the door of a previous administration (the apartheid regime, for example). Taking up the suggestions offered in the present paper for a set of income poverty measures that are rigorous, while at the same time, being comprehensible among the widest possible audience, should help to ensure that when government digests poverty statistics, it cannot strip them of their essential meaning.

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Appendix: AIDS, poverty and Kanbur's 'hard question'

The question of what to say about poverty is apposite in more than just the sense in which Kanbur posed it – since some point in the 1990s, South Africa has been undergoing a demographic transition wholly unlike that proposed by conventional models – namely, a drastic reduction in population growth rates caused by the AIDS epidemic. According to recent estimates, Statistics South Africa thinks that the population growth rate fell from 1.38 per cent per annum over the year 2001-2002 to 1.07 per cent per annum over the year 2007-2008 – corresponding rates for women, who are worse affected by AIDS, are 1.30 and 0.99 per cent, respectively (Statistical release P0302, 27 July 2009, p.8). Although substantial, this decline in the growth rate is much less dramatic than the results reported in the previous year which saw it falling by about ten basis points (one-tenth of one percentage point) each year.[72]

Faced by such a calamity, it clearly is necessary for us to reflect on the linkages between poverty reduction and AIDS. One thing to do would be to speculate about what poverty might have been in the absence of AIDS – if we had the data, we could, for example, decompose estimated changes in poverty into those attributable to AIDS, and those to all other causes (the reductions being chiefly caused by expansion of the social grant system, especially the child support grant).

Regrettably, your average economist (and possibly your average demographer) would soon run into difficulties. Not only is it not possible (for reasons given below) to make the decomposition referred to above, it is also difficult to take the first step in that exercise, namely, estimating what the population would (might?) have been in the absence of AIDS. Nowhere in the catalogue of important national statistics from the official statistics producer are the numbers less satisfactory than in the field of population estimates. In the 2005 mid-year population estimates, Statistics South Africa claimed that year-on-year population growth for 2000-2001 was 1.10 per cent, and 0.92 per cent for 2004-2005 (Statistical release P0302, 31 May 2005, p.10). Its 2008 counterpart gave corresponding estimates of 1.45 and 1.16 (Statistical release P0302, 31 July 2008, p.7). It is hard for a non-specialist to reconcile population estimates in an official annual publication like *South African Statistics* with published growth rates in the mid-year estimates. Digging back into the pre- or early democracy era does little to decrease the difficulties – a 1996 report by the Financial and Fiscal Commission, for example, informs us that the Development Bank of Southern Africa put the population growth rate between

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[72] In the mid-year population estimates for the year 2008, Statistics South Africa reported that population growth rate fell from 1.45 per cent per annum over the year 2001-2002 to 0.82 per cent per annum over the year 2007-2008 – corresponding rates for women were 1.41 and 0.74 per cent, respectively (Statistical release P0302, 31 July 2008, p.7). Statistics South Africa is remiss in not pointing out to users the large differences in estimated population growth rates between their 2008 and 2009 estimates. There is possibly some connection between the new, improved 2009 population growth rates, and a paper by Eric Udjo (2008), a demographer formerly employed by Statistics South Africa. The paper suggests that AIDS prevalence may not be as high as was thought, and that previously estimated falls in life expectancy may be an exaggeration. Udjo's findings are challenged by Dorrington and Moultrie (2008).

1990-1995 at between 2.29 and 2.31 per cent per annum, while Prof Simkins returned a figure of 1.96 per cent per annum for the period 1991-2001.[73]

One institution (there are probably others) that has attempted the task of reconciling the confusing growth rates referred to above, if not actually producing population estimates that agree with the Statistics South Africa figures, is the Centre for Actuarial Research in the University of Cape Town. The job of preparing counterfactual estimates of a population growth has clearly been performed in that centre. Dorrington *et al*, 2006, for example, informed us that "life expectancy was some 13 years below what it is expected it would have been without HIV/AIDS… " (p.3). The table on p.21 of that work smoothes growth rates in such a way as to allow a population growth rate of 2.3 per cent per annum in 1995 to fall away to 0.8 per cent per annum in 2005 (which number, of course, was close to Statistics South Africa's 2007-2008 estimate).

To cut short the ride on the merry-go-round, let us write a counterfactual by simply mixing the Statistics South Africa and Dorrington *et al* stuff. We start by accepting a population size of 40 583 573 for the census month of October 2006[74]. We chop this back to a mid-year figure of 40.27 million, then estimate a 1995 mid-year figure of 39.36 million, using the Dorrington *et al* 1995 growth rate. Assume now that that rate of 2.3 per cent per annum declines in a 'normal' demographic transition process by 0.03 percentage points (three basis points) each year, to give a population growth rate in 2005 of 2.0 per cent per annum. That would yield, all other things being equal, a population in 2005 of 48.64 million. The Statistics South Africa mid-year estimate for that year was 46.89. In other words, over the period 1995-2005, HIV/AIDS caused the population to be smaller by 1.76 million people than we would otherwise have expected it to have been. As we read the figure, let us keep in mind what it is – a crude order of magnitude – the 'real' figure could have been anywhere between say, half-a-million and two-and-half million.

The critical question is: how many of these people would have been poor, as defined, for instance, by either of the two poverty lines referred to above (or by any other measure that could be devised)? The answer is that we do not know – AIDS deaths are educated guesses – AIDS deaths grouped by income category require assumption-making well beyond the heroic.

What we should *not* do, is to take the Bhorat and van der Westhuizen headcount poverty rates for 2005 in the Table 3 above, and apply them to our counterfactual population estimate for that year. Let us simply say instead, that between 1995 and 2005, the number in poverty at the modest poverty line of R322 per capita per month probably increased by about 1.8 million, while at the very low poverty line of R174 it could have fallen by about 1.5 million. We may say, without fear of contradiction, that the increase in the number of poor would have been much greater had the social grant system not been

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[73] The fragment of a report, whose full title I have not been able to track down, from which these figures come was downloaded from http://ffc.co.za/docs/submissions/1996/0513-app4.asp on 23rd March 2009. The originals could, of course, be traced to their roots. That, however, is unnecessary.
[74] See *South African Statistics 2007* (p.2.1).

expanded so dramatically. We should also say, however, that it is possible that the number in poverty in 2005 could have been even larger, were it not for HIV/AIDS.

With that, we are back where we started, namely, with the complaint about Statistics South Africa having taken about 14 years to initiate a survey that may yield authoritative estimates of poverty (and inequality?), if its results had been published as promised in the last quarter of 2010. For a government whose first priority is supposed to be the poor, the record of the provision of data with which to measure progress in the fight against poverty, is not merely unimpressive, it is (or at least it would be, if politicians were not so thick-skinned), an embarrassment.
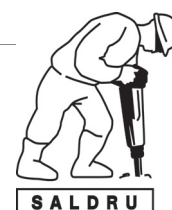
southern africa labour and development research unit

The Southern Africa Labour and Development Research Unit (SALDRU) conducts research directed at improving the well-being of South Africa's poor. It was established in 1975. Over the next two decades the unit's research played a central role in documenting the human costs of apartheid. Key projects from this period included the Farm Labour Conference (1976), the Economics of Health Care Conference (1978), and the Second Carnegie Enquiry into Poverty and Development in South Africa (1983-86). At the urging of the African National Congress, from 1992-1994 SALDRU and the World Bank coordinated the Project for Statistics on Living Standards and Development (PSLSD). This project provide baseline data for the implementation of post-apartheid socio-economic policies through South Africa's first non-racial national sample survey.

In the post-apartheid period, SALDRU has continued to gather data and conduct research directed at informing and assessing anti-poverty policy.   In line with its historical contribution, SALDRU's researchers continue to conduct research detailing changing patterns of well-being in South Africa and assessing the impact of government policy on the poor. Current research work falls into the following research themes: post-apartheid poverty; employment and migration dynamics; family support structures in an era of rapid social change; public works and public infrastructure programmes, financial strategies of the poor; common property resources and the poor. Key survey projects include the Langeberg Integrated Family Survey (1999), the Khayelitsha/Mitchell's Plain Survey (2000), the ongoing Cape Area Panel Study (2001-) and the Financial Diaries Project.