"Smoke and Mirrors" The science of poverty measurement and its application

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INTRODUCTION

An inaugural lecture can take many forms: an opportunity to reveal some new research findings, a review of the latest thinking in a particular field, or even a rant as to why everyone else has got it wrong. This lecture has a more strategic objective: to share with you what I think that I have learnt from 30 years of work in the measurement of poverty and its application. I then want to discuss how this informs my intentions for the newly created Chair in Applied Poverty Reduction Assessment funded by the National Research Foundation and the Department of Science and Technology.

Since its early beginnings in the slums of York and London at the end of the 19th century, the measurement of poverty has become commonplace. It has matured into a technical exercise, perhaps even a science, and has been integrated as the first step of 'poverty diagnostics' routinely undertaken in both developing and developed countries. At best this can be likened to the medical tests that narrow down the likely causes of the ailment and thus enable treatment to be prescribed. At worst, it may be no more than a cursory examination, little diagnosis, and a one-size-fits-all treatment. Until quite recently this was usually the mantra of fiscal discipline, macroeconomic stability, openness to trade and the protection of property rights.

By 2009 over 30 low income countries had completed full Poverty Reduction Strategy Papers (PRSP), with several now embarking on what has been termed 'third generation PRSPs'. It is not surprising that learning how to measure poverty is regarded by students and employers as a useful skill and that my course is usually over-subscribed each year. Many organisations now make available data collection and measurement toolkits of various kinds including the World Bank, CARE international and the United Kingdom's Department for International Development (DFID). The title of Jean Lanjoaw's useful review published by the UNDP ten years ago seems pertinent: the technical aspects of poverty measurement have indeed have been demystified (Lanjouw 2001).

So why then 'smoke and mirrors'? Despite its widespread use, when applied, the measurement of poverty continues to be the subject of a politicised debate in which measurement is still seen as obfuscation, the thresholds as unacceptably conservative, and the division of society into poor and non-poor as being of questionable use. In fact, Eboe Hutchful, a Ghanaian

political scientist, used this term in a 1994 paper to describe the poverty policies of the World Bank. In this paper he contests how the World Bank and Ghanian government used poverty measurement to inform the countries' 'Programme of Actions to Mitigate the Social Costs of Adjustment' (Hutchful 1994). Rather than identifying the causes of poverty, he suggests that the Ghana Living Standards Survey (GLSS) was used to reinforce existing preconceptions of who is poor and how their poverty is to be addressed while the issues of inequality, differentiation and power were glossed over. The result, in Hutchful's words, was '...modest funding, poor design and indifferent implementation (Hutchful, 1994: 583).

Poverty measures are also associated with contentious political choices such as the nature and level of support provided by public policy, how minimum wages are determined or as an administrative threshold beyond which eligibility for public funds is withdrawn. When reduced to no more than a technical exercise, as PLAAS' Andries du Toit puts it, the result is poverty measurement blues in which measures are regarded with suspicion by policy-makers and civil society alike, and researchers retreat into defensive positions around their measure of choice (Du Toit 2005).

I wish to suggest that this situation is neither necessary nor desirable. I will structure the remainder of the lecture has follows: having identified the topic and why it is of interest, I will review how poverty is usually conceptualised and how disagreements about poverty can be placed within broader debates in the field of development studies. I will then move on to the technicalities of poverty measurement, describing the poverty line, methods of measurement and how these are applied. In doing this I will reflect on work in which I have been involved over the last decade hoping to illustrate what can be done to improve both the 'science' and 'craft' of poverty analysis.

Finally I plan to discuss the 'smoke and mirrors'. Here I am concerned with what poverty measurement does not do, what measurements conceal and the implications of this. I will argue that with innovative application, measurement can reflect more than bare statistics concerning the numbers of poor, and allows us to not only see more of the structural nature of poverty, but also possible solutions.

CONCEPTUALISING POVERTY

As with most other forms of quantification, poverty measurement involves deciding upon an appropriate conceptualisation of the issue, deciding upon indicators believed to adequately reflect this vision of deprivation, the collection of data believed to represent these indicators and finally the analysis of the data. Although some analysts such as Michael Lipton had already proposed that consensus had been reached on how to this is done as far back as 1997, the devil is in the detail, or perhaps more specifically, when measurement is put into use. Let me start with the consensus put forward by Lipton.

Here is poverty conceptualised as the inability to attain an absolute minimum standard of living reflected by a quantifiable and absolute indicator applied to a constant threshold, in most cases a minimum income line that separates the poor from the non-poor. By necessity, measurement is quantitative relying upon surveys of income and consumption, and the threshold used is often related to those employed for international comparison, such as a $1-per-day.

Poverty may also be conceptualised as being the lack of resources with which to attain a socially acceptable quality of life. This approach places emphasis on a relative indicator which would vary according to the standards of the society being measured, and may also take into account distributional issues. A minimum amount, such as a national poverty line may be used, but unlike a $1-per-day, this is usually adjusted to take into account changing needs, preferences and national standards of living. Measurement is usually quantitative, although frequently subjective or qualitative approaches may play a role in setting definitions and standards.

Relative poverty has sometimes been related to the distribution of income or wealth and thus as being equivalent to inequality while an absolute definition of poverty sees some scientifically determined minimum required for human survival. In the case of the first approach, the poverty of an individual is thus relative to the well-being enjoyed by others, while in the case of the second, poverty has a universal form that holds across time and space.

In their debate over absolutist and relativist approaches to defining poverty, both Peter Townsend (1985) and Amatya Sen (1985) place emphasis on the dynamics of poverty and wealth and the social determination of deprivation. Thus Townsend (1985: 659) stresses that the necessities of life vary over

time and space, and that they adapt as changes occur in society and in the products of society. The commodities required by people are thus relative in the sense that changes in institutions, technology and social structure are all influences upon the relationship between needs and resources. This means that poverty lines should not simply be updated by price changes, but also in terms of what is included in the bundle of goods that make up the poverty line. What constitutes well-being in one time period, or in a country, may not be sufficient in another context. In Townsend's words, ' ...poverty can be defined objectively and applied consistently only in terms of relative deprivation. Individuals, families and groups can be said to be in poverty when they lack the resources to obtain the types of diet, participate in the activities and have living conditions and amenities which are customary, or at least widely encouraged or approved in the societies to which they belong. Their resources are so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs and activities' (Townsend 1979 1979:31).

Over time, this social construction of need suggests that social norms and values determine what goods and services constitute essential needs while at the same time, social structures determine the allocation of the resources through which these needs are met. Relative poverty in this sense is not about comparison with others in a society, but is rather comparison with what is socially and culturally accepted or required in a particular society at particular point in time.

This is agreed to by Sen who states that the issue of absolute deprivation is not fixed by comparisons made with others who may be more or less deprived, but rather by capabilities. These refer to what a person can or cannot do or be. Being relatively poor compared to others in a community has some bearing on capabilities if this translates into an inability to meet the accepted norms of that community (such as participation in feasts, religious events or football matches). The issue here is not being less able to perform these activities than others, but instead whether these obligations/standards can be met or not.

For Sen, poverty is conceptualised as including constrained choices, unfulfilled capabilities and exclusion. Measurement is recognised as being complex and, as yet, there is no generally accepted approach being used although institutions such as the UNDP have begun to explore alternative methodologies. Qualitative and participatory research techniques frequently

play a central role but there is no agreed approach to determining a measurable threshold.

Poverty has also long been recognised by most researchers as being multi-dimension. For example, in 1983, Robert Chambers proposes the following dimensions: poverty proper, physical weakness, isolation, vulnerability and powerlessness (Chambers 1983). Even amongst those who might be considered as coming from the bible-belt of econometric analysis, education and health outcomes are now recognised as being as least as important as income.

I will resist the temptation to extend this discussion into the work of philosophers such as John Finnis or Martha Nussbaum (Finnis 1980; Nussbaum 1995). The point is rather that generally good measurers of poverty recognize the limitations of their approach, that the notion that poverty is multi-dimensional is well entrenched but that ways of measuring many of these dimensions are for the moment, imperfect.

So given that there is a good deal of agreement on at least elements of the conceptualisation of poverty, why is there apparently so much disagreement when measurements are taken|? In answering this question, Ravi Kanbur's list of differences in the development discourse is helpful (Kanbur 2001). He lists disagreements on the pace and sequencing of fiscal adjustment, monetary and interest rate policy, exchange rate regimes, trade and openness, internal and external financial liberalisation including deregulation of capital flows, the scale and methods of large scale privatisation of state owned enterprises.

He attributes these disagreements to different perspectives regarding aggregation, time horizon and market structure. By the first, he means that some analysts operate in a paradigm characterised by a high level of aggregation (global, regional or national), in which with appropriate reforms, competitive markets will function efficiently over the medium term to produce sustainable reduction. Others are concerned with lower levels of aggregation (urban/rural, men/women, marginalised areas), and see markets as inherently inefficient at least for the poor, and thus unable to deliver improvements to the deprivation felt by those who are poor at critical points in their life course. The first are characterised as 'treasury types' along the researchers who support them, while the latter include civil society and the 'soft' ministries such as Social Development along the researchers who

support them. As would be expected, these groups have different priorities and expectations when trying to assess the impact of policy and broad social-economic trends.

But does this necessarily mean that these perspectives cannot be reconciled? I share Kanbur's views that this is possible but that this requires that both groups recognize and take account of the underlying reasons for their disagreements. In discussing the question of how poverty is measured, I hope to illustrate how I, and the researchers with whom I have been privileged to work, have tried to do this.

MEASURING POVERTY

Financial poverty

Financial poverty is probably the most common way in which absolute poverty is analysed and is thus a good point of departure. First we need a little more information about the science and history of measurement.

In most cases poverty lines denote the income required to purchase a food bundle capable of providing sufficient calories for healthy life, plus a component for non-food items deemed important for a minimum standard of living, such as clothes, housing or the education of children (Ravallion 1995). As already mentioned, the most widely used poverty thresholds have been based on multiples of a 'dollar a day', now revised as PPP$1.25, although as Martin Ravallion, the World Bank's Director of the Development Research Group observes, the median poverty line of all developing countries excluding the poorest 15 runs at around $2.50 per day.

The published use of such 'poverty lines' can be traced back to 1894 when Charles Booth is credited as the first to make use of a line fixed at between 18 and 21 shillings per week for a family of 5 living in London. As an aside, once adjusted for a century of inflation, this works out at around twice the median line used in most developing countries in 2008 (Officer and Williamson 2009). Also of interest is that Booth's lines, and those subsequently proposed by Seebohm Rowntree, were about double the amounts which were being paid out as poor law relief (Gordon 1973).

In the USA, the first thresholds were developed in 1963-64 by Mollie Orshansky, an economist working for the Social Security Administration. Orshansky's purpose was originally not to develop a general threshold, but rather to develop a measure that could be used to assess differentials in opportunity among different demographic groups of families with children (Fisher 1992).

Also of interest, is that although Orshansky's poverty line worked out at $3165 per annum for a four person family, the threshold of $3 000 that was eventually put in place was the outcome of political compromise rather than the direct application of her research. As another aside, this line now works out to be about six times the median poverty threshold of most developing countries.

Orshansky's approach, and that adopted by many researchers during the 70's and 80's, including in South Africa, was to cost a diet and a life-style determined by the researcher to be minimally adequate. In this sense the line is indeed absolute and does not take account of changing living standards or patterns of consumption. Examples of this in South Africa included the Household Subsistence Level (HSL) developed by the Institute of Planning Research at the University of Port Elizabeth and the Minimum Living Level (MLL) still used by the Bureau of Market Research at UNISA .

Such approaches have a long history in South Africa and for example, in 1959, Joy de Gruchy estimated that between 50 and 75 percent of the African population of Johannesburg were unable to afford such a diet. In the media, the link was quickly made to wages (de_Gruchy 1960). In 1972, the Study Project on Christianity in Apartheid Society (Spro-cas) reported that 77 percent of all African families lay below the MLL, and in 1984 Simkins estimated that around 66 percent of Africans were poor (Spro-cas 1972; Simkins 1984). As a newly graduated junior researcher in 1983 I also used the HSL in my first co-authored research papers to estimate that around 75 percent of Africans in rural KwaZulu were below this poverty threshold, similar to that reported in rural Transkei by others in this cohort of new poverty researchers to which I have since belonged (Nattrass and May 1986).

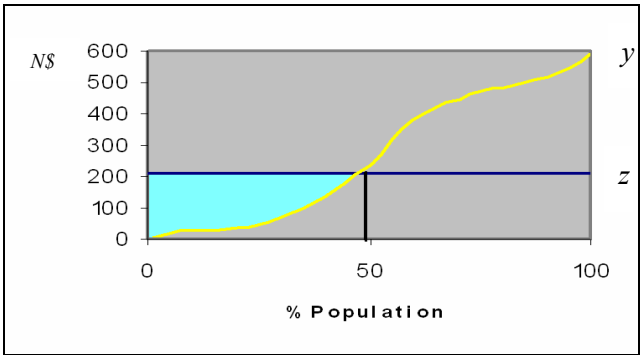
Ten years later, using the well known Southern African Labour and Development Research Unit (SALDRU) data and an updated HSL, I reported that 68 percent of Africans in the rural KwaZulu-Natal could be categorised as poor suggesting that some progress had been made in this region during the 1980's, but that poverty levels in the Eastern Cape had soared to 80 percent (May, Carter et al. 1995). Noteworthy in all of these studies, including (fortunately) my own, is that the inequality of South African society was always included in the analysis, including high levels of inequality in terms of income and wealth in the former townships and homelands.

This researcher-determined approach has been abandoned by many analysts in favour of survey data which is used to identify the diet preferred by low earning households and then estimating the caloric value of this. The cost of this diet to deliver around 2000 Kcal is then calculated as this is considered to be a minimum food energy requirement for a healthy and active adult. The non-food component is estimated by calculating the expenditure on items for

which households are prepared to forego food in order to purchase. These are regarded as being essential for an adequate life style from the perspective of the poor household. In some ways then, the poverty line that results is relative since it includes items which are deemed to be socially and culturally required in a particular society at particular point in time.

The approach can be used even when data are poor and the methodology appears to be both understood and palatable to governments. Ben Roberts and others, improving on methodologies that he and I developed in Lesotho during 2001 was able to generate a poverty line that has since been adopted by the Namibian government (Van Rooy, Roberts et al. 2006). Their data offers the following image of poverty in Namibia that allows me to illustrate further points about the measurement of poverty.

Figure 1: Representing the poverty line in Namibia



Those whose income shown in Namibian dollars (y) lies below the horizontal poverty line (z) are 'the poor' and in a similar manner to the studies of South Africa that I have just discussed, we can count how many they are and divide this by the total population. Moreover, we can see the size of the poverty problem in the shaded part and how far away from the poverty line are the poorest households in Namibia. We can think of these as the poverty gap and the severity of poverty respectively. I will return to the measurement of these in a moment.

Despite the availability of both data and expertise to undertake the same exercise, South Africa remains without an official poverty line. Fortunately the measurers of poverty in South Africa mostly seem to agree that an appropriate threshold for absolute poverty in South Africa lies somewhere between R260 and R515 in 2000 prices, or between PPP$2 and PPP$4. In a

paper by World Bank researcher Berk Ozler (Ozler 2007) much the same approach as Roberts is used. Using a poverty line of R(2000) 322 per person per month this paper shows that around 58 percent of South Africa's population can be categorised as being poor in 1995, a situation that had not changed by 2000, although there had been a marginal decline in the poverty incidence of Africans, from 68 percent in 1995 to 67 percent. Reassuringly (at least for me) is that Ozler's estimates for poverty in KwaZulu-Natal were similar to my own at 63 percent in 1995 increasing to 68 percent in 2000 with the Eastern Cape again being the poorest province in South Africa.

Despite their absence of official endorsement, these lines have been used in series of hotly debated reports which contest whether there has been change in the percentage of those categorised as poor after 2000 (Van der Berg, Burger et al. 2005; Meth 2006). An important point lost during this debate is that whatever line, data or approach is used, the actual number of poor people increased in the immediate post-apartheid era. Consider Table 2.10 from Leibbrandt's et al.'s excellent analysis of poverty trends in the post-apartheid era that was released earlier this year (Leibbrandt, Woolard et al. 2010). While the incidence of poverty modestly declined between from 56 percent in 1993 to 54 percent in 2008, the population increased by an estimated 8.5 million people, and as a result the number living below the poverty threshold increased by 3.8 million, just a little less than the populations of Namibia and Lesotho combined. The changing nature of South African poverty is also evident from their analysis, with the urban population increasing by 9.5 million, swelling the numbers of urban poor by 4.7 million, while the number of rural poor declined by 770 000.

Leibbrandt et al. (2010) suggest that perhaps the rise in urban poverty is a result of the migration by the poor from rural to urban areas. This has two implications, one for those who do not migrate, and the second for those who now face different livelihood opportunities (and different prospects for visibility). This is a good moment to recall Kanbur's point about aggregation. For those concerned with the provision of housing, health care or grants, these figures mean that there has been an increase in their target group. For those concerned with a broader view of South African society, there has been a reduction in the share of our growing population who are categorised as poor.

Finally, as with the many other reports on poverty that I have mentioned, this most recent publication on poverty in South Africa not only links

poverty, inequality, the labour market and social grants, but embeds these topics in its analysis.

Although not without controversy, money-metric measures can also be standardised for cross-country comparison using purchasing power parity (PPP). A well-known example of this is what has been described as 'burgernomics' whereby income is expressed as multiples of Big Mac hamburgers, or as those who have been reading the slides as well as listening now know, 550 kcal bites. This technique allowed the UNDP to rank South Africa in 2007 as being 14th out of the 99 countries for which poverty measurements are reported in terms of the absolute numbers of people living on less than PPP$2. This is despite the country ranking 10th among these countries in terms of its GDP per capita (UNDP, 2009).

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. You will recall this from the slide from Roberts el al's work on Namibia. We can see the application of the p-alpha suite of measures in Leibbrandt et al.'s work. Taking their lower poverty line, there has been an improvement in the poverty gap, with the average gap declining from 32 percent of the poverty line to 28 percent, while the severity of poverty declined between 1993 and 2000, but remains unchanged in 2008. The implication is that there has been some improvement in the welfare of those below poverty line, but that this does not appear to have reached the groups often termed 'the poorest of the poor'(Leibbrandt, Woolard et al. 2010).

As another example of the application of the p-alpha measures at a municipal level, using a data set of 12 000 households collected by the Eastern Cape Socio-Economic Consultative Council (ECSECC), Nompu Nzimande and I calculate this suite of p-alpha measures (May and Nzimande 2007). In this instance we use the $2 per person per day poverty line, or R240 in 2006 prices.

Table 1: Pα Measures by District Council

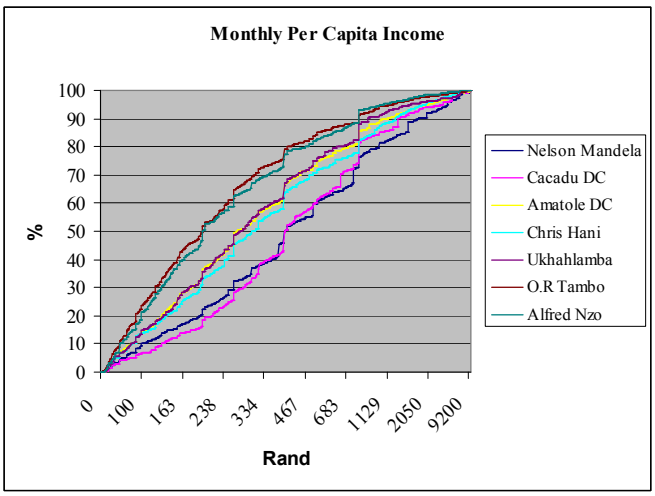
	P^0	P^1	P^2	Min Cost	Sen Index

				(R mill)	
Eastern Cape	0.43	0.20	0.12	881.5	0.18
Nelson Mandela	0.25	0.12	0.07	92.8	0.10
Cacadu DC	0.24	0.10	0.06	28.2	0.11
Amatole DC	0.43	0.19	0.11	234.6	0.18
Chris Hani	0.38	0.17	0.10	96.2	0.16
Ukhahlamba	0.41	0.19	0.11	47.0	0.18
O.R Tambo	0.59	0.29	0.18	287.4	0.26
Alfred Nzo	0.57	0.27	0.16	97.1	0.25
ECDMA10	0.30	0.11	0.06	0.6	0.15

We also calculate the Sen Index which is a combination of the headcount, income-gap, and Gini coefficient (a measure of inequality). This measure takes account of a short coming contained in the Pα approach whereby changes in the income distribution among the poor are not reflected. The Sen index thus takes into account the numbers of the poor, their shortfall in income relative to the minimum needs line, and the degree of inequality in the distribution of their income. It can be thought of as the weighted sum of poverty gaps of the poor and is helpful when tracking trends of convergence or divergence for those below the poverty line.

Overall, some 43 percent of the Eastern Cape can be categorised as being poor using the ECSECC data, a very similar finding to the estimates of Özler (2007) and Leibbrandt et al. (2005) and a distinct improvement on Muller's 1983 estimate of 75 percent. The data confirm official statistics showing the OR Tambo municipality to be one of the poorest in South Africa and we use a cumulative frequency distribution to show that our result is not simply due to our choice of poverty line.

Figure 2: Cumulative Frequency Distribution, Eastern Cape Districts



The poverty gap for the Eastern Cape as a whole is 0.20, again similar to earlier findings, as is the severity of poverty at 0.12. In the table we also take advantage of an interesting attribute of the Poverty Gap which is that it can be used to show the minimum cost of eliminating poverty in the Eastern Cape. This is a hypothetical indication of this cost since this refers only to the money required if it were possible to transfer the exact amount needed to lift each person above the poverty line. As such, it does not reflect the transaction costs of making such a transfer including the cost of finding out by how much each person fell short of the poverty line.

The result is that a minimum of R881.5 million would have been required in 2006 to eliminate poverty in the Eastern Cape through an income transfer. This can be compared to the value of the economic output of the province or the sum of provincial and municipal budgets as a way of demonstrating the affordability of poverty reduction. Or to other state expenditure as a way of demonstrating priorities: let's say perhaps the cost of building the Nelson Mandela Bay football stadium. In this case, the minimum cost of eliminating poverty in the Eastern Cape for one year would be a little less than half the cost of building the stadium.

The Sen Index is shown in the last column and is below that estimated by myself and Ingrid Woolard (2005) for South Africa (0.20) (May and Woolard 2005). While this is largely as a result of lower levels of inequality among the poor in the Eastern Cape, the high values of the P2 and of this index for the two poorest districts (Alfred Nzo and OR Tambo) suggest

alarming levels of deprivation. While many are poor, some appear to exist virtually without any income at all.

Now while I hope that I have shown that the headcount (P0) and the poverty gap (P1) can be readily translated into policy discourse, severity (P2) requires that some subjective value be place on how the severity of the poorest is to be weighted. This lies at the heart of how to integrate distributional issues in the analysis of poverty. So I need to bring inequality more strongly into focus.

As with poverty, there are many ways of measuring inequality and rather than repeat the fine work undertaken by the SALDRU group who have calculated gini coefficients and depict the percentage of total income possessed by each income decile, let me offer some of the less well known. The decile dispersion ratio is a powerful way to convey the message of of Leibbrandt's et al.'s report. Here the wealth of each decile is measured as multiples of the poorest decile. Thus the incomes of second poorest decile are around twice those of the poorest decile, the middle decile (5th) around 6 times the poorest, while the income of the wealthiest group is 88 times greater than that of the poorest decile.

The Pietra ratio is equivalent to the maximum vertical distance between the Lorenz curve and the line of equal income. To put this in another way, the value that is generated approximates the share of total income that has to be taken (robbed) from those above the mean (the rich) and transferred to those below the mean (the poor) to achieve equality in the distribution of incomes, hence the measures' alternative name: the Robin Hood Index. In South Africa, this index has is around 60 percent of total income.

Physical Poverty

Before I am accused of being just another money-centric economist, I had better discuss other dimensions of poverty. Physical poverty reflects inadequate access to essential services and is largely derived from a basic needs approach to development. This recognises that changes in the quality and availability of services are not captured by changes that measure income alone.

Deprivation in this dimension is proxied using indicators such as those concerning house structure and the services that the structure provides. Principal components and factor analysis may be used to develop indices

while some analysts prefer identifying a structural relationship between the components of each of the uni-dimensional measures, assessing their inter-correlations, and then calculating reliability statistics such as Cronbach's α to determine which dimensions should be summed (Fiadzo, Houston et al. 2001; De Vos 2005).

Once again Leibbrant et al.'s report is a useful source of information and in Table 1.4 they summarise Haroon Bhorat's and others analysis of official surveys (Bhorat, Naidoo et al. 2006). Their results show improvements in housing, access to water, access to electricity and to toilets between 1993 and 2004, with access to electricity for lighting increasing from 52 percent of households to 80 percent, and access to piped water increasing from 59 to 68 percent of households. Of course we do not know from these results whether the houses are cracked, the electricity is working, whether the toilets have walls, nor how the tenders to provide these services were awarded.

Although this result is confirmed by the relatively positive position of South Africa in a report released this month by the Oxford Poverty & Human Development Initiative on multi-dimensional poverty, considerable backlogs still exist for most of these services in terms of the un-serviced population, carrying a substantial burden in terms of the cost of delivery (Alkire and Santos 2010).

Table 2: Estimated backlogs in service provision (2005)

	Pop Million	**Cost R billion**
Water	2.1	12.8
Sanitation	3.5	18.4
Electricity	3.3	10.2
Solid Waste	4.5	68.5

Source: (National Treasury 2008): 143

In addition to keeping up with population growth, migration into urban areas and further household fragmentation, it seems that an additional R110 billion will need to be found to eliminate the remaining backlogs in basic service delivery. Let's recall Kanbur's comment on differing time horizons. Despite the impressive delivery of essential services, and the reduction in physical poverty that this may have brought, population dynamics of growth, relocation and composition result in a frustrated citizenry and a moving target in which backlogs persist and may even grow.

Returning to the Eastern Cape, May and Nzimande (2007) provides an interesting comparison of Stats SA's Census 1996 and the 2006 ECSCC survey.

Table 3: Physical Poverty in the Eastern Cape

	Formal house	Electri city	Piped Water	Flush toilet	Refuse removed	Head has grade10+	Mean income
Eastern Cape Census 1996	46.9%	31.2%	24.4%	30.6%	33.8%		R1 403
Eastern Cape	39.8%	67.5%	67.8%	33.0%	36.5%	30.4%	R 1,741
N. Mandela	86.7%	87.6%	99.8%	89.8%	91.2%	50.5%	R 2,438
Cacadu dc	82.9%	83.0%	97.2%	71.2%	90.8%	36.6%	R 1,981
Amatole dc	36.7%	74.5%	73.0%	32.4%	33.3%	29.1%	R 1,815
Chris Hani	39.7%	71.5%	69.2%	28.6%	30.3%	31.2%	R 1,637
Ukhahlamba	41.0%	60.8%	73.3%	21.1%	34.2%	24.5%	R 1,559
O.R Tambo	10.3%	50.8%	32.0%	6.7%	6.9%	21.8%	R 1,449
Alfred Nzo	11.7%	40.4%	62.4%	1.5%	3.4%	24.1%	R 1,240
Ecdma10	86.3%	58.5%	87.7%	50.5%	30.6%	27.9%	R 2,649

She then uses principal component analysis to replicate Stats SA's household infrastructure index to show that while the Alfred Nzo district has the lower score, once population size is taken into account, the OR Tambo district is the most poorly serviced district in the Eastern Cape in addition to being the poorest in terms of income.

So as with financial poverty, the data and expertise are available in South Africa to include indicators of physical poverty into any analysis of deprivation.

Structural poverty

I would now like to move on to discuss some of the reasons for the persistence of poverty that I have described.

This is often referred to as structural, chronic or investment poverty (Reardon and Vosti 1995; Carter and May 2001; Carter and Barrett 2006). Thus far its measurement has largely been conceptualised as an extension of financial poverty in which single-period income or expenditure is distinguished from stocks of assets and the long-term expected stream of

well-being or income that can be generated from these assets. Using panel data in which the same households are re-interviewed over time, we can go beyond the static view of poverty that I have presented.

This recognises that while some may have benefited from economic growth or redistributive policies, others have fallen back either as a result of economic or political change, or arising from broader trends including the impact of HIV/AIDS. Moreover, the life-course of households and individuals is itself a dynamic that brings about movement into and out of poverty as people age, have children and in time, may be able to accumulate skills and capital, but may also be exposed to shocks and negative events that strip assets and erode their ability to earn.

The analysis of structural poverty can potentially identify patterns of mobility and poverty and reveal possible pathways from poverty as well as impediments which block these paths (Bane and Ellwood 1986; Hulme and Shepherd 2003). Together with Michael Carter and Jorge Aguero, I have been trying to distinguish between poverty that is structural and thus persistent from that which is stochastic and thus transitory. In the case of the former, we have in mind a form of asset-based poverty.

Thus, a structurally poor household is one in which both the income that they are observed to earn, and the income that they can be expected to earn based on their asset-holdings are below the poverty threshold. In contrast, a stochastically poor household is one in which their asset-holdings are insufficient to produce an income that is above the poverty threshold, but their observed income is above this threshold, perhaps due to good luck. Equally, a household can be stochastically not-poor if the reverse situation holds and their low income is due to bad luck.

I will start the discussion by reporting that well-used suite of poverty measures developed by Foster, Greer and Thorbecke (1984) for KwaZulu-Natal using the expenditure data of households surveyed in 1993, 1998 and again in 2004 by the KwaZulu-Natal Income Dynamics Study (KIDS) (Agüero, Carter et al. 2007).

Table 4: Pα Measures for KIDS Households

	Measure	1993	1998	2004

Expenditure	P^0	0.51	0.57	0.47
	P^1	0.20	0.26	0.22
	P^2	0.09	0.14	0.12
Income	P^0	0.65	0.54	0.52
	P^1	0.36	0.29	0.28
	P^2	0.24	0.28	0.20
n=847				

Using these panel data, we found that the headcount index of poverty (P0) increased from 0.51 in 1993 to 0.57 in 1998, before falling to 0.47 per cent in 2004. The poverty gap index (P1) increased from 0.20 to 0.26 and then declined to 0.22 while the poverty severity index (P2) increased from 0.09 to 0.14 before recovering slightly to 0.12. In all cases, the trends between 1998 and 2004 are consistent in terms of both income and expenditure-based measures although income shows an improvement in 1998, suggesting measurement error for at least one of the variables.

Table 5: Poverty Spells for Core KIDS Households

Poverty Status* '93-'98-'04	**Income-based**	**Expenditure-based**
P-P-P (Chronically Poor)	22.8	26.6
P-P-N (Upwardly mobile?)	10.5	5.0
P-N-P (Transitorily Poor)	4.6	6.6
P-N-N (Upwardly mobile?)	8.4	10.3
N-P-P (Downwardly mobile?)	4.0	6.9
N-P-N (Transitorily Poor)	11.0	4.3
N-N-P (Downwardly mobile?)	3.7	12.5
N-N-N (Never Poor)	34.9	27.9

* P indicates Poor; N indicates Not-Poor

While these data can be used to depict chronic poverty, this does not yet reflect structural poverty. To estimate this, we create a measure of welfare expressed as multiples of the poverty line. In other words, a score of 1 means that the household exactly meets its minimum requirements, 0.5 half these requirements and 2, twice these requirements. This income based measure is then regressed to yield a predicted asset-based score for each year using a livelihood function that includes the value of productive assets (land, housing and equipment), the mean years of education of resident and non-resident adult members of the household, the value of all transfers to the household (government grants, private pension, maintenance payments and remittances) and the interacted value of each of these assets. After taking

account of measurement error, it now becomes possible to create structural poverty classes.

Table 6: Decomposing Poverty Transitions in KIDS
a) 1993 - 1998

		1998	
		Poor	**Non-Poor**
1993	**Poor**	**39.9%** Chronically Poor, of which: • 8.9% had experienced dual entitlement failures • Structurally Poor < 91%	**11.0%** Got Ahead, of which: • 52.2% Stochastically poor in 1993 • Structurally mobile < 47.8%
	Non-Poor	**17.2%** Fell Behind, of which: • 50.7% Stochastically non-poor in 1998 • Structurally downward <49.3%, of which 60.5% had experienced entitlement failures	***31.9%*** *Never Poor, of which:* • 7.8% had benefited from dual windfalls • Structurally never poor < 92.2%

b) 1998-2004

		2004	
		Poor	**Non-Poor**
1998	**Poor**	**38.3%** Chronically Poor, of which: • 8.6% had experienced dual entitlement failures • Structurally Poor < 91%	**19.0%** Got Ahead, of which: • 52.4% Stochastically poor in 1998 • Structurally mobile < 47.6%
	Non-Poor	**9.2%** Fell Behind, of which: • 51.9% Stochastically non-poor in 1998 • Structurally downward <49.1%, of which 65.7% had experienced entitlement failures	***33.3%*** *Never Poor, of which:* • 11.5% had benefited from dual windfalls • Structurally never poor < 89.5%

For the 1993 to 1998 period, about 40 percent of the sample is chronically poor (measured as poor in both periods), but for 9 percent of this group, the hypothesis that they were structurally poor in both periods can be rejected. This means that they experienced income reducing shocks in both periods.

This defines an upper bound estimate of 91 percent of the chronically poor who are actually structurally poor.

Seventeen percent of households fell behind of which about half had suffered a shock. The remainder are potentially structurally downward, that is they fell behind in this period. Eleven percent got ahead, but over half had received shocks in 1993 (i.e., we could reject the hypothesis that they were expected to be poor in this year). The upward mobility of this group can thus be inferred to be a regression to their expected level of livelihood. This places an upper bound of 48 percent on the number of the upwardly mobile who escaped poverty though accumulation. These households were getting ahead. The remaining 32 percent were never poor, and were not expected to be poor.

The patterns for the 1998 to 2004 period are similar, although with some promising differences. There is a modest decline in structural poverty, a stronger decline in the percentage of households that fell behind and an increase in the percentage of households that got ahead. The observed patterns of declining poverty discussed earlier appear then to be underpinned by structural improvements to assets and to the returns that can be achieved with these assets. This is positive news for South Africa and suggests that we might be on a long term path to reduce poverty. A caveat is that many of those benefiting are the children of the sample who were first interviewed in 1993, who had grown up during the era of economic and political reform and had now been able to establish their own households.

Vulnerability

I have mentioned shocks several times during the course of this last section and vulnerability is an important cause of persistent poverty. This is the last topic that I want to discuss and refers to the risks, shocks and the coping strategies that households adopt when things go wrong. This has been recognised as an important dimension of poverty since repeated shocks have been found to gradually erode a household's welfare (Chambers 1995; Davies 1996).

Sources of risk include natural hazards like drought, commodity price fluctuations, illness and death, poorly functioning or missing input and output markets, sudden changes in policies, changing social relationships, unstable governments and armed conflicts. Some events, like drought, simultaneously affect many households in a community or region. This can

be termed ‘covariate’ or ‘community-wide’ risk and refers to the extent to which an individual, community or sub-group, structure or geographic area is likely to be damaged or disrupted by a disaster (UNDP 1990; Von Kotze 1996). Other risky events, like most illnesses, are specific to individuals or households, and can be thought of as ‘idiosyncratic risk’.

Serious illness and injury shocks are perhaps one of the most common and important and have been found to have significant negative impact on welfare, especially for the poorest, driving up expenditure on health care and reducing capacity for productive activities (Menon, Wawer et al. 1998; Dercon 2004; Beegle, De Weerdt et al. 2006). This is especially pertinent for most of sub-Saharan Africa in which the high prevalence of HIV/AIDS and malaria results in repeated health shocks. Unusually, the prevalence of these illnesses results in their impact being similar to those of covariate shocks increasing the risk of poverty for entire communities and reducing options for coping strategies.

Most studies in Africa that have examined the consequences of AIDS-related deaths at the level of the household have found that they have a significant economic impact in terms of the incomes of afflicted households (Gertler, Levine et al. 2004; Yamano and Jayne 2004; Chapoto and Jayne 2005; Naidu and Harris 2005). In a rural context, male illness has been found to lower wage income and increase informal borrowing during busy agricultural periods (Kochar 1995). Several studies find asset shedding, usually through the sale of land. In some cases this is more frequently reported when the ill person was a man (Yamano and Jayne 2004).

In a survey in South Africa, Steinberg (2002) notes that two thirds of respondents reported a fall in household income as a result of their actions to cope with the impact of HIV-related illness including the direct loss of earners. Households reported increased expenditure on health, diverting income away from other requirements, potentially with significant opportunity costs. Supporting this, in the Free State Province of South Africa, several studies (Bachmann and Booysen 2003; Bachmann and Booysen 2004; Bachmann and Booysen 2006) report greater falls in income and total expenditure amongst households afflicted by episodes of illness by HIV infected member than those in which the HIV status of members was not known.

'Catastrophic' payments associated with health care have been found to further drive poor households below the poverty threshold (Wagstaff and Doorslaer 2003) and UNAIDS (1999) reports that health expenditure increases fourfold while food expenditure falls for households where someone is living with AIDS. These findings support Bachmann and Booysen's (2006) contention that illness rather than death is the cause of impoverishment and health expenditure burdens of as little as five percent of monthly income have been found to trigger the sale of assets or the accumulation of additional debt (Goudge, Gumede et al. 2007). It is quite likely that the direct costs to a household afflicted by HIV/AIDS exceed this, since as the Steinberg study shows for South Africa, households who had met funeral costs in the year prior to being interviewed spent an average of 3.5 times their monthly income on funeral costs.

Discussing the impact of malaria, Sachs and Malaney (2002) describe other costs following from changes in the behaviour of household members. These include those arising from decisions concerning schooling, child-bearing, savings and work-seeking. There are also significant inter-generational consequences of household coping strategies. For example, in Kenya, Tanzania and Malawi, studies have found found links between adult deaths and the progression through school, delays in the enrolment of younger children in school, and the withdrawal of children from school (Munthali 2002; Ainsworth, Beegle et al. 2005; Yamauchi, Buthelezi et al. 2008). In the more urbanised environment of South Africa, Steinberg et al (2002: 21) identify the non-payment of school fees as a coping strategy, and a negative impact on educational attainment has been also been found using the KIDS data for KwaZulu-Natal (Yamauchi, Buthelezi et al. 2008).

Not all the literature supports the notion that adult death results in either negative demographic or economic impacts, and some of these inconsistent results may arise from the differential capacity of households to recover from the shock. Others may be the result of measurement error, inappropriate methodologies when measuring impact or once again, the time horizon of the study. Determining the economic impact of adult mortality on the survivors thus requires investigation of several dynamics, some of which may result in conflicting outcomes.

Firstly, there is accounting for the loss of economic benefits following from the productive activities that cease when a person becomes ill and dies. Second, is accounting for changes in expenditure arising from health care or

from the costs of funerals, some of which may be financed from the sale of assets. Finally, there is accounting for the coping strategies put in place by the survivors in their attempt to mitigate the impact of the illness and death, some of which may involve changes to household size and composition. Each of these effects is likely to be influenced by the economic status of the household prior to the death, as well as attributes that individuals in the household may possess, including their entrepreneurship, values and capacity to adapt. Managing these dynamics requires quite specific types of data, usually panel data, the application of appropriate methods and careful consideration of data limitations (Dercon and Shapiro 2007; Beegle and De Weerdt 2008).

The ADAPT project led by Ian Timæus of the London School of Hygiene and Tropical Medicine and of which I am a co-investigator attempted to do just this. To do this, we make use of the KIDS data already discussed, and data collected by the University of KwaZulu-Natal's demographic surveillance site in northern KwaZulu-Natal. From the KIDS data we find that young adult deaths became a more frequent event after 1998, with poorer households more likely to experience young adult deaths during this period of high HIV/AIDS mortality than better off households. When we examine the growth in per capita expenditure over the full period of KIDS (1993-2004), we also find that on average, young adult deaths have an adverse impact on the expenditure per head of households in KwaZulu-Natal. In the later period (1998-2004) young adult deaths have a particularly negative impact on households who receive above the median income. This was because the young adults who died in these households did not have lower earnings than survivors as was the case in poorer households. However the economic impact of adult deaths varies by the age of the person dying, and over time, and depends on the economic characteristics of the affected household. The implication is that while no simple generalisations concerning the impact of adult mortality can be identified, the deaths of young adults (largely from AIDS) do not usually appear to be catastrophic for poor households, at least in economic terms.

The reasons for the resilience of poor households can partly be attributed to the well developed welfare grants system in South Africa. However this also reflects the high unemployment rate, especially among young adults, and the unimportance of farming in the livelihoods of the rural poor in South Africa. Notwithstanding this, deaths in very poor households have different implications from those in less poor households and deaths of middle-aged

adults have different implications from those of young adults. Moreover, the impact on households of the death of young adults changed between the mid-1990s and the years around 2000 as mortality in this age range rose, suggesting that AIDS and other causes of death have different consequences. This could be either because AIDS deaths are typically preceded by much longer periods of ill-health than other deaths of young adults, or because young people who die from AIDS have markedly different characteristics from those who die of other causes.

CONCLUSION: SMOKE AND MIRRORS?

So what are the take-home messages from all of this?

The first is that at least in South Africa, poverty researchers have not avoided issues of distribution and the concentration of economic power. Instead the majority of papers written over the past 40 years have been concerned with income and wealth gaps, whether between black and white, urban and rural or among those below the poverty line. However while we may have accepted that inequalities of opportunity based on race or gender are unjust, we have yet to demonstrate the implications of high inequality for poverty reduction. This is an important task since internationally inequality, especially in terms of wealth, has been shown to slow economic growth, and economic growth has been shown to reduce poverty. There are many points of contention here since the way in which growth is achieved can, in Else Øyen's words, also produce poverty (Øyen 2002).

Growth may result in poverty reduction, but it 'ain't necessarily so' depending on what the costs of achieving growth are, and who carries these costs. In case you are wondering, this time the quote is from Sportin' Life, a drug dealer in Porgy and Bess, George and Ira Gershwin's opera about poverty.

Related to this is that we do have a reasonable sense of poverty trends in South Africa. It seems that the already high levels of poverty found in the 1960's peaked some time in the early 1980's at around 75 percent in the most deprived areas, declined slowly until the late 1990's, and appear to have declined more rapidly in the first part of this century. Access to assets, especially education, appears to have been a major determinant of these trends, although the violent actions of the apartheid state had much to do the increase in poverty in the 25 year period from 1960 to the mid 1980's. This was poignantly described in Francis Wilson and Mamphela Ramphele's seminal book, 'Uprooting Poverty' (Wilson and Ramphele 1989).

If the results from KIDS are correct, we may now be on a long term pathway of asset accumulation for poor households which sees a reduction in structural poverty. We will have to wait until we have a second wave of data from the National Income Dynamics Study (NIDS) currently being undertaken by University of Cape Town before making this conclusion. Despite this I have two concerns:

I suspect that there are deep pockets of poverty in South Africa that are not being adequately reached by government policy. The measures of poverty that I have presented from Leibbrandt et al (2010) suggest a reduction of poverty for those close to the poverty line (shown in the poverty gap) but not for those well below this line (shown in the poverty severity). The data from the Eastern Cape show that there are districts in South Africa with extraordinarily high levels of poverty in terms of all measures, and that within these areas, there may be severely deprived groups who have little chance of benefiting from South Africa's wealth or the redistributive policies of government.

I am not sure who these groups are, nor how they survive, nor how they can be reached. As the new chair in Applied Poverty Reduction Assessment, working with Statistics South Africa, and using their recently completed Living Conditions Survey which surveyed 30 000 households in South Africa, I hope to contribute towards our understanding of how to identify and reach the least resourced in our society.

The second concern is that the South Africa economy remains inefficient in terms of its ability to translate economic growth into the prosperity of its population. A useful tool here is known as the poverty elasticity of growth which shows what decrease in poverty results from economic growth. South Africa performs badly in terms of this according to a United Nations University paper by Rasmus Heltberg, well below that of countries in Asia and South America and little better than countries in sub-Saharan Africa that have far less developed economies (Heltberg 2002). The reasons for this need to be better understood if we are to increase the pace of poverty reduction. As a first step towards this, we will soon be looking at the impact of public sector investment to foster local economic development and poverty reduction working with KwaZulu-Natal's Gijima Local Competiveness Fund.

To continue with the take-home messages:

Although poverty measurement is often based on financial poverty, measurers generally recognise that there are many dimensions of poverty. In fact most of those who measure in terms of financial poverty acknowledge that there are other forms of poverty, that the exact position of the income threshold is somewhat arbitrary, that the indicators are proxies subject to

measurement error, and that measures are imperfect, with the technically better often being intuitively less clear. In Mollie Orshanky's words: '...unlike some other calculations, those relating to poverty have no intrinsic value of their own. They exist only in order to help us make them disappear from the scene...With imagination, faith and hope, we might succeed in wiping out the scourge of poverty even if we don't agree on how to measure it' (Oshansky, 1968 quoted in Fisher, 1992).

Where then to start? Well some dimensions are of particular concern, and in proposing consensus, Lipton recommends that low levels of capabilities such as literacy and life expectancy be regarded as major components of poverty, but that these are best measured separately rather than amalgamated with consumption measures. We have seen how the incidence and impact of adult deaths varies according to income and inequalities in health and life expectancy are perhaps the most fundamental of all inequalities. In particular, it is widely accepted that 'socioeconomic status gaps in child mortality are not simply inequalities, they are also inequities – inequalities that are unjust and unfair' (Victora, Wagstaff et al. 2003:233).

From the KIDS data we know that stunted children in KwaZulu-Natal do less well in their first few years at school than children who are an appropriate height for their age (Yamauchi, Buthelezi et al. 2008). Ingrid Woolard and others have shown that the reductions in household poverty that resulted from the introduction of the Child Support Grant produced substantial reductions in stunting of young children that are likely to produce, in turn, substantial increases in those children's productivity and wages once they grow up (Aguero, Carter et al. 2009).

The problem is that we do not understand enough about the correlates of child well-being to be able to plan other appropriate and effective interventions. In this instance using a R1m award by the Programme to Support pro-Poor Policy Development in South Africa (PSPPD) and the EU, we will be working with the London School of Hygiene and Tropical Medicine and the University of Cape Town to further analyse the determinants of differential child outcomes using both KIDS and NIDS data.

And finally, the proposition raised in this lecture is that measurement can be, and has been, much more than the smoke and mirrors of an anti-politics machine. No doubt some of the motivation behind poverty measurement remains what Oliver McGregor described in 1957 as: '. . . social research

and social policy derived essentially from professional and middle-class anxieties to maintain the stability of institutions by correcting the measured costs and inefficiencies of social wastage' (McGregor 1957: 154). Nonetheless, the researchers that I have mentioned in this lecture appear to have overcome their anxieties and have not flinched when making often contentious recommendations including those concerning taxation, land reform and wealth redistribution.

This does not mean keeping messages simple. In fact I think that this is a recipe for disaster that is both condescending and misplaced and this may have been the cause of the poor design of Ghana's 'Programme of Actions to Mitigate the Social Costs of Adjustment' described by Hutchful (1994). The assumption seems to be that too much information and too nuanced an approach will confuse the poorly capacitated policy maker who will then stray from a narrow and rocky road of righteous policy.

I don't think that this is so. I don't think that too much information is the reason for why policies are adopted that do not assist the poor, nor do I think that the road of righteous policy is self-evident. And finally, I think as responsible poverty researchers that we cannot afford to do this. To let Kanbur have the last word: 'If the world is complex, or if the evidence is uncertain, or if legitimate differences in perspective and framework explain differences in conclusions, analysis must take these on board.' (Kanbur 2001:16).

Actually I have changed my mind and I am going to give the last word to an old favourite of mine, Stanslav Andreski's 'Social science as sorcery'. Here he writes: 'So long as authority inspires awe, confusion and absurdity enhance conservative tendencies in society. Firstly, because clear and logical thinking leads to a cumulation of knowledge and the advance of knowledge sooner or later undermines the traditional order. Confused thinking, on the other hand, leads nowhere in particular and can be indulged indefinitely without producing any impact upon the world' (Andreski 1972:90). The trick then is blowing away the smoke and correctly positioning the mirrors.

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