



**What are the Distributional Implications of
Halving Poverty in South Africa when
Growth Alone is not Enough?**

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What are the Distributional Implications of Halving Poverty in South Africa When Growth Alone is not Enough?

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Abstract

The South African government has set a target of halving poverty by 2014. Using microdata from the 2005/6 Income and Expenditure Survey, this article frames government's stated target of halving poverty by 2014 in terms of specific measures of the poverty gap and poverty headcount ratio. With the poverty line as defined here, about half the South African population is classified as poor. Even so, the aggregate poverty gap is only about 3% of GDP. Projections of poverty in 2014 under various growth scenarios indicate that growth alone will be insufficient to halve poverty by then. It would take average annual growth of 8.7% between 2006 and 2014 to halve both the poverty gap and poverty headcount ratio with the current distribution of income and expenditure. However, projections of the effects of a range of growth and distributional scenarios on poverty, using a new method for simulating pro-poor distributional change, indicate that halving poverty appears feasible with moderate growth rates and fairly mild pro-poor distributional change. The results are indicative as to the scale of distributional changes necessary to halve poverty under various growth scenarios.

Keywords income distribution, poverty, inequality, South Africa.

JEL codes D30, D31, I32.

1 Introduction

The South African government has targeted the halving of poverty by 2014, although exactly what this means in economic terms is yet to be elaborated and a national poverty line is still being developed, in terms of which government's target is to be framed. This study uses income and expenditure microdata to frame government's stated target of halving poverty by 2014 in terms of specific measures of the poverty gap and poverty headcount ratio. This forms the basis for an analysis of under what growth and distributional scenarios the target could be achieved.

The issues being analysed here have important policy implications. The South African government is currently in the process of unpacking what the target of halving poverty means, and this research is thus directly relevant to policy-makers as well as to economists concerned with issues of distribution and poverty. The projections presented here of poverty under various growth/distributional scenarios have clear analytical and policy implications.

The existing literature points to an increase in poverty in South Africa between 1995 and 2000, with the possibility of some reduction thereafter. Hoogeveen and Özler (2005), using a normative poverty line of R322 per month, find that the poverty headcount ratio remains at about 58% between

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1995 and 2000. However, using lower poverty lines they find significant increases in poverty and especially in extreme poverty. Hoogeveen and Özler characterise growth between 1995 and 2000 as not being pro-poor either absolutely or relatively, as real income growth of the poor was actually negative and was below mean real income growth.

Leibbrandt et al. (2004) find a slight worsening of income poverty between 1996 and 2001, especially for Africans. Simkins (2004) uses several measures of poverty and finds that poverty unambiguously rose between 1995 and 2000. A similar conclusion is drawn by Pauw and Mncube (2007) using the same datasets. Meth and Dias (2004) find that poverty worsened in South Africa between 1999 and 2002, with up to 4.5 million more people falling below a subsistence-based poverty line, although the increased intensity of poverty is mitigated if the ‘social wage’ is factored in. Ardington et al. (2005) test the robustness of the general finding in the literature that poverty increased between 1996 and 2001 to various aspects of the data (such as missing data), and their results confirm that poverty did indeed rise.

Van der Berg et al. (2005) using unofficial data (a marketing survey) observe a slight worsening in poverty between 1995 and 2000, but a decline in poverty between 2000 and 2004. The UNDP (2003) finds a small reduction in the poverty headcount ratio between 1995 and 2002. A review put out by the South African government (Government of the Republic of South Africa, 2008) claims declines in both the poverty gap and the poverty headcount ratio between 1995 and 2005, and attributes this decline primarily to government’s social welfare grants.

The generally unimpressive record of income poverty reduction since the advent of democracy in South Africa highlights the challenge of significantly cutting poverty. Countries such as Chile and to a lesser extent Brazil have made significant progress in reducing poverty in recent years, through dedicated programmes centred around targeting spending on the poor. Halving poverty by 2014 in South Africa, as per government’s commitment, would arguably require a significant shift given the apparent stubbornness of poverty levels thus far.

Section 2 of this paper quantifies what the ‘halving of poverty’ could mean, by setting out a monetary poverty line, clarifying two relevant measures of poverty, and by using the latest income and expenditure survey data to put figures to the target of halving poverty. Section 3 projects the poverty headcount ratio and poverty gap in 2014 under various growth scenarios, considering specifically whether poverty can be halved through growth under the current distributions of income and expenditure. Section 4 analyses the effects of various combinations of growth and distributional change on poverty, and section 5 discusses the broader implications of the findings. Section 6 concludes.

2 Framing the ‘halving of poverty’ target

The various datasets of the 2005/2006 Income and Expenditure Survey (IES) were utilised for this analysis. These are the official national household surveys produced by the national statistical agency, Statistics South Africa.¹ All data were inflated or deflated to March 2006 (depending on when the household was surveyed), using monthly CPI data. Both income and expenditure/consumption are shown in initial analysis, but the subsequently focus is on expenditure/consumption since this is most relevant to poverty. All calculations were undertaken on a household per capita basis, as elaborated further below.

AsgiSA does not define precisely what is meant by ‘poverty’ and hence what a ‘halving of poverty’ would actually mean. A process has been underway since 2005, led by National Treasury and Statistics SA, to develop a national poverty line, and the official government targets for halving poverty are then to be framed in terms of that line. This study therefore uses the proposals contained in the official Statistics SA/National Treasury Discussion Document (2007) as a starting point to

¹The original datasets were accessed through the South African Data Archive of the National Research Foundation.

derive an appropriate line for this study. This is a semi-normative poverty line based on a cost-of-basic-needs approach. Statistics SA calculates a food poverty line at R211² per capita per month (in 2000 prices). This is intended to represent the minimum amount required to purchase enough food to meet an average person's basic daily food-energy requirements over a month. Statistics SA then estimates the non-food component of a poverty line as R111 per capita per month. This yields a total poverty line of R322 per capita per month in 2000 prices.

Drawing on the aforementioned Discussion Document, this study uses as a basis the lower poverty line suggested in the Discussion Document (R322 per capita per month in 2000 prices). This R322 baseline was inflated to March 2006 levels (using national CPI rates for the lowest two quintiles) for use with the 2005/6 IES data. This results in the poverty line of R322 in 2000 prices being converted to a line of R450.48 in March 2006 prices. The baseline poverty line used in the analysis which follows is thus R450 per capita per month (or R5 400 per capita per annum) in March 2006 prices. Some parts of the analysis also consider the effects of using the 'food poverty line' as calculated by Statistics SA. This includes only the food items needed to meet minimum energy requirements, and excludes the costs of clothing, shelter, transport, and so on. This was calculated by Statistics SA at R211 per capita per month (in 2000 prices) which translates to R295 per month in March 2006.

Setting the level of a monetary poverty line answers only part of how to gauge poverty, and hence how to define what halving poverty would mean. One way of measuring poverty is the poverty headcount ratio, and this is the measure that government seems inclined to use to quantify poverty. The poverty headcount ratio measures the incidence of poverty, which is an important dimension of poverty. The simplicity of this measure may make it intuitively appealing from a policy perspective. However, the poverty headcount ratio gives no indication of the intensity of poverty. The actual incomes of all the people falling below the poverty line do not enter into the poverty headcount ratio. The intensity of poverty can appropriately be measured not by the poverty headcount ratio but by the aggregate poverty gap, which sums the gaps between the poverty line and the income or expenditure of everyone falling below the poverty line.

The choice of poverty measure has significant policy implications, particularly insofar as specific targets for the reduction of poverty are part of government policy. The poorest people are highly unlikely to be lifted above the poverty line in the near future, and any increase in their incomes will have no impact on the poverty headcount ratio. To the extent that success in poverty reduction is measured exclusively in terms of the poverty headcount ratio, this could de-emphasise raising the incomes of the poorest people. This is particularly important when, as will be seen below, about half of South Africans can be classified as poor. Measuring the halving of poverty solely in terms of the poverty headcount ratio could imply a focus on the second quartile of the population and not the poorest quartile.

Given the important shortcomings of the poverty headcount ratio, and the information about the intensity of poverty conveyed by the aggregate poverty gap, it seems advisable that the target of halving poverty be framed not only in terms of halving the poverty headcount ratio but also in terms of halving the poverty gap. The analysis that follows uses this dual measure of the 'halving of poverty', in terms of halving both the poverty headcount ratio and the aggregate poverty gap.

Finally, concretising the meaning of halving of poverty by 2014 requires the specification of a starting point. AsgiSA was however formally launched in February 2006. The 2005/06 IES data (indexed to March 2006) are used as the baseline starting point for analysing the halving of poverty.

Employing a baseline poverty line of R450 per capita per month yields a poverty headcount ratio of 52.45% (using expenditure) and 49.56% (using income) in 2006. In other words, roughly half of South Africans fall below this poverty line. The aggregate poverty gap comes out at just under R60 billion (R59.65b using income and R59.82 using expenditure). Given that both the income and expenditure poverty headcount ratios are in the region of 50%, the 'halving of poverty' target can be approximated as involving the following two components:

²The exchange rate in 2006 (the year of the data) was R6.76/US\$.

- *Cutting the poverty headcount ratio to 25% of the population by 2014;*
- *Reducing the aggregate poverty gap to R30 billion (in March 2006 Rands) by 2014.*

It is worth noting that, although about half the population is classified as poor, the poverty gap is only about 3% of GDP.

The analysis of the relationship between distribution, growth, and poverty that follows is based on how these targets can be achieved. The actual policies that could be implemented to address poverty or change distribution fall outside of the scope of this article. Rather, the focus is on what the commitment in AsgiSA to halving poverty means in terms of growth and distribution, and under what growth/distributional scenarios these targets can be achieved.

3 Can poverty be halved through growth?

In order to establish whether the AsgiSA target of halving poverty can be achieved through distributionally neutral growth, various growth rates are applied uniformly across each of the 47 391 192 individuals in the (weighted) dataset.

Since the poverty line is a monetary poverty line based on the cost of a basket of goods, it remains constant in real terms. This means that, with any positive growth, there will be reductions in the poverty gap and headcount ratio, so long as there is not a worsening of distribution affecting the bottom half of the population.

AsgiSA sets GDP growth targets of at least 4.5% between 2005 and 2009, and at least 6% between 2010 and 2014. These rates are targets and not projections or forecasts. Realistically it seems inconceivable that these rates will actually materialise, particularly in the light of the global economic problems. Nonetheless, we consider how poverty would evolve by 2014 with these rates and the current distributional structure. Applying AsgiSA-targeted growth rates uniformly across the distribution to ascertain the effects on poverty means that people gain uniformly in proportionate terms; in absolute terms the wealthy of course gain many times more than the poor with a uniform growth rate.

Table 1 shows what the halving of poverty would mean in terms of the poverty headcount ratio and aggregate poverty gap, for both expenditure and income (a similar table is shown in Appendix 1 using the food poverty line). It also shows how far growth at the rates targeted in AsgiSA could go in reducing poverty. Growth at the AsgiSA targeted rates would make significant inroads into poverty – cutting the poverty headcount ratio by about a third and the poverty gap by around 45%. However, even at these unrealistically high growth rates, neither the poverty gap nor the poverty headcount ratio can be halved with the current distribution of income or expenditure.

TIP curves are utilised here to show both the poverty gap and poverty headcount ratio under the current distributions of income and expenditure, and subsequently to explore the relationship between distribution, poverty, and growth and specifically to assess what combinations of growth and distributional change would allow for the halving of the poverty gap and poverty headcount ratio. Derived from Jenkins and Lambert (1997), ‘TIP’ refers to the ‘Three I’s of Poverty’: the incidence, intensity, and inequality of poverty. TIP curves plot the cumulative sum of the poverty gaps per capita (y-axis) against the cumulative population share (x-axis).

Formally the TIP curve can be denoted (following Jenkins and Lambert) as $TIP(g; p)$ where p is the cumulative population share with $0 \leq p \leq 1$ and p on the x-axis is plotted against $\sum_{i=1}^k \frac{q_i}{n}$. Thus

$$TIP(g; \frac{k}{n}) = \sum_{i=1}^k \frac{q_i}{n} \text{ for } k \leq n \text{ (with intermediate points derived through linear interpolation).}$$

The slope of the TIP curve at any given percentile equals the poverty gap for that percentile. For the subset of the population falling below the poverty line, the TIP curve is an increasing concave function of p , while for people above the poverty line the curve is horizontal (since their poverty

gaps are zero). Insofar as the curve flattens as it approaches the poverty line, this shows the decline in the poverty gap as expenditure or income increase towards the threshold.

The extent of poverty incidence, in terms of the poverty headcount ratio, is shown by the value of p at the point where the curve becomes horizontal. This is shown by the length of the non-horizontal part of the TIP curve.

The intensity of poverty is shown by the overall height of the TIP curve, since the height of the curve (at $p = 1$) is the aggregate poverty gap averaged over the entire population. The average poverty gap amongst the population falling below the poverty line is given by the slope of a ray from the origin to $(h, TIP(g; h))$.

The degree of inequality amongst the poor is shown by the degree of concavity of the non-horizontal section of the TIP curve. If all of the poor had equal incomes, then the non-horizontal section of the curve would be a diagonal straight line (with a gradient equalling the difference between the poverty line and the average income of the poor).

Figure 1 shows the TIP curve for current expenditure (on a household per capita basis, per month). The curve plots over 47 million individual points, the cumulative poverty gaps of every South African (weighted from the original survey data). It can be seen that about half of the population currently falls under the poverty line of R450 per capita per month. Halving the poverty headcount ratio would mean cutting it to about a quarter. This target for the headcount ratio is shown by the dotted vertical line at around 0.26. The mean poverty gap per capita over the whole population is about R105 per capita per month. Halving the poverty gap would mean bringing it down to about R53 per capita, and this target is shown by the horizontal dashed line. Meeting the targets of halving both the poverty gap and the poverty headcount ratio would mean bringing the point of the TIP curve at which it becomes flat below the horizontal dotted line as well as to the left of the vertical dotted line.

In Figure 2 below the original TIP curve for expenditure is compared with that which would result if the growth rates targeted in AsgiSA were to materialise through to 2014, given the current distribution of expenditure. The pattern of expenditure that would derive from that is shown as a dashed curve. With the growth rates as hoped for in AsgiSA, the poverty gap is reduced drastically and the poverty headcount ratio also falls significantly. Despite this, it can be seen that neither the poverty gap nor the poverty headcount ratio is halved. Even in the absolutely improbable event of the AsgiSA-targeted growth rates materialising, this would be insufficient to halve poverty without some pro-poor distributional change (in the sense of distributional change that disproportionately raises the income and expenditure of the poor).

In fact, it would take annual growth rates of 8.7% per annum from 2006 to 2014 to halve both the poverty gap and poverty headcount ratio of both income and expenditure, with the current distribution. GDP in South Africa grew at a real average annualised rate of 4.1% between 2000 and 2006, which was higher than for many years previously, and 2.4% between 2006 and 2009.³ These rates were reached during the recent commodities boom from which South Africa benefited, and which is unlikely to continue in the near future. The global economic crisis has also depressed growth rates in South Africa, and will in all probability result in a decline in growth rates. Taking into account actual growth rates from 2006 until the present, the impossibility of halving poverty through growth alone becomes clearly apparent.

With the current distribution, it would take many years of growth to halve poverty (in particular, the poverty headcount ratio). Were GDP to grow at an annual rate of 4% per annum, both measures of poverty would not be halved until the year 2022. With GDP growth of 3% per annum, only in the year 2027 would poverty be halved. This dramatically illustrates that relying on growth to bring down poverty would effectively mean that poverty would not be halved for a long time to come.

³Calculated from GDP data published by the South African Reserve Bank, downloaded from www.reservebank.co.za.

4 Poverty outcomes under alternative growth/distributional scenarios

4.1 Distributional changes

Having established the impossibility of growth alone leading to the halving of poverty by 2014, given the current distribution of income and expenditure, we therefore examine what growth-distribution scenarios could halve poverty by 2014.

There is an almost infinite variety of hypothetical distributional changes that could result in a halving of poverty. Distributional changes across the entire population are considered in the scenarios that follow, as explained below. Of course this is not how distributional change occurs in practice, and it would be very difficult to design policies to effect these outcomes with any degree of precision (and redistributive changes would of course also incur significant administrative costs and other types of transaction costs).

The concern here is not so much a direct redistribution of income through social transfers, although this could certainly be a component of distributional change. The analysis is concerned more fundamentally with an overall shift in the growth path towards more ‘pro-poor growth’, in the sense of growth in which the incomes of the poor increase relatively more than do those of the non-poor. The distributional changes simulated here are intended to be indicative of the scale of ‘redistribution’ of incomes and expenditure that would result from a more pro-poor growth path. For instance, one in which returns to unskilled labour rose more rapidly than returns to skilled labour, and/or a relative expansion in employment opportunities. Such shift would not result in the exact distributional changes simulated here; these projections are indicative in nature and are suggestive as to what combinations of growth and a more egalitarian distribution could result in a halving of poverty.

4.2 Method for simulating distributional changes

The methodology used in simulating alternative distributional scenarios is set out below with reference to income for heuristic purposes, but these were undertaken with each of income and expenditure. The method is explained intuitively here, and mathematically in Appendix 2.

We begin by ranking the entire South African population from highest to lowest in terms of household per capita income. The distributional changes simulated here ‘revolve’ around a specific point in the distribution. In the simplest case this is the median income earner. We have also used the person at the 66.6th percentile (i.e. where a third of people have higher incomes) and the 75th percentile. This ‘anchor’ point is the only person whose income is unaffected by the distributional change.⁴ Everyone with a higher income than this person loses from the distributional change and everyone below that person gains. The extent to which someone loses or gains depends on how far they are from the unaffected person: the highest income earner loses most while the lowest gains most. The simulated distributional change is generally rank-preserving because of the relatively small increments spread continuously over a population of over 47 million, with a small number of marginal rerankings.

In the simplest case in which distributional change revolves around the median income earner, the change is symmetrical around that point. The loss of the highest income earner is the exact gain of the lowest; the loss of the second highest income earner is the gain of the second lowest; and so on. In this case the distributional change is both mean-preserving and median-preserving.

In a slightly more complex variation, the point around which the distributional change revolves is not the median income-earner (i.e. the 50th percentile), but the person at for instance the 66.6th or 75th percentile. In these cases the distributional changes simulated are mean-preserving but

⁴Since weights are being used this is not necessarily an actual individual, but the principle is the same.

not median preserving, and the distributional change is not symmetrical around the person whose income remains constant. If for example the change in the distribution of revolves around the 75th percentile, the gain of the bottom three income earners must be matched by the loss of the top income earner, the gain of the next three income earners must be matched by the loss of the second highest income earner, and so on.

One parameter of these transformations is the ‘scale’ of the distributional change, in terms of how much income is redistributed. The simplest way to think about this is to set by how much the income of the lowest earner should grow through the distributional change. Simulations have been run here in which the income or expenditure of the bottom income earner grows by amounts ranging between R50 and R300 per month. While this would constitute a very significant increase in income for someone at the lowest end of the distribution, the negative effect at the top of the distribution is but a miniscule fraction of the income of the highest earners.

For example, in the case of a distributional change in which the income of the lowest-income person rises by R50 and the distributional change revolves around the median, the income of the highest-income person would decline by R50. The income of the second-lowest-income person would rise by just under R50 and that of the second-highest-income by fall by just under R50 and so on, with the amounts falling uniformly from both sides until reaching zero at the median. In the case of a distributional change of a maximum R50 but revolving around the 75th percentile, the income of the lowest-income person rises by R50 while the income of the highest-income person declines by R150, with the absolute amounts declining from both ends (but in larger increments for the top quarter of the distribution) until reaching zero at the 75th percentile.

An alternative way of modelling distributional changes would have been simply to apply different growth rates to different parts of the distribution spectrum – for instance, that the income or expenditure of the bottom decile grows at 7%, that of the next decile at 6.5%, and so on. However, such a method is much cruder than the one employed in this paper. The method used here avoids an outcome where the income or expenditure of the person at the top end of the bottom decile grows significantly more than that of the person just above them at the bottom of the next decile. In the method employed here, the growth rates vary not by income category (e.g. deciles) but by individual, resulting in a much more continuous distributional change across the distributional spectrum.

Note that the ‘losers’ from the distributional change, at the upper end of the distribution, do not actually suffer any net loss of income or expenditure in the scenarios set out below, as these simulated distributional changes are combined with various growth scenarios. The income or expenditure at the top still grows considerably in every scenario (and far more than other people in absolute terms), but slightly less than it would in the absence of the equalising distributional change.

This analysis does not model the causal relationships between growth and distribution. It uses micro-data to simulate distributional changes and to combine these changes with various growth rates in order to quantify the effects on poverty.

4.3 Projected poverty outcomes under various growth/distributional scenarios

Growth rates averaging between 1% and 7% per annum through to 2014 are considered here. While the upper growth scenarios are not at all likely to materialise, they are included here for the purposes of comparing various growth/distribution combinations.

We thus simulate the effects on the poverty gap and headcount ratio of eighty-four different combinations of growth and distributional change, for each of income and expenditure. These scenarios combine seven alternative growth rates (1%, 2%, 3%, 4%, 5%, 6%, and 7% annual average growth rates through to 2014) with four different ‘intensities’ of pro-poor distributional change (in which the income of the lowest-income person rises by R50, R100, R200, or R300) and in which distributional change revolves around each of the median, the 66.6th percentile, and the 75th percentile. This allows for a consideration of the effects on poverty of combining growth with change

in distribution that benefits the poor.

Poverty outcomes under two such scenarios are shown in Figure 3 for illustrative purposes. The solid line shows the expenditure pattern that would result from 6% GDP average growth per annum through to 2014, combined with a progressive distributional change in which the poorest South African is just R50 better off than they would otherwise have been. The dashed line shows a scenario in which growth is fairly low at 2% per annum but there is a more intensive distributional change, with the lowest-expenditure person gaining an additional R200 per month (with decreasing amounts thereafter, as explained earlier). The poverty gap is halved in both of these scenarios (as can be seen by the fact that both curves lie below the horizontal dotted line). However, while the poverty headcount ratio is reduced in both cases, this is by less than half (both curves flatten out a bit to the right of the vertical dotted line). Neither of these particular growth/distribution combinations is quite enough to halve the proportion of people living below the poverty line.

Figure 4 shows two growth/distributional scenarios in which both the poverty gap and the poverty headcount ratio are halved. In the scenario depicted with a solid line, GDP grows at 4% per annum, while in terms of distribution the expenditure of the poorest person is R200 per month higher than would otherwise be the case. The dashed line shows a scenario of GDP growth of 3% per annum with distributional change where the expenditure of the poorest person is raised by R300 per month. The TIP curves for both scenarios fall well below the horizontal dotted line, indicating that the poverty gap is cut by much more than half (in the second scenario the poverty gap is cut by almost 80%). Both curves flatten out to the left of the vertical dotted line, showing that the poverty headcount ratio is cut by at least half (in the second scenario it falls as far down as low as 12%). In these growth/distribution scenarios the target of halving poverty is thus achieved on both counts.

Table 2 summarises whether the targets of halving the poverty headcount ratio and the poverty gap could be met under a range of growth/distribution scenarios. While these results are shown for expenditure, there is only very minor variation for income. The effects of GDP growth through to 2014 at averages of 1-7% per annum are considered. These growth rates are shown here combined with four different pro-poor distributional scenarios. Following the method described earlier, in the most ‘intensive’ distributional change the maximum gain is R300 per month, which benefits the very poorest person, with the gains decreasing from there. In the least ‘intensive’ distribution scenario shown here, the lowest-expenditure person gains by only R50 per month; intermediate scenarios of R100 and R200 are also shown. The results shown here are for distributional changes revolving around the 66.6th percentile. For each scenario Table 2 indicates whether or not the target of halving poverty is met. Since the halving of poverty is being considered in terms of halving both the poverty headcount ratio and the poverty gap, in each scenario an ‘H’ indicates that the poverty headcount ratio is (at least) halved while a ‘G’ indicates that the poverty gap is (at least) halved. The eleven scenarios in which both dimensions of poverty are halved are shaded in.

Even under a (unrealistically optimistic) scenario of 7% annual growth through to 2014, the poverty headcount ratio cannot be halved without some distributional change. Conversely, even with growth as low as 2% per annum, both the poverty gap and poverty headcount ratio can be halved with distributional change in which the poorest person consumes an additional R300 per month.

4.4 Distributional outcomes under various growth/distributional scenarios

Tables 3-5 show what inequality of expenditure (household per capita) would look like under the various growth/distributional scenarios. The Gini coefficient of the current distribution of expenditure is 0.67, and without any distributional change this would of course remain the same irrespective of the growth rate.⁵ Before considering growth, the last row of the tables shows how much the Gini

⁵The only reason why the Gini varies across growth rates under a given distributional scenario is that the distributional changes were implemented *after* applying the growth rates, so that the value of a distributional change

would be brought down to under each of the distributional scenarios.

Distributional change in which the poorest person gains an additional R50 per month, with decreasing gains for each person going up the distribution, would already cut the Gini to 0.65 (for distributional change around the 75th or 66th percentiles) or 0.66 (for distributional change around the 50th percentile). The most intensive distributional change modelled here, in which the poorest person consumes an additional R300 per month, could bring the Gini down as far as to 0.56. While this level of inequality would be a significant improvement on current levels, it would still be extremely high by international standards, bringing South Africa to about the current level of inequality in Brazil.

Finally, it can be noted that, while the point at which distributional change revolves does not really affect the impact on poverty, it does affect the overall distributional outcome. As would be expected, the higher the point in the expenditure spectrum around which distributional change revolves, the greater the reduction in poverty (for any given growth rate and maximum gain at the bottom). For instance, under 4% annual growth and with distributional change in which the poorest person consumes an additional R200 per month, the current Gini coefficient of 0.67 falls to 0.63 in the case where distributional change revolves around the median, to 0.62 where distributional change revolves around the 66.6th percentile, and to 0.61 where distributional change revolves around the 75th percentile.

5 Discussion

Some important implications emerge from these scenarios concerning meeting the target of halving poverty. First, the target of halving poverty by 2014 does appear to be feasible, under growth rates that are a bit lower than in recent years and with quite mild distributional change. It might be suggested therefore that this target should not be given up upon or treated as some distant goal or rhetorical aspiration. This is reinforced by the fact that the entire poverty gap in South Africa (using the poverty line specified here) is just 3% of GDP.

Second, however, it is virtually impossible that the AsgiSA poverty reduction target will be attained in the absence of a pro-poor shift in the growth trajectory. Realistically, growth alone will not enable the halving of poverty. Furthermore, it is unlikely that the growth path would endogenously evolve in a sufficiently pro-poor way, without active policy interventions designed to achieve this shift.

Third, these scenarios warn that any worsening of inequality will put the AsgiSA poverty targets even further out of reach. Given that income and expenditure include non-earnings sources, economic growth would in itself not necessarily be distributionally neutral in the absence of policy measures to ensure that the unemployed also benefit. Growth which failed to carry along those in the lower part of the distribution would not even have the poverty-reducing effects shown earlier for growth alone. South Africa thus definitely cannot afford any worsening of inequality if poverty is to be halved by 2014.

Fourth, given that government is still finalising the level of the national poverty line, the possible temptation for policymakers to set this too low should be avoided. It currently appears that, notwithstanding the background research by Statistics SA into the minimum amount which could be used for a poverty line, government is considering setting it even lower than this level. This might be motivated at least in part by the realisation of just how many people would fall under such a line, and perhaps a concern that it would be difficult to halve that number of people within a reasonable timeframe. One insight that emerges from this analysis is that even middling growth with no distributional change goes a long way towards halving of poverty by 2014, and with what

differs relative to the post-growth income or expenditure values. Had the distributional changes been applied prior to the respective growth rates, the Gini would be constant for any given distributional scenario, irrespective of the growth rate. However, this would mean that the scale of the distributional change would not be identical for any given distributional scenario, as the growth would also affect the size of the effective distributional change.

might be considered fairly mild pro-poor distributional change the halving of poverty appears to be feasible. While a poverty line in the region of R450 per capita per month (as used in this analysis) means that about half of all South Africans would currently be classified as poor, this should not necessarily motivate the choice of a lower poverty line given the feasibility of dramatically cutting poverty over the next few years.

Given South Africa's levels of income per capita and status as an upper-middle income country, the scale of poverty is associated more with distributional patterns than with the total amount of resources available. Poverty in South Africa would be far lower than it is, were distribution to be at anything approaching a typical level of inequality by international standards.

While decent rates of growth could make some inroads into poverty, the scale of poverty means that growth alone will fall short. Internationally, Bourguignon (2004) emphasises that distribution matters for poverty reduction, and that comparative international evidence indicates that over the medium run distributional changes can account for significant increases or decreases in poverty. Highlighting the country-specificity of this relationship, he suggests that changing the distribution is likely to be more important than growth for reducing poverty in middle-income and inegalitarian countries. South Africa is a classic instance of such countries. The simulations of the effects of various growth/distributional scenarios suggest that halving poverty by 2014 requires a 'pro-poor' shift in the growth trajectory (over and above the distributional policies currently in place), such that distribution becomes less unequal. Conversely, any worsening of inequality will put the AsgiSA poverty reduction targets beyond reach.

Distributional changes would of course not in practice materialise in the manner modelled here, but these simulations are indicative of the scale of distributional changes needed to halve poverty. The most important dynamic underlying actual distributional changes is likely to be through the labour market, in terms of both employment creation (or losses) and the distribution of earnings amongst the employed. Social spending certainly has a role to play in ameliorating inequality and poverty, particularly in the short to medium term. However, South Africa's inequality is unlikely to be brought down to 'decent' levels – at least to 'normal' standards of inequality internationally – through social spending, but rather through increased demand for low- and semi-skilled labour and through a closing of wage gaps.

Dramatic improvements in distribution rarely come about without active measures targeted specifically at lessening inequality. Moderate decreases in inequality may well materialise as a by-product of other dynamics. However, the magnitude of the reduction in inequality that would be required to bring South Africa anywhere in line with international norms is not going to happen without policies dedicated to that end. The distributional changes analysed here would not even bring South Africa down to typical levels of inequality for a middle-income country, but to the range of highly unequal countries such as Brazil.

A stylised fact of distributional changes internationally, at least in recent decades, is what might be termed a 'downward stickiness' of inequality (see Palma, 2007). Increases in inequality are much less reversible than are decreases. For instance, in countries where a government instituted conservative economic policies that worsened income distribution, followed by the election of a government that switched to more 'progressive' policies, the distribution of income typically hardly comes down and certainly not down to the initial levels. Even where the intention is genuinely to improve income distribution, this often turns out to be far more difficult than anticipated. This is not surprising, as the wealthy are generally far better able to protect their income than are the poor, as well as being better placed to reverse any 'unfavourable' changes in distribution that do occur. This asymmetry in distributional changes underlines the point that a significant improvement in income distribution is highly unlikely to materialise without strong policy interventions geared towards that goal. Improving income distribution is possible, but it takes effort.

With the poverty line as defined here, the aggregate poverty gap is only about 3% of GDP. This suggests that poverty in South Africa should not be viewed as an insurmountable problem. In fact, given that half of the population falls below that line, 3% of GDP is a comparatively small amount,

and is smaller than what might have been expected before analysing the data. Of course the actual cost of eliminating poverty would significantly exceed this amount if considered in terms of direct transfers (given issues of targeting and administration).

Nonetheless, considering the huge scale of poverty in terms of its incidence, in conjunction with the rather small scale when considered in terms of GDP, the feasibility of dramatic reductions in poverty is suggested. If this proves intractable through a shift in the growth path, direct transfers could prove effective (as they have been in the case of Brazil). The extreme levels of inequality in South Africa would seem to suggest that there is considerable scope for pro-poor distributional change.

In this vein it might be suggested that the reduction of inequality be placed as a more central and explicit goal of government policy than is currently the case, both for its own sake and in order to significantly reduce poverty. Whether the reduction of inequality is a desirable goal in its own right is obviously a political issue. An associated consideration, if indeed the reduction of inequality is a public policy objective, is how strongly and in what ways this is to be pursued insofar as there are tensions between this and other policy goals.

6 Conclusion

This study has investigated how poverty rates in South Africa might evolve under various combinations of growth and distributional change. Specifically, it evaluates whether the target set by the South African government of halving poverty by 2014 can be achieved through growth alone. This target has not yet been fully fleshed out, but it is proposed here that it be defined in terms of both the poverty gap and the poverty headcount ratio, and an updated monetary poverty line was set out here. The target of halving poverty by 2014 was thus concretised here as cutting the poverty headcount ratio to a quarter of the population and reducing the aggregate poverty gap to R30 billion (in March 2006 Rands). With the current distribution of income and expenditure, these targets cannot be reached even were the highly ambitious growth goals set by government before the economic crisis to materialise. Simulations indicate that relying on growth alone, were the current distributional structure to remain, would mean that poverty would only be halved by the year 2027 under growth rates of 3% per annum or by 2022 under growth rates of 4% per annum.

This underlines the imperative of pro-poor distributional change if poverty is to be halved by 2014. Scenarios combining various growth scenarios with a range of simulations of pro-poor distributional change point to the feasibility of halving poverty by 2014. For instance, with growth rates of 2% combined with distributional change in which the poorest person can consume a maximum of R300 more per month, or alternatively growth of 4% per annum combined with distributional change where the poorest person consumes a maximum of R200 more per month. Inequality in South Africa is extremely high by international standards. If policymakers in South Africa are serious about halving poverty, active interventions would be needed to avoid any worsening of inequality and actually to reduce inequality – specifically, the shares of income and expenditure going to the bottom half of the population. Finally, the method developed here for simulating distributional changes could be applied to investigating the impact of various combinations of growth and pro-poor distributional change in other countries.

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Table 1: Poverty projections under alternative growth scenarios

| | Poverty headcount ratio (%) | Poverty gap (R billion) |
|---------------------------------|-----------------------------|-------------------------|
| Expenditure: | | |
| 2006 actual | 52.46 | 59.82 |
| Target: halving poverty | 26.23 | 29.91 |
| Growth at AsgiSA targeted rates | 34.33 | 32.00 |
| Income: | | |
| 2006 actual | 49.57 | 59.65 |
| Target: halving poverty | 24.79 | 29.83 |
| Growth at AsgiSA targeted rates | 33.75 | 33.98 |

Table 2: Meeting of poverty targets under alternative growth/distribution scenarios

| Growth | Distribution | | | | |
|--------|--------------|------|------|------|------|
| | R300 | R200 | R100 | R50 | None |
| 7% | H, G | H, G | H, G | -, G | -, G |
| 6% | H, G | H, G | -, G | -, G | -, G |
| 5% | H, G | H, G | -, G | -, G | -, - |
| 4% | H, G | H, G | -, G | -, - | -, - |
| 3% | H, G | -, G | -, G | -, - | -, - |
| 2% | H, G | -, G | -, - | -, - | -, - |
| 1% | -, G | -, G | -, - | -, - | -, - |

Notes:

Growth refers to the average annualised growth rate between 2006 and 2014 under the various scenarios.

Distribution refers to the distribution scenarios as set out in the text. R300 means that the expenditure of the lowest-income person is R300 per month higher than it would otherwise have been (with amounts decreasing from there as income rises); similarly for R200, R100, and R50.

For each scenario (growth/distribution combination), H means that the poverty headcount ratio is at least halved and G indicates that the poverty gap is at least halved; the symbol – means that those measures are not halved.

Table 3: Distributional change around 50th percentile

| Growth | Distribution | | | | |
|--------|--------------|------|------|------|------|
| | R300 | R200 | R100 | R50 | None |
| 7% | 0.62 | 0.64 | 0.65 | 0.66 | 0.67 |
| 6% | 0.62 | 0.64 | 0.65 | 0.66 | 0.67 |
| 5% | 0.61 | 0.63 | 0.65 | 0.66 | 0.67 |
| 4% | 0.61 | 0.63 | 0.65 | 0.66 | 0.67 |
| 3% | 0.61 | 0.63 | 0.65 | 0.66 | 0.67 |
| 2% | 0.60 | 0.62 | 0.65 | 0.66 | 0.67 |
| 1% | 0.59 | 0.62 | 0.64 | 0.66 | 0.67 |
| - | 0.59 | 0.62 | 0.64 | 0.66 | 0.67 |

Note: Expenditure inequality, measured with Gini coefficient.

Table 4: Distributional change around 66.6th percentile

| Growth | Distribution | | | | |
|--------|--------------|------|------|------|------|
| | R300 | R200 | R100 | R50 | None |
| 7% | 0.61 | 0.63 | 0.65 | 0.66 | 0.67 |
| 6% | 0.60 | 0.62 | 0.65 | 0.66 | 0.67 |
| 5% | 0.60 | 0.62 | 0.65 | 0.66 | 0.67 |
| 4% | 0.59 | 0.62 | 0.64 | 0.66 | 0.67 |
| 3% | 0.58 | 0.61 | 0.64 | 0.66 | 0.67 |
| 2% | 0.58 | 0.61 | 0.64 | 0.65 | 0.67 |
| 1% | 0.57 | 0.60 | 0.64 | 0.65 | 0.67 |
| - | 0.56 | 0.60 | 0.63 | 0.65 | 0.67 |

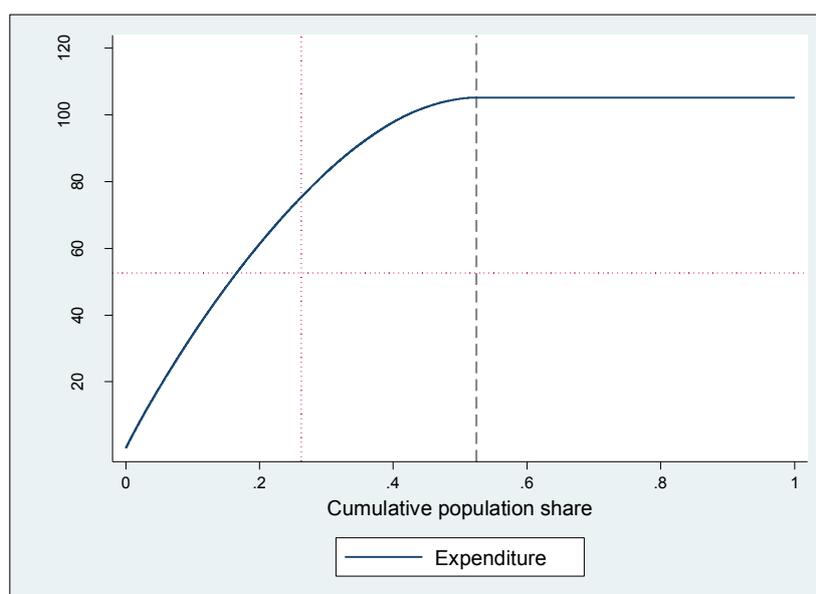
Note: Expenditure inequality, measured with Gini coefficient.

Table 5: Distributional change around 75th percentile

| Growth | Distribution | | | | |
|--------|--------------|------|------|------|------|
| | R300 | R200 | R100 | R50 | None |
| 7% | 0.60 | 0.62 | 0.65 | 0.66 | 0.67 |
| 6% | 0.59 | 0.62 | 0.64 | 0.66 | 0.67 |
| 5% | 0.59 | 0.61 | 0.64 | 0.66 | 0.67 |
| 4% | 0.58 | 0.61 | 0.64 | 0.65 | 0.67 |
| 3% | 0.57 | 0.61 | 0.64 | 0.65 | 0.67 |
| 2% | 0.57 | 0.60 | 0.64 | 0.65 | 0.67 |
| 1% | 0.56 | 0.59 | 0.63 | 0.65 | 0.67 |
| - | 0.55 | 0.59 | 0.63 | 0.65 | 0.67 |

Note: Expenditure inequality, measured with Gini coefficient.

Figure 1: TIP curve of expenditure



Note: Poverty line set at R450 per capita per month, as discussed in the text (Figures 1-4).

Figure 2: TIP curve of expenditure and expenditure with AsgiSA targeted growth rate

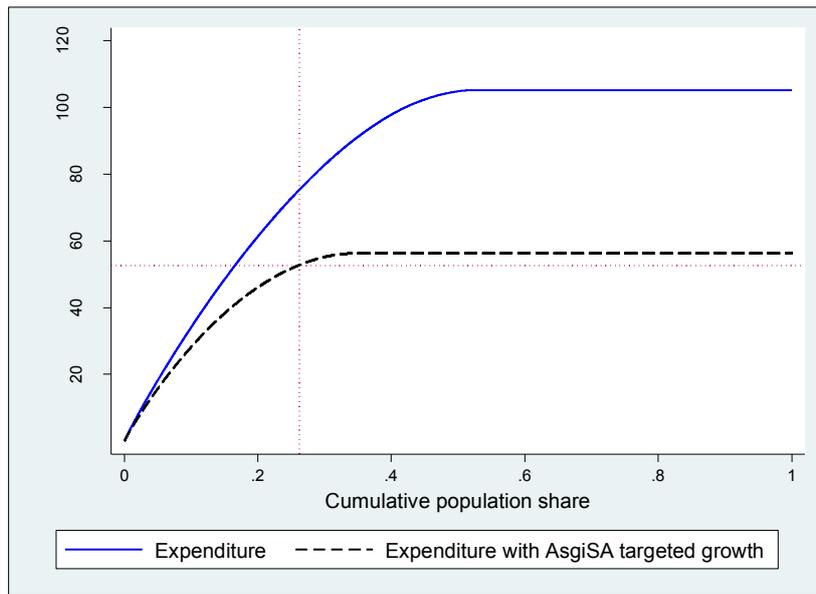


Figure 3: TIP curve of expenditure under alternative growth/distribution scenarios

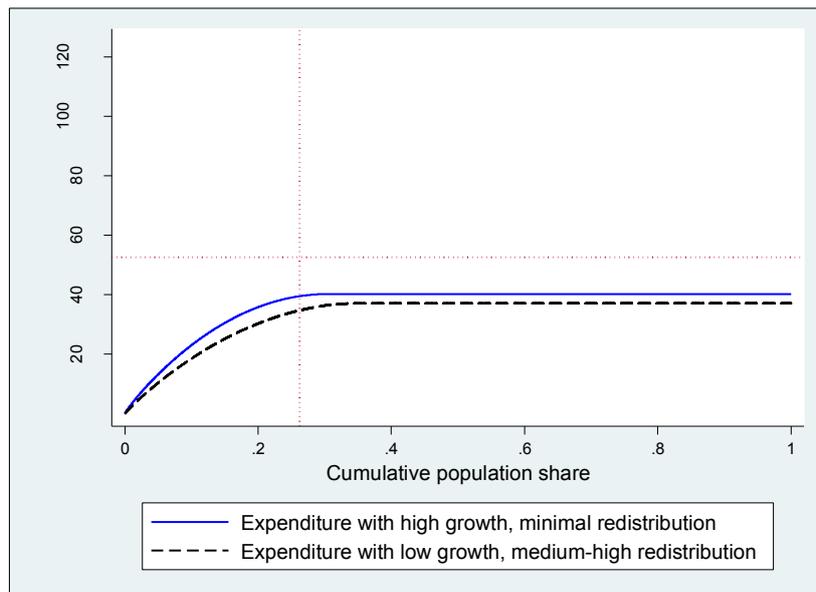
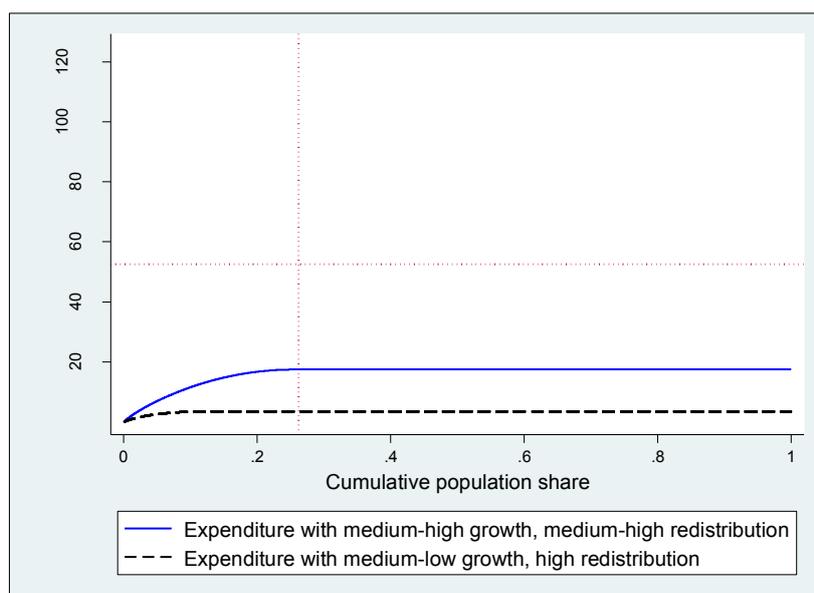


Figure 4: TIP curve of scenario halving poverty gap and headcount ratio



APPENDIX 1: RESULTS USING FOOD POVERTY LINE

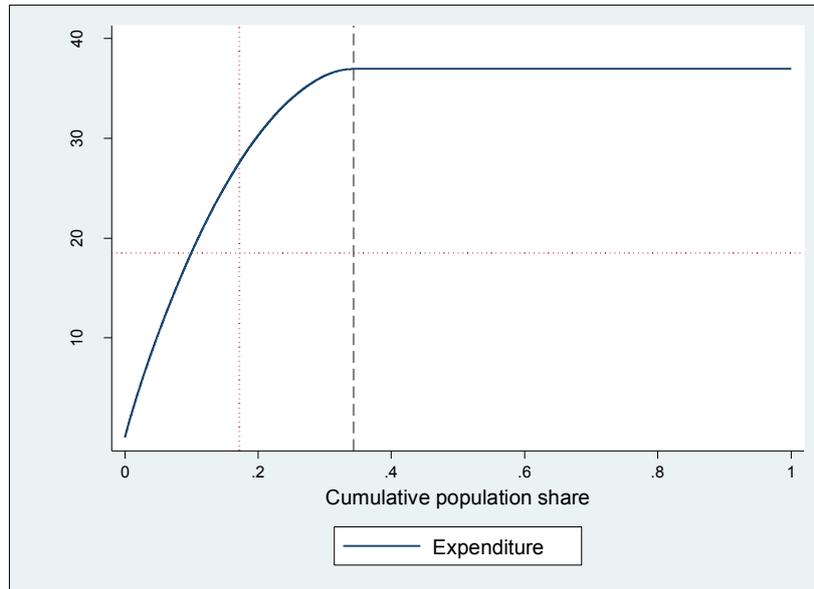
Table A1 shows what halving of poverty would mean in terms of the food poverty line, and what poverty rates can be projected for 2014 using this line under alternative growth scenarios with the current distribution of expenditure and income respectively.

Table A1: Poverty projections [using food poverty line] under alternative growth scenarios

| | Poverty headcount ratio (%) | Poverty gap (R billion) |
|---------------------------------|-----------------------------|-------------------------|
| Expenditure: | | |
| 2006 actual | 34.36 | 21.02 |
| Target: halving poverty | 17.18 | 10.51 |
| Growth at AsgiSA targeted rates | 17.52 | 8.76 |
| Income: | | |
| 2006 actual | 33.86 | 22.31 |
| Target: halving poverty | 16.93 | 11.16 |
| Growth at AsgiSA targeted rates | 18.57 | 10.57 |

Figure A1 shows the TIP curve using the food poverty line (set at R295 per capita per month). Using this lower line means that the poverty headcount ratio is significantly lower, at around 34% of the population. Furthermore, the poverty gap is significantly lower, just about R36 per capita per month when averaged over the entire population. The dotted horizontal and vertical lines show what the targets for halving the poverty gap and headcount ratio are, respectively, if the food poverty line is used.

Figure A1: TIP curve of expenditure, using food poverty line



Notes:

Food poverty line set at R295, as discussed in the main text.

A different scale is used in this case as from the other TIP curves (in Figures 1-4).

APPENDIX 2: METHOD USED FOR SIMULATING DISTRIBUTIONAL CHANGES

To set out the method described in section 4 more formally, let x_i denote the income or expenditure of person i where the population is ranked from lowest to highest in terms of variable x , for $i = 1, 2, \dots, n$. That is, x_1 is the lowest income or expenditure and x_n the highest. Note that this ranking will differ for income and for expenditure. In this analysis, $n = 47\,391\,192$.

Select ρ , the point around which the distributional change will revolve. For symmetrical distributional change around the median, $\rho = 0.5n$; for distributional change around the person at for example the 75th percentile, $\rho = 0.75n$.

Let θ_i be the value of the distributional change affecting person i such that:

$$\begin{aligned} \theta_i &> 0 \text{ for } i < \rho; \\ \theta_i &< 0 \text{ for } i > \rho; \text{ and} \\ \theta_i &= 0 \text{ for } i = \rho. \end{aligned}$$

Select ω , the value of the gain to the person with the lowest income or expenditure [$i=1$].

The range of values to be redistributed will be:

$$\omega \leq \theta_i \leq |\phi| \text{ where } \phi \text{ is the maximum loss to the person with the highest income or expenditure } [i=n] \text{ and } \omega > 0 \text{ and } \phi < 0.$$

For the special case of distributional change revolving around the median ($\rho = 0.5n$),

$$\omega = -\phi;$$

while for distributional change around points higher than the median (e.g. $\rho = 0.75n$),

$$\omega < |\phi|.$$

Then for $i < \rho$, the distributional gain will be:

$$\theta_i = \omega - \frac{\omega(i-1)}{\rho-1} = \frac{\omega(\rho-i)}{\rho-1}.$$

It can be seen that for the poorest person, the distributional gain will be the full value of the maximum distributional change, ω , while for the person just below the unaffected person (e.g. immediately below the median person in the simplest case) the distributional gain will be positive but close to zero. For $i > \rho$, the distributional loss will be:

$$\theta_i = (\rho-i) \frac{\sum_{i=l}^{\rho-1} \theta_i}{\sum_{i=\rho+1}^n (i-\rho)}.$$

This is a general expression which mathematically balances the aggregate loss to upper-income earners with the aggregate gain to lower-income earners who gain from distributional change, no matter around which point the distributional change revolves.

Note that in this exposition we have selected the maximum gain to the person with the lowest income or expenditure [$i=l$], ω , then calculated the gain to the other people in subset $i < \rho$; this allowed for the derivation of the loss to the people in subset $i > \rho$. The method could equally have begun by selecting the loss to the person with the highest income or expenditure [$i=n$], ϕ , and calculating $\theta_i \forall i > \rho$ and thence deriving $\theta_i \forall i < \rho$; the results would be identical.

The post-distributional-change income of person i will thus be:

$$\tilde{x}_i = x_i + \theta_i$$

Such that

$$\tilde{x}_i > x_i \forall i < \rho; \quad \tilde{x}_i = x_i \text{ for } i = \rho; \quad \text{and } \tilde{x}_i < x_i \forall i > \rho.$$