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# **Growth without Poverty Reduction?**

## **Examining Micro-Macro Links in Tanzania**

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**Growth without Poverty Reduction?**  
**Examining Micro-Macro Links in Tanzania**  
*Abstract*

Studying the relation between economic growth and income poverty reduction without taking changes in the distribution of income into consideration is like setting up *Othello* without Iago in the play. Without any further references to Shakespeare, this paper examines the relations between poverty levels, economic growth and changes in inequality in Tanzania during the 1990s. It offers four conclusions. First, the efficiency with which growth reduces poverty increases with a country's income level, so low-income countries should combine growth promotion with redistribution; second, growth in Tanzania during the 1990s, has accelerated, but has also been concentrated in sectors to which the majority of the poor have few links; third, the efficiency with which income growth reduces poverty in Tanzania appears very sensitive to the *pattern* of growth; fourth, recent poverty reduction strategies do not appear to recognize this fact and rely apparently instead on a strategy in which growth increases tax revenue that can be used to alleviate poverty through an expansion of publicly supplied (social) services.

The selected strategy appears particularly ill-chosen, both because of Tanzania's historical tax collection record and because of the emerging consensus on the state as a facilitator, not a producer, in the development process.

*Keywords:* poverty, inequality, growth, Tanzania

*JEL codes:* I32, O15, O55

## 1. Introduction

For a sustained reduction of income poverty rates to take place, economic growth is necessary. Although often considered a self evident statement, it contains more complicated issues than what text books' sweeping statements on "trickle-down" usually acknowledge. For one thing, the relation between economic growth<sup>1</sup> and poverty reduction displays wide variations across countries and over time that are not easily explained by simply examining the income distribution of the poor.<sup>2</sup> Second, the relation depends on the poverty metric used—and if non-income aspects of poverty are taken into consideration, it is quite possible that a policy action or an external shock may improve poverty rates when measured along one dimension, but make them worse while measuring poverty in another dimension.<sup>3</sup> Third, the concept of "poverty elasticity" – sometimes employed to capture the relation between growth and poverty reduction – is often more confusing than enlightening, both because it is sometimes calculated under the assumption that the distribution of income remains constant over growth episodes (which typically is not the case), and because it is

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<sup>1</sup> For the purposes of this paper "economic growth" will be taken to mean increases in real per capita GDP.

<sup>2</sup> A uniform increase of per capita incomes will bring a larger reduction in headcount poverty if many of the poor have incomes just below the poverty line, but even if one controls for that, the impact of growth on poverty differs sharply across countries and over time.

<sup>3</sup> One example will suffice. Assume that poverty is measured as an index consisting of disposable income and access to primary education. If the government increases taxes to finance an expansion of the education sector, it is possible that poverty in the income dimension will increase while at the same time poverty in the education dimension will fall. The net effect will depend on how these two variables are weighed to construct the index and theory cannot guide us here.

sometimes forgotten that the sensitivity of poverty to economic growth depends on the shape of the Lorenz curve around the poverty line, not the entire distribution (Bhalla, 2002; Bourguignon, 2004).

In modern poverty research, utilizing the growing number of high-quality household budget surveys from around the world, several factors that single out Africa as a special case have emerged. For instance, Chen and Ravallion (2004), in a recent update of global poverty trends, compute trend rates of change in the headcount index. The trend is significant with a negative coefficient for all continents except sub-Saharan Africa (SSA) and Latin America. Furthermore, the mean income of the poor (when the poverty line is the 1PPP\$/day) is lower in SSA than in any other continent. This means, of course, that it takes, *ceteris paribus*, more growth in SSA to achieve a given poverty reduction. Finally, the elasticity of the poverty gap to economic growth is around  $-1.3$  in SSA. The corresponding numbers are  $-3.9$  for South Asia,  $-3.7$  for Eastern Europe and Central Asia, and  $-2.5$  for the global poverty gap. This means that to diminish the poverty gap by 10 percentage points, GDP per capita in SSA must increase – for a constant distribution of income – by 7.7 percent, while an increase of 2.6 percent is sufficient to accomplish the same proportional reduction of the poverty gap in South Asia.

But even if SSA is different from other regions in the developing world, it is far from homogenous: the relation between growth and poverty reduction displays wide variations across African countries. And of these, Tanzania consistently comes out as one in which there has been increasing growth in the 1990s, but apparently very little reduction in income poverty (*cf.* below). This suggest not only that there is an “Africa factor” in that SSA shows slower poverty response to growth than other regions, but

that there is a “Tanzania factor” as well, for while the growth elasticity of headcount poverty in several African countries ranges from  $-1.3$  to  $-5.4$ , the corresponding number in Tanzania is  $-0.7$ . Similarly, while the growth elasticity of the poverty gap in several African countries ranges from  $-1.8$  to  $-10.3$ , in Tanzania it is a mere  $-0.9$ .<sup>4</sup> This suggest not only that Tanzania needs more growth to achieve any given poverty reduction objective, but also that the relations between growth, inequality and poverty are different in that country than in many other African countries. This is noteworthy and perhaps somewhat surprising, both because many of the countries in SSA have been pursuing similar policy packages for the past decade or so, and because the production and trade structures do not seem to differ dramatically.

The purpose of this paper is to probe deeper into the issues raised by these observations. It is organized in the following way. Section 2 provides some general remarks on the relations between poverty, inequality and growth and shows in particular that while poverty in principle can be reduced by either income growth or reductions in inequality, the efficiency of growth as a poverty reduction instrument increases with the level of income. Section 3 shows that high growth is vital for Tanzania to reach stated poverty objectives, but also that even high growth can be hampered by relatively modest increases of inequality. Section 4 uses the available household budget data for Tanzania to decompose income growth into poverty effects and income distribution effects. I illustrate, through simulations, how different growth

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<sup>4</sup> African countries include Botswana, Burkina Faso, Kenya, Malawi, Senegal, South Africa, and Uganda. Elasticities were calculated using the most recently available household budget survey and are partial elasticities in that the distribution of income is assumed constant. Data for the “inequality elasticity” (i.e., the number measuring

patterns generate effects in terms of poverty reduction that are sharply different. In particular, growth concentrated in sectors where the poor reside – i.e., agriculture in general and subsistence agriculture in particular – can have a dramatic impact on poverty levels. Section 5 reviews some pertinent features of the current poverty reduction strategy and I argue that expansion of social services, rather than stimulation of agriculture, is central to that strategy. Given the emerging consensus between donors and the government on the proper role of the state in the development process, it is not entirely clear that the strategy leading from growth to poverty reduction over increased and publicly supplied social services is either warranted or efficient. Section 6 concludes.

## 2. Growth, Inequality and Poverty

Any metric measuring income poverty at time  $t$  can be written as

$$(1) \quad P_t = P(z, \mu_t, L_t)$$

where  $P$  is the poverty metric (such as the headcount poverty ratio),  $z$  is the poverty line,  $\mu$  is mean income and  $L$  is a set of parameters describing the Lorenz curve;  $L$  usually contains cumulative population and cumulative income for various income classes, such as deciles. Consequently, any change in the chosen poverty metric can be decomposed as (with dropped time subscripts)

$$(2) \quad dP = \frac{\partial P}{\partial z} dz + \frac{\partial P}{\partial \mu} d\mu + \frac{\partial P}{\partial L} dL$$

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poverty's response to changing inequality, with per capita income constant) are available upon request.

Dividing through by  $P$  and manipulating a little gives

$$(3) \quad \hat{P} = \varepsilon_z \hat{z} + \varepsilon_\mu \hat{\mu} + \varepsilon_L \hat{L}$$

where a hat denotes a growth rate (i.e.,  $\hat{x} = dx/x$ ) and  $\varepsilon_x$  denotes the elasticity of  $P$  with respect to  $x$  (i.e.,  $\varepsilon_x = \frac{\partial P}{\partial x} \frac{x}{P}$ ). The rate of change of income poverty, in other words, depends on how poverty responds to changes in  $z$ ,  $\mu$  and  $L$ , weighted with the growth rates of these three variables.

There are two things that should be noted before we plunge into the analysis. First, I ignore interactions between  $z$ ,  $\mu$  and  $L$ . In practice, one often observes increases of the poverty line as mean income increases, so to the extent that  $z$  represents a minimum acceptable standard of living, it might be possible that  $\partial z / \partial \mu > 0$ . Similarly, there are possible causal relations between the distribution of income (reflected in  $L$ ) and the rate of change of mean income (i.e.,  $\hat{\mu}$ ). However, as this analysis focuses on a relatively brief period (about a decade), and since I wish to be able to study poverty rates over this period, the poverty line is kept constant (in real terms), and possible interaction effects (which are still controversial in the literature, anyway; cf. Dollar and Kraay, 2002; Bourguignon, 2003) are ignored.

Second, note that the change in  $L$  over time is shown as a change in the distribution of income. Henceforth, this will be interpreted as a change in the Gini coefficient, with  $dL > 0$  meaning increased income inequality, and vice versa.<sup>5</sup>

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<sup>5</sup> I use later the standard deviation of the log of income ( $\sigma$ ) to measure inequality. In the case of a lognormal distribution of income, this is related to the Gini coefficient



Armed with these qualifications, expression (3) can be simplified to

$$(4) \quad \hat{P} = \varepsilon_{\mu} \hat{\mu} + \varepsilon_L \hat{L}$$

where, obviously,  $\varepsilon_{\mu} \leq 0$  and  $\varepsilon_L \geq 0$ . Income poverty decreases when mean income increases (and the distribution of income is constant) and decreases when the distribution of income becomes more unequal (and mean income is constant). Hence a given rate of per capita growth will have a stronger impact on poverty the less inequality of income increases during this process.<sup>6</sup> To put it differently: the reason why headcount poverty decreased by around four per cent for each percent increase of per capita incomes in Korea during the 1990s, while the corresponding number for Nepal in the late 1990s was only 0.5 percent is because the distribution of income in Nepal worsened more during growth. The *pattern of growth* obviously matters for growth's impact on poverty.

It is possible to become even more specific, following Datt and Ravallion (1992) and Bourguignon (2003). Let  $F_t(Y)$  denote the proportion of the population with incomes below  $Y$  at time  $t$ . With  $z$  as the poverty line,  $F_t(z)$  is the headcount ratio. Furthermore, normalize incomes so mean income equals one; this relative distribution is denoted  $\tilde{F}_t(Y)$ . Following Datt and Ravallion (1992) a change in the head count ratio,  $H$ , between time  $t$  and  $t'$  can then be written as

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(G) through  $G = 2\Pi\left(\frac{\sigma}{2^{1/2}}\right) - 1$  where  $\Pi$  is the cumulative distribution of the standard normal. See Aitchison and Brown (1966).

<sup>6</sup> So one might define 'pro-poor growth' as a growth episode with a constant (or a favorable change in the) distribution of income.

$$(5) \quad \Delta H = H_{t'} - H_t = \left[ \tilde{F}_t\left(\frac{z}{\bar{y}_{t'}}\right) - \tilde{F}_t\left(\frac{z}{\bar{y}_t}\right) \right] + \left[ \tilde{F}_{t'}\left(\frac{z}{\bar{y}_{t'}}\right) - \tilde{F}_t\left(\frac{z}{\bar{y}_{t'}}\right) \right]$$

where  $\bar{y}$  is mean income. The first expression is simply the “growth effect” on poverty – the impact of a uniform increase of all incomes at the “old” relative distribution of income. The second is the “redistribution effect” – the change in the relative distribution of income at the new level of mean income. From this general formulation, the growth elasticity of poverty can be written as

$$(6) \quad \varepsilon = \lim_{t' \rightarrow t} \frac{\frac{\left[ \tilde{F}_t\left(\frac{z}{\bar{y}_{t'}}\right) - \tilde{F}_t\left(\frac{z}{\bar{y}_t}\right) \right]}{\tilde{F}_t\left(\frac{z}{\bar{y}_t}\right)}}{\frac{(\bar{y}_{t'} - \bar{y}_t)}{\bar{y}_t}},$$

but the redistribution elasticity is more difficult to translate, mainly because it often cannot be represented by a scalar (Bourguignon, 2003: 11).

However, by assuming that the income distribution is lognormal (which is a very common assumption in empirical economics), some ground can be gained. In this case, the relative distribution can be written as

$$(7) \quad \tilde{F}_t(Y) = \Pi \left[ \frac{\log(Y)}{\sigma} + \frac{1}{2} \sigma \right]$$

where  $\Pi$  is the cumulative distribution function and  $\sigma$  is the standard deviation of the log of income. We are now in a position to see how income levels, inequality and poverty reduction hang together. Following Bourguignon (2003), use (7) to express

the growth elasticity of poverty, as in (6) above:

$$(8) \quad \varepsilon = \frac{\Delta H}{\Delta \log(\bar{y}) H_t} = \frac{1}{\sigma} \lambda \left[ \frac{\log(z/\bar{y}_t)}{\sigma} + \frac{1}{2} \sigma \right]$$

Here,  $\lambda$  is the ratio of the density to the cumulative function, and  $\Delta \log \bar{y}$  is the growth rate of mean income. Two important conclusions follow from (8): first, the growth elasticity of poverty is an increasing function of the level of income, i.e., the inverse of the ratio  $(z/\bar{y}_t)$ ; second, the growth elasticity of poverty is a decreasing function of the level of income inequality, represented here by  $\sigma$ , the standard deviation of the logarithm of income.

Is it possible to draw any policy conclusions directly from these formal exercises? Since the growth elasticity increases with the level of income, it suggests that low-income countries should combine growth-promoting policies with some measure of redistribution. This appears particularly important in the case when initial inequality is high.

### **3. Growth and Inequality in the Aggregate**

The package of strategy papers associated to the HIPC process are focused on poverty alleviation through two distinct, though interrelated, channels: growth which increases the income of the poor and reallocation of government expenditures. The impact of the latter will depend on a host of factors most of which are closely monitored in the annual Public Expenditure Review (PER) exercise. Most of those involved appreciate that it is not just a matter of changing the allocations in the budget, but the flow of money from the Treasury to the final beneficiary can be diverted, misappropriated or

simply spent badly which decreases the value of that money for the final user.<sup>7</sup> It should also be noted that while better supply of services from the government are an important component in the fight against poverty, the government cannot eradicate poverty – it can only render it more easy for poor people to increase their income, be it through better access to commodity or labor markets, or by lowering the costs of making economic transactions. However, it is equally important to realize that the government may focus on income poverty through facilitating growth, or non-income poverty through facilitating (or supplying) social services. In both cases, economic growth is necessary: in the first, because it may increase the demand for the labor and output of the poor; in the second, because it increases tax revenue which may be used to finance better and more social services.

The extent to which economic growth reduces income poverty in reality depends on a host of factors. As noted by Dollar and Kraay (2002), incomes of the poorest quintile rise on average in tandem with median income. Consequently, if per capita incomes increase by three percent, incomes of the poorest 20 percent of the population also increase – on average – by three percent. This is just another way of stating the (well-known) fact that there is no strict relation between the distribution of income and the level of income.

It is important, however, to qualify the conclusion of Dollar and Kraay. As several authors have noted (cf. Danielson, 2004 for a survey), there is enormous variation in the results; in some cases, the poorest quintile increased its income by more than the

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<sup>7</sup> Thus for instance Reinikka and Svensson (2001) show that approximately 13 percent of the funds allocated to primary education in Uganda's budget actually hit the ground, i.e., reached the schools.

mean; in other, incomes of the poorest quintile actually fell when average incomes increased (Timmer, 1997 contains a useful discussion). One of the more important factors determining the extent to which the poor benefit from growth is the pattern of growth: if growth takes place in sectors to which the poor have few linkages (such as, for instance, heavy industry), their benefit is likely to be smaller than if growth takes place in, say, small-scale agriculture.

The growth record in Tanzania has improved during the 1990s. Recent data (IMF, 2004*b*) suggest that the growth rate of GDP (in constant prices) doubled between 1997 and 2003. Furthermore, Danielson (1997: Table 1) reports that per capita income grew at around one percent per annum between 1986 and 1994, and WDI (2004) suggests that the acceleration of growth rates (accompanied by accelerating increases in real per capita incomes) started around 1995. From these sources, it seems reasonable to conclude that per capita incomes have increased (with occasional dips, particularly during the 1980s, and after the El Niño disaster in 1997) since the late 1980s.

In Table 1 a few simulations are presented. The point of departure is the poverty elasticity from TAKWIMU (2000: Table 50), which is based on calculations from the 1991/92 household budget survey. We assume – with GoT (2000: 14) – that the share of the population falling below the basic needs poverty line is 48 percent in the year 2000; that population growth is 2.8 percent per annum for all income classes, and that the distribution of income remains unchanged. Given these assumptions, a real GDP growth of 6% implies that per capita incomes increase by 3.2% ( $6\% - 2.8\%$ ). This in turn means that the share of the population below the poverty line decreases by  $-0.69 \times 3.2\% = 2.2\%$  per annum. Similar calculations are made for other GDP growth

rates to illustrate the sensitivity of the poverty strategy on the assumption concerning GDP growth. The last row of the table indicates the year when the intermediate poverty objective has been achieved, i.e., the year when the share of the population under the poverty line has been halved.

**Table 1 here**

This exercise assumes that the distribution of income remains constant, i.e., that when GDP grows at six percent (so per capita incomes increase at 3.2 %), everybody's income grow at this rate. This is clearly an unrealistic assumption, for growth is by its very nature an unequal process that is concentrated to particular sectors or areas, and may eventually "trickle down". In general, if growth is associated to a more even distribution of income, incomes of the poor grow faster than the national average and poverty is reduced faster, and vice versa.

What we have is a set of estimated poverty elasticities based on the 1991/92 HBS (HBS91, for short) that assume that the distribution of income is constant. There are several indications that this is not realistic, so we use the estimated elasticities from the HBS91 to simulate the rates of growth required to halve the number of people below the national poverty line by 2015 under the assumption of improving, constant and worsening income distribution. The results are in Table 2. It is clear that even modest changes in inequality have dramatic effects on the rate of growth required to achieve the objectives in the poverty reduction strategy. This is an illustration of the point made above, viz., that growth becomes more efficient for poverty reduction the higher the level of income.

## **Table 2 here**

Based on these data and the assumptions that (a) GDP will growth by six percent per annum; and (b) the agricultural sector will grow by 5 percent per annum, the current poverty reduction strategy (GoT, 2000: 14) includes three objectives:

- Reducing the proportion of the population below the basic needs poverty line from 48 percent in 2000 to 42 percent in 2003 (with a long term target of 24 percent by 2010);
- Reducing the proportion of the rural population below the basic needs poverty line from 57 percent in 2000 to 49.5 percent in 2003 (with a long term target of 29 percent in 2010);
- Reducing the proportion of food poor from 27 percent in 2000 to 23.5 percent in 2003 (with a long term target of 14 percent by 2010).

The first PRSP progress report (GoT, 2001) revealed that poverty levels had not changed very much over the 1990s. One possible conclusion for this is the one drawn in the PRSP progress report, viz. that “the significant improvement in economic growth during the second half of the 1990s barely compensated for the poor performance in the first half of the decade.” (p. 8).

However, another possible conclusion is that the improving growth recorded from 1995 and onwards has failed to reach the poor, mainly because growth has been principally in sectors to which the poor have few linkages. This suggestion is supported by the fact that formal sector employment appears to have fallen in the 1990s – and poverty is linked to informal sector employment. Data from the ongoing

Integrated Labour Force Survey and preliminary data from the 2000/01 Household Budget Survey (henceforth, HBS01) suggest that the proportion of household heads with principal employment in the informal sector (outside agriculture) had increased, between 1991 and 2000, from 30 to 43 percent in Dar es Salaam, from 23 to 29 percent in other urban areas, and from 9 to 14 percent totally in mainland Tanzania (GoT, 2001: Table 1(i)). However, it is difficult to draw definitive conclusions before the publication of the full set of raw data from the Household Budget Survey.

We do know, however, that the majority of the poor derive most of their income from agriculture. In HBS01, almost 81 percent of the poor stated that “Farming/livestock/fishing” was the main source of income. Although the corresponding figure in the HBS91 was almost 86 percent, it is important to realize that the sources “self-employed without employees” and “not active” increased during the decade.<sup>8</sup> It is not unreasonable to assume that most of the poor in these categories are still active in rural areas and thus indirectly dependent on agriculture.

If we look at the performance of agriculture during the decade, a dismal picture emerges. Regressing agriculture’s share of GDP on a time trend produces a negative coefficient which is highly significant ( $p = 0.002$ ), and the time trend alone explains (in a statistical sense) almost 60 percent of the decline. Moreover, growth in the

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<sup>8</sup> “Self-employed without employees” increased from 0.2 percent of the poor in HBS91 to 5 percent of the poor in HBS01 and “Not active” increased from 2.7 percent of the poor in HBS91 to 5.5 percent of the poor in HBS01 (TAKWIMU, 2002: Table 8.4).



primary sector<sup>9</sup> seems to have been driven mainly by an expansion of mining. Although mining output data are not available, export figures are and it seems reasonable to assume that most, if not all mining output is exported.<sup>10</sup> Between 1989/90 and 2001, the value of exports from the mining sector increased from US\$34.6 mn to US\$623.3 mn, an average annual increase by over 150 percent – and one should not forget that a substantial fraction of the gold and gems that are produced are smuggled out of the country, so these figures are, if anything, an underestimate.

Consequently, output in the primary sector, net of minerals, has probably declined, as a share of GDP, even faster than what the trend regression suggests. Since the overwhelming majority of the poor are engaged in agricultural activities that have little to do with mining, we may conclude that the sector in which the majority of the poor reside and from which they earn a living has lagged behind the rest of the economy; the fruits of growth have failed, by and large, to reach the rural poor.

In addition, Danielson (2002) examined supply elasticities in Tanzania to see to what extent the liberalization that started in the mid 1980s had an impact (farm-gate prices were increased substantially, thanks to the elimination of many marketing boards). He found that the composition of agricultural output had shifted in favor of food crops since the mid 1980s (i.e. since the beginning of the reforms). One possible explanation for this seemingly anomalous result is that increasing price fluctuations

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<sup>9</sup> I use here “agriculture” as a synonym to “primary”, mainly because the national accounts (and the WDI) divide recorded production into three sectors: agriculture (primary), industry (secondary) and services (tertiary).

<sup>10</sup> Mining output in Tanzania is mainly gold and gems.

and deteriorating conditions in infra-structure (including market access) forced farmers into more subsistence farming to avoid the perils of the market. This is consistent with the observation that the share of traditional exports – essentially cash crops – have declined as a share of total exports; from 1997 to 2002 traditional exports declined from almost 60 percent of total exports to less than 20 percent.

The available evidence thus suggests (i) that output of agriculture has lagged behind output of non-agriculture (particularly if the mining sector is excluded from agriculture) and (ii) that the share of the population dependent on agriculture has increased. Consequently productivity in that sector has gone down (at least relative to non-agriculture, but possibly in absolute terms as well).

#### **4. Decomposing Growth**

Under the assumption that incomes can be represented by a lognormal distribution, expression (8) can be used to calculate how changes in income levels, poverty and inequality interact. Although sufficient data for decomposing income changes during the 1990s have not been available for this paper (but see Section 4), it is revealing to look at how different sectoral patterns of growth will affect the aggregate outcome. It will be argued that it is particularly revealing to look at the performance of agriculture, both because the majority of the population gets their earnings from that sector, and also because it is the sector that houses the majority of the poor (so rapid agricultural growth is likely to lead to a more equal distribution of income). Throughout, it should be recalled that the long-term growth target for Tanzania (in PRSP, HIPC and PRGF policy documents) is 6 percent real GDP growth per annum. Although this can be contested, it is here taken as a given.

I rely on the method developed by Ravallion and Datt (1992) to illustrate the impact on poverty and income distribution of varying the rate of growth of agriculture. In addition, the exercise serves to show that it is very difficult to attain the PRSP poverty targets unless the agricultural sector in general, and small-holder agriculture in particular enters a phase of significantly higher growth. The reason for this is that growth in nonagriculture is likely – at least in the absence of rural-urban migration – to increase income inequality, which tends to counteract the impact of growth of poverty.

Two separate sets of simulations are presented. In the first, it is assumed that the overall growth rate of the economy is six percent per annum for 2000-10.<sup>11</sup> The poverty impact of varying rates of growth of agriculture is simulated and the poverty impact is decomposed into inequality and growth components, along the lines suggested in the previous section. I further assume that the rate of growth of population is 2.8 percent per annum in all sectors, and that the shares of population in the different sectors remain constant over time. The latter assumption implies that there is no net migration between sectors – an assumption that could be questioned. However, the simulations are for illustrative purposes only, and should not be taken to represent an effort to project what will actually happen. Table 2 presents the results.

The two items “Growth effect” and “Inequality” in any given row correspond to the two right-hand side bracketed terms in (5) and will always add up to the total poverty

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<sup>11</sup> Note that  $\dot{y} = \alpha \dot{a} + (1 - \alpha) \dot{n}$  where  $y$  is GDP,  $a$  is value of agricultural output,  $n$  is value of non-agricultural output and  $\alpha$  measures agriculture’s share in GDP (currently 0.5). A hat denotes rate of growth. With an overall rate of growth at 6 percent per annum, the necessary rate of growth of nonagriculture follows residually for each assumed rate of growth of agriculture.

effect. The poverty effect, in turn, will have a negative sign when poverty is decreasing and the number shows the percentage change in *the share of the population* being below the (basic needs) poverty line. It is thus possible in these simulations to have a reduction of the poverty rate while at the same time the number of people below the poverty line increases.

The patterns in the three sub-tables are similar, and we therefore focus on the sub-period 2000-05. When agricultural growth is below 6 percent (so non-agriculture grows faster than 6 percent), inequality increases and the inequality effect thus neutralizes part of the poverty impact that emanates from growth. At the same time, the growth effect becomes smaller the lower the rate of agricultural growth. Both of these effects reduce the rate of poverty reduction.

### **Table 3 here**

On the other hand, the column headed 8% illustrates the efficiency of agricultural growth for poverty reduction. Recall that we assume that the overall rate of growth of the economy is 6 percent, so if agriculture grows at 8 percent, nonagriculture grows at an average rate of 4 percent.<sup>12</sup> There are two points to make from this. First, it would seem very difficult to achieve the rapid poverty reduction rates assumed in the PRSP without high and sustained agricultural growth. Second, a government that is committed to reducing poverty has to have very strong arguments not to focus most of its efforts on agriculture. A reading of the Tanzania PRSP is not very convincing – at least not as far as budget allocations are concerned – regarding the government’s determination to raise agricultural growth (cf. IMF, 2004: §10).

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<sup>12</sup> I assume that the share of agriculture in total output is 50 percent.

In the next simulation the fact that there are huge differences between different sectors within agriculture is explicitly recognized. In particular, average incomes are significantly lower among those working in subsistence agriculture than among those in e.g., export agriculture. I assume that subsistence agriculture comprises half of the agricultural sector (and thus 25 percent of total output), and the poverty impact of different rates of growth of subsistence agriculture is simulated. Results are in Table 4.

As expected, the results from Table 3 are amplified – the poverty impact is higher the higher the rate of growth in subsistence agriculture, and the distribution of income worsen considerably as soon as the economy's average rate of growth exceeds that of subsistence agriculture. Again, it seems that a sensible strategy for reducing income poverty in the economy should focus very hard on subsistence agriculture, as the poverty impact there – despite relatively low aggregate poverty elasticity – is significant.

#### **Table 4 here**

It deserves to be repeated that these calculations are based on shaky data and bold assumptions. Nevertheless, they serve to illustrate a fundamental fact: if the majority of the poor are located in a certain sector, growth in that sector may have a large impact on poverty, even if the over-all poverty elasticity is low. The reason for this is that the growth effect and the income distribution effect pull in the same direction: if growth of agriculture is higher than the economy's average, the distribution of income will become more even with amplifies the growth effect.

A final word should be said about the assumption that there is no net migration

between sectors. The reason for making this assumption is technical; the program used for simulation does not allow for changes of sectoral population fractions. However, there are several reasons why inclusion of migration effects into the simulations would serve to strengthen the results. The reason is that we have theoretical and empirical reasons to believe that the rate of intersectoral migration is partly determined by intersectoral income differences, and that average productivity in the sector experiencing net emigration is likely to fall. Consequently, if the rate of growth of agriculture (or subsistence agriculture) is higher than in the rest of the economy, net emigration from agriculture will fall. This in turn will have two possible effects: productivity in agriculture will not fall as much as it otherwise would have and poverty in the nonagricultural sector will not increase. Consequently by assuming in the simulations that there is no net migration between sectors, the positive impact of agricultural growth on poverty is underestimated.

## **5. Policies to Fight Poverty**

Tanzania reached the Decision Point (DP) under the Enhanced HIPC Initiative in April 2000 and started immediately to receive interim debt relief (i.e., relief of interest payments, but no stock reductions). To reach the Completion Point (CP), the country would have to perform adequately with respect to the agreement under the IMF's Poverty Reduction and Growth Facility (PRGF) and to adopt a number of structural measures, including privatization of DAWASA – the water utility in Dar es Salaam – preparation for privatization (“unbundling”) of TANESCO – the electricity utility – implementation of an action plan to combat corruption, conclusion of the ongoing tax reform, and submission to Parliament of amendments to the Tanzania Investment Center Act to improve business and investment climate. The Poverty Reduction

Strategy Paper – a condition for the HIPC Decision Point – should be drafted in dialogue with all stakeholders (notably “civil society” through NGOs), subjected to a first annual progress report, and approved by the Boards of the IDA and the IMF.

Given the shaky data on poverty in many low-income countries, the drafting of a realistic plan to fight poverty is no easy task. Fortunately for Tanzania, however, it was possible to build on the existing poverty strategy from 1997 – the National Poverty Eradication Strategy—but it was felt that existing knowledge was too weak to facilitate a realistic PRSP. Consequently, the government initiated a household budget survey, designed so as to facilitate comparison with the results from the HBS91. In addition the government was required to adopt a medium-term expenditure framework to determine allocations to priority sectors. Again this was made easier in Tanzania, both because of the well-developed process for the annual Public Expenditure Review (PER), and because close monitoring of allocations to priority sectors had been routine since the implementation of the multilateral debt relief fund (MDF) in 1998 (cf. Danielson and Mjema, 2001 for a discussion of the MDF).

However, the interim PRSP was not endorsed by the IDA and IMF Boards, mainly because the results from the HBS were not available, and costings and time-frames were considered unrealistic. In addition, the process through which the interim PRSP had been drafted was criticized, mainly on the ground that consultations with civil society and NGOs were superficial. A final PRSP that addressed some of the weaknesses was completed in October 2000 and was followed the next month by a joint staff assessment by IDA and the IMF that recommended endorsement of the document. The first annual progress report was completed in August of 2001, and in November of 2001, the Boards of the IDA and the IMF agreed that Tanzania had

reached the completion point. From then on, the multilateral debt relief as calculated in the completion point document (IDA/IMF, 2000) became irreversible.

Since one condition for being eligible for HIPC debt relief is the existence of a realistic poverty reduction strategy, with clear sectoral allocations, it is possible to say something about the poverty reduction strategy adopted by simply inspecting the allocations in the PRSP. However, to put things into perspective, it is instructive to start by comparing the HBS01 to the HBS91. Some observations are in Table 5.

Is it possible to say conclusively whether poverty has increased or decreased in Tanzania during the 1990s? The HBS01 was designed so as to facilitate comparison to HBS91 (even though a certain amount of uncertainty clouds any such comparison; cf. TAKWIMU, 2002). However, as Table 5 reveals, results are mixed. On the one hand, the headcount poverty ratio has gone down, both when the food poverty line and the basic needs poverty line are used as demarcators. On the other hand, the *number* of poor have increased, in some cases drastically so: the number of people with an expenditure below the basic needs poverty line is estimated to have gone up by 20 percent. In addition, income inequality has increased, particularly in Dar es Salaam, which suggests that growth has been concentrated in certain sectors to which the poor have few and weak linkages.<sup>13</sup> Also, most non-monetary indicators of well-being appear to have deteriorated: access to piped water is down, as is access to toilets, the fraction of children in very poor households that go to school and the

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<sup>13</sup> The recent IMF report (IMF, 2004a) shows in Table 24 that while exports have increased by approximately 90 percent between 1997/98 and 2003/04, gold exports increased from a fraction of percent in 1997/98 to almost half of total exports in 2003/04. Most mineral activities are being carried out using capital intensive technology and highly skilled labour, so the links to the poor is weak.



fraction of poor household heads that report salaries activities as a major source of income. Average income is up, but average use of public services is down.

### **Table 5 here**

In previous sectors, I have tried to establish two essential facts. First, growth in Tanzania during the 1990s has been lop-sided, concentrated in a few sectors like tourism and mining. The sectors in which the poor reside or to which the poor have strong links lag behind. Second, to reduce poverty in accord with the objectives of the PRSP, strong growth in agriculture (and particularly subsistence agriculture) is necessary. This is so, both because agricultural growth would raise incomes of the poor and because it would serve to decrease income inequalities (which, in turn, make growth even more efficient as an instrument for poverty reduction.

It is thus instructive to take a closer look at the strategy for poverty reduction. However, a reading of the essential documents reveals little, since they are marred by rhetorical statements suggesting that everything is important and contain very little analysis. Instead, I look at the budget allocations in the PER/PRSP to see which sectors that are being favored. The data are in Table 6.

There are seven priority sectors, marked by bold in the Table. Expenditures in these sectors (both recurrent and development) account for approximately half of total expenditures of the central government. Allocations between priority sectors are very biased in favor of social sectors – education and health account together for almost two-thirds of priority expenditures. From the evidence supplied in Table 5, it seems that this is a reasonable strategy: after all, income poverty declined in the 1990s while

several indicators of non-income poverty increased.

**Table 6 here**

However, it is a bit worrying that the sectors that are likely to facilitate economic growth in the short to medium run appear neglected. Expenditure on agriculture and rural roads are likely to lower transaction costs for farmers and other rurally based producers, and to facilitate income increases among these groups. Yet these two sectors receive only around ten percent of all priority expenditures. Moreover, in the policy matrix accompanying the PRSP update, the objectives for priority spending in agriculture are to “create an enabling and conducive environment”, “ensure food security” and “strengthen support services” (IMF, 2004a: 68).

In general, growth can be used to decrease poverty in one out of two ways (or a combination of these). First, policy-makers may try to influence the pattern of growth so as to benefit directly sectors in which the poor reside. Thus for instance, growth may affect the incomes of the poor either through increased demand for labor or through increased demand for the goods produced by the poor. The second is to try to maximize the rate of growth without much regard for its pattern. The idea behind this strategy would be to maximize growth in tax revenues – revenue that can be used to improve infrastructure and social services.

The material presented in the PRSP suggests that Tanzanian policy-makers pay little attention to the pattern of growth and focus heavily on improving the supply of social services. A similar allocation can be found for many bilateral donors in Tanzania. Increasing the supply of social services lead probably to a healthier and better educated population and is likely to imply improving indicators on non-income

poverty. It is, however, difficult to see the impact of this on income poverty, particularly in the medium and long run.

Moreover, there are two further points to be made with regard to the “growth → tax revenue → social services” strategy. First, it requires that the government is able to collect taxes. Tanzania has a long history of low collection rates (although tax rates have been quite high), and not even a number of decisive measures – such as the establishment of the Tanzania Revenue Authority and the introduction of a VAT – have done much to improve collection rates. This raises a question mark regarding how well the government will be able to realize the potential tax revenue that is created by growth. Second, the strategy puts the government in the centre, as the financier and possibly the supplier of social services. It is not clear how a poverty reduction strategy that is driven by the government can be combined with the emerging consensus (not only in Tanzania, but throughout most low-income countries and the entire donor community) on the proper role of the government in the development process. Increasingly, donors and recipient governments talk about the private sector as the engine of growth; that the government should facilitate private sector activities through legislation and possibly infra structure; but that the government should “rationalize its portfolio” and concentrate its energies on things that the private sector cannot or does not want to do.

## **6. Concluding Remarks**

In this paper, I ask why poverty levels are seemingly stubborn to changes in per capita income. For the better part of the 1990s, per capita incomes have grown in Tanzania; yet poverty rates change only slowly if at all, and the number of poor have actually

increased. Why is this? Is the solution more and faster growth?

The conclusion of this paper is that while faster growth is likely to have an impact on poverty levels, it is also possible to try to influence the pattern of growth. I illustrate through simulation, first, that the relation between poverty levels and economic growth is very sensitive to the distribution of income and, second, that growth in agriculture is very efficient from a poverty reduction point of view, mainly because growth in that sector would automatically decrease income inequality.

From this point of view it is somewhat surprising that agriculture is not in focus in the official poverty reduction strategy. In the current strategy – as revealed by the allocations in the PRSP – focus is on social sectors. Although this is likely to lead to an improvement in non-income poverty indicators, it is very difficult to see to what extent it will stimulate economic growth in the short or medium run.

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<b>Table 1</b>				
Growth and Poverty Alleviation in Mainland Tanzania: Different Scenarios				
	8%	6%	4%	2%
2005	35	37	40	43
2010	25	29	33	38
2020	13	18	23	31
<i>Poverty at 24%<sup>a</sup></i>	<i>2011</i>	<i>2014</i>	<i>2020</i>	<i>2032</i>

*Source:* Poverty elasticity from TAKWIMU (2000). Poverty estimates from GoT (2000).

*Note:* Population is assumed to growth as 2.8% per annum throughout the period. Income distribution is assumed to be constant. Poverty elasticity is  $-0.69$ . The share of the population under the poverty line in 2000 is assumed to be 48%.

<sup>a</sup> Indicates the year when 24 percent of the population falls below the national basic needs poverty line. This represents a halving of the current poverty rate.

<b>Table 2</b>		
Required Annual Real GDP Growth to Halve Poverty by 2015. Three Scenarios		
	Food Poverty	Basic Needs Poverty
One percent increase in inequality p.a.	6.2%	7.6%
No change in inequality	4.6%	5.9%
One percent decrease in inequality p.a.	3.5%	4.9%

*Source:* TAKWIMU (2000), Table 53

*Note:* Calculations are based on the results from the 1991 Household Budget Survey. Inequality is measured as the Gini coefficient. Population is estimated to grow at 2.8 percent per annum.

**Table 3**  
Decomposition of Headcount Poverty, 2000-05, 2005-10, 2010-20

	<b>Annual Rate of Growth of Agriculture in Real Terms</b>			
	8%	6%	4%	2%
<i>A. 2000-2005 (all data in annual terms)</i>				
Poverty effect	-7.8	-4.6	-2.8	-1.6
Growth effect	-5.9	-4.6	-3.2	-2.7
Inequality	-1.9	0.0	0.4	1.1
<i>B. 2005-2010 (all data in annual terms)</i>				
Poverty effect	-7.6	-4.4	-2.7	-1.5
Growth effect	-5.9	-4.4	-3.3	-2.7
Inequality	-1.7	0.0	0.5	1.2
<i>C. 2010-2020 (all data in annual terms)</i>				
Poverty effect	-7.2	-3.8	-2.5	-1.3
Growth effect	-6.0	-3.8	-3.1	-2.6
Inequality	-1.2	0.0	0.6	1.3

*Sources:* Own calculations based on 1991/92 HBS data, adjusted to reflect conditions in 2000 (TAKWIMU, 2000), Ravallion and Datt (1990) and Ramdas et al. (2002).

*Note:* The growth effect and inequality add up to the poverty effect. A minus sign indicates a reduction in poverty. The poverty measure used is the headcount ratio. The error term that almost always results from poverty decompositions has been divided equally between growth and inequality. In all cases it is less than ten percent of the poverty effect.

**Table 4**  
Decomposition of Headcount Poverty, 2000-05, 2005-10, 2010-20

	<b>Annual Rate of Growth of Subsistence Agriculture in real terms</b>			
	8%	6%	4%	2%
<i>A. 2000-2005 (all data in annual terms)</i>				
Poverty effect	-10.1	-6.6	-4.1	-2.4
Growth effect	-7.7	-6.6	-4.7	-3.1
Inequality	-2.4	0.0	0.6	0.7
<i>B. 2005-2010 (all data in annual terms)</i>				
Poverty effect	-10.0	-6.5	-4.1	-2.3
Growth effect	-7.5	-6.5	-4.6	-2.9
Inequality	-2.5	0.0	0.5	0.6
<i>C. 2010-2020 (all data in annual terms)</i>				
Poverty effect	-9.4	-5.9	-3.9	-2.1
Growth effect	-7.0	-5.9	-3.2	-2.7
Inequality	-2.4	0.0	0.7	0.6

*Sources:* See Table 3

*Note:* The note to Table 3 applies here as well. In addition it is assumed that subsistence agriculture employs half of those active in agriculture. Growth rates include changes in non-monetary GDP (all of which is assumed to be subsistence agriculture).



**Table 5**  
Poverty Indicators, HBS91 and HBS01.  
(All data refer to Mainland Tanzania unless otherwise indicated)

Indicator	HBS91	HBS01
Food poverty, headcount ratio	21.6	18.7
Basic needs poverty, headcount ratio	38.6	35.7
Number of food poor ('000)	5,305	5,965
Number of basic needs poor ('000)	9,481	11,388
Gini coefficient	0.34	0.35
Gini coefficient, DSM	0.30	0.36
Consumption expenditure Quintile I <sup>a</sup>	7.0	6.9
Ratio, Quintile I/Quintile V <sup>b</sup>	6.1	6.4
Main income source: sale of food crops	41.4	40.6
Main income source: sale of cash crops	21.6	17.2
Main income source: wages or salaries in cash	13.1	9.3
Main income source: income from own business	10.4	13.0
HH member operating a savings/current account (%)	18.0	6.4
Salaried activity by HH head <sup>c</sup>	21.9	14.6
No education of household head in poor HH <sup>d</sup>	32.2	36.9
Primary+ education of household head in poor HH <sup>e</sup>	2.1	2.8
% of children 7-13 in school, very poor households	54.4	50.1
% of children 7-13 in school, poor households	57.3	59.2
HH access to piped water, very poor	37.5	28.6
HH access to piped water, poor	32.8	30.0
HH access to any toilet, very poor	91.5	88.6
HH access to any toilet, poor	90.8	90.9

*Source:* Compiled from TAKWIMU (2002).

*Note:* "Very poor" refers to households falling below the food poverty line; "poor" refers to households below the basic needs poverty line. The latter poverty line is approximately 40 percent higher than the former.

<sup>a</sup> Quintile I refers to the poorest 20 percent of the population. "Consumption expenditure" refers to the share of that group's expenditure of total consumption expenditure.

<sup>b</sup> Quintile V refers to the richest 20 percent of the population.

<sup>c</sup> The sum of all households heads that reported one of the following as their major source of income: "employee – government", "employee – parastatal", "employee – other" or "self-employed with employees".

<sup>d</sup> Percentage of the poor households in which the head has no education

<sup>e</sup> Percentage of the poor households in which the head has above primary education

**Table 6**  
Allocations to Priority Sectors, FY01/02-FY04/05, TSh bn

	2001/02	2002/03	2003/04	2004/05
<b>Education</b>	344.9	436.2	502.3	564.7
<i>Basic education</i>	116.6	171.3	371.3	417.4
<b>Health</b>	142.1	186.7	214.3	284.9
<i>Primary health</i>	101.0	113.3	124.4	165.4
<b>Water</b>	32.5	51.9	64.4	87.7
<b>Roads</b>	179.6	190.2	236.0	289.5
<i>Rural roads</i>	21.5	22.8	57.0	69.9
<b>Judiciary</b>	18.8	23.2	32.7	46.0
<b>Agriculture</b>	31.9	60.2	93.1	112.3
<b>HIV/AIDS</b>	4.0	5.3	21.2	58.7
Total Priority Sectors	753.8	953.7	1,164.0	1,443.9
Total priority (%) <sup>a</sup>	46.8	46.6	44.9	n/a

Source: IMF (2004a), Table 6

<sup>a</sup> As percentage of total central government expenditure