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Growth, poverty and distribution in Tanzania

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This paper is intended as a contribution to the debate about the relationship between economic growth and national objectives, and the way in which achievement of the latter can be assessed by alternative indicators of economic and social performance. Faster growth of GDP is an instrumental rather than a final goal, as has been recognised in recent decades with the emphasis on growth as a vehicle for poverty reduction, notably in the setting of the Millennium Development Goals. In Tanzania, this has been the thrust of the Poverty Reduction Strategy and the National Strategy for Growth and Reduction of Poverty 2005-2010 (Mkukuta). But there is evidence that real growth over the past decade in Tanzania has not been reflected in rapid reduction in poverty rates. This pessimistic assessment forms part of a wider set of concerns about the relationship between growth and individual well-being. The 2007 *Poverty and Human Development Report* (PHDR) for Tanzania highlighted the fact that real GDP growth had reached historically high levels over 2000-2006, but that the findings from the Views of the People Survey in March/April 2007 indicated that “few adult Tanzanians think they are enjoying the fruits of economic growth” (PHDR, page 79). “In all income groups ... more people perceive falling rather than rising living standards” (PHDR, page 82).

The growth/poverty nexus is currently much discussed. In particular, it has been addressed in the recent Interim Report to REPOA by Mkenda, Luvanda and Ruhinduka (2010).¹ In this paper, we make extensive reference to this Interim Report and to the earlier paper by Hoogeveen and Ruhinduka (2009), in which they discuss developments between 2000 and 2007, the period on which we focus, using data from the 2000/2001 and 2007 Household Budget Surveys. Like the authors of the Interim Report, we believe strongly in the “imperative of interrogating the data” (page 21 of the Interim Report). The use of data to assess economic and social performance is one of the main themes of this paper; the second is the design of indicators to assess performance. The experience of the past decade leads one to consider not only the extent of substantive progress but also the way in which social objectives are translated into concrete measures and indicators. In this way, the paper may contribute to the establishment of goals for the next stages of the MDGs and the MKUKUTA process.

¹ Their report covers much of the ground that we originally envisaged for our scoping paper; we have therefore written up our work in a rather different form from that originally envisaged.

1. Central question

The authors of the Interim Report ask of the Tanzanian experience “How come the impressive growth from 2000 to 2007 did not lead to the reduction in poverty nor did it lead to an increase in income inequality?” (Mkenda, Luvanda and Ruhinduka, 2010, page 7). The reported poverty rates (headcounts) were 35.7 per cent in 2000/1 (referred to here as 2001) and 33.4 per cent in 2007. There was a reduction but it was small: approximately 6 per cent (or one standard error). Tanzania is off-track to reaching the poverty MDG target (Hoogeveen and Ruhinduka, 2009). This was despite a growth record that, as reported, is indeed impressive. Total GDP of Tanzania Mainland in 2007 was 51 per cent higher in real terms than in 2001 (National Bureau of Statistics, 2009, page 12, GDP at basic prices).

The main aggregates that we shall be discussing and the percentage changes between 2001 and 2007 are summarised in Table 1. Since the results of the Household Budget Survey, and the poverty calculations, are presented in terms of a 28 day period, we have adopted the same period in lines 3-6 of the table.

Table 1 Main aggregates Tanzania Mainland (2001 prices)

| | 2001 | 2007 | Percentage change |
|--|--------|--------|-------------------|
| 1. GDP at basic prices annual billion Tshs | 8,515 | 12,875 | 51.2 |
| 2. Population million | 32.9 | 38.3 | 16.5 |
| 3. GDP per capita per 28 days Tshs | 19,865 | 25,795 | 29.9 |
| 4. Household final consumption (national accounts) per capita per 28 days Tshs | 15,924 | 20,078 | 26.1 |
| 5. Household consumption (overall definition) per capita per 28 days Tshs | 9,997 | 10,470 | 4.8 |
| 6. Household consumption (restricted definition) per capita per 28 days Tshs | 8,897 | 9,109 | 2.4 |

Sources: Lines 1-5, see text; line 6 own calculations from HBS.

The first point to make is that the poverty figures and GDP differ in that the former depends on consumption per person, whereas the latter is the national total. Between 2001 and 2007, the population of Tanzania Mainland grew, according to the national accounts figures (National Bureau of Statistics, 2008, page 13) by 16.5 per cent, so that the more relevant figure is the increase in GDP per person, which was 29.9 per cent between 2001 and 2007. This is still a very impressive macro-economic performance, and leaves the central question unanswered. Growth of 29.9 per cent in per capita GDP should have substantially reduced poverty.

The Interim Report by Mkenda, Luvanda and Ruhinduka (2010) contains a number of clues as to why this reduction in poverty appears not to have happened. In these comments, we have re-arranged the material and reached conclusions that are similar in some respects and different in others. The main original empirical research we have conducted is that relating to the measurement of government expenditure, and that relating to the use of (historical) income tax data. Both of these are the subject of separate notes.

2. Consumption poverty and inequality

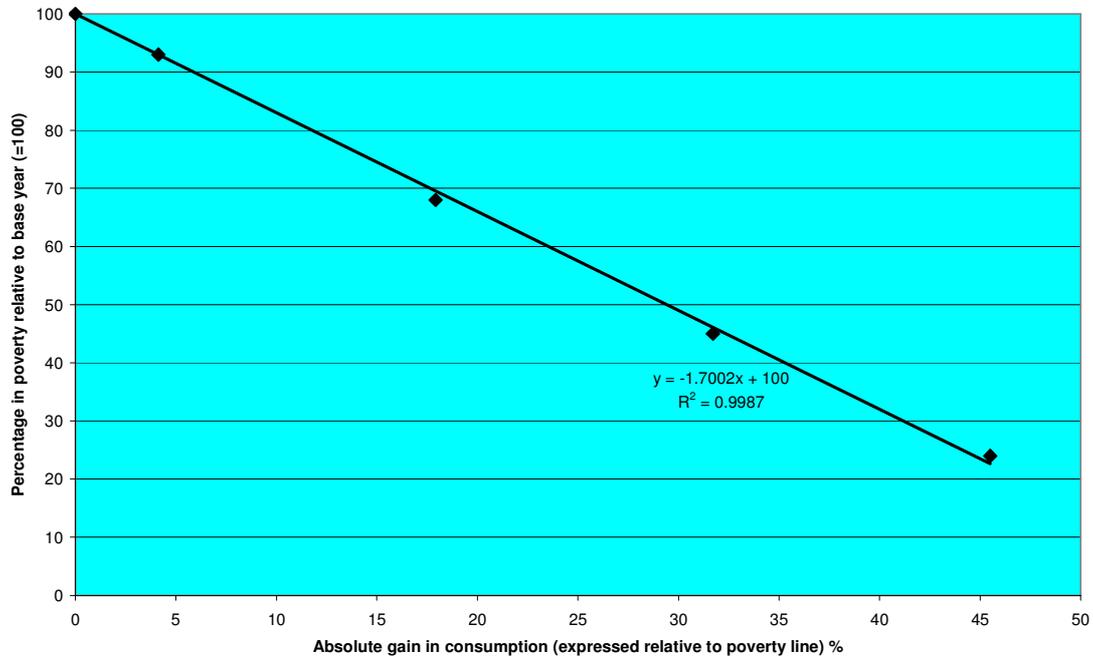
The poverty reduction is particularly disappointing given the calculations made from the household surveys that many households are quite close to the poverty threshold. On this basis, an overall increase in per capita consumption levels would take many people out of poverty. Figure 1 re-arranges the data from Table 2.4 of Mkenda, Luvanda and Ruhinduka (2010) to show (with squares) the increases in per capita consumption that would take different proportions of the population out of poverty. The increases are expressed as percentages of the poverty line. The third point from the left shows that an 18 per cent increase would, if all consumption levels were raised by this absolute amount, take 32 per cent of people out of poverty. The fitted line suggests that each increase in absolute incomes of an amount equal to 10 per cent of the poverty line would reduce the poverty rate by 17 percentage points.

There are several reasons why rapid growth has not caused this to happen. The first is that the rise in household consumption has not been equally shared. Mkenda, Luvanda and Ruhinduka (2010) tend to dismiss the role of inequality: “overall income inequality did not increase appreciably” (page 59). This is based on the “marginal” changes reported in standard inequality measures such as the Gini coefficient and the generalised entropy indices (Table 2.5). The report on the 2007 Household Budget Survey notes that “inequality in the population as a whole has remained unchanged since 2000/1” (2009a, page 53). Hoogeveen and Ruhinduka draw attention to the fact that the growth incidence curve for Tanzania is flat (2009, page 14).

In their choice of inequality measures, and use of growth incidence curves, these authors follow standard practice in using measures of a relative kind: the “no change” position is one in which all consumption levels rise by the same proportion. There is constant relative inequality aversion. We are however measuring poverty in an absolute way, with a poverty level fixed in real terms. If we are concerned with the impact of distribution on poverty reduction, then it seems more appropriate to use an absolute inequality measure, where the no change position is one where all consumption levels rise by the same absolute amount (as in Figure 1) and where the “cost” of inequality

is measured in absolute not proportionate terms (for discussion of the different uses of the word “absolute”, see Atkinson and Brandolini, 2010).²

Figure 1 Predicted fall in poverty from increases in consumption per capita

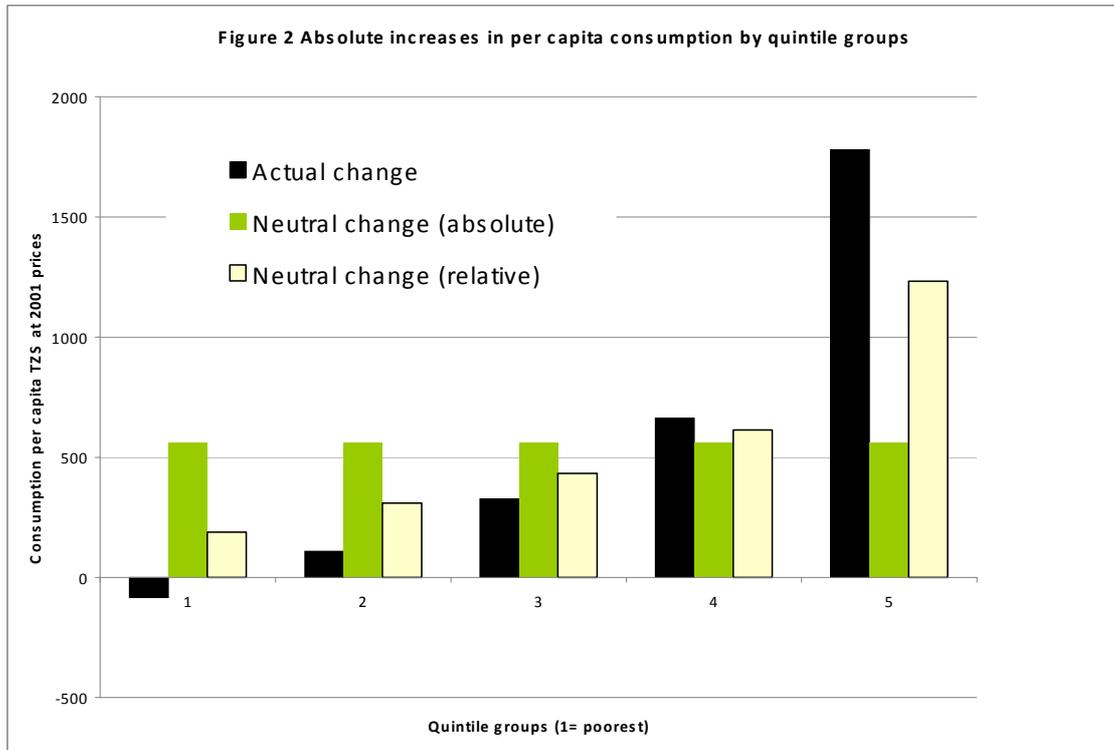


Source: in text

Use of an absolute inequality measure means that growth incidence curves have to be seen in a different light. Hoogeveen and Ruhinduka (2009, Figure 2.5) show that “all income groups equally benefited from growth” (page 14). The exceptions are the poorest decile group who became worse off and the top decile group whose consumption grew relatively fast. (These departures caused the relative measures of inequality, such as the standard Gini, to rise slightly.) However, “equally” means equal in proportionate terms. Translated into absolute increases, the gains in consumption increased steadily up the scale. Here we illustrate this point in Figure 2 using the figures for different quintile groups shown in Table 2.1 on page 18 of the Interim Report. (We have simply taken these figures as illustrative.) Figure 2 shows the absolute changes in per capita consumption. The bottom 2 quintile groups, which largely consist of those below the poverty line, had on average virtually no growth in per capita consumption (averaging the loss for the bottom group with the modest absolute gain for the next groups). On the other hand, the gain for the top quintile is 3

² It should be noted that we are here referring to measures of inequality that aid our understanding of the changes in the (absolute) poverty measure. If we were concerned with inequality as such, then there may be good grounds for keeping a relative measure.

times the amount that would have been generated by an equal absolute increase in all consumption levels. Taking an absolute approach to the measurement of inequality gives a different perspective, as may be seen from a comparison with the final set of bars in Figure 2, which show the absolute gains where each group receives the same proportionate increase.



Source: in text

To sum up, when considering the contribution of growth to reducing absolute poverty, it seems natural to measure inequality also on an absolute basis, and this highlights the fact that the poorest have benefited much less in absolute terms. The distribution of the absolute gains was far from neutral.

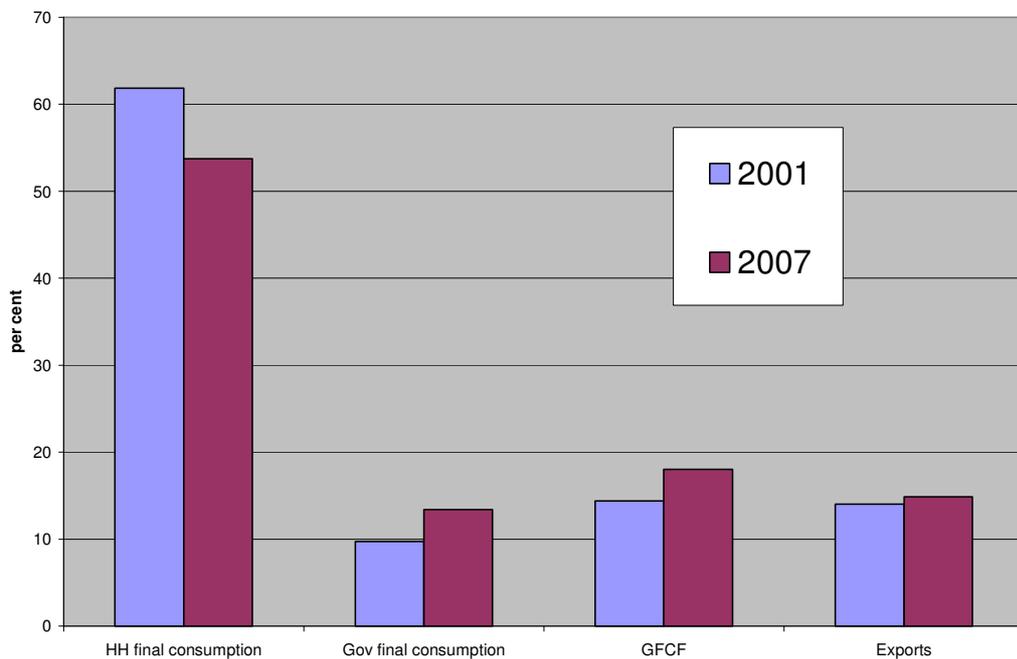
3. Household consumption in the national accounts

The unequal distribution of recorded household consumption can only however be part of the explanation. There remains the large difference between the average rise in per capita consumption between 2001 and 2007 shown by the household surveys, which is 4.8 per cent (see line 5 in table 1, which comes from the Interim Report, page 18), and the rise in per capita household consumption recorded in the national accounts.

According to the constant price (2001 market prices) national accounts for Tanzania Mainland 1998-2007, household final consumption has not risen as

fast as GDP (National Bureau of Statistics, 2008, Table 13)- see Table 1. As is illustrated in Figure 3, there has been a pronounced shift in the proportion of (GDP + imports) going to household consumption. Household consumption has fallen from 62 per cent to 54 per cent, with rises for government final consumption (+ 3 percentage points) and gross fixed capital formation (+ 4 percentage points). As a result, the rise in household consumption expenditure per capita between 2001 and 2007 was 26 per cent, or some 4 percentage points less than the rise in GDP per capita. This explains part, but only a modest part, of the discrepancy.

Figure 3 Expenditure from GDP+imports



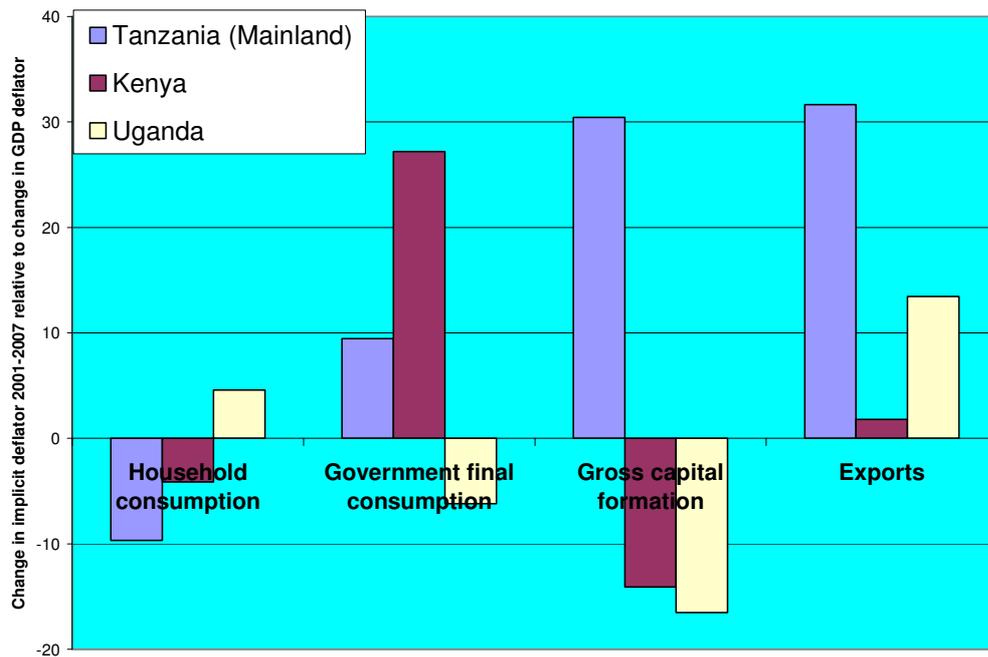
Source: in text

The fall in household consumption is even larger in the current price national accounts (National Bureau of Statistics, 2008, Table 12), where it fell between 2001 and 2007 from 62 per cent to 48 per cent. This highlights one of the key issues: the change in relative prices. The price deflator for household consumption rose by 42 per cent between 2001 and 2007, compared with much larger increases for other categories of expenditure: 62 per cent for government final consumption, 85 per cent for gross capital formation and 83 per cent for exports (Table A.1 in the appendix). The increase in the deflator for household consumption was 10 percentage points less than that for GDP as a whole.

These differences in rates of price change are quite striking. It seemed therefore natural to ask how far the Tanzanian experience differed in this respect from that of neighbouring countries. In Figure 4 are shown the deflators

implicit in the UN national accounts for the same expenditure categories for Kenya and Uganda (United Nations website).³ In each case, the deflator for a category is expressed as a difference from that in the overall GDP deflator. From this it appears (a) that Tanzania was not alone in having quite wide differences in the rates of price change, and (b) the deviation in the case of household consumption was largest in Tanzania, being -4 percentage points in Kenya and +5 percentage points in Uganda.

Figure 4 Differences in price deflators 2001-2007



Source: in text

If it were the case that increase in the price deflator for household consumption were too low, then the rise in real household consumption between 2001 and 2007 would be reduced below 26 per cent. It would however require a very substantial upward revision in the deflator, since the increase in current price terms in per capita household consumption was 80 per cent. It is however the case that just such a large upward revision is suggested by the price index estimated in the report of the 2007 Household Budget Survey (HBS) (National Bureau of Statistics, 2009a, page 44), which shows an increase of 93 per cent. There are, however, major differences in the coverage of household consumption in the HBS compared to national accounts, to which we now turn.

³ These have not been cross-checked against national sources for Kenya and Uganda, but in the case of Tanzania there is close agreement between the UN and national figures.

4. The gap between household consumption in the HBS and in the national accounts

In OECD countries, measured consumption is typically substantially lower in household surveys than in the national accounts. On the other hand, this is not necessarily the case in developing countries. Indeed, according to the estimates of Deaton (2005, Table 2), the average ratio for 74 surveys in Sub-Saharan Africa is 1.0.

In the case of Tanzania, according to the HBS in 2001 average per capita household consumption was 9,997 Tshs per 28 days (National Bureau of Statistics, 2009a, page 44). According to the national accounts, the average per capita household consumption in 2001 in current prices was 15,915 Tshs per 28 days.⁴ In other words, the household survey was 63 per cent of the national accounts figure - see Table 2.

The most obvious way in which this gap would be important in the present context would be if the gap had widened - as in some other developing countries such as India - causing the household recorded consumption to grow less rapidly. But this was not the case in Tanzania. In 2007, average per capita household consumption was 20,212 Tshs per 28 days (National Bureau of Statistics, 2009a, page 44). According to the national accounts, the average per capita household consumption in 2007 in current prices was 28,691 Tshs per 28 days. This implies that the household survey figure had *increased* to 70 per cent of the national accounts figure - see Table 2. It is in constant (2001) price terms that the survey figure has lagged: the household survey figure was 63 per cent of the national accounts in 2001 but had fallen to 55 per cent by 2007.⁵ It is the difference in deflators that is responsible for the difference in growth rates.

⁴ This figure differs slightly from that in Table 1 since the 2001 figures at 2001 prices are a little different from those for 2001 in current prices (see Tables 12 and 13 in National Bureau of Statistics, 2008).

⁵ In contrast, for the period between the 1991/2 HBS and that for 2001/2, the findings of Demombynes and Hoogeveen (2007, page 601) show that the ratio did not change greatly.

Table 2 Relation between national accounts (NA) and Household Budget Survey (HBS) measures of household consumption per 28 days in *nominal terms*

| | 2001 | 2007 |
|--|--------|--------|
| Per capita household expenditure from NA Tshs | 15,915 | 28,691 |
| Per capita household expenditure from HBS Tshs (overall definition) | 9,997 | 20,212 |
| Ratio HBS to NA | 62.8 | 70.4 |
| Per capita household expenditure from HBS Tshs (restricted definition) | 8,897 | 17,501 |
| Ratio HBS to NA | 55.9 | 61.0 |

Source: see text.

The gap between survey and national accounts may however help explain this difference, and it is therefore helpful to set out several of the reasons why the two concepts differ. In considering the gap, it is important to bear in mind that both sides - survey and national accounts - must be investigated. The key elements seem to be:

- a) the HBS analysis of poverty and inequality uses a “restricted” definition of consumption (excluding for example, medical, education and telecommunications expenditures, and household durables);
- b) the HBS overall coverage of consumption for the households surveyed excludes certain items of consumption (for example, water);
- c) all surveys suffer from non-response, and this cannot be fully offset by replacement sampling; this typically affects both top and bottom of the distribution;
- d) the inclusion in the national accounts of imputed rents for housing,⁶
- e) the fact that household final consumption includes “imputed expenditures made by Government and Non-profit institutions serving Households (NPISHs) on behalf of households” (National Bureau of Statistics, 2008, page 3).⁷

These survey/national accounts differences are relevant for a number of different issues, including the definition of poverty, to which we return below. We begin however with the possible explanations of the discrepancy in price deflators. (It should be noted that we are not in a position to assess the deflators themselves.)

⁶ There is also an issue regarding consumer durables. As discussed by Mkenda, Luvanda and Ruhinduka (2010, page 29), no imputation is made in the Tanzanian HBS.

⁷ It should be noted that these are excluded from Government Final Consumption (National Bureau of Statistics, 2008, page 3).

The first point is that the use of a restricted definition of consumption reduces still further the ratio to national accounts. Restricted consumption is some 89 per cent of the survey total in 2001, and is slightly lower (87 per cent) in 2007. This reduces the ratio, relative to the national accounts, in 2001 to 56 per cent - see Table 2. This suggests one possible reason why the price deflators could differ. The exclusions by category can have a powerful effect if relative prices have been changing. The price ratios quoted in the HBS Report (National Bureau of Statistics, 2009a, Appendix A) certainly suggest wide variations across commodities.

The difference could be further explained by the factor (c), particularly non-response at the top. The report on the 2007 Household Budget Survey notes the “substantial developments and apparent growth in activity in Dar es Salaam” and the possibility that “these developments are largely benefiting a relatively small group of households that are difficult to capture in a household survey” (National Bureau of Statistics, 2009a, page 52). Even if non-response is proportionately small in terms of the number of households, with a skewed distribution they could account for a much larger proportion of total household consumption. The grossing up of respondents may cause the overall consumption pattern to be mis-represented. This depends on a double difference (differential non-response and differential consumption patterns) but the latter may be quantitatively important. The impact may be further magnified by geographical differences in price inflation. We suggest below (section 5) that this be further investigated.

The possibility that differences arise in price indices is reinforced by factors (d) and (e) listed above. The inclusion of government provided health and education means that there are categories in the 44 per cent not covered where the price relativities may have changed. This is further complicated by the fact that private expenditure on these items has also changed. The household surveys show that between 2001 and 2007 households increased their recorded expenditure on education by a quarter and reduced that on health by a fifth (Hoogeveen and Ruhinduka, 2009, Table 2.2).

To sum up, given the wide conceptual differences between the survey and national accounts definitions of consumption, it is not perhaps surprising that price indices differ, although the differences may also reflect their methods of construction (which we have not investigated). The broader conclusion that we draw is that - faced with this conflicting picture - it would be good to consider fresh approaches, both to the measurement of changes in real consumption, and, more generally, to the choice of indicators for assessing economic and social performance.

In what follows, we raise five issues:

- triangulation from alternative sources (section 5);

- the role of government provision of education and health care (section 6);
- focus on food and other specific indicators (section 7);
- changing household structure and composition (section 8);
- indices of multiple deprivation at the household level (section 9).

5. *Incomplete survey response and triangulation*

The potential importance of differential survey response suggests an alternative line of approach, which is to look for triangulating evidence from the fiscal data. Fiscal data used to be the main starting point for income-side estimates of national income, but have now been largely discarded. As explained by Mkenda, Luvanda and Ruhinduka, national income is measured by a combination of production and expenditure methods. The income method is not used “due to difficulties in obtaining reliable data on wages, interest income, rent income and profits” (2010, page 24). These difficulties certainly mean that the overall approach is correct, but the income statistics can be used as triangulating data. As has been shown in the case of India, the income tax data can be used to provide at least a lower bound on the incomes of the top part of the distribution. According to Banerjee and Piketty (2005), in India around a quarter of the growing gap between survey estimates and national accounts can be accounted for by the increase in top income shares.

Tanzania used to publish distributions of taxpayers by income (the most recent we have located are for 1974 in the publication *Income Tax Statistics for the Year 1974*). These and earlier data are described in an historical analysis by Atkinson (2010). In recent years, it should be possible to make use of the Income Tax Department Quarterly Reports of the Tanzania Revenue Authority. These reports contain information on the number of taxpayers and the tax assessed by presumptive tax bands.

The income tax data could be employed to augment the data in the HBS. In the United Kingdom, the main income distribution statistics are obtained from a household survey (the Family Resources Survey) but with the top of the distribution adjusted using data from the tax records (the Survey of Personal Incomes). The adjustment is made via the grossing factors applied to respondents with incomes in excess of a specified level (around the top 1 per cent). The tax data are of course affected by tax avoidance and tax evasion, but they provide an alternative, if imperfect, perspective.

To sum up, reconciliation of the household survey and national accounts figures involves examination of each source, but it is also likely to be informed by consideration of alternative sources, and the tax records seem well worth further investigation.

6. The role of government expenditure on health and education

There is wide agreement that public spending on health and education in Tanzania has increased significantly over the period. Such public spending can potentially make a major contribution, particularly to the extent that it is allocated equally in absolute terms across the population (taking account of medical and educational needs).

In addressing this question, the statistics on total government spending on health and education need careful interpretation, as is discussed in a separate note (Lugo, 2010). There are a number of differences between sources where public spending is disaggregated. In part this comes about on account of some sources referring to budgeted spending and others to realised spending. In part it reflects the difference between central government spending and total government spending. The latter includes spending by regional and local governments funded from sources other than central government. These sources include local taxes and transfers from foreign donors and NGOs.

The figures in Table 3 are consolidated, including all financing sources, but relate, we understand, to budgeted expenditure. They are expressed in per capita terms per 28 days, in order to facilitate comparison with the household consumption figures. The amounts are expressed in nominal terms. We also show, in Table 4, on the same basis, the household private expenditures on health and education.

Table 3 Government expenditure on health and education per 28 days

| | 2001 | 2007 |
|---|------|-------|
| Education (consolidated) government budget per capita Tshs | 521 | 1,969 |
| Ratio to HBS household consumption (overall definition) | 0.05 | 0.10 |
| Health (consolidated) government budget per capita Tshs | 277 | 1,352 |
| Ratio to HBS household consumption (overall definition) | 0.03 | 0.07 |

Sources: own calculations based on Basic Education Statistics in Tanzania (Ministry of Education and Vocational Training) and National Health Accounts (World Health Organization) for government spending and National Bureau of Statistics (2008) for population figures.

Between 2001 and 2007 government spending in education and in health in relation to total household expenditure has doubled. The ratio to household consumption has risen from 0.05 to 0.10 in the case of education and from 0.03 to 0.07 in the case of public spending in health. In turn, average household

(private) expenditure in education as a proportion of total expenditure has increased marginally (despite the elimination of school fees in 2002) whereas expenditure in health has decreased, though only marginally.

Table 4 Household expenditure on health and education per 28 days

| | 2001 | 2007 |
|--|--------------|--------------|
| All household medical expenses per capita Tshs | 231 | 355 |
| Ratio to HBS household consumption (overall definition) | 0.023 | 0.018 |
| Government hospitals, dispensaries | 68 | 84 |
| Other hospital/dispensaries | 23 | 50 |
| Private hospitals | 65 | 50 |
| Traditional healers | 14 | 12 |
| Traditional medicine | 7 | 13 |
| Dentistry, eye testing, spectacles | 10 | 9 |
| Prescribed medicine | 24 | 72 |
| Household medicine | 15 | 25 |
| Other medical cares | 5 | 40 |
| All household education expenses per capita Tshs | 226 | 563 |
| Ratio to HBS household consumption (overall definition) | 0.023 | 0.028 |
| School fees | 139 | 372 |
| School uniform, equipment, school books | 61 | 111 |
| Food at school | 8 | 8 |
| Other expenses (extra classes/tuition) | 14 | 28 |
| Other in kind expenses | 4 | 44 |

Sources: own calculations from HBS.

The amounts of government spending are substantial. In order to take these into account, it would be possible to impute to households an amount corresponding to government spending on health and education in order to arrive at a more complete measure of household consumption. This would take account of the fact that private spending on these items may have been adjusted in response to the changed public spending.

There are however a number of reasons why this could potentially be misleading:

- If imputations are made to extend the coverage of household consumption, then it may be necessary to adjust upwards the poverty standard applied;
- The distributional incidence of the provision, and the inter-relation between public and private provision, has to be determined, where quality as well as quantity of provision is important;
- It is the benefit to households rather than the cost of provision that should be allocated.

The second issue is discussed by Hoogeveen and Ruhinduka (2009) and Mkenda, Luvanda and Ruhinduka (2010). Among the problems are the fact that assigning the public spending to households involves estimating household needs and uses of these services. In the case of education, the number of children who attend publicly funded schools is not directly observable from the HBS. Moreover, the earlier studies identify the crucial question of the *quality* of provision, which leads naturally to the third issue. In the case of non-marketed output, there is no necessary connection between the marginal cost of provision and the marginal benefit to the recipient. There is no reason to suppose that the quantity of education or health care supplied is at a level that equates marginal benefit with either marginal or average cost (Atkinson, 2005, page 89).

The tenuous nature of the link between spending figures and individual benefit suggests that it would be better to concentrate on outcome measures for individual services. Such a move would parallel that in the UN *System of National Accounts* 1993, where measures of government input have been replaced by measures of the output of government services. In the case of the Tanzanian HBS, Hoogeveen and Ruhinduka (2009, page 34) examine primary school completion rates over the period 2001 to 2008. This is the kind of indicator that we have in mind. At the same time, it must be remembered that there is an extensive as well as an intensive margin. The completion rate may be (slightly) lower in 2008 than in 2001, but this applies to a larger proportion of pupils attending school. For example, the 2008 statistics show a reduced percentage, compared with 2001, passing the National Standard IV examination, but the total passing was 890,000 in 2007, compared with 459,000 in 2001 (BEST website, Table 2.11).

To sum up, we believe that, rather than seeking an augmented measure of household consumption including public spending, it would be better to develop a series of outcome indicators.

7. Focus on food and other specific indicators

Mkenda, Luvanda and Ruhinduka (2010) argue that the national accounts estimates of the growth of agricultural output may be overstated. In the case of maize, the NBS figures, which underlie the national income estimates, show a growth of 34 per cent between 2001 and 2007, whereas the Ministry of Agriculture (MAFSC) figures show a rise of 28 per cent (Table 3.2 of the Interim Report).

The mismatch between survey and national accounts may therefore be due in part to overstatement of growth in the national accounts. However, even with the higher national accounts figure for production, agricultural output has not grown at the rate of GDP. As Mkenda, Luvanda and Ruhinduka rightly stress, “the contribution of the agricultural sector has been going down” (2010, page 13). The UN national accounts figures for the whole sector of agriculture,

hunting, forestry and fishing (UN national accounts website) show for Tanzania mainland a rise between 2001 and 2007 of 30 per cent (whereas GDP rose by 52 per cent). With the overall increase in population of 16.5 per cent, this means that agricultural output per capita rose by only 12 per cent. It may therefore be the case that the disappointing reduction in the poverty rate reflects the limited growth in food output per capita.⁸ The evidence from the HBS analysed by Hooegeveen and Ruhinduka (2009, Table 2.2) shows that per capita food consumption hardly changed in real terms between 2001 and 2007 (figures for Tanzania mainland). The 5 per cent increase in total consumption took the form largely of increased household expenditure on fuel, transport and telecoms.

These shifts in the *pattern* of household consumption, coupled with our earlier discussion of the difference in price deflators, raises questions about the validity of a poverty indicator based on total consumption. The shift in spending pattern obscures the failure of food consumption to rise, and points to the use of a narrower indicator centred on food and nutritional standards, as in the MDG and MKUKUTA goals.

This serves to underline the potential weaknesses of placing too much weight on a single consumption poverty indicator. At several points in the analysis it has become clear that total household consumption falls between two stools. In one direction, as we have just seen, total consumption has not picked up the fact that per capita food consumption has hardly changed. In the other direction, total household consumption is not sufficiently extensive to capture other changes that affected household well-being, such as government spending. For this reason, Hooegeveen and Ruhinduka (2009) and others have turned to considering a fuller range of more specific indicators, such as those for household durables. For instance, the household survey indicators of housing conditions show that the proportion of households with durable walls has risen from 24.7 per cent to 34.0 per cent and that the proportion with a durable roof has risen from 43.6 per cent to 55.6 per cent (Table 2.8). The proportion with mosquito nets has risen from 37.3 per cent to 68.7 per cent.

To sum up, the discussion of this section reinforces our view that a portfolio of indicators should be used.

8. *Changing household structure and composition*

The shift in consumption patterns raises the further question of the relation between household consumption and individual well-being. We have earlier argued for looking at *per capita* consumption, and this does indeed seem the right starting point. The analysis of the HBS makes use of a scale (National Bureau of Statistics, 2009a, page 82 reproduced as table A.2 here in the

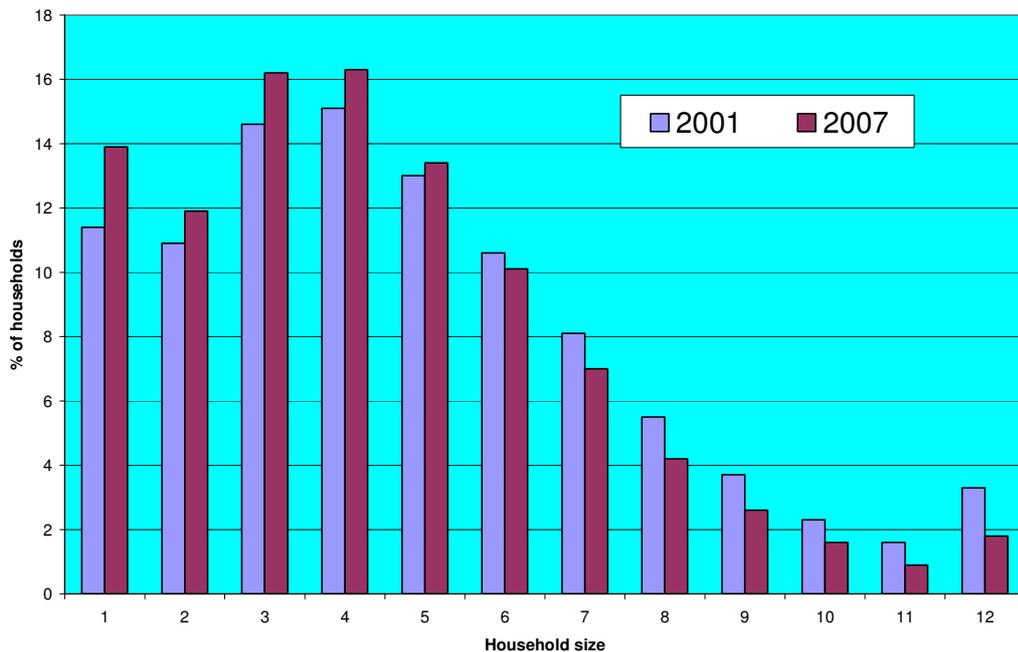
⁸ Recent international evidence about the contribution of agricultural growth to poverty reduction is summarized by Janvry and Sadoulet (2009).

appendix) that allows for differences by age and gender. For food, such a scale may indeed be appropriate.

However, for non-food items the approach is less obviously justifiable. To begin with, a gender differential (favouring females at ages 3-4 and 11-12, and males from age 15 upwards) may be questioned. Secondly, the household scale is simply the sum of individual needs and does not depend on the household composition. For items such as heating and shelter there are likely to be economies of scale. If that is the case, and there has been a shift towards goods generating such economies, then the increase in equivalised consumption may be under-stated by the current calculation.

The scales become particularly important where there are changes over time in the household composition. As may be seen from Figure 5, households in 2007 are overall much smaller. In 2001, 35 per cent of households had 6 or more members; by 2007 this had fallen to 28 per cent. The drop seems to be driven by changes in Dar es Salaam and other urban areas. In the capital, the proportion of single-member households increased by 6 percentage points (from 13 to 19 per cent) - see Table A.3 in the appendix.

Figure 5 Change in household size from 2001 to 2007



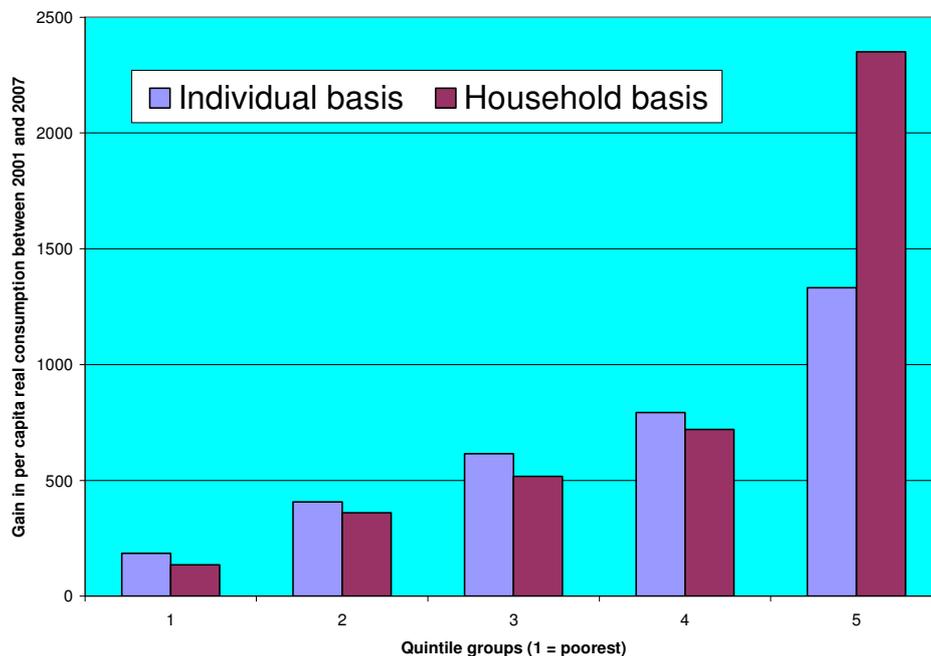
Source: own calculations from HBS.

The fall in household size is largest among the poorest households (Table A.4 in the appendix). This means that an equivalence scale taking account of

the economies of scale might show a smaller reduction in poverty (since the households were less able to share out the cost of durables, housing, etc.).

Along with the use of equivalence scales comes the issue of *weighting*, which is often overlooked. It may seem natural to count people, so that the bottom quintile group, for example, contains 20 per cent of the population. However, on occasion statistics are presented where each household counts for 1, and the bottom quintile group consists of 20 per cent of households. As may be seen from Figure 6, this can make quite a difference.

Figure 6 Counting people or counting households?



Source: own calculations from HBS.

To sum up, attention needs to be paid to the choice of equivalence scale and to weighting.

9. Multiple deprivation at the household level

The thrust of much of the preceding argument has been in the direction of using a number of indicators, avoiding over-concentration on a single measure of consumption poverty. This is very much in the spirit of the MDGs and the Tanzanian National Strategy. At the same time, use of the full range of dimensions is a very extensive exercise. The MDGs have 8 goals, 21 targets, and 60 indicators for monitoring progress (revised framework of January 2008). The Tanzanian National Strategy has 3 main clusters: growth and the reduction of income poverty (I), improvement of quality of life and social well-being (II), and

governance and accountability (III). Each of these embodies a number of supporting goals (6 in the case of Cluster I, 5 for Cluster II and 7 for Cluster III).

A multi-dimensional approach risks, however, diluting the message. As was argued in the first Human Development Report, “too many indicators could produce a perplexing picture - perhaps distracting policy-makers from the main overall trends” (United Nations Development Programme, 1990, page 11). There are two main ways of addressing this problem. The first is that adopted in the Human Development Report, which introduced the composite Human Development Index (HDI), combining the dimensions of income, life expectancy, and educational attainment. This approach first aggregates across households for a single dimension and then combines the aggregate indicators. The second approach is to combine the dimensions at the level of the individual household. In short, this is concerned with the degree of overlap between the several dimensions of deprivation. Where there is a series of deprivation measures - nutrition, housing, durables, schooling, health - then how far are the same households deprived on the different dimensions?

In order to illustrate the second approach - multiple deprivation at the household level - we present in Table 5 information of deprivations in three dimensions of well-being and the extent of overlap between them. The indicators chosen are closely related to a set of goals in Cluster II on quality of life and social well-being. We consider school attendance of children of school-age (between 5 and 16 years old), access to safe sources of drinking water (piped or protected) and an indicator of possession of durable assets. The choice is illustrative, other dimensions and indicators could have been selected.

Between 2001 and 2007, school attendance and ability of durable assets have improved significantly, whereas access to protected sources of drinking water has deteriorated (Table 5). Despite the latter, the combined effect is to reduce the proportion of Tanzanians who suffer from any of the three forms of deprivation: this has fallen from 90 per cent to 80 per cent. Equally there has been a fall in the proportion deprived on all 3 dimensions: from 19 per cent to 10 per cent.

At the same time, there has been an increase in one category of the deprived: those lacking only access to water. In 2007 there are almost 10 per cent more individuals that only lack access to protected water. This raises the issues of (a) the weights to be placed on different dimensions and the way in which they are aggregated in an indicator of multiple deprivation at the household level, and (b) the way in which the deprivation “scores” of individual households are aggregated to form an overall assessment. The selection of the weights is crucial (see Decanq and Lugo, 2010). In the case just discussed, the measured extent of progress may be sensitive to the weight placed on access to water, relative to the other two dimensions. If it were decided that access to water were the sole concern, then deprivation would have increased from 46 per cent in 2001 to 51 per cent in 2007. The issue of aggregation across

individuals is discussed by Anand and Sen (1997). We are more concerned about a household deprived on all dimensions, but how much more weight do we attach to them than to a household deprived on all except one dimension? One limiting case is that of “Rawlsian” social judgments, where we assess overall performance simply in terms of the proportion deprived on all dimensions. As we have seen, this proportion has fallen, indicating definite progress.

Table 5. Deprivations in schooling, access to protected water and durable assets

| Proportion of the individuals living in households ... | 2001 | 2007 |
|--|------|------|
| School deprived: at least one child 5-16 years old not in school | 55.2 | 34.5 |
| water deprived: no access to piped or protected source of drinking water | 45.8 | 50.7 |
| assets deprived: no car or no more than one "small asset" | 66.6 | 47.4 |
| Distributions of individuals | | |
| Not deprived in school, water or assets | 10.3 | 20.1 |
| Only school deprived | 8.9 | 7.5 |
| Only water deprived | 4.7 | 14.4 |
| Only assets deprived | 17.3 | 15.1 |
| School and water deprived | 9.5 | 10.7 |
| Water and assets deprived | 12.5 | 15.9 |
| School and assets deprived | 17.6 | 6.6 |
| School, water and assets deprived | 19.1 | 9.8 |

Source: own calculations based on HBS 2001 and 2007.

Note: “small assets” include television, radio, telephone (including mobile phones), refrigerator, bicycle and motorcycle.

There are no doubt differences of opinion about the appropriate form of aggregation. There may however be situations in which a definite conclusion may be reached without needing to reach full agreement. Suppose in the present case that the policy objective is to reduce the proportion of households who suffer multiple deprivation in the sense of being deprived on 2 or more dimensions. Then it may be checked from Table 5 that - regardless of the weights attached to the different dimensions - there was an improvement in Tanzania between 2001 and 2007.⁹

Our analysis is purely illustrative, but we hope indicates the direction in which multiple deprivation at the household level can be incorporated in a manageable way into the assessment of economic and social performance. It also allows us, having started from pessimistic perceptions about the growth/poverty nexus, to end the paper on a positive note.

⁹ This may be seen by considering the cumulative proportion deprived starting from those on all 3 dimensions and then adding those deprived on exactly 2 dimensions. The cumulative proportions are lower in 2007 for all of the 6 possible combinations.

Conclusions

Our main points are:

- The importance of working with per capita figures, in view of the rapid population growth; but attention needs to be paid to the potential significance of changes in household size and spending composition for poverty measurement, with a reconsideration of the equivalence scales;
- Inequality should not be seen purely in relative terms; there are good reasons when considering the impact of distributional change on poverty reduction for treating as a “neutral change” one in which all consumption has increased by the same absolute amount; on this basis, inequality in Tanzania has grown substantially, and greater poverty reduction could have been achieved if the absolute increases in real income had been more evenly spread;
- Given the limitations in the definition of total consumption, and the differing estimates of price inflation, there is a case for downplaying the measure of consumption poverty and considering instead a portfolio of deprivation indicators that reflect specific types of consumption, notably nutritional indicators, housing and durables, and those that reflect spending on health care and education;
- Such a portfolio would, in turn, highlight the key roles played, on the one hand, by agricultural production, and, on the other hand, by public provision of health care and education, where issues of quality and distribution are important;
- The portfolio could be the basis for the analysis of multiple deprivation at the individual household level, capturing the degree of overlap of disadvantage; our illustrative analysis showed how this could be done in a manageable way, and brought out the extent of progress in Tanzania in the 3 dimensions considered.

We have suggested a number of avenues for future research:

- The triangulation of performance measures using other sources, notably those on the income side from income tax and other administrative data;
- The reconciliation of different data sources on government spending;
- The tracking the outcomes of government spending;

- The development of equivalence scales that allow for household composition;
- The development of measures of multiple deprivation at the household level.

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Appendix

Table A.1. Implicit deflators of Gross Domestic Product by Expenditure (2001 = 100)

| Implied deflators | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006r | 2007p |
|---------------------------------------|-----------|-----------|-----------|------------|------------|------------|------------|------------|------------|------------|
| Gross Domestic Product (GDPmp) | 81 | 88 | 95 | 100 | 107 | 116 | 124 | 132 | 139 | 152 |
| Final Consumption | 80 | 89 | 96 | 100 | 105 | 114 | 120 | 123 | 131 | 146 |
| Households | 81 | 90 | 96 | 100 | 104 | 114 | 119 | 121 | 129 | 142 |
| Government | 75 | 85 | 94 | 100 | 108 | 113 | 125 | 133 | 138 | 162 |
| Investment | 99 | 94 | 96 | 100 | 105 | 119 | 147 | 158 | 169 | 185 |
| Gross Fixed Capital Formation | 99 | 94 | 97 | 100 | 105 | 120 | 147 | 158 | 169 | 185 |
| Changes in Inventory | 89 | 90 | 94 | 100 | 108 | 102 | 134 | 155 | 165 | 201 |
| Exports | 82 | 81 | 82 | 100 | 110 | 113 | 127 | 136 | 171 | 183 |
| Goods | 95 | 98 | 98 | 100 | 116 | 120 | 139 | 151 | 217 | 252 |
| Services | 71 | 68 | 69 | 100 | 104 | 105 | 115 | 120 | 137 | 139 |
| Imports | 95 | 92 | 92 | 100 | 98 | 108 | 130 | 126 | 154 | 178 |
| Goods | 95 | 94 | 95 | 100 | 98 | 108 | 130 | 126 | 154 | 171 |
| Services | 95 | 90 | 87 | 100 | 98 | 108 | 130 | 126 | 154 | 204 |

Source: National Bureau of Statistics (2008), Table 14.

Table A.2. Adult equivalence scale

| Age groups | Sex | |
|------------|-----------------|--------|
| | Male | Female |
| 0 – 2 | X ₁ | 0.40 |
| 3 – 4 | X ₃ | 0.40 |
| 5 – 6 | X ₅ | 0.56 |
| 7 – 8 | X ₇ | 0.64 |
| 9 – 10 | X ₉ | 0.76 |
| 11 – 12 | X ₁₁ | 0.80 |
| 13 – 14 | X ₁₃ | 1.00 |
| 15 – 18 | X ₁₅ | 1.20 |
| 19 – 59 | X ₁₇ | 1.00 |
| 60 + | X ₁₉ | 0.80 |

Source: HBS report (National Bureau of Statistics, 2009a), Table A.6.

Table A.3. Distribution of number of household members (%)

| Number of household members | Dar es Salaam | | Other urban areas | | Rural areas | | Mainland Tanzania | |
|-----------------------------|---------------|-------|-------------------|-------|-------------|-------|-------------------|-------|
| | 2001 | 2007 | 2001 | 2007 | 2001 | 2007 | 2001 | 2007 |
| 1 | 13.2 | 19.4 | 12.8 | 13.8 | 8.5 | 8.1 | 11.4 | 13.9 |
| 2 | 9.8 | 14.8 | 11.6 | 11.4 | 9.8 | 9.5 | 10.9 | 11.9 |
| 3 | 14.1 | 18.8 | 15.1 | 16.5 | 14.0 | 13.0 | 14.6 | 16.2 |
| 4 | 15.8 | 15.5 | 15.3 | 16.8 | 14.5 | 16.7 | 15.1 | 16.3 |
| 5 | 12.2 | 12.1 | 12.8 | 13.4 | 13.3 | 14.8 | 13.0 | 13.4 |
| 6 | 11.6 | 7.8 | 10.1 | 10.2 | 11.4 | 12.5 | 10.6 | 10.1 |
| 7 | 8.5 | 4.8 | 7.5 | 6.8 | 9.0 | 9.6 | 8.1 | 7.0 |
| 8 | 4.7 | 2.6 | 5.2 | 4.6 | 6.0 | 5.5 | 5.5 | 4.2 |
| 9 | 3.3 | 1.9 | 3.4 | 2.2 | 4.4 | 3.9 | 3.7 | 2.6 |
| 10 | 2.0 | 0.8 | 2.1 | 1.8 | 2.7 | 2.1 | 2.3 | 1.6 |
| 11 | 1.8 | 0.6 | 1.6 | 0.9 | 1.7 | 1.3 | 1.6 | 0.9 |
| 12 | 3.0 | 0.8 | 2.5 | 1.6 | 4.6 | 3.1 | 3.3 | 1.8 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
| Average size | 4.33 | 3.68 | 4.49 | 4.37 | 5.08 | 5.03 | 4.94 | 4.78 |
| Population proportion | 5.79 | 7.45 | 13.81 | 17.64 | 80.41 | 74.9 | 100.0 | 100.0 |

Source: own calculation, based on HBS.

Table A.4. Average household size, by quintile of per capita household expenditure (overall definition) across households

| Quintile of per capita expenditure | Dar es Salaam | | Other urban areas | | Rural areas | | Mainland Tanzania | |
|------------------------------------|---------------|------|-------------------|------|-------------|------|-------------------|------|
| | 2001 | 2007 | 2001 | 2007 | 2001 | 2007 | 2001 | 2007 |
| 1 | 6.64 | 5.32 | 6.65 | 5.71 | 6.66 | 6.34 | 6.66 | 6.24 |
| 2 | 6.13 | 4.92 | 5.81 | 5.12 | 5.75 | 5.58 | 5.77 | 5.49 |
| 3 | 5.47 | 4.51 | 5.01 | 5.02 | 4.83 | 5.07 | 4.89 | 5.02 |
| 4 | 4.39 | 3.83 | 4.32 | 4.49 | 4.08 | 4.36 | 4.16 | 4.33 |
| 5 | 3.20 | 2.89 | 3.07 | 3.03 | 2.90 | 3.01 | 2.99 | 2.99 |
| Total | 4.34 | 3.68 | 4.49 | 4.37 | 5.09 | 5.03 | 4.95 | 4.78 |

Source: own calculations from HBS.