# Structural Changes in Tanzanian Poverty Over 15 Years: 1976 to 1991

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# 1. INTRODUCTION

Tanzania, according to The World Bank, is the third poorest country in the world. After a protracted period of crisis in the late 1970s and early 1980s, the government has been implementing successive stabilization and structural adjustment programs (SSAPs) since 1984 . These programs have been adopted after considerable internal debate and opposition. One of the major issues in the context of the adjustment debate has been the impact of the SSAPs on households and especially on poor households. Opponents of the SSAPs have argued that these programs have a detrimental impact on the poor, and they are supported in their assessments by international donors such as UNICEF (Cornia et al. 1987). However, these arguments have not been substantiated by empirical research.

In Tanzania, the conventional wisdom is that real incomes of households declined significantly during the late 1970s and early 1980s, according to the analysis of Bevan et al. (1988). Adjustment in turn stopped the declining real income trend according to Collier and Gunning (1990), and led to slight real income increases. According to these authors, real incomes in Tanzania at the end of the decade of 1980-1990 were significantly below those of 1976.

Official GDP trends suggest a similar interpretation. Between 1976 and 1984, real per capita official GDP declined by 12 percent, while between 1984 and 1991, it rose by 7.5 percent. If these trends are combined, real per capita GDP in Tanzania in 1991 was about six percent below that of 1976.

Sarris and van den Brink (1993) questioned the above trends on the grounds that much of the economic activity in Tanzania during the crisis period went underground and was unobservable. What appears to be a decline in real incomes is suggested by Sarris and van den Brink (1993) to have been a decline in real *official* incomes, while incomes from parallel activities are supposed to have compensated for part of the real official income losses.

The analysis and arguments of Bevan et al. (1988), were based on comparison of household surveys at various points in time. The problem, however, with some of the surveys used by Bevan et al. (1988), especially those of 1980 and 1983, apart from the fact that they were not based on nationally representative household samples, was that they measured only incomes and not consumption expenditures. Given the presence of extensive price and other controls in Tanzania during the years of the survey, it is most likely that households increasingly underestimated their incomes in response to income questions (a problem which is almost always present in household surveys).

Under the hypothesis that real incomes in Tanzania declined substantially between 1976/77 (the period of the coffee boom, and the last period before the onset of the severe crisis), and 1984, and then stabilized or increased slightly from 1984 onward; it is probable that real household expenditures in the early 1990s were still below those of 1976. The purpose of this paper is to test this

hypothesis, and to examine the current extent of poverty in Tanzania in comparison with that of the preadjustment period, as investigated by Sarris and van den Brink (1993).

The comparison will be done using the 1976/77 national household budget survey (NHBS), which has not been published, but from which the authors obtained several tables, and a 1991 national household survey conducted in collaboration between the Cornell Food and Nutrition Policy Program (CFNPP) and the Economic Research Bureau (ERB) of the University of Dar es Salaam (for a first report see Tinios et al., 1993). The 1991 survey is the first nationally representative household survey to have been done in Tanzania since 1976, and hence is the only one with which the 1976 one can be compared.

Comparison of household survey results at different points in time is the best way to empirically assess the real income status of households before and after some event, and has not been done for any country in Africa due to the lack of appropriate surveys. While comparison of household characteristics based on survey results does not attribute the changes to any one given policy or SSAP (for this one needs a counterfactual modeling framework, such as the one constructed for Tanzania by Sarris (1994)), it provides the best method to compare real income changes.

Section 2 briefly discusses the two surveys and compares some overall household characteristics. Section 3 compares real expenditures of households in 1976 and 1991 in an aggregate fashion. Section 4 presents comparative distributional results. In Section 5 a comparative poverty analysis is made. Finally, Section 6 summarizes the conclusions.

## 2. THE 1976 AND 1991 HOUSEHOLD SURVEYS

There are similarities but also important differences between the 1976 and 1991 household surveys. Both surveys were nationally representative of the mainland. The 1976 National Household Budget Survey (NHBS) interviewed a total of 5,000 households in a representative random sample, of which 3,247 (64.9 percent) were rural. The 1991 CFNPP-ERB survey interviewed 1,046 households, of which 477 (45.6 percent) were in rural areas. The 1991 sample (details are given in Tinios et al., 1993), while random at the national level and the level of the ward, was not random at the level of households and oversampled some small, but important categories in the population (e.g. civil servants, large businessmen). This implies that the weights used to expand household information to the national level had to be carefully constructed in order to take this non-random sampling into account. The 1976 survey was a true budget survey on recorded expenditures and extended over a period of one year. The 1991 survey was done over a period of two months (August - September), and was based on recall. The results of the 1976 survey were designed to give unbiased results by region, and along a rural-urban division. The 1991 survey was designed to give unbiased information along three regional divisions (rural, urban non Dar es Salaam, and urban Dar es Salaam).

In Tinios et al. (1993), some of the 1991 survey results were subjected to comparison with independent sources of information (i.e., production statistics), and there did not appear to be any systematic biases. In fact, if any, the 1991 survey results as computed from the raw data tend to bias consumption expenditures downward (thus making it more difficult to reject one of the principal stated hypotheses). We accept that the 1976/77 survey was unbiased, given its detailed and meticulous organization.

Table 1 compares the distribution of household sizes in rural and urban areas (for the 1991 survey, the figures for all urban regions are aggregated from the non Dar es Salaam and Dar es Salaam respective totals). In the 1991 survey, the definition of the household was "all people that usually lived together and ate their meals together over the last 12 months." In the 1976 survey, it was not clear from the available documents if the exact same definition was used. As the exact definition makes a difference with respect to the size of household (Tinios et al., 1993), it is not clear whether the overall difference in average household size (5.7 in the 1976/77 NHBS versus 6.1 from the 1991 survey) is due to definitions or represents real change. However, examining the distributions in Table 1, it is clear that the difference is due to the larger average household size in the rural sector in 1991, and in particular the greater proportion of large households (larger than six members), combined with the smaller proportion of very small households (one or two members) in rural areas. On the contrary, in the urban areas both the distribution as well as the average household size appear similar in the two surveys.

Table 1 — Distribution of Household Sizes in the 1976/77 and 1991 Surveys

| | Rural | | Urban | |
|---|---|---|---|---|
| Household Size | 1976/77 | 1991 | 1976/77 | 1991 |
| 1 | 4.8 | 1.6 | 12.5 | 10.5 |
| 2 | 9.3 | 6.0 | 10.9 | 9.8 |
| 3-4 | 25.9 | 24.3 | 23.9 | 24.9 |
| 5-6 | 25.1 | 24.8 | 24.7 | 24.3 |
| 7-8 | 17.3 | 22.4 | 14.8 | 16.6 |
| 9+ | 17.6 | 20.9 | 13.1 | 13.9 |
| Total number of households | 2585.1 | 3074.6 | 453.7 | 826.6 |
| Total population (000) | 14993.3 | 19581.3 | 2268.5 | 4231.6 |
| Mean household size | 5.8 | 6.4 | 5.0 | 5.1 |
| Sampled households | 3247 | 477 | 1753 | 569 |

Source: Computed from 1976/77 and 1991 survey data.

Note: Figures are percent of households in group, unless otherwise noted.

The fact that the average household size in rural areas is larger in the 1991 survey, coupled with the fact that this comes largely from opposing changes in the tails of the size distribution, and that larger households are more likely to have more young children; implies that when computing per capita household expenditure figures in the 1991 survey, the bias is toward estimating *lower* per capita figures than what could be the true values. Again, this would make the rejection of the overall real expenditure decline hypothesis more difficult.

Table 2 compares the educational levels of heads of households in rural and urban areas in 1976 and 1991. It is quite clear that there seems to be a substantial upgrading of the educational level of heads of households both at the very low level (declines in proportion without education), as well as the high levels (increases in the proportions with secondary and post-secondary education).

This must have been a result of the campaign for universal primary education that started in Tanzania in the late 1960s and early 1970s. Given the small period of operation of such a policy in 1976, it is to be expected that the share of heads without education should decline over time, and the share of those with some education should rise. Of interest, nevertheless, is the significant increase in the share of household heads with some secondary and/or post-secondary education, which in the urban areas has doubled to nearly 20 percent, while in the rural areas has increased 4.5 times to 3.5 percent. In any event, these shares are still quite low in absolute terms.

**Table 2** — Comparison of Educational Levels of Heads of Households, 1976 and 1991 (percent)

| | Rural | | Urban | |
|---|---|---|---|---|
| | 1976/77 | 1991 | 1976/77 | 1991 |
| No education | 53.8 | 28.8 | 39.1 | 16.2 |
| Some or complete primary | 45.1 | 62.2 | 50.6 | 59.7 |
| Some or complete secondary | 0.8 | 3.3 | 9.2 | 15.2 |
| Post-secondary | 0.0 | 0.2 | 0.4 | 3.8 |
| Other | 0.3[a] | 5.5[b] | 0.7[a] | 5.0[b] |
| Non stated or missing | 0.0 | 0.0 | 0.0 | 0.1 |
| Total | 100.0 | 100.0 | 100.0 | 100.0 |
| Number of households (000) | 2,585.1 | 3,074.8 | 453.7 | 826.9 |

Source: Computed from 1976/77 and 1991 survey data.

[a] Vocational course after primary or partial secondary.
[b] Adult literacy, etc.

## 3. AVERAGE HOUSEHOLD EXPENDITURES IN 1976 AND 1991

In this section, we compare average real consumption expenditures in 1976/77 and 1991 for rural and urban areas. To do this, it is necessary to compare nominal consumption figures from the 1976/77 NHBS with similar figures from September 1991. This is normally done by using appropriate deflators. In Tanzania there are three published official consumer price indices. The first is the so-called National Consumer Price Index (NCPI), which currently is based on urban consumption weights from the 1976/77 NHBS, and is computed by sampling prices in all major Tanzanian cities. In addition there are two other indices published; the cost of living in Dar es Salaam for middle income groups, and for wage-earners (low income). These indices use different weights than the NCPI, and by 1991 are considerably higher than the NCPI (differences of 40-50 percent). No known rural cost of living index is published or exists.

If the ratio of the urban to the rural cost of living has remained constant from 1976 to 1991, then we can use to NCPI to bring to the same date both rural and urban expenditure levels. To assess whether the rural and urban costs of living have evolved in unison, the following test was done. From the 1976 survey we obtained information on values and quantities consumed for several food items in rural and urban regions. This allowed the computation of prices (namely unit values) for these items for rural and urban regions. These computed unit values were of necessity the same for all quantities consumed whether purchased or from own production.

We then computed the per capita total expenditure on these items in rural areas using first rural and then urban prices. Since the quantities in these computations are the same, the ratio between these two figures reflects the ratio between the urban and rural costs of the given commodity basket. To check on the computation we repeated the calculation using the urban quantities. The result in the first case was a ratio of 1.191 while in the second case it was 1.131. This implies that for the given bundles (which turned out to represent 70.6 percent of total expenditures for the rural areas and 59.6 percent for the urban areas), the average urban cost of living in 1976 was between 13 and 19 percent higher than the average rural cost of living.

We repeated these computations for 1991 using the exact same food items as in 1976 (albeit different quantities). In 1991 these items represented 61.1 percent in rural areas and 48.4 percent of total expenditures in urban areas. In the 1991 computations, although we had separate prices for purchases and consumption out of own production we computed weighted average prices for rural and urban areas. The ratios of the urban to rural costs of living, done in the same way as before, were 1.239 using rural quantities, and 1.192 using urban quantities. These figures imply that the ratio of the average urban to the average rural cost of living (at least for food) has increased only slightly. Given the results of the above test, we used in our first set of comparisons the NCPI to inflate both rural and urban 1976 figures.

The 1976/77 NHBS was conducted from September 1976 to August 1977, while the NCPI uses the whole of year 1977 as a base. To be consistent we took the average of the September 1976 to June 1977 quarterly figures of the NCPI, as our base rather than 100 (which is the 1977 average) and hence, our base for updating was 95.7. In September 1991 (which is the month of the survey, and on the basis of which annual figures were computed) the published NCPI was equal to 2,428.7. Hence the 1976 nominal figures must be multiplied by 25.378 (the ratio of the above two numbers), to make them comparable to the 1991 figures. The different budget shares in rural areas do not affect these computations much. If we apply the rural aggregate 1976 budget shares to the published prices for the components of the NCPI, the difference between a "rural" NCPI and the published urban one is less than two percent. This is consistent with our micro-test just described, which suggested that the ratio of the cost of living between urban and rural areas has stayed roughly the same.

Table 3 presents the per household and per capita total and "subsistence" (namely out of own production) consumption expenditures for 1976/77 and 1991 for the rural and urban areas in 1991 prices. The per capita expenditures in the 1991 survey are computed in two ways. The first computes total national expenditures for the group and then divides it by the group population. This "macroeconomic" average, which is comparable to the figure derived from the 1976/77 NHBS tables, is reported in the per capita row under the 1991 figures, as column (i). In column (ii) under the 1991 figure, we repeat the per capita figure as computed by first taking per capita magnitudes *for each household*, and then weighting them by the household weights to arrive at group totals. The two estimates are not the same. Since the sampling unit is the household, one should use the measure reported in column (ii) to characterize a "representative" household. However, the "macroeconomic" averages are comparable to figures derived from national accounts, and we use them in the sequel. Since the figures of column (i) are smaller than the figures of column (ii), this practice again makes it more difficult to reject the income decline hypothesis.

The difference, however, does not appear to affect the main conclusion from the table, which is that average real per household or per capita expenditures in Tanzania appear to be much higher in 1991 compared to the pre-crisis and boom period of 1976/77. For the rural sector, average per capita total expenditure in 1991 (using the lower of the two figures in Table 3), seems to be 34.9 percent higher than what it was in 1976/77. For urban households the 1991 per capita total expenditure appears to be 125 percent higher in real terms compared to 1976/77, a very large increase. For all of Tanzania, the average per capita total expenditure in 1991 appears to be 60.7 percent higher, in real terms, than in 1976/77. This high percentage increase is partially due to the larger share of urban population in 1991.

Turning to subsistence consumption, it is apparent that in rural areas (where more than 95 percent of subsistence consumption consists of food), its share in total consumption has declined considerably between 1976/77 and 1991. This is consistent with the increase in real incomes in rural areas. In urban areas it appears to have grown as a share of total expenditures. However, this is largely due to the definition of subsistence consumption in 1991. For

Table 3 —Comparison of Real Consumption Expenditures in 1976/77 and 1991 using the NCPI (Tsh in 1991 prices)

| | 1976/77 | 1991 | | Percent Change between 1991[a] and 1976/77 |
|---|---|---|---|---|
| | | (i) | (ii) | |
| **Rural per household** | | | | |
| Total expenditure | 123,908 | 184,760 | | 49.1 |
| Subsistence consumption | 64,023 | 65,077 | | 1.6 |
| Share of subsistence in total (percent) | 51.67 | 35.2 | | |
| **Rural per capita** | | | | |
| Total expenditure | 21,503 | 29,013 | 32,365 | 34.9 |
| **Urban per household** | | | | |
| Total expenditure | 214,485 | 378,499 | | 76.5 |
| Subsistence consumption | 18,038 | 50,164 | | 78.1 |
| Share of subsistence in total (percent) | 8.41 | 13.3 | | |
| **Urban per capita** | | | | |
| Total expenditure | 32,984 | 74,203 | 92,262 | 125.0 |
| **Tanzania per household** | | | | |
| Total expenditure | 144,870 | 225,382 | | 55.6 |
| Subsistence consumption | 62,975 | 61,954 | | -1.6 |
| Share of subsistence in total (percent) | 43.5 | 27.5 | | |
| **Tanzania per capita** | | | | |
| Total expenditure | 23,023 | 36,988 | 44,984 | 60.7 |

Source: Computed from 1976/77 NHBS and 1991 CFNPP-ERB survey data.

[a] The figures in column (i) are used.

the figures in Table 3, subsistence consumption in 1991 was considered to be anything that is not purchases. This includes wages in kind and consumption from own business output. It turns out that in 1991 the share of the latter two components in urban "subsistence" consumption is 46 percent, compared to only 3 percent for the rural sector. By comparison, in the 1976/77 survey, more than 96 percent of urban as well as rural subsistence consumption was food. It is not clear where wages in kind and consumption of own business output were placed in the 1976 survey. Furthermore, the valuation procedure for subsistence consumption was not defined in the technical manuals we obtained. Had we taken only own produced food as a proxy for subsistence consumption, the corresponding per household figure would be 34,181 Tsh, compared to 50,164 indicated in Table 3, and this would constitute only nine percent of total urban consumption expenditure. This, nevertheless, constitutes a small proportional increase over 1976/77.

The overall conclusion from the aggregate comparisons in Table 3 is that real household expenditures, after the initial phase of the adjustment, are not lower, and on the contrary appear to be much higher than those of the pre-adjustment, and also those of the pre-crisis "normal" period.

The only way in which the above conclusions could be reversed is if the true cost of living indices were much higher than the published ones. To check on this possibility we attempted direct price comparisons for several items between 1976 and 1991. The procedure for doing this was the following. From the tables available to us from the 1976/77 NHBS we could obtain for rural and urban areas total values (monetary and subsistence) and total quantities consumed for various detailed food items as already explained above. Using these we estimated the average unit values in rural and urban areas implied for these items by the published 1976 data. For urban areas, these were broadly consistent with the 1976/77 detailed information on urban market prices compiled by the Bureau of Statistics (BOS) as input to the computation of the NCPI.

From the 1991 survey we had detailed information on prices, as well as between overall rural and urban areas. Again we computed average unit values for the same items using the ratios of total values of the products consumed and total quantities. We then used the per capita total quantities (monetary and subsistence) consumed of these food products to compute their corresponding values in 1991. In other words if $Q_{io}$, $p_{io}$ denote the base year per capita quantity consumed and unit value (price) for item i , then $V_{bo}$ where:

$$V_{bo} = \sum_{i} Q_{io}\, p_{io} \qquad (1)$$

denotes the per capita expenditure on the set of given food items in 1976. The revaluation of these quantities for 1991 yields a value of $V_{bt}$ where:

$$V_{bt} = \sum_{I} Q_{Io}\, p_{It} \qquad (2)$$

and $p_{1t}$ are the prices of the same products in 1991. $V_{bt}$ denotes the expenditure needed in 1991 to purchase the same commodity bundle as in 1976. If we could do the computations in (1) and (2) for all consumed items, then the ratio of $V_{bt}$ and $V_{bo}$ would be the Laspeyres (base weighted) consumer price index.

$$P_b = \frac{V_{bt}}{V_{bo}} \qquad (3)$$

As it turns out we could do these computations for items that amounted for 55-60 percent of total expenditures in 1976.

We could also do the same computations using 1991 per capita quantities. Using similar terminology we obtain:

$$V_{fo} = \sum_{I} Q_{It}\, p_{Io} \qquad (4)$$

$$V_{ft} = \sum_{I} Q_{It}\, p_{It} \qquad (5)$$

$$P_f = \frac{V_{ft}}{V_{fo}} \qquad (6)$$

$V_{fo}$ denotes the amount of money one would need in 1976 to purchase the commodity bundle consumed in 1991 (namely the final period), and $P_f$ is the corresponding current weighted (Paasche) price index.

The indices $P_b$ and $P_f$ computed in this fashion both turned out to be higher than the food component of the NCPI. The food NCPI turns out to be 2,538 (using 1976/77 as 100, and September 1991 data). By contrast the index $P_b$ turned out to be equal to 3,835 for rural areas and 3,794 for urban areas. The index $P_f$ turned out to be equal to 3,131 for rural areas and 3,312 for urban areas. The difference is of the order of 50 percent for $P_b$ and 30 percent for $P_f$.

The large difference between the Laspeyres and the Paasche types of food price indices (22.5 percent for rural and 14.6 percent for urban areas) could be due to households switching among different forms of the same commodity. For instance, in 1976 the per capita annual consumption of maize grain and maize flour (maize is the principal food staple in Tanzania) in rural areas was 17.2 kgs and 75.6 kgs respectively, while in urban areas the figures were 10.7 kgs and 49.2 kgs respectively. In 1991 by contrast the rural per capita consumption of maize grain was 77.5 kgs while for maize flour it was 5.3 kgs. In the urban areas the figures were 68.4 kgs of maize grain and 19.1 kgs for maize flour. Clearly there has been a switch toward the unprocessed form of maize consumption. This seems to be the result of large increases in the maize flour to maize grain price differential (from 13-20 percent in 1976 to 70-90 percent in 1991). The above pattern seems to be true in all cereals. This switch can bias the cost of living as the cost of grinding is part of consumption in one case and not in the other, albeit it should be part of "consumption out of own production".

We tried to recompute the indices $P_b$ and $P_f$, using raw product equivalents and some information on the cost of grinding from the 1976 survey. The resulting price indices $P_b$ and $P_f$ turned out to be 3,395 and 3,178 for the rural areas, and 3,455 and 3,339 for the urban areas respectively. These indices not only exhibit much smaller differences, but also seem to be closer to the values of $P_f$ reported earlier, which are much smaller than the values of $P_b$. In the sequel we use the original figures of $P_b$ and $P_f$ indicated earlier, with the understanding that the alternative price indices derived on the basis of $P_b$ are rather extreme, while those derived on the basis of $P_f$ are much closer to an alternative to the NCPI cost of living index.

Table 4 presents the results of doing direct revaluations of 1976 quantities consumed and expenditures, using $P_b$ for the food items for which no direct comparison could be made, and the non-food NCPI for the non-food part of expenditure, and compares the figures with actual 1991 expenditures. This comparison marginally reverses the conclusion of increased per capita real expenditure for the rural areas, but preserves it for the urban areas, albeit less forcefully. However, the decline in per capita real expenditure for the rural areas is small (3.4 percent), and given the orders of magnitude involved, the extreme assumptions made, and the noise in the data, it cannotbe considered significant.

It must be emphasized that the assumptions made for the computations all tended to bias upwards the revaluation of 1976 expenditures. For instance, had we used the food NCPI for the revaluation of the non-directly comparable items of the food budget (rather than the higher value of $P_b$), the revalued real per capita rural total consumption expenditure in 1991 would have been 2.1 percent lower than the actual 1991 observed expenditure, rather than 3.4 percent higher, as indicated in Table 4. Had we used the alternative base weighted indices indicated above, derived by correcting for the cost of grinding, the ratio of 1991 to 1976 per capita rural expenditures would be 109.4, while for the urban areas the ratio would be unchanged at 166.7.

**Table 4** — Comparison of Average Real per Capita Consumption Expenditures in 1976 and 1991 using Direct Revaluation and 1976 Quantities

| | | Rural | Urban | Total |
|---|---|---|---|---|
| Per Capita Total Consumption Expenditures in 1976 (Tsh Current Prices) | | 847 | 1,300 | 907 |
| Percent of Total Consumption Expenditure in 1976 Accounted for by Items for which Direct Comparison is Made | | 61.4 | 55.5 | 60.6 |
| Direct Revaluations using 1976 per Capita Quantities | | | | |
| $V_{bo}$ | | 520 | 721 | 546 |
| $V_{bt}$ | (1) | 19,939 | 27,353 | 20,914 |
| Other Consumption Expenditures | | | | |
| (i) Food in 1976 (Current Prices) | | 118 | 143 | 122 |
| Revalued to 1991 using $P_b$ | (2) | 4,542 | 5,441 | 4,661 |
| (ii) Non-Food in 1976 (Current Prices) | | 209 | 435 | 239 |
| Revalued to 1991 using non-food NCPI | (3) | 5,548 | 11,562 | 5,802 |
| Total Consumption Expenditure in 1976 revalued to 1991 {=(1)+(2)+(3)} | | 30,030 | 44,356 | 31,383 |
| Actual Total Expenditure in 1991 | | 29,012 | 74,208 | 36,988 |
| Ratio 1991/1976 (Percent) | | 96.6 | 167.3 | 117.9 |

Source: Author's computations.

Table 5 performs the reverse computation, whereby some of the actual 1991 quantities for the 1991 food items are devalued to 1976 using actual 1976 prices. For the rest of food we use $P_f$, and for non-food we use the non-food component of the NCPI. The results in this case, which according to our discussion of alternative costs of living is a reasonable alternative to comparisons made on the basis of the NCPI, are consistent with the earlier computations of Table 3 and suggest increases in per capita incomes in both rural and urban areas between 1976 and 1991, although not as large as the ones indicated in Table 3.

Given the index number problems involved, it thus appears that on average between 1976 and 1991 real per capita incomes in rural Tanzania have slightly increased, while real per capita incomes in urban Tanzania have increased considerably. Given the population shift between rural and urban areas, in all cases the average real per capita consumption expenditures in mainland Tanzania appear to have increased considerably between 1976 and 1991.

It is not possible from the analysis to ascertain whether the increase in real expenditure has all occurred after the onset of adjustment or has been occurring throughout the crisis period, even though not observed by official statistics. Nevertheless, the hypothesis put forward for testing, which suggested that real incomes in Tanzania at the end of the decade of 1980 were below those of the pre-crisis period appears to be rejected.

Since the comparisons of expenditures in 1976 and 1991 involves the use of a deflator, and since use of different deflators might alter the results, we constructed two new deflators to use in the subsequent analysis. The first uses the estimated value of $P_b$ for food, and the non-food component of the NCPI for the non-food items. In this sense it is close to a Laspeyres type index, and according to earlier discussion represents a rather high upper bound on possible true price developments. The second uses $P_f$ for the food component, and the non-food component of the NCPI for non-food items. It is thus closer to a Paasche type index. The resulting indices are given in Table 6.

It can be seen that both indices are considerably higher than the NCPI in 1991 and that the base weighted index is markedly higher. However, given earlier discussion, the base weighted type of alternative price index must be considered rather unlikely and can serve as an extreme upper bound, while the other index in Table 6 is a more appropriate alternative to the NCPI.

**Table 5** — Comparison of Average Real per Capita Consumption Expenditures in 1976 and 1991 using Direct Revaluation and 1991 Quantities

| | | Rural | Urban | Total |
|---|---|---|---|---|
| Per Capita Total Consumption Expenditures in 1991 (Tsh Current Prices) | | 29,012 | 74,208 | 36,988 |
| Percent of Total Expenditure in 1991 Accounted for by Items for which Direct Comparison is Made | | 62.6 | 48.7 | 60.1 |
| Direct Revaluations using 1991 Quantities | | | | |
| $V_{ft}$ | (1) | 18,152 | 36,169 | 21,326 |
| $V_{fo}$ | | 580 | 1,092 | 670 |
| **Other Consumption Expenditures** | | | | |
| (i) Food in 1991 (Current Prices) | | 3,048 | 7,758 | 3,879 |
| Devalued to 1976 using $P_f$ | (2) | 97 | 234 | 122 |
| (ii) Non-Food in 1991 (Current Prices) Devalued to 1976 using the non-food component of NCPI | | 7,814 | 30,280 | 11,783 |
| | (3) | 294 | 1,140 | 444 |
| Total Consumption Expenditure in 1991 Devalued to 1976 {=(1)+(2)+(3)} | | 971 | 2,467 | 235 |
| Actual Total Expenditure in 1976 | | 847 | 1,300 | 907 |
| Ratio 1991/1976 (Percent) | | 114.6 | 189.8 | 136.2 |

Source: Authors' computations

Table 6 — Values of Alternative Consumer Price Indices in September 1991: (1976/77 = 100)

| | Rural | Urban | Tanzania | Percent Difference of Alternative Aggregate CPI from NCPI in 1991. |
|---|---|---|---|---|
| Base (1976) Weights (Laspeyres type) | 3549.6 | 3421.7 | 3525.4 | 38.9 |
| 1991 Weights (Paasche type) | 3010.5 | 3050.6 | 3022.4 | 19.1 |
| NCPI | 2537.8 | 2537.8 | 2537.8 | 0.0 |

Source: Authors' computations

## 4. THE DISTRIBUTION OF EXPENDITURE IN 1976 AND 1991

The conclusions arrived at in the previous section based on aggregate figures could be due to serious income maldistributions. If, for instance, the wealthiest households gained considerably at the expense of the poor, then on average one could obtain the aggregate results of the previous section. In this section, we investigate the changes in expenditure distribution.

Most of the distributional tables available to us from the 1976/77 NHBS concerned distribution of households according to total household monetary and not total expenditures. The monetary expenditures include expenditures for investment items and other savings like increases in cash, and are hence higher than monetary consumption expenditures, and are intended to represent total cash incomes. The only aggregate distributional information we were able to obtain for 1976 concerned the distribution of all individuals in mainland Tanzania according to per capita total incomes (not consumption expenditures).

To translate the 1976 income intervals into consumption expenditure intervals the following procedure was used. From separately available tables grouping households according to monetary and not total income per household in 1976, we were able to estimate ratios of total consumption expenditures to total income for these grouped household data. These suggested that for the lower monetary income classes the ratios of consumption expenditure to income were close to 100 percent. When the ranges in the available data were translated to per capita terms, using group average household sizes, it turned out that for all (except for the two highest per capita income levels, for which the distribution of individuals was available), the ratio of consumption expenditures to income was close to 100 percent. Therefore, it was only for the two highest income intervals where it was necessary to derive a correspondingly lower expenditure level.

Table 7 presents the frequency and cumulative distribution of individuals in Tanzania in 1976 and 1991. The first column shows the available income intervals in the 1976 data. The second column exhibits the corresponding consumption expenditure intervals as estimated, using average savings rates for higher income households, available in other parts of the 1976/77 survey.

Column 3 gives the distributional data available from the 1976/77 survey. The next three columns were estimated using different assumptions about inflation. For column (4) the expenditure intervals of column 2 we revalued to 1991 using the NCPI (method A). For column 5, the revaluations were done using the base weighted alternative national level price index of Table 6 (method B). For column 6, the revaluations used the 1991 weighted alternative national level index of Table 6 (method C).

The cumulative distribution in 1991 using method A dominates the distribution in 1976 for all intervals above the 300 Tsh per capita level.

Table 7 —Distribution of Individuals in 1976 and 1991 According to per Capita Total Consumption Expenditures

**A. FREQUENCY DISTRIBUTION**

| Per Capita Income Group in 1976 | Per Capita Consumption Expenditure Group in 1976 | DISTRIBUTION IN 1976 | DISTRIBUTION IN 1991 Expenditure Interval Revaluation Using METHOD A | METHOD B | METHOD C |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| | | | Percent of Individuals | | |
| 0-50 | 0-50 | 0.0 | 0.4 | 0.5 | 0.4 |
| 51-100 | 51-100 | 0.0 | 0.3 | 0.9 | 0.4 |
| 101-200 | 101-200 | 1.1 | 1.3 | 2.6 | 1.4 |
| 201-300 | 201-300 | 3.2 | 2.7 | 6.1 | 4.7 |
| 301-400 | 301-400 | 8.2 | 5.3 | 10.5 | 4.5 |
| 401-500 | 401-500 | 10.3 | 5.4 | 10.8 | 7.6 |
| 501-1000 | 501-950 | 42.7 | 30.0 | 28.5 | 28.5 |
| 1001-2000 | 951-1780 | 26.2 | 29.4 | 26.1 | 28.1 |
| 2000+ | 1780+ | 8.3 | 25.2 | 14.1 | 24.4 |
| | | 100.0 | 100.0 | 100.0 | 100.0 |

**B. CUMULATIVE DISTRIBUTION**

| Per Capita Income Group in 1976 | Per Capita Expenditure Group in 1976 | DISTRIBUTION IN 1976 | DISTRIBUTION IN 1991 Expenditure Interval Revaluation Using METHOD | METHOD B | METHOD C |
|---|---|---|---|---|---|
| (1) | (2) | (3) | (4) | (5) | (6) |
| | | | Percent of Individuals | | |
| 0-50 | 0-50 | 0.0 | 0.4 | 0.5 | 0.4 |
| 51-100 | 51-100 | 0.0 | 0.7 | 1.4 | 0.8 |
| 101-200 | 101-200 | 1.1 | 2.0 | 4.1 | 2.2 |
| 201-300 | 201-300 | 4.3 | 4.6 | 10.1 | 6.8 |
| 301-400 | 301-400 | 12.5 | 9.9 | 20.6 | 11.3 |
| 401-500 | 401-500 | 22.8 | 15.3 | 31.4 | 18.9 |
| 501-1000 | 501-950 | 65.5 | 45.3 | 59.8 | 47.5 |
| 1001-2000 | 951-1780 | 91.7 | 74.8 | 85.9 | 75.6 |
| 2000+ | 1780+ | 100.0 | 100.0 | 100.0 | 100.0 |

Source: Computed from the 1976/77 and 1991 Household Surveys.

Dominance means that the cumulative percentage of individuals is lower for 1991 at all levels of expenditure above 300.[1] In other words, given a level of per capita expenditure in 1976 larger than 300 Tsh (call it e.g. E) a smaller proportion of individuals in 1991 lives in households with per capita expenditures lower than PE, where P is a cost of living index computed by one of the three exhibited methods (the NCPI for method A). For expenditure levels below 300, the dominance is reversed but, as will be seen later, this range is not relevant for poverty comparisons. The cumulative distributions in 1991 using revaluation methods B and C dominate the distribution for 1976 only at the highest expenditure intervals. This means that the degree of poverty can be higher or lower in 1991 compared to 1976 depending on the poverty level chosen and method of computing the poverty index.

It thus appears that if the NCPI is a good indicator of price changes between 1976 and 1991, then the distribution of expenditures, based on the aggregative comparison done in Table 7, is better in 1991 compared to 1976. Nevertheless, it appears that the share of people living in households with the four lowest per capita expenditure levels has slightly increased, from 4.3 percent in 1976 to 4.6 percent in 1991. However, the share of people living in households that belong in the top two intervals of per capita expenditure has increased considerably, from 34.5 percent in 1976 to 54.6 percent in 1991.

These last two observations hold when the revaluations use the other two methods. This means that conclusions concerning improvements in the overall distribution of expenditure will depend on the welfare function chosen. If one values the very poor (bottom 5-10 percent) then it appears that their relative position has declined. If one values the middle classes, then it appears that their relative share has also declined. However, a substantial share of people seem to have gone from the middle to the upper expenditure levels.

Given the significant differences between average rural and urban levels of expenditure observed in the 1991 survey, it is important to compare distributions separately for the rural and urban sectors. Unfortunately for the 1976/77 survey the available distribution tables are tabulated according to the monetary total expenditures only (namely monetary incomes). In order to be able to compare with 1991, the following procedure was used.

First, for the grouped data of 1976, we estimated a relation between total monetary consumption expenditure per household and total monetary income per household, using an OLS regression. The best econometric results (after several functional specifications were tried) were the following (figures in parentheses are standard errors).

---

[1] For formal definitions of stochastic dominance in the context of income distribution, see Atkinson (1987), Foster and Shorrocks (1988), and Ravallion (1992).

(i) For rural areas

$$\ln EM = \underset{(0.375)}{0.698} + \underset{(0.044)}{0.894} \ln YM \qquad (7)$$

$$\bar{R}^2 = 0.981$$

(ii) For urban areas

$$\ln EM = \underset{(0.144)}{1.440} + \underset{(0.016)}{0.813} \ln YM \qquad (8)$$

$$\bar{R}^2 = 0.997$$

where EM is per household monetary consumption expenditure, and YM is per household total monetary income (namely excluding subsistence income). The fits are very good and the coefficients are highly significant.

Using the above relations, we translated the 1976/77 tabulated intervals of monetary income into intervals of monetary consumption. The latter were then projected to 1991 using the three different deflators of methods A, B, C discussed earlier.

Table 8 gives the available distribution of Tanzanian rural and urban households in 1976/77 according to monetary income intervals. The corresponding monetary consumption expenditure intervals as estimated via equations (7) and (8) are shown in the next column. It must be noted that for the two lowest urban intervals the equation for the urban sector (8) when used to transform the income intervals into consumption intervals, yielded estimates of the upper bounds of household monetary consumption expenditure that were higher than monetary incomes. This would imply that, on average, poor urban households consumed more than their income. We judged that this could be true for a given year but could not constitute a permanent feature; and for these two intervals the corresponding monetary expenditure intervals were left equal to the monetary income intervals.

The next two columns in the table give the distribution and cumulative distribution of people living in households with the stated monetary incomes. The next two columns give the average total and monetary consumption expenditures per household respectively, while the following two columns give the same figures on a per capita basis. The last two columns give the shares of monetary consumption expenditure in total consumption expenditure, and the shares of food in total consumption expenditure. It appears that low monetary income is associated with low overall consumption expenditure. Movements to higher monetary consumption expenditure intervals are associated with higher shares of monetary to total consumption expenditure, and lower food budget shares.

Table 8 —Distribution of Tanzanian Rural and Urban Population in 1976 According to Household Monetary Incomes (All Prices in 1976 Tsh)

| Monetary Income Interval (Tsh/Household) | Corresponding Monetary Consumption Expenditure Intervals (Tsh/Household) | Percent of People | Cumulative Percent of People | Total Consumption Expenditure per Household | Monetary Consumption Expenditure per Household | Total Consumption Expenditure per Capita | Monetary Consumption Expenditure per Capita | Percent Monetary Consumption Expenditure in Total Consumption Expenditure | Percent Food Expenditure in Total Consumption Expenditure |
|---|---|---|---|---|---|---|---|---|---|
| A. RURAL | | | | | | | | | |
| 1) 0-999 | 0-966 | 12.0 | 12.0 | 2930 | 590 | 681 | 137 | 20.1 | 87.9 |
| 2) 1000-1999 | 967-1796 | 26.2 | 38.2 | 4138 | 1283 | 766 | 238 | 31.0 | 82.9 |
| 3) 2000-3999 | 1797-3339 | 35.7 | 73.9 | 4723 | 2346 | 787 | 391 | 49.7 | 75.3 |
| 4) 4000-5999 | 3340-4798 | 12.8 | 86.7 | 5982 | 3805 | 965 | 614 | 63.6 | 70.4 |
| 5) 6000-7999 | 4799-6206 | 5.3 | 91.9 | 7782 | 5087 | 1112 | 727 | 65.4 | 67.4 |
| 6) 8000-9999 | 6207-7577 | 3.0 | 95.0 | 9747 | 6953 | 1160 | 828 | 71.3 | 67.1 |
| 7) 10000-24999 | 7578-17193 | 4.5 | 99.5 | 11114 | 8213 | 1323 | 978 | 73.9 | 57.8 |
| 8) 25000-39999 | 17194-26175 | 0.4 | 99.8 | 14750 | 11497 | 1534 | 1210 | 78.9 | 55.9 |
| 9) 40000+ | 26176+ | 0.2 | 100.0 | 11976 | 7583 | 1006 | 637 | 63.3 | 74.4 |
| 10) TOTAL | | 100.0 | | 4883 | 2360 | 847 | 410 | 48.3 | 75.3 |
| B. URBAN | | | | | | | | | |
| 1) 0-999 | 0-999 | 4.6 | 4.6 | 2139 | 842 | 509 | 200 | 39.3 | 85.2 |
| 2) 1000-1999 | 1000-1999 | 7.4 | 12.0 | 2710 | 1363 | 589 | 296 | 50.3 | 84.1 |
| 3) 2000-3999 | 2000-3589 | 17.5 | 29.5 | 3626 | 2729 | 788 | 593 | 75.2 | 75.4 |
| 4) 4000-5999 | 3590-4991 | 17.2 | 46.6 | 4709 | 4272 | 1070 | 971 | 90.7 | 66.8 |
| 5) 6000-7999 | 4992-6307 | 13.1 | 59.8 | 6069 | 5746 | 1214 | 1149 | 94.7 | 70.8 |
| 6) 8000-9999 | 6308-7563 | 13.4 | 73.1 | 7325 | 7104 | 1308 | 1269 | 97.0 | 70.9 |
| 7) 10000-24999 | 7564-15936 | 21.2 | 94.3 | 10467 | 10297 | 1836 | 1807 | 98.4 | 65.7 |
| 8) 25000-39999 | 15937-23358 | 2.9 | 97.2 | 17905 | 17776 | 2842 | 2822 | 99.3 | 54.2 |
| 9) 40000+ | 23359+ | 2.8 | 100.0 | 27801 | 27368 | 3808 | 3749 | 98.4 | 41.9 |
| 10) TOTAL | | 100.0 | | 6507 | 5959 | 1300 | 1190 | 91.6 | 66.5 |

Source: Authors' computations.

An anomaly seems to exist with respect to the figures of the two highest rural intervals. For these intervals the average total monetary consumption expenditure per household appears to be below the range indicated by the respective interval. This was the case also for the available monetary income figures, and we do not know the reason for the anomaly. A possibility is that some such households incur large expenditures for items such as purchases of houses, which would have been included in total monetary expenditures (which here we take as a proxy for total monetary income) but not in consumption expenditures. In any case, the households in these classes comprise only 0.6 percent of all the rural population, and hence, given that they are the highest income groups, cannot affect the distributional comparisons much at the low income levels.

Table 9 presents a comparison of the distributions of rural and urban populations according to the 1976 monetary consumption expenditure per household intervals exhibited in Table 8 (arranged in ascending order), and where the NCPI has been utilized to project the 1976 intervals to 1991 (method A). The first thing to notice is that the distributions in 1991 clearly dominate the distributions in 1976 in both rural and urban areas. For instance, in 1976, 86.7 percent of the rural population lived in households with cash consumption incomes in the lowest four intervals. The same proportion in 1991 was 63.3 percent. In the urban areas the same proportion from 46.6 percent in 1976 was reduced to 14.5 percent in 1991.

Comparing the average per capita total consumption expenditures in 1991 with those of 1976 for each interval, it appears that within every interval in both rural and urban areas the 1991 per capita expenditures are higher than the average in 1976. The only major exception seems to be the lowest monetary consumption expenditure rural group, which, albeit relatively smaller in 1991 compared to 1976 (10 percent of the 1991 rural population or 1.89 million people, compared to 12 percent in 1976 or 1.79 million people), is seen to enjoy on average only 58.1 percent of the equivalent per capita consumption expenditure in 1976. While this aberration might be due to data problems, it nevertheless is something that needs to be further investigated, as it implies increased depth of poverty for the very poorest.

Table 10 presents the same information as Table 9, except that the 1976 intervals have been revalued using the base year alternative CPI (method B), which was seen to be much higher than the NCPI. Comparison of the cumulative distributions again shows that with the exception of the lowest rural interval, the distributions in 1991 clearly dominate the distributions in 1976, in both the rural and urban areas. The last column again shows that within each interval, with the exception of the four lowest rural classes, the per capita total expenditures are higher in 1991. Clearly, since method C involves price indexes in 1991 intermediate in value between those of methods A and B, the results concerning the cumulative distributions are not going to be different since the distribution in 1991 according to method C will lie between the distributions according to methods A and B, both of which dominate the distributions of 1976.

Table 9 —Comparison of the Distributions of Rural and Urban Populations in 1976 and 1991 According to Monetary Consumption Expenditures per Household using Revaluation Method A

| 1976 Monetary Consumption Expenditure Interval* | Cumulative Distribution of People (Percent) | 1976 Total Expenditure per Capita in 1991 Prices (Tsh) | Share of Monetary in Total Consumption Expenditure (Percent) | Share of Food in Total Consumption Expenditure (Percent) | Cumulative Distribution of People (Percent) | 1991 Total Expenditure per Capita in 1991 Prices (Tsh) | Share of Monetary in Total Consumption Expenditure (Percent) | Share of Food in Total Consumption Expenditure (Percent) | Ratio 1991/1976 per Capita Total Consumption Expenditure (Percent) |
|---|---|---|---|---|---|---|---|---|---|
| | | 1976 Data | | | | | 1991 Data | | |
| A. RURAL | | | | | | | | | |
| 1 | 12.0 | 17292 | 20.1 | 87.9 | 10.0 | 10051 | 23.8 | 86.2 | 58.1 |
| 2 | 38.2 | 19445 | 31.0 | 82.9 | 22.1 | 18234 | 35.4 | 82.7 | 93.8 |
| 3 | 73.9 | 19976 | 49.7 | 75.3 | 45.8 | 21140 | 51.0 | 78.7 | 105.8 |
| 4 | 86.7 | 24486 | 63.6 | 70.4 | 63.3 | 25740 | 65.3 | 73.8 | 105.1 |
| 5 | 91.9 | 28212 | 65.4 | 67.4 | 73.3 | 32302 | 67.0 | 75.0 | 114.5 |
| 6 | 95.0 | 29448 | 71.3 | 67.1 | 80.2 | 37510 | 72.4 | 71.0 | 127.4 |
| 7 | 99.5 | 33577 | 73.9 | 57.8 | 95.0 | 47319 | 74.5 | 66.0 | 140.9 |
| 8 | 99.8 | 38923 | 78.9 | 55.9 | 98.1 | 59247 | 87.4 | 71.4 | 152.2 |
| 9 | 100.0 | 25540 | 63.3 | 74.4 | 100.0 | 86153 | 87.7 | 64.0 | 337.3 |
| Total | | 21502 | 48.3 | 75.3 | | 29013 | 64.8 | 73.1 | 134.9 |
| | | 1976 Data | | | | | 1991 Data | | |
| B. URBAN | | | | | | | | | |
| 1 | 4.6 | 12925 | 39.3 | 85.2 | 1.0 | 24393 | 10.8 | 91.4 | 188.7 |
| 2 | 12.0 | 14953 | 50.3 | 84.1 | 3.3 | 21698 | 57.8 | 83.6 | 145.1 |
| 3 | 29.5 | 20006 | 75.2 | 75.4 | 8.2 | 26792 | 66.7 | 69.1 | 133.9 |
| 4 | 46.6 | 27159 | 90.7 | 66.8 | 14.5 | 35989 | 76.7 | 66.9 | 132.5 |
| 5 | 59.8 | 30802 | 94.7 | 70.8 | 25.1 | 35696 | 79.1 | 70.0 | 115.9 |
| 6 | 73.1 | 33196 | 97.0 | 70.9 | 28.8 | 43067 | 73.7 | 62.4 | 129.7 |
| 7 | 94.3 | 46602 | 98.4 | 65.7 | 67.1 | 69469 | 85.5 | 63.1 | 149.1 |
| 8 | 97.2 | 72128 | 99.3 | 54.2 | 81.4 | 94569 | 91.4 | 55.7 | 131.1 |
| 9 | 100.0 | 96649 | 98.4 | 41.9 | 100.0 | 131201 | 90.5 | 52.9 | 135.7 |
| Total | | 32985 | 91.6 | 66.5 | | 74203 | 86.6 | 59.2 | 225.0 |

* The intervals are those indicated in Table 8.

Table 10 —Comparison of the Distributions of Rural and Urban Populations in 1976 and 1991 According to Monetary Consumption Expenditures per Household using Revaluation Method B

| 1976 Monetary Consumption Expenditure Interval* | Cumulative Distribution of People (Percent) | 1976 Total Expenditure per Capita in 1991 Prices (Tsh) | Share of Monetary in Total Consumption Expenditure (Percent) | Share of Food in Total Consumption Expenditure (Percent) | Cumulative Distribution of People (Percent) | 1991 Total Expenditure per Capita in 1991 Prices (Tsh) | Share of Monetary in Total Consumption Expenditure (Percent) | Share of Food in Total Consumption Expenditure (Percent) | Ratio 1991/1976 per Capita Total Consumption Expenditure (Percent) |
|---|---|---|---|---|---|---|---|---|---|
| | 1976 Data | | | | 1991 Data | | | | |
| A. RURAL | | | | | | | | | |
| 1 | 12.0 | 24186 | 20.1 | 87.9 | 13.6 | 12982 | 23.8 | 87.1 | 53.7 |
| 2 | 38.2 | 27197 | 31.0 | 82.9 | 32.2 | 18509 | 45.2 | 78.6 | 68.1 |
| 3 | 73.9 | 27940 | 49.7 | 75.3 | 62.3 | 24188 | 59.5 | 76.4 | 86.6 |
| 4 | 86.7 | 32249 | 63.6 | 70.4 | 76.2 | 33399 | 69.6 | 73.3 | 97.5 |
| 5 | 91.9 | 39460 | 65.4 | 67.4 | 83.3 | 39545 | 74.0 | 69.7 | 100.2 |
| 6 | 95.0 | 41188 | 71.3 | 67.1 | 87.2 | 44741 | 75.0 | 66.5 | 108.6 |
| 7 | 99.5 | 46963 | 73.9 | 57.8 | 97.4 | 50226 | 75.8 | 66.6 | 106.9 |
| 8 | 99.8 | 54441 | 78.9 | 55.9 | 99.3 | 85570 | 89.5 | 64.1 | 157.2 |
| 9 | 100.0 | 35722 | 63.3 | 74.4 | 100.0 | 89711 | 91.4 | 68.9 | 251.1 |
| Total | | 30030 | 48.3 | 75.3 | | 29013 | 64.8 | 73.0 | 96.6 |
| | 1976 Data | | | | 1991 Data | | | | |
| B. URBAN | | | | | | | | | |
| 1 | 4.6 | 17427 | 39.3 | 85.2 | 1.4 | 19320 | 17.3 | 90.0 | 110.9 |
| 2 | 12.0 | 20160 | 50.3 | 84.1 | 6.2 | 23379 | 66.9 | 73.2 | 116.0 |
| 3 | 39.5 | 26974 | 75.2 | 75.4 | 13.1 | 39625 | 73.7 | 67.9 | 146.9 |
| 4 | 46.6 | 36618 | 90.7 | 66.8 | 26.6 | 33308 | 77.8 | 69.3 | 91.0 |
| 5 | 59.8 | 41530 | 94.7 | 70.8 | 33.4 | 58111 | 79.0 | 64.4 | 139.9 |
| 6 | 73.1 | 44758 | 97.0 | 70.9 | 42.0 | 53011 | 87.8 | 65.8 | 118.4 |
| 7 | 94.3 | 62834 | 98.4 | 65.7 | 79.5 | 82378 | 87.6 | 58.9 | 131.1 |
| 8 | 97.2 | 97249 | 99.3 | 54.2 | 91.7 | 110537 | 91.3 | 60.4 | 113.7 |
| 9 | 100.0 | 130312 | 98.4 | 41.9 | 100.0 | 152907 | 90.2 | 47.3 | 117.3 |
| Total | | 44356 | 91.6 | 66.5 | | 74203 | 86.6 | 59.2 | 167.3 |

* The intervals are those indicated in Table 8.

One of the important aspects of household welfare is the pattern of consumption expenditures. The share of expenditures spent on food is normally very large at low income levels, and declines at higher income levels. It is interesting to ascertain whether the periods of crisis and adjustment that have rocked Tanzania have changed the overall consumption patterns. Tables 9 and 10 include the shares of total expenditure spent on food in the various intervals.

Noticeable in both tables is the decrease in the share of total expenditure devoted to food in almost all intervals. In the rural areas in the aggregate the food budget share from 75.3 percent in 1976/77 declined to 73.1 percent by 1991, an observation consistent with higher real rural incomes in 1991. In the urban areas the decline is larger, from 66.5 percent in 1976/77 to 59.2 percent in 1991. Given the large shift in population between rural and urban areas between 1976/77 and 1991, the conclusion is for a significant decline in the national expenditure share devoted to food, again something consistent with higher 1991 average real expenditures as compared to 1976/77.

Figures 1 and 2 exhibit the cumulative distribution of rural and urban population in 1976, and in 1991 using the two revaluation methods exhibited in Table 9 and 10. It is quite obvious that the distribution in 1976 appears to be strongly dominated by the distributions in 1991, irrespective of the method of revaluation chosen.

Figure 1 — Tanzania: Cumulative Distribution of Rural Population (1976 and 1991)

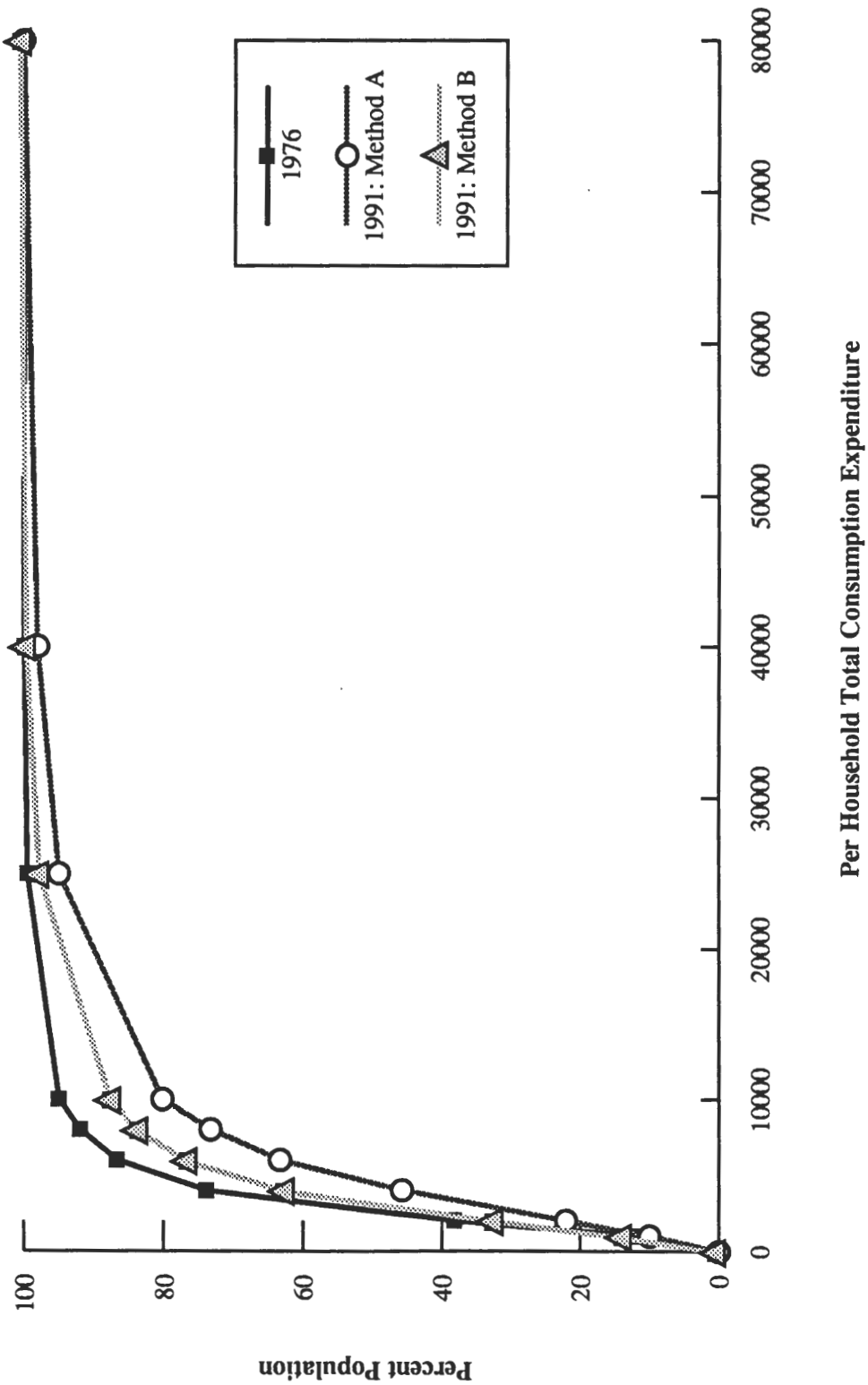
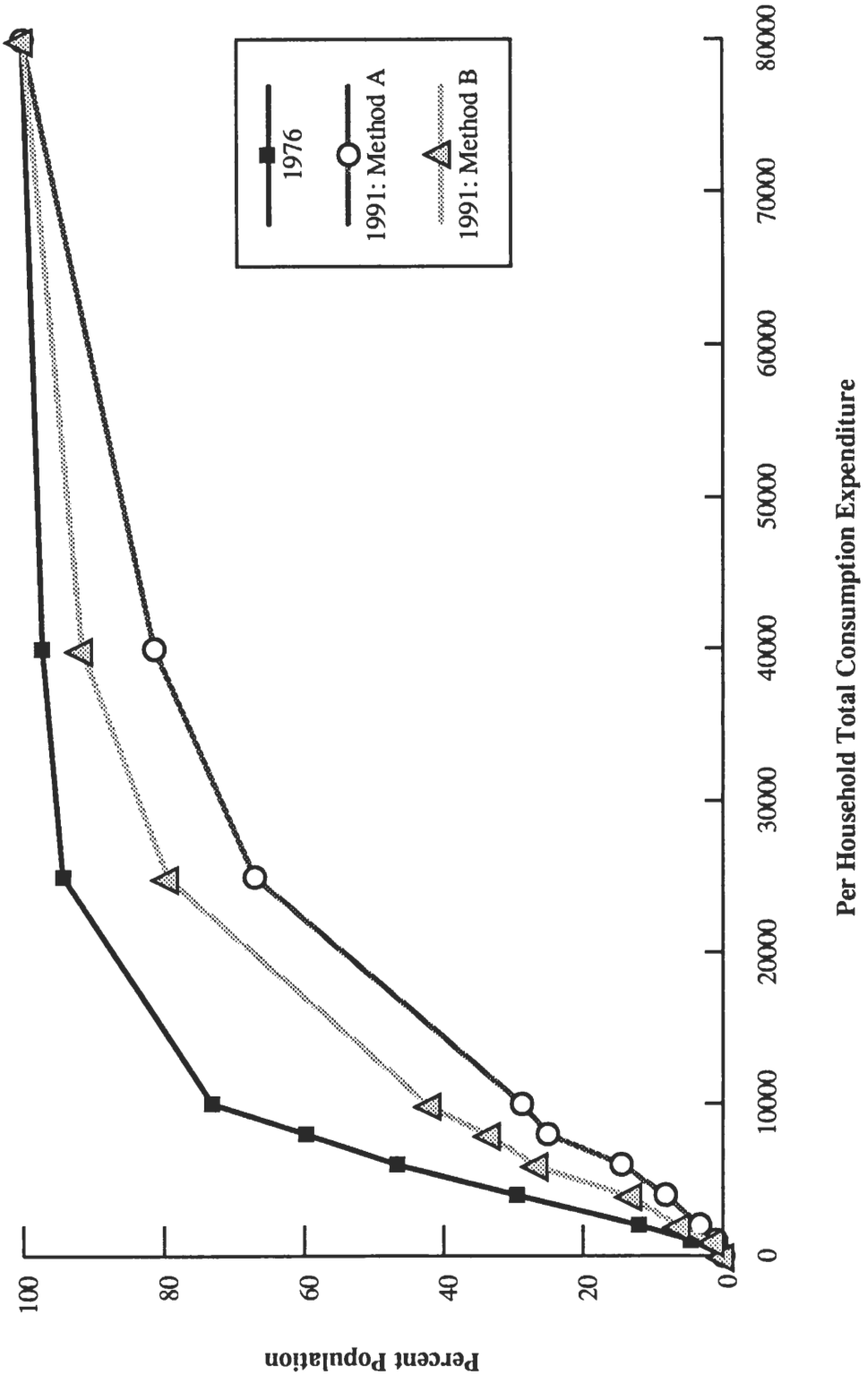


**Figure 2** — Tanzania: Cumulative Distribution of Urban Population (1976 and 1991)



## 5. POVERTY IN 1976/77 AND 1991

An extensive poverty analysis based on the aggregated interval data available for 1976/77, was done by Sarris and van den Brink (1993). It was estimated there that, depending on the definition of poverty, upwards of 60 percent of households and individuals lived below poverty at that time. Since the definition of the poverty lines were hampered by the availability of only grouped data, it was decided to base the comparative analysis on the 1991 results, and project poverty lines backward.

The procedure used was the following. First, for the data from the 1991 survey, regressions were run between the (logarithm) of total calorie consumption per head per day, as the dependent variable, and the (logarithm) of total expenditure per head as the independent variable. The regressions were run separately for all rural regions, urban non Dar es Salaam, and Dar es Salaam. The resulting coefficients were then used to solve the equations for particular daily consumptions of calories. The solution is the annual level of total consumption expenditure that, on average, is needed to attain the given calorie level. The econometric results appear in Table 11. The fit of the three equations is reasonable and the coefficients significant.

"Poverty lines" for 1991 are estimated in Table 12 for three levels of daily calorie consumption, 1900, 2000, and 2100, to see the sensitivity of the results to the stipulated calorie level. These calorie based poverty lines have started to be employed in development economics literature instead of more arbitrary lines (Greer and Thorbecke, 1986).

The first thing to notice in Table 12 is that to acquire the same number of calories, people in Dar es Salaam appear to need to spend twice as much as those in rural areas. Thus the line for 2000 calories per person per day is 27.7 thousand Tsh per person in rural areas and almost 55 thousand Tsh in Dar es Salaam. Despite this, the proportion of people deemed *poor* by this criterion is twice higher in rural areas (59%) than in Dar es Salaam (27%). In the urban areas as a whole 31.7 percent of the people are deemed as *poor* by this criterion. So, one in three people in towns, and three out of five in rural areas had insufficient funds to consume more than 2000 calories per person per day in 1991.

Several ways to project the poverty lines backward were used. First, we used the NCPI as done earlier, under method A. The rural poverty lines of Table 12 estimated for 1991 were projected backward to 1976; first by dividing by 25.38, namely the ratio of the NCPI discussed earlier to the 1976/77 base CPI (95.7). To obtain the poverty lines for the urban sector as a whole, we first weighted the two urban poverty lines in 1991 by the 1991 national shares (estimated in the 1991 survey, see Tinios et al., 1993) of population in each urban region in all urban population (0.647 for urban non Dar es Salaam and 0.353 for Dar es Salaam). These were then projected backward using the NCPI.

Table 11 — Calorie per Head OLS Regressions (Standard Error in Parentheses)

| | Intercept | Log (Consumption Expenditure per Capita) | $\bar{R}^2$ |
|---|---|---|---|
| Rural | 0.8860<br>(0.2939) | 0.6565<br>(0.0289) | 0.520 |
| Urban non-DSM | 3.6760<br>(0.3322) | 0.3770<br>(0.0301) | 0.340 |
| DSM | 0.3517<br>(0.3889) | 0.6642<br>(0.0339) | 0.601 |

Source: Computed from 1991 CFNPP-ERB survey data.

Note: Dependent variable is log (Calories per Capita per Day).

**Table 12** — Alternate Calorie Based Poverty Lines and Levels of Poverty in 1991

| | All Tanzania | Rural | Urban non-DSM | DSM | All Urban[a] |
|---|---|---|---|---|---|
| **Expenditure at 1900 Calories (Tsh/cap)** | ... | 25,613 | 28,969 | 50,866 | ... |
| Poor as: | | | | | |
| Percent of households | 43.6 | 50.1 | 21.2 | 16.2 | 19.5 |
| Percent of population | 50.5 | 55.6 | 28.9 | 23.0 | 26.8 |
| **Expenditure at 2000 Calories (Tsh/cap)** | ... | 27,721 | 33,186 | 54,950 | ... |
| Poor as: | | | | | |
| Percent of households | 47.6 | 54.1 | 26.4 | 18.3 | 23.7 |
| Percent of population | 54.4 | 59.3 | 34.6 | 26.5 | 31.7 |
| **Expenditure at 2100 Calories (Tsh/cap)** | ... | 29,831 | 37,777 | 59,138 | ... |
| Poor as: | | | | | |
| Percent of households | 51.4 | 58.2 | 29.2 | 20.4 | 26.2 |
| Percent of population | 58.1 | 63.2 | 37.1 | 29.7 | 34.5 |

Source: Tinios et al (1993).

[a] The levels of urban poverty are weighted averages of the levels in the two urban sub-sectors.

Second, we used the base (1976) weighted (Laspeyres) rural and urban consumer price indices discussed earlier (re. Table 6), which were substantially larger than the NCPI. This was referred to earlier as method B. Third, we used the rural and urban consumer price indices based on final quantity weights (Paasche), as discussed earlier, which have intermediate values between the NCPI and the base weighted indices, and was referred to earlier as method C.

Table 13 presents the per capita total expenditure levels for 1976/77 and in 1976/77 prices corresponding to the 1991 poverty lines in Table 12, and the three methods outlined. We have derived national poverty levels in 1976/77 using the 1976 shares of rural and urban populations (0.87 and 0.13 respectively), and used them to estimate from Table 7 earlier, the share of households and people in 1976/77 below the relevant levels of expenditure (by linear interpolation in the relevant intervals). This is a rather crude method which does not allow poverty estimates separately for rural and urban areas, but it seems a reasonable one given the available information. Since the 1991 poverty levels are based on consumption expenditures while the intervals of Table 6 on incomes, the adjusted intervals as described earlier were used for the interpolations.

Comparing the aggregate headcount poverty levels of 1991 in Table 13 with those of Table 12, the following observations can be made. When we use the NCPI to compare poverty levels, there appears to be a significant decline in the level of poverty (as measured by the headcount ratio), irrespective of the poverty line chosen. From between 69 and 75 percent of the population classified as poor in 1976, the proportion in 1991 appears to drop significantly to no-higher than 58 percent. This is expected as it was seen from Table 7, that the expenditure distribution in 1991 dominates the one for 1976 at the expenditure levels of Table 13.

The same result is obtained when method C is used for deflating the poverty lines, which as discussed earlier implies that prices on average grew between 1976 and 1991 by 19 percent more than what is implied by the NCPI. When, finally, one uses method B, which implies substantially higher inflation than what is indicated by the NCPI (39 percent higher), then for the poverty line corresponding to 2100 Kcal/cap/day, a reduction in the headcount ratio obtains, while for the other two poverty lines a small increase is observed. In other words, in all but two rather extreme cases, the level of poverty in 1991 as measured by the headcount ratio, seems to be substantially lower compared to that of 1976.

While the headcount levels may have declined, the absolute number of people living in poverty may have increased given the increase in population between 1976 and 1991. Table 14 gives the number of households and people below poverty in 1991 and 1976 (using the three methods outlined above). Using method A, it appears that in absolute level, the number of people deemed *poor* has increased slightly between 1976 and 1991. When methods B and C are used, this increase is considerably higher. Thus it appears that despite a relative decline in poverty in Tanzania, absolute poverty (measured by the number of people living below poverty) does not seem to have declined, and has most likely increased.

Table 13 —Expenditure Levels in 1976/77 Corresponding to Calorifically Defined Poverty Lines in 1991, and Percent of Poor Households and People in 1976/77 Corresponding to these Levels

| | Rural | Urban | Tanzania |
|---|---|---|---|
| **Method A** | | | |
| Expenditure at 1900 Kcal/Day/Capita | 1009 | 1446 | 1066 |
| Percent of Poor Households | | | 58.6 |
| Percent of Poor People | | | 69.2 |
| Expenditure at 2000 Kcal/Day/Capita | 1092 | 1610 | 1160 |
| Percent of Poor Households | | | 62.1 |
| Percent of Poor People | | | 72.1 |
| Expenditure at 2100 Kcal/Day/Capita | 1175 | 1786 | 1255 |
| Percent of Poor Households | | | 65.5 |
| Percent of Poor People | | | 75.1 |
| **Method B** | | | |
| Expenditure at 1900 Kcal/Day/Capita | 722 | 1073 | 767 |
| Percent of Poor Households | | | 38.8 |
| Percent of Poor People | | | 48.1 |
| Expenditure at 2000 Kcal/Day/Capita | 781 | 1194 | 835 |
| Percent of Poor Households | | | 44.6 |
| Percent of Poor People | | | 54.6 |
| Expenditure at 2100 Kcal/Day/Capita | 921 | 1340 | 975 |
| Percent of Poor Households | | | 55.3 |
| Percent of Poor People | | | 66.3 |
| **Method C** | | | |
| Expenditure at 1900 Kcal/Day/Capita | 851 | 1203 | 897 |
| Percent of Poor Households | | | 49.9 |
| Percent of Poor People | | | 60.5 |
| Expenditure at 2000 Kcal/Day/Capita | 840 | 1324 | 903 |
| Percent of Poor Households | | | 50.4 |
| Percent of Poor People | | | 61.0 |
| Expenditure at 2100 Kcal/Day/Capita | 991 | 1486 | 1055 |
| Percent of Poor Households | | | 58.2 |
| Percent of Poor People | | | 68.8 |

Source: Authors' estimates.

Table 14 —Number of Households and People Below Poverty in 1976/77 and 1991 (,000)

| | 1976/77 | | | 1991 | | |
|---|---|---|---|---|---|---|
| | Method A | Method B | Method C | Rural | Urban | Mainland Tanzania |
| **1900 Calorie Poverty Line** | | | | | | |
| Number of Households | 1780.7 | 1179.0 | 1516.3 | 1540.5 | 161.4 | 1701.9 |
| Number of People | 11880.1 | 8257.7 | 10386.5 | 10887.2 | 1134.8 | 12022.0 |
| **2000 Calorie Poverty Line** | | | | | | |
| Number of Households | 1887.1 | 1355.2 | 1531.5 | 1663.5 | 195.9 | 1859.0 |
| Number of People | 12378.0 | 9373.6 | 10472.4 | 11611.7 | 1343.1 | 12954.0 |
| **2100 Calorie Poverty Line** | | | | | | |
| Number of Households | 1990.4 | 1680.4 | 1768.6 | 1789.5 | 217.1 | 2006.6 |
| Number of People | 12893.0 | 11382.3 | 11811.4 | 12375.4 | 1459.3 | 13834.0 |

Source: Computed from 1976/77 and 1991 survey data.

## 6. CONCLUSION

The results explored in this paper should help quiet the critics of stabilization and adjustment programs in Tanzania who claim that they have a detrimental impact on the poor. The comparisons made in this paper between the 1976/77 and 1991 nationally based surveys suggest improvements in both absolute as well as relative real expenditure terms compared to the pre-crisis period, especially in urban areas.

The analysis used a variety of techniques and subjected the comparisons to sensitivity analysis by using alternative and much higher consumer price indices to deflate nominal magnitudes. In all but few rather extreme and unlikely cases, the comparisons supported the overall conclusion that average per capita real consumption expenditure, and the distribution of it among households has improved. This, despite the fact that all assumptions were designed to make it more difficult to reject the hypothesis of income declines and worsening of the distributions. Nevertheless, it appears that the absolute number of people classified as *poor* has increased, and this is something that warrants further study.

It is not possible to assess whether the improvements have all occurred in the post-adjustment period, or whether they are due to adjustment policies. However, given the universally acknowledged pre-1984 crisis, it is rather unlikely that real average household incomes could have improved by much between 1976/77 and 1984. Thus, it appears that the post-1984 period in Tanzania has been marked by an overall improvement in both absolute as well as relative real incomes.

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