Changes in poverty in Uganda, 1992-1997

Simon Appleton

with

Tom Emwanu, Johnson Kagugube and James Muwonge

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Centre for the Study of African Economies,
University of Oxford,
St Cross Building, Manor Road,
Oxford, OX1 3UL, UK.

Abstract: Analysis of five nationally representative household surveys from Uganda show a fall in poverty from 1992-1997. Using an absolute poverty line calculated following Ravallion and Bidani, we find 56% of Ugandans were poor in 1992 falling to 44% in 1997/8. The conclusion that poverty fell is robust to the choice of poverty measure and poverty line. General growth accounts for most of the fall in poverty, although there was also an improvement in the progressivity of the distribution. Up to 1995/96, half of the fall in poverty was attributable to coffee-growing households. Poverty increased in households with non-working heads.

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1. Introduction

According to macroeconomic data, Uganda in the 1990s is an economic success story, unfortunately rather rare in sub-Saharan Africa. Despite this, however, there is some concern within the country over whether the growth recorded in official statistics is reflected in rises in the living standards of the majority of the people, particularly the poor[1]. Most people in the country, and almost all the poorest, depend on small holder agriculture for their livelihoods but there is little reliable data on that sector, apart from that provided by household surveys. The national accounts imply that Uganda's high growth has been driven disproportionately by growth in non-agricultural sectors. Hence, it is conceivable that little or none has benefited many poor farming households. This paper investigates this issue by comparing living standards as estimated by five recent nationally representative household surveys.

The government of Uganda began monitoring living standards through household surveys with the Integrated Household Survey (henceforth, IHS) in 1992. This was a large survey, both in the size of the sample (10000 households) and the questionnaire (covering many topics other than consumption, such as income, employment, health, education, time use, fertility etc.). Each year thereafter there has been a Monitoring Survey covering around 5000 households and a shortened questionnaire, focussing mainly on consumption information. The data from four Monitoring Surveys (henceforth, MS-1, MS-2, MS-3 and MS-4) are now available. These surveys can be analysed to provide information on changes in poverty, measured by reference to private household consumption, over time in Uganda. The Monitoring Surveys were primarily designed for this purpose. All five surveys rely on similar sampling procedures and questionnaires (Appendix Table 1 provides further details on the surveys)[2].

Poverty comparisons involve three main decisions: choice of a welfare measure; choice of a poverty line and choice of a poverty index for aggregation. We focus exclusively on household private consumption, although this is not to deny the importance of the many other dimensions of welfare or intra-household issues. We scale household private consumption by calorific equivalence scales and hence focus on consumption per adult

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[1]This concern is voiced in the Uganda Human Development Report, 1997:

> *"the perennial concern is that the benefits of strong growth have yet to translate into measurable improvements in the standard of living for the majority of people"* (UNDP, 1997, p2)

[2] An earlier attempt to compare the IHS with an earlier survey, the Household Budget Survey of 1989, was unsuccessful (see Appleton, 1996). The HBS was re-analysed as part of the preparation for the present paper, but still produced apparently incomparable results with the IHS and the Monitoring Surveys. Consumption in the HBS appears too high relative to the subsequent surveys. Appleton (1996) suggested that the incomparability arose from questionnaire design problems with the IHS. However, this suggestion appears less plausible given the evidence in this paper of the comparability of the IHS results and those from the Monitoring Surveys which were not subject to the same supposed questionnaire design problems as the IHS. Sampling problems with the HBS may be a more likely explanation. Mean household size was one person higher in the HBS than in the census in 1991 and the subsequent household surveys.

equivalent. An absolute poverty line is estimated following Ravallion and Bidani (1994) and consists of a food poverty line and an estimate of non-food requirements. The food poverty line is national, giving the cost of obtaining sufficient calories given the kinds of food consumed by the poor. The non-food requirements are allowed to differ by region and by urban-rural residence, but in all cases are estimated as the non-food spending of those whose consumption is only equal to the food poverty line. We explore the sensitivity of our results to alternative poverty lines. We focus mainly on the P-alpha poverty indices (Foster, Greer and Thorbecke, 1984) although some information on inequality and the distribution of welfare is provided. The analysis centres mainly on changes over time, including some sectoral decompositions of these changes.

Our analysis complements the poverty study carried out on the surveys by the government's Coordination of Poverty Eradication Project and Department of Statistics (Republic of Uganda, 1997a). The earlier study was conducted before the release of the Third and Fourth Monitoring surveys and used a poverty line defined as two-thirds of mean consumption per adult equivalent in the IHS. The present paper derives a poverty line based on calorie requirements and updates the analysis. It also includes some additional adjustments to ensure comparability of the consumption data, together with some further decompositions of interest. It should be noted, however, that the two studies, despite rather different methods, agree on the general direction of poverty trends in Uganda in the period.

The paper is organised into three substantive parts: calculation of changes in mean consumption per capita over time; estimation of an absolute poverty line; and analysis of changes in poverty over time.

2. Measuring living standards in Uganda

Arguably the most important stage in poverty comparisons over time is obtaining reliable information on the variable used to measure household welfare, in this case, private consumption. Poverty statistics are merely scalar functions of the distribution of the welfare measure. Although it might be thought that private consumption could be directly taken from responses in the household surveys, in practice, a number of adjustments are necessary to ensure comparability across surveys. In this section we detail the adjustments necessary for Uganda, focussing on their implications for mean consumption per capita. We concentrate on per capita means partly for convenience, but they should also provide a useful guide for poverty comparisons. Indeed, to anticipate the findings in Section 4, most of the change in poverty over the Ugandan surveys can be attributed to changes in the mean of consumption rather than changes in its distribution.

2.1 Obtaining consistent estimates of consumption

Table 1 reports the estimates of consumption per capita as calculated in the official survey reports and after a number of adjustments [3]. The adjustments fall into three categories: adjustments for sampling, for questionnaire design and for prices.

Compared to household surveys in some sub-Saharan countries, sampling in the Ugandan surveys is relatively good[4]. All five surveys used the same sampling frame, drawn from the 1991 census. They drew large samples — around 10000 households in the IHS and 5000 in each MS — and were designed to be nationally representative. However, there are three aspects of sampling that may cause problems for comparisons over time: geographic coverage, seasonality and the panel aspect of the data. Here we discuss the first two issues, returning to the panel at the end of this section. Security problems led to some Monitoring Surveys excluding some districts. The largest exclusions were large parts of four districts (Kitgum, Gulu, Kasese and Bundibugyo) from MS-4[5]. We adjust for this by excluding these four districts in their entirety from all subsequent calculations (unless stated otherwise). These four districts included 6.9% of Uganda's population in the 1991 census (Republic of Uganda, 1995). They are relatively poor so that their omission raises mean consumption per capita: by 1.8 per cent in the IHS and by 2.3 per cent in the MS-1.

One possible source of incomparability in the sampling of the surveys is that, while the IHS was conducted throughout an entire year, MS-1 and MS-2 were conducted only during certain months of the year. This is problematic since food consumption is reported for a short recall period and subject to seasonal variations. In this paper, we do not adjust for seasonality - largely because the data on which month households were surveyed in the Monitoring Survey appear very unclean. Furthermore, whilst it might be possible to make some correction for seasonality based on the pattern observed in the IHS, this would be potentially misleading because there was abnormally poor weather in some regions in some months in the IHS. Preliminary analysis - and local observation - suggest that the period April-July is usually the time when food is most plentiful in the country. These months were not covered in MS-1 and only partly covered in MS-2. However, given that the IHS and MS-4 did both cover a full year, our comparison of poverty at the beginning and end of the period should not be affected by seasonality.

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[3] The figures differ very slightly from those in the official survey reports, perhaps due to subsequent cleaning of the data.

[4] There was a panel element to the surveys, with half of the households in each Monitoring Survey designed to come from enumeration areas previously surveyed in the IHS and half of these households intended to be the same households. This paper does not focus on the panel aspects of the survey, although these offer opportunities for further research.

[5] Some rural areas of Kabale district were not covered in the IHS; nor were parts of Kotido, Moroto, Kasese and Kisoro in the MS-2. These differences are not corrected for, as it is unclear how to adjust for them and their effects are likely to be minor.

The four surveys have similar sections on consumption in their questionnaires. In the Monitoring Surveys, the consumption sections were almost identical—there were some changes in the MS-3 (maintained in MS-4), but evidence suggests they have had no appreciable effec[6]. There are greater differences between the IHS and MS questionnaires. The IHS has rather more item codes, but unlike the MS, did not print them on the questionnaire: the expenditure sections of the IHS questionnaire were left blank for the interviewer to fill in. The IHS used multiple recall periods for expenditures in most cases: in the MS, expenditures were reported using only one recall period. The IHS collected information on health and education expenditures at an individual level, whereas the MS simply inquired about the total for the household[7]. In the absence of experimental evidence, it is hard to know how to adjust for these changes or gauge their effects. One indicator is the composition of expenditures. If the share of certain item groups changes markedly between the IHS and MS, this might be due to differences in questionnaires. In fact, as Table 2 shows, the composition of expenditures was fairly similar across the IHS and MSs Perhaps the most obvious discrepancy is in the share of expenditures on transport and communications: in the IHS, they account for 0.72% of total expenditure; in the MS-1, they account for 2.45%. This disparity reflects a printing error: the IHS omitted an item for fares on public transport. To adjust for this, we imputed a value for such an item using the regional shares in the MS-1[8]. Omission from the IHS of health expenditures for Arua district was dealt with in a similar manner. These adjustments together raise the mean consumption figure for the IHS by 1.7%. No

[6] Most changes were on the section for food consumption, with more item codes and a column added for purchases away from home. On non-food consumption, the only changes were the addition of items for expenditures on traditional medicine and for purchases of cars. However, these changes do not seem to cause severe comparability problems. In particular, one might expect the more extensive food expenditure section to lead to greater reporting of food. However, food (and health expenditure) rises less between the MS-2 and MS-3 than the expenditure on the non-food items for which the questionnaires were unchanged. Excluding Kitgum and deflating by the CPI, expenditure on the non-food items treated consistently between the surveys rose by 16.5%. Expenditures on food, health and cars were effectively stagnant (rising by 0.2%). In these circumstances there seems little reason to adjust for the change in the questionnaires between MS-2 and MS-3.

[7] Where there were alternative recall periods for particular items in the IHS, we aimed to be consistent with conventions used in the Monitoring Surveys. The exception to this was for food purchases, where we used 30 day recall rather than short recall. The short recall data gave a food share (66%) substantially in excess of those in the Monitoring Surveys. In addition, it produced a less congruent ratio of consumption of own produced food to total food. The ratios were 50-52% for rural areas in the Monitoring Surveys and in the IHS using 30 day recall for food purchases, but 43% for the IHS using short recall.

[8] This is a striking example of sensitivity to questionnaire design. Both IHS and MS had an item for "other transport expenses", but only the MS questionnaire explicitly mentioned public transport fares as an example. To adjust for the change in questionnaire design, we did not include the item as reported in the IHS but instead assumed the item had the same share as in the MS-1 (with separate shares for rural and urban areas).

attempt was made to adjust for other differences in questionnaire design and item coverage[9].

Three adjustments were made to get the consumption estimates into constant prices. First, home consumption of food was revalued to be at market prices. Interviewers were supposed to make sure that respondents valued home consumption of food in farm gate prices, although this convention has not always been well documented[10]. We estimated prices as the median unit values from the household data [11]. Estimates were done separately by region and urban-rural location (so eight sets of prices were identified). The unit values for household purchases were used as estimates of market prices; the unit values for home consumption were used as estimates of farmgate prices. Table 3 shows the effect of revaluation, which is to increase home consumption of food by around 30%.

The second price adjustment was for inflation: the composite national CPI was used as the price deflator and expenditures converted into 1989 prices. Although the CPI is only collected for major urban areas, it does appear fairly reliable. During the period, there were no price controls or other distortions. Furthermore, an earlier exercise for the period 1989-92 using unit values from household survey data had largely corroborated the CPI. Between 1989 and 1992, the alternative price index rose broadly in line with the CPI: by 135% compared to 127% (Appleton, 1996)[12]. For the MSs, we adjusted for inflation between the surveys by deflating all nominal values by the survey average value of the CPI[13]. However, there was substantial inflation during the course of IHS: prices at the end of the survey being 30% greater than prices at the beginning. Consequently, for the IHS we deflated nominal values by the average value of the CPI for the month in which a household was surveyed.

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[9] An IHS item for expenditure on "weddings, funerals and other ceremonies for non-household members" was not included. The MS only had an item "expenditure on household functions".

[10] The convention is only documented in the manual of instructions for the Third Monitoring Survey.

[11] This was complicated by the fact that quantities could be reported in different units, including some unspecified measures such as "heaps", "bunches" etc. Where possible only metric measures were used. For some items most units codes were non-metric, in which case only reports with a single unit code were used to avoid having to make different units comparable. It was not necessary to convert quantities into metric units except when calculating calories per shilling for the food poverty line. For that purpose, conversion factors from Kayiso (1993) were used for non-standard unit codes for the few items where output was never reported in metric units.

[12] Although the alternative deflator increased by a similar amount as the CPI between the HBS and IHS, its movements during the IHS were somewhat different. In particular, it fell more towards the end of the survey than did the CPI. This was true even in areas — such as central urban — where the CPI might be expected to be more accurate. For this reason, it was decided to use the CPI to control for inflation rather than an alternative deflator based on unit values for food purchases in the surveys.

[13] More precisely, consumption was deflated differently according to the recall period: 365 day recall items were deflated using an average of the CPI over the previous twelve months; 30 day and shorter recall items were deflated using the CPI for the relevant month.

The third price adjustment was for regional variation in prices. Food prices are markedly higher in some areas of Uganda, particularly urban areas, than others. It was possible to use unit values for purchases of major food items to construct regional food price indices for each survey (Table 4 refers). Median unit values were used so as to make the results insensitive to outliers. The weights for the index were based on the national expenditure shares of the major food items and associated minor items. Although the index differs to some extent between the surveys, the qualitative pattern of regional price differences is uniform: Central region has the highest food prices, followed by East and West, with Northern regional having the lowest prices. Non-food prices were assumed to be constant across the country. It is sometimes argued that non-food prices may be higher in rural areas due to transport costs, but this is not well established. For example, prices of processed foods such as sugar — which might be thought to resemble non-food prices in requiring transport from factories to rural areas - were essentially uniform within the surveys. In a study of the Cote d'Ivoire, Grootaert and Kanbur (1994) found non-food prices to be generally lower in rural areas than urban areas [14]. The regional price adjustment is of importance primarily when making intra-country (eg urban-rural) comparisons rather than inter-temporal comparisons[15].

The final adjustment to the data arises from the panel nature of the surveys [16]. It was intended that the Monitoring Surveys have a panel element, with half the enumeration areas being continually revisited and within those areas, half of the households visited were to be the same households. In practice, there was very high attrition of households and the panel element was abandoned in its entirety in MS-4. The attrition was too high to reflect household mobility and presumably reflects a failure to locate panel households[17]. Preliminary investigation suggests that there is little need to adjust for any biases that may have arisen from the attrition and replacement process. In MS-2 and MS-3, mean expenditures per capita are similar amongst the panel households; the non-panel households in panel EAs and the non-panel EAs. However, the panel feature did lead the since the Statistics Department to change its system for weighting households to provide

[14]Three rural areas were distinguished, with non-food price indices being 89 in East Forest, 102 in West Forest and 88 in the Savannah (the index was 100 in urban areas).

[15] It does raise the overall national expenditures somewhat, since prices were adjusted to survey median values. Urban areas were over sampled and this effect is not corrected for when calculating median values, so the survey prices disproportionately reflect higher urban prices.

[16] There are other adjustments for sampling which one could consider making to the data. The population shares in different regions change markedly between the surveys, not all of which may be genuine or explicable by changes in multipliers. For example, in the IHS, the Northern region (excluding Kitgum) comprises 18.6% of the population; in the MS-2, it is 16% (Table 11 refers).

[17]Arguably, the panel was not high on the priorities of those collecting the data: for example, it has never been used in official reports. Moreover, it would be easier for enumerators to replace panel households than locate them. One proposal to create incentives to locate households would be to require that where panel households must be replaced, they be replaced by those now residing in the same dwelling as was occupied by the panel households. If this rule was enforced, attrition should largely reflect genuine mobility. I am grateful to Christiaan Grootaert for this idea.

nationally representative estimates. For MS-1, it assigned very low population multipliers to panel households, effectively making them unimportant in determining national estimates. Non-panel households in panel EAs were also given low weights. It later changed this system for MS-3 to give roughly equal weight to panel and non-panel elements in the survey and revised the multipliers for the MS-2 to be in line with the new system[18]. However, the multipliers for MS-1 were not revised. This issue is important because households in panel urban EAs saw a large rise in mean living standards between MS-1 and MS-2, whilst those in non-panel EAs saw a sharp fall. It would be desirable if the MS-1 population multipliers were revised using the same system as the MS-2 and MS-3[19]. However, until that is done, the MS-1 multipliers can be roughly amended to be similar to those of the MS-2. For those in "old" EAs, the weights used in the MS-2 can be used[20]. For those in new EAs, the MS-1 multipliers can be used after scaling them downwards to give them the same relative weight as new EAs have in the MS-2[21]. With both new and old EAs, the amended MS-1 weights were deflated to allow for population growth between MS-1 and MS-2. Using the amended weights, the estimate of population using MS-1 is 0.2% below that using the old weights, which seems an acceptable margin of error. However, the amended weights do alter estimates of mean per capita consumption in the MS-1 substantially, raising it in rural areas and lowering it in urban areas.

2.2 Changes in mean consumption per capita

After all adjustments, the surveys imply that consumption per capita rose by 16.5% in between 1992 and 1997 (Table 1 refers). For both rural and urban areas separately, the rise is slightly less — at 15.9% and 11.4% respectively. This discrepancy between the national and disaggregated figures can be explained by the increase in the estimate of the relative size of the urban population from 12.4% in the IHS to 13.3% in MS-4. The overall rise in mean consumption in the bottom line fully adjusted figures is not driven by the adjustments to the data. Taking the consumption figures as calculated in the

[18] The 5797 individuals in the panel households in the MS-1 when weighted represented only 22935 individuals out of the country's population of 17million. The 6110 people in the "new" households in "old" EAs, represented 0.71m. The 10918 people in the new EAs were taken to represent the remaining estimated 16.75m members of Uganda's population. By contrast, in the MS-2, although the proportions of the sample in old households and old EAs were similar to those in the MS-1, their weights were much higher. People in new EAs were taken to represent only 8.76m of the estimated 17.75m population.

[19] The IHS weights might not need to be revised, since there were no "old" EAs and households at that time to be differentially weighted.

[20] 17 "old" EAs could not be matched with those in the MS-2. For these EAs, new multipliers were constructed by first taking the average over the new and old households in the EA of the MS-1 multipliers. This was then scaled upwards by the ratio of the total MS-2 weight given to people sampled from old EAs to the total MS-1 weight to people sampled from old EAs.

[21]To do this, we scale using the ratio of the total weight given to people sampled from new EAs in the MS-2 to the total weight given to people sample from the new EAs in the MS

official survey reports and deflating by the CPI implies a 22.9% rise between 1992 and 1995/6. The adjustments lead to a downward revision of the unadjusted figures because of the exclusion of four districts in 1997/8 and the omission of public transport fees in 1992.

The average growth in mean consumption per capita from the first to last household survey is close to that estimated in the national accounts (Table 5 refers)[22]. It is hard to make precise comparisons because the national accounts data is reported in fiscal years (July to June) whereas the IHS and MS-4 covered something closer to calendar years. The surveys from the IHS to MS-4 span an interval of almost exactly five years, with the mid-points of both surveys being around August (Appendix Table 1 refers). During the five year interval from fiscal year 1992/93 to fiscal year 1997/98, private consumption per capita in the national accounts rose by 16.1%. If instead we take the five year interval between fiscal years 1991/92 and 1996/97, the average growth is 16.7%. These figures are remarkably close to those from the 16.5% figure derived from the household surveys. The two estimates may not be strictly independent because the household survey data is one source used when estimating consumption in the national accounts. However, some of the Monitoring Surveys may not have been used for the national accounts estimates, as they have only recently been cleaned and officially reported on. Moreover, both the level of consumption and the pattern of year-on-year changes are different in the macro and micro data. The household surveys report substantially lower levels of private consumption than the national accounts: in some cases, the discrepancy is almost a third. The household survey data also show a smoother pattern of growth than the macro figures. Mean consumption per capita rises strongly between each survey: by 4.9% between IHS and MS-1; by 5.9% between MS-1 and MS-2; by 2.1% between MS-2 and MS-3; and by 2.7% between MS-3 and MS-4. However, the phasing of the increases in welfare over the five years is very different for urban and rural areas. In line with the national pattern, living standards in rural areas grow fairly steadily between each survey. However, in urban areas, most of the growth in the period occurs between 1992 and 1993/4, when welfare rises by 8.3%.

3. Defining an absolute poverty line for Uganda

As yet, there is no officially approved poverty line in Uganda[23]. In this section, we construct an absolute poverty line reflecting the monetary cost of meeting certain basic

[22] Note that the figures in Table 5 differ from "constant price consumption" as reported in the national accounts, since they use the CPI rather than GDP deflator.

[23] Kikafunda, Serunjogi and Migadde (1992) have estimated a nutrition-based absolute poverty line for Uganda using the 1989/90 Household Budget Survey. They arrive at a figure of 6745 Ugandan Shillings per month per person. This is somewhat higher than the estimate in this paper of 6252 Ugandan Shillings (1989 prices) per adult equivalent per month. The use of the HBS, which excludes much of the Northern region and has higher consumption estimates, may partially account for the discrepancy. There are also differences in method: Kikafunda et al used regional food baskets and appear to have allowed for very heavy levels of meat consumption. In Western rural and many other areas, their baskets allow the poor to eat 64% as much meat (in kg) as matooke (see Table 7, p38). By contrast, in this paper, the ratio of meat to matooke weights in the food basket is 1.6%.

needs. When using a poverty line to evaluate improvements in living standards of the poor over time, it is desirable to fix the poverty line in real terms. If the poverty line is made relative and allowed to rise with improvements in general living standards, then it is possible that poverty will rise despite the living standards of the poor having risen. Whilst such an increase in relative poverty may be interesting, our focus in this paper is whether poorer people have become materially better off. This is not to deny that poverty ultimately has an important relative aspect and that countries may want to set higher poverty lines for policy purposes as they become more affluent. However, for the relatively short period analysed here, this does not seem to be a relevant issue.

Given that it is desirable to fix the poverty line over time in real terms, the issue arises over the level at which is should be fixed. One approach is to fix the poverty line with reference to some point of the distribution of consumption. This was done in an earlier analysis of the Ugandan data, taking the poverty line to be two-thirds of the mean consumption per capita in the IHS (Republic of Uganda, 1997). Although this poverty line is initially defined relative to general living standards, the fact that it is fixed in real terms over time makes it possible to assess changes in living standards. The problem with such an approach is that it is ultimately arbitrary – it is not clear why two-thirds of the mean is chosen, rather than three-fifths or any other ratio.

There are two main alternatives to arbitrarily fixing the poverty line relative to general living standards. One alternative is the "dollar a day" line used by the World Bank (1990), which sets the line at one dollar, in 1985 purchasing power parity exchange rates, per person per day. This is useful for international comparisons but still rather arbitrary. The more appealing alternative is to set the poverty line at some estimate of the costs of meeting basic needs. Making this operational is difficult because of the problem of defining what are "basic needs". In this paper, we follow the approach of Ravallion and Bidani (1994). In common with most of the literature, this approach focuses on defining food-related needs and only indirectly estimates non-food requirements. We address the issue of non-food requirements in section 3.3. Food-related needs are commonly reduced to energy requirements only. This is clearly a simplification, as protein, vitamins and other nutrients are also required from food. People also value food in terms of taste and variety, and it is rather austere to neglect this aspect. In the case of Uganda, we explicitly focus only on calories. However, we find the cost of obtaining calorie requirements based on the typical diet of the poor in Uganda. Presumably this diet reflects, at least in part, non-calorie food needs and preferences for variety. Consequently, our method should implicitly allow for some non-calorie food requirements.

We estimate absolute poverty lines using the First Monitoring Survey. This was chosen since it is fully national but is more comparable than the IHS with the other Monitoring Surveys (in terms of questionnaire design).

3.1 Calorie requirements and equivalence scales

The first step in defining a calorie-based poverty line is specifying how many calories are "sufficient". Unfortunately, there is no consensus in the literature on setting poverty

lines as to how many calories are required. Recent World Bank Poverty Assessments of sub-Saharan African countries have drawn poverty lines based on varying calorific requirements, from a low of 1,700 calories per day in urban Ethiopia to a maximum of 2,700 calories in the Gambia (Hanmer, Pyatt and White, 1997). In most of the literature, the choice of the number of calories underlying the poverty line was not justified by references to work by nutritionists specifying energy requirements. Lipton and Ravallion (1995) identify the energy requirements set by WHO (1985) as the most widely used "official estimates". Consequently, we adopt these standards for Uganda. As shown in Table 6, the WHO requirements vary with age, sex, intensity of work, pregnancy and lactation. We first define the poverty line according to the needs of a man, aged 18-30[24]. We focus on the requirements for "moderate" work, since the calories required for this are the very similar to as those estimated by WHO (1985) in illustrative calculations for subsistence farmers and for rural women in developing countries. From Table 6, it can be seen that the WHO recommends 3000 calories a day for men aged 18-30 engaged in moderate work[25].

Energy requirements differ by age and sex. We allow for varying needs by age by using calorific equivalence scales based on Table 6. The equivalence scale for a person of a given age and sex category is set equal to the ratio of the recommended intake for a male of the relevant age divided by 3000, the requirements for the reference category of men aged 18-30. We do not allow for sex differences in calculating the equivalence scales used to deflate household consumption. A woman aged 18-30 would have 0.7 of the weight of man using calorific equivalence scales. Given that the equivalence scales are to be used to assess people's relative needs, the authors are uncomfortable in making such a large adjustment for sex differences[26]. As a result of this misgiving, we do not allow for sex differences when calculating calorific equivalence scales and simply use the

[24] The choice of age is not substantive, because, as explained below, when applying the poverty line to Ugandan households we adjust for age-differences in calorific requirements. The choice of sex is more important, since we do not adjust for sex-differences in calorific requirements. However, given that sex adjustments are not made, it is appropriate to focus on energy requirements of the sex believed to have higher energy requirements, i.e. males.

[25] It is important to note that falling below the recommended energy intakes does not imply starvation or even malnutrition. The allowances include a safety factor required only for individuals undergoing periods of illness, injury or stress. Moreover, Lipton (1983) argued that mean adult weights in most tropical places lie 15-30% below reference weights used in estimating energy requirements. Sukhatme (1978) suggested that because of significant interpersonal and intertemporal differences in calorie requirements, recommended allowances should be reduced by around 15% when estimating malnutrition.

[26] Even in terms of calories, the WHO standards are questionable. One report based on observation of three communities reported that women worked between 12 and 18 hours a day, with a mean of 15 hours (UNICEF/ACFODE, 1988). Figures for men were not given, but are unlikely to have been at those levels. In the IHS, information on time use is reported for the busiest twelve hours of the day: on average in this period women work an extra hour and a half more than men. This differential arises only in rural areas.

WHO calorie requirements for males to derive equivalence scales which we apply to both males and females[27].

Applying the adult equivalence scales in Table 6 to the sample of the First Monitoring Survey, we find that the estimated total population of 17.8 million corresponds to 13.6 million adult equivalents. Thus in the case of Uganda, the requirement of 3000 calories per adult equivalent corresponds to an average requirement of 2283 calories per capita in the country. Whilst the 3000 calorie per adult equivalent requirement seemed rather high compared to that assumed in poverty lines for other countries, the per capita requirement is not so far from requirements assumed in other studies[28].

It should be noted that the equivalence scales assume that non-food requirements vary by age in the same way that food requirements vary. Nor do the scales allow for the economies of scale that are likely to arise with larger households. Estimating non-food requirements by age or household economies of scale is a difficult exercise, seldom attempted in assessments of poverty[29].

3.2 The food poverty line

Many combinations of foods ("food baskets") could meet the requirement of 3000 calories. However, it is most relevant to construct a food basket based upon the actual consumption patterns of the poor in Uganda. Of course, since the poverty line has not yet been defined, one cannot know who exactly the poor are. In the case of Indonesia, Ravallion and Bidani (1994) focussed on the consumption patterns of the poorest 15%. This was presumably because a poverty line defined using an alternative method had found 15% of Indonesians to be poor. In the case of Uganda, 15% seems rather a low figure so we have focussed on the poorest 50% of people, ranked by consumption per adult equivalent[30]. Previous work using the IHS data had defined a poverty line based on the consumption patterns of the bottom 50% and found that over half Ugandans lived below this line (World Bank, 1996). However, it remains a rather unsatisfactory feature of the Ravallion and Bidani method that devising the poverty line depends on some initial judgement about how many people are poor. In the Ugandan case, the line is sensitive to this judgement. For example, if the food poverty line derived here had been based on the average consumption patterns of all Ugandans, rather than just the poorest 50%, the line would have been 21% higher.

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[27]This procedure was also followed by Appleton (1996) and in World Bank (1996).

[28]For example, Ravallion and Bidani (1994) base their poverty line for Indonesia around a requirement of 2100 calories per capita per day.

[29]Lanjouw and Ravallion (1996) estimate household economies of scale based on the effects of household size on welfare indicators such as stunting, wasting and the food share. Their preferred estimate, based on stunting, gives strong economies of scale but estimates based on the other two welfare indicators do not.

[30]The consumption estimates are fully adjusted as detailed in Section 2.

To calculate the food poverty line, we first use the MS-1 data to estimate the mean quantities of 28 major food items (listed in Table 7) consumed by the poorest 50%. These mean quantities constitute a reference food basket: the typical food basket of the poor. We aim to identify a food basket yielding 3000 calories where items are consumed in the same proportion as in the reference food basket. Although the MS-1 included direct questions about quantities consumed, these were often reported in non-metric and sometimes unspecified units (e.g. heaps, bunches, etc). Rather than attempt to convert all units into kilograms, an indirect approach was taken to estimating quantities. Quantities were estimated as values (including home consumption) divided by prices per kilogram. Prices per kilogram were estimated as the survey median unit values of purchases made in a few unit codes, typically metric only. These prices are reported in column 2 of Table 7. In one or two cases — notably matooke — there were insufficient metric responses and conversion factors (for the three types of "bunches") had to be used; these conversion factors were taken from Kayiso (1993). When calculating quantities, values were adjusted for regional price differences and home consumption revalued into market prices.

We then estimate how many calories were generated by the reference food basket. We do this using the calorific values of East African foods as reported by West (1987), the relevant numbers (in calories per kilogram) being reproduced in column 3 of Table 7. For some foods, part of the weight of the food is not of nutritional value being inedible or lost in preparation. Estimates of the percentage of the food retained for consumption are given in column 4 of Table 7 Multiplying the mean quantities of foods consumed by their calorific value and retention rates, we estimated that the poorest 50% in Uganda consumed around 1373 calories per day per person (not per adult equivalent). Consequently, the typical diet of poor Ugandans would have to be scaled upwards by a factor of 2.19 in order to generate 3000 calories per person per day. Scaling up the reference food basket by this factor gives us the food basket reported in column 1 of Table 7. This is the food basket that we cost in order to identify the food poverty line. The amount of calories provided per day from each food item in the basket is reported in column 5. The food basket is very varied, with at least five important staples (matooke, sweet potatoes, cassava, maize, millet and sorghum). This reflects regional variations in staple crops across the country. The basket allows for some expenditure on a variety of non-staple foods. These items should help meet other nutritional needs not specified in detail — for protein, vitamins and minerals. The total cost of the food basket, our food poverty line, is 11463 Uganda Shillings per month (in the average prices of the MS-1 survey; these MS-1 prices must be deflated by 2.63 to be converted to the 1989 prices used in reporting most real expenditures in this paper).

The variety of staples is an argument for estimating separate regional poverty lines. For example, matooke is rarely consumed in the north but is common in the West. This regional variation in staples may reflect differences in availability, relative prices, tastes and income. Allowing for such differences in food baskets is likely to lead to different food poverty lines, since staples differ in the amount of calories provided per shilling. For example, matooke is a rather expensive way of obtaining calories (17.4 shillings per 100 calories) whereas sorghum is relatively cheap (6.4 shillings per 100 calories). Whether one wishes to allow for different regional food baskets is a difficult normative

issue. There is a technical problem (albeit solvable) in making sure the baskets do not differ because of regional differences in income. The broader question seems to depend partly on whether one is interested in comparing incomes or satisfaction of basic needs. If one is solely interested in comparing real incomes ("economic welfare"), with the poverty line acting only as a somewhat arbitrary way of identifying the poor, then a single national food basket seems preferable. However, if one is concerned with whether people in different regions are obtaining adequate calories (part of "basic needs"), then regional food baskets are perhaps more appropriate. Future work will investigate the extent to which different regional food baskets lead to substantially different food poverty lines in Uganda. However, this exercise is probably more important when comparing poverty levels across regions than when comparing changes in national poverty over time (this was the finding of Dercon and Krishnan, 1998, for Ethiopia).

3.3 Non-food requirements

As is standard in the literature, we make no attempt to itemise non-food requirements. Such an itemisation would involve making controversial judgements about the necessity of a myriad of small or infrequently consumed heterogeneous non-food goods and services. To avoid entering such a quagmire, we follow the common practice of estimating non-food requirements indirectly by looking at the non-food spending of poorer people. In particular, we follow Ravallion and Bidani (1994) in identifying non-food requirements, NF, as the non-food expenditure of those whose expenditure is just equal to the food poverty line, z_f. The rationale for this is that, since at this level of welfare the poor have sacrificed some of their need for calories, the non-food expenditures they have chosen to give priority to should also be regarded as meeting essential needs. This level of non-food expenditure can be estimated using a regression of the food share s_i of household i on the log ratio of consumption per adult equivalent, y_i, to the food poverty line, z_i^f, locational dummy variables, D_{ij} and other variables, w_i, such as demographic composition[31].

$$s_i = \alpha + \beta \ln(y_i/z_i^f) + \gamma \ln(y_i/z_i^f)^2 + \Sigma_j \phi_j D_{ij} + \delta w_i + v_i \qquad (1)$$

where v_i is an error term

When $y_i=z_{if}$, the foodshare, s_i, in region j for a household with explanatory variables, w_m, is given by $\alpha + \phi_j + \delta w_m$. To calculate the foodshare to be used in the poverty line (column 1 of Table 9), we set w_m equal to the mean characteristics of the poorest half of the population, ranked by real expenditure per adult equivalent. Required non-food expenditure, NF, is therefore $(1- \alpha - \phi_j - w_m \delta)z_{if}$. Thus the total poverty line, z_j, in location j is given by:

$$z_j = z^f_j (2 - \alpha - \phi_j - w_m \delta)$$

[31] The square of the log ratio of consumption to the poverty line is also included in the regression to improve goodness of fit.

This method allows different locations to have different non-food requirements. For example, urban people often have to pay more for given accommodation than rural people. This may reflect differences in prices and perhaps social norms. By Engel's Law, urban people will also tend to have higher non-food ratios because they have higher consumption per adult equivalent. However, this effect does not contaminate the procedure because the regional effects, ϕ_j, are estimated controlling for differences in consumption per adult equivalent.

The regression in equation (1) is reported in Table 8. The dependent variable is the share of those foods included in the food basket used to generate the poverty line (listed in Table 7) — items (e.g. "other foods") not included in the basket are treated as "non-food" items for the purposes of this exercise. The model predicts a mean food share of 0.566 for those whose real consumption per adult equivalent is just equal to the poverty line (column 1, table 11 refers). This gives a national poverty line of 16443 Uganda shillings per adult equivalent per month (MS-1 prices). Taking a purchasing power parity exchange rate of 369 shillings to the dollar, this is equivalent to $44.56 per adult equivalent a month. (At the official exchange rate of 1195 shillings per dollar, it amounts to $13.76 a month.) In the case of Uganda, the line is equivalent to $34 per capita per month and hence comparable the "$1 a day" poverty line sometimes used for international poverty comparisons by the World Bank.

Poverty lines differ between rural and urban areas because estimated non-food requirements vary (column 2, table 9). This is because the predicted food share when at the food poverty line is much lower in urban areas than in rural areas (e.g. 0.49 in Central urban compared to 0.68 in Western rural). Western rural has the lowest poverty line — 15189 Uganda shillings (MS-1 prices) per adult equivalent per month — whilst Central urban has the highest — 17314[32]. These regional differences in poverty lines are relatively modest. However, it should be noted that a single food basket is used for all regions and are costed at uniform national prices. Since food prices are much higher in urban areas, the difference between urban and rural poverty lines is much greater when valuing in nominal terms (and not at uniform national prices)[33]. In nominal terms, the poverty line for central urban is 106% higher than that in Western rural.

4. Changes in poverty and inequality

In the previous sections, we reported how we calculated our welfare measure (adjusted household consumption per adult equivalent) and the poverty line. Here we report the

[32] That Western rural should have the lowest poverty line raises some doubts about the appropriateness of working with a national food basket. One reason why the foodshare may be predicted to be higher in Western rural (and hence the poverty line lower) is that it is more expensive to obtain sufficient calories using matooke, a favoured staple in Western region.

[33] The food poverty lines in nominal terms (column 3, Table 9) are not equal to the food poverty lines in national prices scaled by the food price index reported in Table 3. This is because the food price index was based on the consumption patterns of the whole population, whereas the poverty line is based on the consumption patterns of the poorest half of the population.

results of comparing welfare measures with the poverty line in the four surveys. We follow recent convention in using the Foster-Greer-Thorbecke, Pα, statistics to aggregate the data. These can be defined as:

$$P\alpha \equiv 1/n \sum_{i=1,n} \{\max[z-c_i,0]/z\}^{\alpha}$$

where n is the number of individuals in the population; z is the poverty line; c_i is the welfare measure (consumption per adult equivalent); and α is a parameter.

The Pα index has a number of desirable properties, notably that it encompasses a number of familiar poverty indices and that it is additively decomposable, a property exploited below. When α takes the values 0 or 1, the FGT index reduces to more familiar indicators. P0 is the headcount: the proportion of people living below the poverty line. This measure is often the focus of policy discussions, because it is so easily interpretable. However, it has a number of drawbacks compared to the other Pα statistics used which make it important to check that results are robust to using alternative statistics. A chief drawback with the P0 indicator is that it is insensitive to changes in the welfare of the poor that do not take them above the poverty line. For example, if all the poor (only) became 50% poorer, the P0 index would not change. Conversely, the index will be very sensitive to changes in the welfare of those living close to the poverty line, as opposed to the very poor. The P1 index is not subject to this criticism and also has a ready interpretation as the "per capita aggregate poverty gap". That is to say, the mean shortfall of the welfare of the poor from the poverty line, expressed as a proportion of the poverty line and averaged across the population as a whole. It is thus one measure of the minimum cost of eliminating poverty through perfect transfers. The index is insensitive to transfers amongst the poor (for example, from the less poor to the very poor). P α indices with α>1, such as P2, are sensitive to such transfers and for this reason are of interest. Although the P2 index does not suffer from the limitations noted earlier with P0 and P1, it has its own drawbacks. It is somewhat arbitrary — it is not clear why α=2 is preferred to any other α>1 — and has no obvious or intuitive interpretation. In addition, it will be more sensitive to low outliers in the data.

4.1 Poverty trends

Tables 10.1.1 through to Tables 10.5.2 present poverty statistics for the five surveys. Data are disaggregated by location, both by urban-rural and by the four regions of the country. For each survey, two tables are presented: one reporting poverty statistics using the absolute poverty line derived above; the other using only the food poverty line. The poverty rates assessed relative to the poverty line tell us those about those whose consumption is insufficient to meet our estimate of their basic needs. Poverty rates assessed relative to the food poverty line tell us about those whose consumption is insufficient to meet even their calorie needs. Along with the poverty statistics, we report the percentage of people in each location, their mean household consumption per adult equivalent and the contribution each location makes to each poverty statistic (i.e. what percentage of national poverty is attributable to each location). Given that poverty

statistics are estimates, it is useful to test whether changes in their values are statistically significant (Kakwani, 1990). We report tests of the significance of the changes in the poverty statistics between IHS and MS-4 in Table 11.

In the first survey, the IHS, 56% of people were estimated to be below the poverty line and 36% below the food poverty line. These statistics show that absolute poverty levels were very high in Uganda. Most people did not have enough money to meet our estimate of their basic needs. More than one third did not have enough even to meet only their calorie requirements, let alone any other needs. These high poverty rates are perhaps not surprising given the very low national income of the country (ranked sixth lowest in the world in 1992 by the World Bank, 1994). Poverty rates in urban areas were much lower than in rural areas, but were nonetheless substantial: 28% of urban people lived below the poverty line and 11% lived below the food poverty line. There were pronounced regional differences in poverty rates. In the poorest area, Northern rural, 72% lived below the poverty line. However, poverty was widespread in all areas: even in the most prosperous area, Central urban, more than one in five people lived below the poverty line. Urban areas suffered relatively less from poverty defined relative to the food poverty line only, but this is of questionable relevance given that above we showed non-food needs to be higher in urban areas.

Absolute poverty remained pervasive at the end of the four surveys. However, it did fall quite substantially. In the MS-4, 44% people were poor compared to 56% in the IHS. This 21% fall in the headcount was accompanied by a 16% rise in mean consumption per adult equivalent. This implies an elasticity of poverty with respect to growth of around minus 1.26. This elasticity is rather low (in absolute terms): for example, in Nigeria, the figure is estimated to be −1.45 whilst in Ghana it is put at −1.73 (World Bank, 1995). However, this seems to reflect the high level of the poverty line rather than any regressive aspect of Uganda's pattern of growth. Using a lower poverty line, the food poverty line, the growth elasticity is higher, at −1.8. This reflects the larger proportionate fall in the number of people living below the food poverty, from 36% to 25% during the period. The other $P\alpha$ indices also show marked declines, especially the P2 index. Whereas the P0 indicator fell by 21%, P1 fell by 19% and P2 by 41%. By any standards, the fall in poverty over a period of only five years has been substantial.

As poverty rates have fallen, the cost of interventions to reduce poverty has also fallen (although this is somewhat offset by population growth). Recall that the P1 index is proportional to cost (per adult equivalent) of eliminating poverty through perfectly targeted transfers. Our estimates imply that this minimum estimate of the cost of eliminating poverty through transfers has fallen by over a quarter[34]. The P1 index for the IHS implies a total annual cost of eliminating poverty through perfect transfers ("the simple sum") of 714,924 million Ugandan shillings (1993/4 prices) or $595 million

[34]The total cost of eliminating poverty through perfect targeting is given by nP_1Z where n is the population and Z the poverty line. We include Bundibugyo, Gulu, Kasese and Kitgum in the population, although they were excluded from the estimate of P_1. Since these districts are poorer than Uganda as a whole, the cost will be understated - by around two percentage points in 1992.

(using the 1993 official exchange rate). The corresponding figures for 1997/98 are 555,378 million shillings (1993/4 prices) and $464 million. To remove poverty relative to the food poverty line through perfect targeting, the cost would have been $227 million in 1992 and $149 million in 1997/8[35].

Poverty fell in both rural and urban areas during the period. Mean living standards rose faster in rural areas: the mean rise in consumption per adult equivalent was higher in rural areas than urban areas (17% compared to 10%). However, as we will show, focussing on the urban mean may be misleading and poverty statistics fell proportionately more in urban than rural areas. The headcount fell by almost two-fifths in urban areas (42%); the proportionate fall in rural areas was half of this (19%). Perhaps surprisingly, living standards in central urban areas grew modestly, by 4%, between the first and last surveys. This may be partly a consequence of in-migration: the estimated share of the country's population in these areas rose by 0.7%, a proportionate increase in the size of the central urban population of just nine percent. Other urban areas experienced large improvements in living standards; with Northern and Eastern towns seeing rises in mean consumption of 27% and 32% respectively.

All regions had lower poverty in 1997/8 than in 1992, regardless of which $P\alpha$ statistic is used or whether the poverty is measured relative to the total poverty line or just the food poverty line. Furthermore, all these falls in poverty are statistically significant (with the exception of P_2 for urban Western; Table 11 refers). However, the magnitude of the falls varied greatly. Mean consumption per adult equivalent rose most strongly in Central region, by 21%, and most modestly in Eastern region, by 12%. The corresponding figures for the Western and Northern regions were 16% and 15% respectively. These movements in average living standards are reflected in the changes in the poverty statistics. Central region saw the sharpest fall in poverty, with the headcount falling by over a third, from 46% to 28%. In the East, the headcount fell by only five points. In the North and West, the headcount fell by twelve and eleven points respectively. The poverty

[35] It is tempting to compare these figures with Uganda's external assistance in 1993 of $531 million. It can be seen that Uganda's present external assistance is roughly similar to the cost of eliminating poverty through perfect targeting. However, it cannot be assumed that poverty could be eradicated by channelling external assistance into transfers to the poor. Presumably the assistance currently has some impact in reducing poverty and thus channelling it to transfers would worsen the poverty gap that had to be filled by transfers. Transfers are unlikely to be perfect. An alternative assumption is that targeting is infeasible, in which can transfers must be uniform. The P1 measure gives a ratio of the cost of eliminating poverty through perfectly targeted transfers relative to that of uniform transfers. In 1997/8, it would have cost $3,387 million to eradicate poverty through uniform transfers to all Ugandans (assuming no administrative costs). Furthermore, if the transfers were used to fund private consumption, they would have to be perpetual. Poverty would be eliminated in one year but would return in the next. One-off transfers may have permanent benefits to the extent that they are saved and invested, but such saving would imply transfers would have to be correspondingly higher to raise the consumption of the poor to the poverty line. Substantial external assistance is likely to continue in the medium term, but donors cannot be assumed to be willing to pay indefinitely. Finally, much of the external assistance may be loans rather than grants or tied to particular imports. Nonetheless, it remains a legitimate question whether some external assistance could make a larger impact on poverty if channelled directly to the poor.

gap, P_1, was halved in the Central region but fell by only 17% in the Eastern region. One measure of the severity of poverty, P_2, falls by 57% in Central region but only 24% in Eastern. The net effect of these regional disparities is to widen the gap in living standards between the Central and Eastern regions. In 1992, Central region accounted for 25% of the poor in the country and Eastern region accounted for 30%. By 1997/8, Central region accounted for only 19% of the poor compared to Eastern region, which accounted for 35%. Defining poverty relative to the food poverty line only, the contrast is even more stark: although Eastern and Northern regions comprise less than half (45%) the population of Uganda surveyed in 1997/8, they accounted for three quarters (62%) of those whose total consumption is insufficient even to meet their calorie needs. (In 1992, they accounted for 53%). It is noteworthy that this occurred during a time of administrative and fiscal decentralisation. These institutional changes are surely not responsible for the increasing spatial disparity in welfare and poverty. However, the widening geographic inequalities will require greater government redistribution between regions.

The conclusion that poverty fell between the IHS and MS-4 is robust to the choice of poverty line. Figure 1 shows the results of dominance analysis by plotting the poverty incidence curves for the five surveys. The poverty incidence curves plot the headcount indices on the y-axis against different poverty lines (expressed as multiples of the original poverty line) on the x-axis. As the poverty incidence curve for the IHS is above that for the MS-4, we can see that for all poverty lines, there would be a higher headcount in the IHS than in the MS-4. Given such first-order dominance, it also follows that poverty would be higher in the IHS than MS-4 for all absolute poverty lines for all $P\alpha$ statistics other than P0. By contrast, we can see that the poverty incidence curves for MS-3 intersects that for MS-1 and MS-2 at points, implying that it does not wholly dominate them. In particular, for very low poverty lines - at around 50% of the poverty line - the headcount is higher for MS-3 than for MS-1 and MS-2. This implies that the position of the very poorest households may have deteriorated between MS-1 and MS-3.

The emphasis of the discussion in this section and indeed most of the paper is on comparing the first and last surveys. Movements in living standards during the intervening surveys are not stressed. However, being able to track changes in living standards on a yearly basis is useful in determining whether the comparison between the first and last surveys is driven by one or other survey year being somehow atypical. As discussed in Section 2.2, growth in mean living standards in Uganda as a whole was sustained between each survey, although strongest between the first three surveys (IHS to MS-2). The headcount index at the national level also fell between each survey. This fairly steady year-on-year growth and poverty reduction is reassuring in suggesting that the improvement in living standards in the last survey compared to the first is not driven by one year of perhaps abnormal weather conditions. That said, there has been considerable variation in growth and poverty reduction between each of the five surveys, especially at the regional level. For example, it is questionable whether poverty was reduced between MS-2 and MS-3. The P2 index actually worsened while the P1 index remained constant. The time path of poverty reduction has varied particularly at the regional level. Some poverty indicators worsened for the Western region between IHS

and MS-1. The West appears to bounce back between MS-1 and MS-2, but Eastern region and other urban areas experience worsening poverty. Between MS-1 and MS-2, poverty indicators worsened in the North. The headcount in Central region rose between MS-3 and MS-4. Clearly poverty reduction has not been smoothly continuous across all regions throughout the period.

4.2 Inequality

Poverty statistics focus only on the lower part of the distribution of welfare and even within that part can mask interesting features due to the aggregation involved. It is more informative to look at the distribution in its entirety, which is what was done towards the end of the previous section with Figure 1. One simple way of presenting the distribution in tabular form is to report the values of mean consumption per adult equivalent at the median and at other deciles (Table 12 refers). The median rise in living standards between the IHS and MS-4 is 17.7%, close to the rise in the mean. As implied by the dominance analysis, consumption per adult equivalent is higher in MS-4 than in the IHS at all deciles. Comparing the relative gains (not tabulated), there is a tendency for the lower (poorer) deciles to see a greater rise in living standards. The rise in consumption per adult equivalent is 29% at the bottom decile; 23% at the second decile and 21% for the third. for the bottom tenth, by 25% for the next poorest. The higher deciles also grow somewhat more than the median, although the difference is not pronounced at one or two percentage points. Disaggregating into rural and urban areas, the pattern in rural areas is very close to that in the country as a whole. However, in urban areas, the picture is rather different. For a start, the median rise in consumption per adult equivalent in urban areas during the period is 22%, more than twice the 11% rise in mean consumption per adult equivalent. Similarly large rises are apparent at all urban deciles. It appears that mean consumption per adult equivalent provides a misleading picture of the overall improvement in living standards of the urban population[36]. Using the median rather than the mean implies that urban living standards have risen faster than rural ones. In urban areas as in rural areas, there is again some tendency for consumption to rise more at the lower deciles. For example, consumption rises by 26% at the bottom decile; for the second and third deciles, the rise is 29% and 30%.

Focussing on growth at the median and at each decile implies a rather different time path from that implied by growth at the mean. Both perspectives agree that there was substantial growth between the IHS and MS-1 (5.5% at the median and 4.9% at the mean). However, at the median, the growth between MS-3 and MS-4 is equally strong (5.7% compared to 2.7% at the mean). Viewed at the mean, growth between MS-1 and

[36]It appears that consumption falls during the surveys for some households in the top tenth of the urban population. Since these households have very high consumption, their fortunes are very influential in determining the mean rise in consumption per adult equivalent, which is calculated in the "macroeconomic" way by summing consumption across all households and dividing by the population. Whether the apparent fall in the living standards of the top tenth of the urban population is genuine requires further investigation but is not central to this paper given our focus on the poor.

MS-3 was modest. Indeed, during this period, the poorest 20% of the population did not experience noticeable improvements in living standards and the poorest got poorer. Consumption per adult equivalent at the bottom decile was 4% lower in MS-3 than MS-1 while for the second decile, living standards were essentially unchanged.

Table 13 reports the Gini coefficients for the surveys as a measure of the overall inequality in consumption per capita. The fact that the lower deciles saw greater rises in living standards than the more affluent leads to a fall in the Gini coefficient between the first and last surveys. The improvement in the progressivity of the distribution is most marked in urban areas[37].

The fall in inequality within Uganda has made some contribution to poverty reduction, but most of the gains can be attributed to overall growth. This is shown by a decomposition of the change in poverty statistics between IHS and MS-4 following Datt and Ravallion (1991). We decompose the change in a poverty indicator P between two years, t_1 and t_2 into three components: growth, G, distribution, D, and a residual:

$$P_{t2} - P_{t1} = G + D + R$$

The growth component, G, is the difference between the initial poverty indicator, P_t and what would have arisen from distributionally neutral growth. That is to say, if there was the same mean per capita consumption, M, as in year t_2 but the same relative distribution (Lorenz curve, L) as in t_1.

$$G=P(M_{t2},L_{t1}) - P_{t1}$$

The distribution component, D, is the difference between the initial poverty indicator, P_t, and what would have arisen from a pure distributional change. That is to say, if there was the same mean per capita consumption as in year t_1 but the same relative distribution as in t_2

$$D=P(M_{t1},L_{t2}) - P_{t1}$$

Table 14 applies this decomposition. Growth accounts for 87% of the fall in the headcount (whether defined relative to the poverty line or food poverty line) can be attributed to growth, as can all of the fall in the poverty gap. Improvements in distribution account for only 12%. For the other poverty indices the contribution of shifts in the distribution of welfare rises relative to that of growth but remains secondary. For the P_1 index, distributional changes account for a quarter of the fall in poverty while for the P_2, they account for a third.

[37]Like the discrepancy between mean and median growth in urban areas, this is partly driven by the apparent fall in consumption amongst the top 10% of the urban population.

4.3 Sectoral decomposition

Poverty statistics can be disaggregated in many ways. One interesting disaggregation is by economic sector, as this provides a potential link between macroeconomic events and households welfare. Table 15 classifies households into mutually exclusive sectors roughly corresponding to those used in standard national accounts. With two exceptions, the classification is based upon the main industry in which the household head works. One exception is for households where the head's main activity is crop farming. These households were divided into two depending on whether they grew any non-food cash crops (mainly coffee, with some cotton, tobacco, tea and other non-food crops). Typically, such households will obtain more revenue from food crops, but are still assigned to the cash crop sector. The other exception is for households were the head is not working (mainly households with retired heads); these households were placed into a separate category "not working", although some members may in fact be generating income. The classification is a convenience designed to obtain mutually exclusive assignments of households to sectors given the data constraints (which include the absence of data on income by sector in the monitoring surveys). In reality, households may work in many industries and in some cases the main industry in which the head works may not be the most important source of income to the household.

We disaggregate poverty by sector for the IHS and for MS-3; it is not possible to carry out the disaggregation in MS-4 because the survey does not identify which crop farmers grow cash crops. In 1992, most Ugandans (70%) lived in households where the head's main activity was crop farming[38]. Around one third of those individuals lived in households growing some non-food cash crop. This reflects the fact that coffee growing was widespread, despite the fact that in 1992/93 it accounted for only around 3-4% of total crop agricultural revenue in the country (World Bank, 1996). There is some evidence of movement into cash crops during the period of the surveys: the size of the sector increased from covering 23% of people in the IHS to covering 27% in MS-3. However, there is no evidence of a movement out of agriculture: indeed, the sector grew slightly in terms of population share during the surveys. Trade and government services were the next most populous sectors, each covering 7% of Ugandans. Trade did not change in size during the surveys, although households in the government sector decreased from 6.8% in the IHS to 5.5% in the MS-3. The "not working" sector cover was the next largest sector, growing from 4.3% to 4.9%. Manufacturing remained fairly constant at around three and a half percent of the population. Other sectors covered 2% or less of the population, with some sign of growth in the size of the service sector.

The food crop sector was the poorest of the major sectors in 1992/93 and experienced only relatively modest declines in poverty. The P0 and P1 indicators fell by less— both absolutely and relatively — than those for the country as a whole. Cash crop farming was the second poorest sector in the IHS, but experienced dramatic declines in poverty

[38] Henceforth, for ease of expression, we will refer to people as being in a sector if their head's main activity is in that sector. This should not be taken to imply that all the people said to be in the sector actually work in the sector (only their household heads must work in the sector).

between the IHS and MS-3. Whatever poverty indicator is used, the reduction in poverty in the cash crop sector was over twice as large as that in the country as a whole[39]. These improvements in poverty were driven by above average rises in mean consumption per adult equivalent, which rose by a third in the sector. One factor underlying these gains is the rise in the world price for coffee during the period. The unit price of Ugandan coffee exports was as follows:

1991/92	0.86 (US$/kg)
1992/93	0.82
1993/94	1.14
1994/95	2.55
1995/96	1.72
1996/97	1.33

source: Republic of Uganda (1994, 1997b)

At the height of the coffee boom, Uganda was receiving export prices for coffee three times greater than in 1992. Other factors are also important. Poor weather conditions in coffee growing areas depressed output in 1991/92. Output is also likely to have been enhanced by the price and market liberalization policies in the coffee sub-sector. Although these were initiated in 1990, there is likely to have been a lagged response in output due the time needed for newly planted coffee trees to bear fruit (around five years).

Poverty fell in nearly all sectors. One exception is mining, although this result may be questionable given the very small sample size. In addition, there was an increase in the headcount defined relative to the food poverty line in miscellaneous service sector (and mean consumption per adult equivalent fell), but other poverty statistics for that sector improved slightly. However, perhaps the most notable exception to the generally favourable trends was in the non-working sector, where all poverty indicators worsened despite rising mean consumption per adult equivalent. The headcount rose only slightly, but this masks more serious deterioration in other indicators. The P1 statistic rose by 23%; the P2 statistic by 39%.

The cash crop sector was not the only one to experience reductions in poverty much above the national trend. Manufacturing and trade, although starting from much lower initial levels of poverty, saw greater proportionate reductions. Hotels, construction, transport and communications also performed strongly. The government sector lagged somewhat behind the country as a whole in terms of growth in mean per capita consumption, although poverty rates fell comparably.

[39] This comparison is fairly straightforward, since poverty rates in the cash crop sector were of a similar magnitude to those in the country as a whole in the IHS. Between the IHS and MS-3, the headcount fell by 27% for the cash crop sector; for the country it fell only half as much - by 13%. The P1 indicator fell by 43% for cash crop households; for Uganda, it fell by 20%. The P2 indicator for the cash crop sector fell by 53%; for the country as a whole it fell by 23%.

It is possible to decompose the national change in poverty into the effects of changes in poverty within sectors and movements between sectors (Ravallion and Huppi, 1991). This allows one to assess whether poverty has fallen because people within certain sectors have become better off or because people have moved to more affluent sectors. If P_{t1} is a poverty indicator for time t1, then:

$$P_{t2}-P_{t1} = \Sigma\,(P_{it2}-P_{it1})n_{it1} \quad \text{intra-sectoral effects}$$
$$\Sigma\,(n_{it2}-n_{it1})P_{it1} \quad \text{inter-sectoral effects}$$
$$\Sigma\,(P_{it2}-P_{it1})(n_{it2}-n_{it1}) \quad \text{interaction effects}$$

where n_{it2} is the proportion of the population in sector i at time t1 and P_{it1} is the poverty indicator for sector i at time t1. The interaction effects tell us whether people switched out of or into sectors where poverty was falling or not (if positive, people moved into sectors where poverty was falling).

Applying this methodology to Uganda in Table 16, we see that an improvement in the conditions of cash crop farmers and their families was responsible for over half of the improvement in poverty between the IHS and MS-3. Improvements in the lot of food crop farmers made a more modest contribution to the fall in the headcount, but account for around a quarter of the improvement in other poverty indicators. Other sectors make more modest contributions, with trade, manufacturing and government services being the more noticeable (largely due to their size). The worsening poverty of those in households whose head is not working is also evidenced in the table. Population shifts between sectors also help explain some of improvement in poverty, but their contribution is less only around 2-4%. Interaction effects were positive, implying that people moved into sectors where poverty was falling faster (such as cash crop farming).

5 Summary and conclusions

The data on private consumption from five recent Ugandan household surveys provide a picture of rising living standards in accordance with the macroeconomic data on growth. The finding that urban living standards have risen is unsurprising given the many indicators of strong performance of non-agricultural sectors and the visible progress in the major towns. However, the household survey data is perhaps the strongest evidence available that living standards in rural areas have also improved commensurately with the macroeconomic evidence.

An absolute poverty line can be calculated for Uganda, sufficient to meet calorie needs given the typical diet of the Ugandan poor and to meet minimum non-food requirements. The line implies that 56% of Ugandans were poor in the IHS falling to 44% in MS-4, a significant and substantial reduction in poverty during a relatively short interval of five years. However, the high levels of both figures illustrates both the low base from which Uganda's recovery has started and how far the country has yet to go in order to eliminate absolute poverty. The result of falling poverty is robust to whatever poverty line is chosen. It is explained mainly by growth although there have been improvements in the distribution of welfare. Poverty reduction has been uneven across economic sectors, with

those engaged in cash crop farming, manufacturing and trade faring particularly well. The improvement in the living standards of those growing cash crops accounts for over half of the fall in poverty in the country during the period. Although the data generally imply improvements in the welfare of Ugandans, a number of less favourable trends were identified. Regional disparities were exacerbated during the period, with Central region growing the most strongly and Eastern region lagging behind. At the median, living standards rose more in urban areas than in rural areas. Finally, poverty worsened during the first four surveys for those in households where the head was not working.

The rise in living standards observed in the surveys is evidence of broad-based growth. Although there is much debate about whether growth "trickles down", it is clear that such terminology is inappropriate here. If anything, growth in living standards has been strongest amongst poorer households. Nonetheless, many questions remain concerning implications for the future and for our understanding of the recent past. The period considered is relatively short - five years - and it remains to be seen whether the impressive reduction in poverty observed here can be sustained in the long term. This will partly depend on whether growth can be sustained but also on how growth is distributed. On the latter point, the experience of 1992-97 may be a poor guide for the future. This is because growth in the period was driven partly by the coffee boom and partly by a process of recovery from the economic collapse of the 1970s and 1980s.

The temporary nature of the coffee boom raises the issue of whether the associated rise in living standards observed will only be temporary. One merit of using consumption rather than income to measure welfare is that, according to Permanent Income Hypothesis, it will be less affected by temporary windfalls. Indeed, empirical research has tended to confirm that export crop farmers do often save heavily out of any windfalls due to price booms (Bevan, Collier and Gunning, 1993). Consequently, it is unlikely that consumption will fall with the end of coffee boom and indeed MS-4 provides no evidence that is has. However, it is not clear that future growth will have the same effect on poverty as that arising from the coffee boom. Much will depend on the sources of growth: the extent to which the poor derive income from growing sectors or can enter such sectors. One reason why growth during the period has mapped so clearly into poverty reduction is that before the boom, coffee farmers were as poor as the average Ugandan.

More generally, the period studied may mark the transition of Uganda from recovery to fresh growth. Although long term comparisons are problematic, it appears that Uganda has now returned to the real income levels enjoyed in the early 1970s. The process of recovery to those income levels may have involved a pattern of growth that is quite different from what will arise with subsequent development. Recovery has necessitated the rehabilitation of traditional export crops, the restoration of the public sector and a reversal of the retreat to subsistence. Although it is hard to predict what will be the nature of future growth, it is unlikely to be a simple continuation of the processes of recovery. These considerations imply a need to continue monitoring poverty and living standards at the microeconomic level.

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Table 1: Adjusted comparison of mean consumption per capita (Ush. Per month)

a) Total:

	IHS 92/93	MS-1 93/94	MS-2 94/95	MS-3 95/96	MS-4 97/98
As calculated in official reports	11574	13195	15221	17499	20540
1. excluding Kasese, Kitgum, Gulu & Bundibugyo	11786	13501	15388	17721	20747
2. adjusting for public transport fares	11981	-	-	-	-
3. revaluing home consumed food at market prices	12769	14748	16643	18568	21976
4. adjusting for regional prices	13187	15267	17064	18973	22139
5. adjusting for inflation (1989 prices)	5452	5825	6058	6187	6353
6 reweighting MS-1	5452	5718	6058	6187	6353

b) Rural

	IHS 92/93	MS-1 93/94	MS-2 94/95	MS-3 95/96	MS-4 97/98
As calculated in official reports	9547	10116	12470	14303	17210
1. excluding Kasese, Kitgum, Gulu & Bundibugyo	9675	10351	12564	14411	17367
2. adjusting for public transport fares	9788	-	-	-	-
3. revaluing home consumed food at market prices	10633	11685	13887	15323	18714
4. adjusting for regional prices	11400	12571	14669	16082	19141
5. adjusting for inflation	4701	4794	5206	5242	5488
6. reweighting MS-1	4735	4862	5206	5242	5488

c) Urban

	IHS 92/93	MS-1 93/94	MS-2 94/95	MS-3 95/96	MS-4 97/98
As calculated in official reports	25869	34092	34334	37194	42047
1. excluding Kasese, Kitgum, Gulu & Bundibugyo	26697	35177	35312	38929	42746
2. adjusting for public transport fares	27471	-	-	-	-
3. revaluing home consumed food at market prices	27858	35833	36085	39362	43205
4. adjusting for regional prices	25805	33822	33957	37498	41647
5. adjusting for inflation	10752	12919	12067	12246	11979
6. reweighting MS-1	10752	11645	12067	12246	11979

Table 2: Shares of total consumption (percentages)

	IHS	MS-1	MS-2	MS-3	MS-4
Food	58.58	58.18	54.95	52.91	53.69
Beverages & tobacco	3.45	4.29	4.52	3.83	4.56
Restaurants	1.37	2.28	2.01	1.9	2.21
Clothing & footwear	4.5	4.35	3.96	5.04	4.18
Other goods	7.1	4.92	5.7	6.63	6.44
Rent, fuel & power	12.53	13.94	14.8	14.52	14.15
Transport & comm.	0.72	2.45	3.02	3.64	3.43
Health	4.14	3.32	4.22	3.27	4.59
Education	5.26	5.15	5.21	6.05	4.92
Other services	2.36	1.12	1.59	2.21	1.84

Nominal shares excluding Kitgum, Kasese, Bundibugyo and Gulu districts; reweighting MS-1

Table 3: index of value of home consumption at market prices to value at farm gate prices

	IHS	MS-1	MS-2	MS-3	MS-4
national	123	135	137	121	131
central,rural	123	163	138	123	131
central,urban	131	138	139	128	134
east,rural	124	120	142	123	139
east,urban	141	130	142	119	135
west,rural	118	118	131	120	133
west,urban	122	135	136	120	121
north,rural	125	143	137	114	113
north,urban	145	135	136	116	133

Table 4: Regional food price indices

	IHS	MS-1	MS-2	MS-3	MS-4
national	100	100	100	100	100
central,rural	103	114	107	112	108
central,urban	128	123	125	125	113
east,rural	88	81	89	91	99
east,urban	114	100	104	97	108
west,rural	87	78	82	86	91
west,urban	97	85	91	96	98
north,rural	80	79	81	76	83
north,urban	92	88	88	84	93

Table 5: National accounts estimates of private consumption per capita

Fiscal Year	Nominal (sh/month)	Real (1989 prices)	% Growth
1991/92	12094	6205	
1992/93	16167	6380	2.8
1993/94	16949	6275	-1.6
1994/95	19824	6917	10.2
1995/96	22151	7192	4.0
1996/97	24070	7243	0.7
1997/98	26067	7414	2.4

Notes:
Data is in fiscal years (1st July to 30th June).
Real consumption is obtained using the CPI as a deflator.
Source: national accounts data are unpublished figures supplied by the Statistics Department, Ugandan Ministry of Economic Planning

Table 6: Equivalence scales and daily calorific requirements

Age	Male			Female			Equivalence scale
1	820			820			0.273
1-2	1150			1150			0.383
2-3	1350			1350			0.450
3-5	1550			1550			0.517
5-7	1850			1750			0.617
7-10	2100			1800			0.700
10-12	2200			1950			0.733
12-14	2400			2100			0.800
14-16	2650			2150			0.883
16-18	2850			2150			0.950
	Type of work						
	Light	Medium	Heavy	Light	Medium	Heavy	
18-30	2600	3000	3550	2000	2100	2350	1
30-60	2500	2900	3400	2050	2150	2400	0.977
>60	2100	2450	2850	1850	1950	2150	0.845
				+285 if pregnant (last 3 months)			
				+500 if breast-feeding (first 6 months)			

Source: WHO (1985)
Note: equivalence scales are gained by dividing male calorific requirements by 3000
Age ranges are of the form x (inclusive) to y (exclusive) years eg 1 refers to below one year of age.

Table 7: Derivation of the food poverty line (MS-1 prices)

Food item	1. Quantity (kg per month)	2. Price (Ush/kg)	3. Calories/kg	4. Retention	5. Calories per day	6. Cost per month (Ush 1993 prices)
matooke	28.54	67	770	0.50	366	1903
sweet potatoes	34.12	63	1020	0.70	812	2133
cassava	9.02	200	2557	0.89	684	1804
Irish potatoes	0.36	250	750	0.85	8	89
rice	0.06	700	3600	1.00	7	42
maize (grain)	0.30	400	3470	0.90	32	121
maize (flour)	1.54	350	3540	1.00	181	538
bread	0.02	1300	2490	1.00	1	20
millet	2.25	300	3231	0.65	158	676
sorghum	1.57	200	3450	0.90	163	314
beef	0.31	1100	2340	0.80	19	339
other meat	0.05	1000	2340	0.75	3	52
chicken	0.09	1167	1460	0.61	3	111
fresh fish	0.62	467	1030	0.60	13	290
smoked fish	0.39	583	3005	0.70	28	229
eggs	0.00	2000	1490	0.88	0	8
milk	0.55	400	640	1.00	12	219
cooking oil/ghee	0.06	1400	8570	1.00	18	89
passion fruits	0.10	382	920	0.75	2	37
sweet bananas	2.34	50	1160	0.56	51	117
onions	0.18	323	480	0.80	2	57
tomatoes	0.70	192	200	0.95	4	134
cabbages	0.33	125	230	0.78	2	41
beans (fresh)	0.73	400	1040	0.75	19	292
beans (dry)	2.86	350	3300	0.75	236	1002
groundnuts	0.59	600	2350	0.93	43	355
sim-sim	0.45	222	5930	1.00	89	100
sugar	0.35	1000	3750	1.00	44	352
TOTAL					3000	11463

Table 8: Regression of food share

Variables	Coefficients	T-ratio
Constant	0.550	60.55
log consumption per capita divided by food poverty line	0.060	11.89
square of log consumption pc divided by food poverty line	-0.053	-19.84
central rural	-0.119	-15.26
eastern urban	0.044	5.48
eastern rural	-0.052	-6.46
western urban	0.066	8.44
western rural	-0.020	-2.50
northern urban	0.029	3.52
northern rural	-0.031	-3.65
household size	0.008	1.54
women-headed household	0.006	1.05
The following variables are as proportions of household size:		
boys aged <6 years	0.071	3.99
girls aged <6 years	0.089	4.81
boys aged 6-12 years	0.052	2.62
girls aged 6-12 years	0.047	2.34
boys aged 13-17 years	0.041	1.92
girls aged 13-17 years	0.022	1.00
women aged 18-59	0.056	4.41
men aged 60+	0.082	5.33
women aged 60+	0.075	4.32
Number of observations:	4962	
Adjusted R-squared	0.255	
Mean of dependent variable	0.586	

Table 9: Poverty lines in Uganda (1993 prices)

region	1. predicted food share	2. poverty line (national prices)	3. Food poverty line (nominal)	4. Poverty line (nominal)
Central rural	0.609	15947	13971	19435
Central urban	0.49	17314	14837	22409
Eastern rural	0.653	15446	8832	11900
Eastern urban	0.557	16548	11300	16312
Western rural	0.675	15189	8209	10877
Western urban	0.589	16174	9245	13043
Northern rural	0.638	15610	8410	11452
Northern urban	0.578	16304	9433	13417
National (average)	0.566	16443	11463	16443

Nominal lines are shown for information only and are not used in the analysis

Table 10.1.1: Poverty in the IHS (relative to total poverty line)

	Pop. Share	Mean CPAE	P0	P1	P2	Contribution to P0	P1	P2
national	100	7108	55.5	20.4	9.94	100	100	100
rural	87.6	6160	59.4	22.1	10.86	93.7	95	95.7
urban	12.4	13806	28.2	8.3	3.46	6.3	5	4.3
central	30.6	9330	45.5	15.6	7.21	25.1	23.4	22.2
east	27.9	6185	59.2	22.1	10.93	29.7	30.3	30.7
west	24.2	6501	52.8	18.7	9.03	23	22.2	21.9
north	17.3	5514	71.3	28.3	14.47	22.2	24.1	25.2
central rural	22.7	6923	52.8	19	8.95	22	21.1	20.4
central urban	8	16180	21.5	5.9	2.26	3.1	2.3	1.8
east rural	25.4	5893	61.1	23.1	11.5	27.9	28.8	29.3
east urban	2.5	9130	40.6	12	5.16	1.8	1.5	1.3
west rural	23.1	6258	53.8	19.2	9.33	22.4	21.8	21.7
west urban	1.1	11720	29.7	7.3	2.6	0.6	0.4	0.3
north rural	16.5	5384	72.2	28.7	14.66	21.4	23.2	24.3
north urban	0.8	8025	52.6	20.6	10.76	0.8	0.9	0.9

Table 10.1.2: Poverty rates relative to the food poverty line (only) in the IHS

	Pop. share Share	Mean CPAE	P0	P1	P2	Contribution to P0	P1	P2
national	100	7108	35.8	11.1	4.86	100	100	100
rural	87.6	6160	39.2	12.3	5.39	96.1	96.9	97.2
urban	12.4	13806	11.4	2.8	1.1	3.9	3.1	2.8
central	30.6	9330	25.4	7.3	3.02	21.8	20.1	19
east	27.9	6185	40	12.5	5.45	31.2	31.4	31.3
west	24.2	6501	34	10.6	4.67	23	23.1	23.2
north	17.3	5514	49.7	16.3	7.44	24.1	25.4	26.5
central rural	22.7	6923	31.8	9.4	3.91	20.2	19.1	18.2
central urban	8	16180	7.2	1.4	0.51	1.6	1	0.8
east rural	25.4	5893	42.2	13.3	5.82	29.9	30.3	30.4
east urban	2.5	9130	18	4.7	1.72	1.3	1.1	0.9
west rural	23.1	6258	35.1	11.0	4.85	22.6	22.9	23
west urban	1.1	11720	10.8	2.1	0.67	0.3	0.2	0.1
north rural	16.5	5384	50.7	16.5	7.55	23.3	24.5	25.6
north urban	0.8	8025	31.5	11.2	5.31	0.7	0.9	0.9

CPAE = consumption per adult per equivalent (1989 shillings per month)

Table 10.2.1: Poverty in the MS-1 (relative to total poverty line)

Sector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
national	100	7422	52.2	17.0	7.59	100	100	100
rural	87.4	6365	56.7	18.7	8.40	95.0	96.0	96.7
urban	12.6	14741	20.6	5.4	1.99	5.0	4.0	3.3
central	31.4	10240	35.6	10.6	4.39	21.5	19.5	18.2
east	26.5	6117	58.0	19.7	9.17	29.5	30.8	32.1
west	26.3	6543	56.0	17.6	7.47	28.2	27.2	26.0
north	15.7	5464	69.2	24.4	11.51	20.8	22.5	23.8
central rural	23.1	7758	43.4	13.2	5.56	19.2	17.9	16.9
central urban	8.3	17140	14.2	3.4	1.15	2.3	1.7	1.3
east rural	24.5	5789	60.2	20.7	9.67	28.3	29.8	31.3
east urban	2.0	10113	30.5	7.8	2.95	1.2	0.9	0.8
west rural	25.2	6306	57.4	18.1	7.70	27.7	26.7	25.5
west urban	1.2	11594	24.9	7.4	2.75	0.6	0.5	0.4
north rural	14.6	5231	70.9	25.3	11.96	19.8	21.6	23.0
north urban	1.1	8517	46.2	13.6	5.68	1.0	0.9	0.8

Table 10.2.2: Poverty rates relative to the food poverty line (only) in the MS-1

ector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
national	100	7422	30.4	8.3	3.24	100	100	100
rural	87.4	6365	33.8	9.3	3.65	97.1	97.9	98.3
urban	12.6	14741	7.0	1.4	0.44	2.9	2.1	1.7
central	31.4	10240	16.2	4.1	1.52	16.7	15.6	14.7
east	26.5	6117	35.5	10.3	4.23	31.0	33.0	34.7
west	26.3	6543	34.5	8.6	3.13	29.9	27.3	25.4
north	15.7	5464	43.6	12.7	5.22	22.5	24.0	25.2
central rural	23.1	7758	21.0	5.4	2.01	15.9	15.1	14.3
central urban	8.3	17140	2.7	0.5	0.16	0.7	0.5	0.4
east rural	24.5	5789	37.4	11.0	4.52	30.2	32.5	34.2
east urban	2.0	10113	11.7	2.3	0.71	0.8	0.6	0.4
west rural	25.2	6306	35.5	8.9	3.25	29.3	27.0	25.2
west urban	1.2	11594	14.5	2.2	0.56	0.6	0.3	0.2
north rural	14.6	5231	45.2	13.3	5.47	21.7	23.3	24.6
north urban	1.1	8517	22.2	5.2	1.84	0.8	0.7	0.6

Table 10.3.1: Poverty rates in the MS-2 (relative to total poverty line)

Sector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
National	100	7855	50.1	16.3	7.30	100	100	100
rural	87.6	6820	54.0	17.7	7.95	94.5	95.2	95.4
urban	12.4	15162	22.3	6.4	2.71	5.5	4.8	4.6
central	31.8	11453	30.5	8.5	3.47	19.4	16.6	15.1
east	28.5	5717	64.9	23.7	11.30	36.9	41.3	44.0
west	25.3	6925	50.4	15.0	6.36	25.4	23.3	22.1
north	14.5	5782	63.5	21.1	9.48	18.3	18.7	18.8
central rural	23.7	9294	35.9	10.1	4.10	17.0	14.7	13.3
central urban	8.1	17786	14.6	4.0	1.62	2.4	2.0	1.8
east rural	26.3	5408	66.8	24.7	11.84	35.1	39.8	42.6
east urban	2.2	9448	41.5	11.5	4.75	1.8	1.5	1.4
west rural	24.1	6615	51.6	15.5	6.55	24.8	22.8	21.6
west urban	1.2	13019	25.4	6.6	2.67	0.6	0.5	0.4
north rural	13.5	5590	65.1	21.6	9.62	17.6	17.9	17.8
orth urban	0.9	8561	39.8	15.1	7.47	0.7	0.9	1.0

Table 10.3.2: Poverty rates relative to food poverty line (only) in the MS-2

Sector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
national	100	7855	29.0	8.0	3.16	100	100	100
rural	87.6	6820	31.8	8.8	3.49	96.0	96.5	96.7
urban	12.4	15162	9.3	2.3	0.85	4.0	3.5	3.3
central	31.8	11453	13.0	3.3	1.17	14.2	13.1	11.8
east	28.5	5717	43.4	12.7	5.36	42.6	45.5	48.2
west	25.3	6925	27.9	7.3	2.72	24.4	23.2	21.7
north	14.5	5782	37.9	10.1	4.00	18.9	18.3	18.3
central rural	23.7	9294	15.5	4.0	1.44	12.7	11.9	10.8
central urban	8.1	17786	5.6	1.2	0.36	1.6	1.2	0.9
east rural	26.3	5408	45.8	13.5	5.67	41.5	44.4	47.1
east urban	2.2	9448	14.7	3.9	1.66	1.1	1.1	1.1
west rural	24.1	6615	28.8	7.6	2.81	23.9	22.8	21.4
west urban	1.2	13019	10.2	2.5	0.84	0.4	0.4	0.3
north rural	13.5	5590	38.7	10.3	4.05	18.0	17.4	17.3
north urban	0.9	8561	27.2	7.6	3.24	0.9	0.9	1.0

Table 10.4.1: Poverty rates in MS-3 (relative to the total poverty line)

Sector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
national	100	8091	48.5	16.3	7.64	100	100	100
rural	86.5	6936	53.0	18.1	8.50	94.6	95.6	96.2
urban	13.5	15493	19.5	5.4	2.13	5.4	4.4	3.8
central	28.8	11308	30.1	8.0	3.15	17.8	14.2	11.9
east	30.8	6667	57.5	21.5	10.95	36.5	40.5	44.1
west	25.1	7561	46.7	14.7	6.41	24.1	22.5	21.0
north	15.4	5778	68.0	24.4	11.44	21.5	22.9	23.0
central rural	19.8	8643	37.1	10.0	3.95	15.2	12.2	10.2
central urban	9.0	17198	14.5	3.7	1.39	2.7	2.0	1.6
east rural	28.7	6226	59.4	22.4	11.47	35.1	39.3	43.0
east urban	2.1	12673	31.8	9.4	3.82	1.4	1.2	1.1
west rural	23.8	7225	48.3	15.2	6.67	23.7	22.2	20.8
west urban	1.3	13772	16.2	4.4	1.72	0.4	0.3	0.3
north rural	14.2	5503	70.3	25.3	11.92	20.6	22.0	22.2
north urban	1.1	9210	39.6	12.4	5.34	0.9	0.9	0.8

Table 10.4.2: Poverty rates relative to the food poverty line (only) in MS-3

ector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
national	100	8091	27.9	8.4	3.61	100	100	100
rural	86.5	6936	31.2	9.5	4.08	96.9	97.4	97.7
urban	13.5	15493	6.4	1.6	0.61	3.1	2.6	2.3
central	28.8	11308	11.4	2.8	1.02	11.8	9.7	8.1
east	30.8	6667	37.1	12.5	5.86	41.0	45.6	49.9
west	25.1	7561	26.0	7.3	2.89	23.4	21.8	20.0
north	15.4	5778	43.1	12.5	5.17	23.8	22.9	22.0
central rural	19.8	8643	15.3	3.7	1.33	10.9	8.8	7.3
central urban	9.0	17198	2.9	0.9	0.32	0.9	0.9	0.8
east rural	28.7	6226	38.9	13.2	6.19	40.0	44.9	49.1
east urban	2.1	12673	12.8	3.0	1.29	1.0	0.8	0.8
west rural	23.8	7225	27.0	7.6	3.02	23.0	21.6	19.9
west urban	1.3	13772	8.0	1.5	0.45	0.4	0.2	0.2
north rural	14.2	5503	45.0	13.1	5.44	22.9	22.2	21.4
north urban	1.1	9210	20.2	5.0	1.79	0.8	0.7	0.6

Table 10.5.1: Poverty rates in MS-4

Sector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
national	100	8280	44.0	13.7	5.91	100	100	100
rural	86.7	7225	48.2	15.2	6.56	95.1	95.8	96.3
urban	13.3	15151	16.3	4.3	1.65	4.9	4.2	3.7
central	30.0	11327	27.7	7.7	3.08	18.9	16.9	15.6
east	28.5	6867	54.3	18.4	8.27	35.2	38.3	39.9
west	24.9	7534	42.0	10.8	3.96	23.8	19.7	16.7
north	16.5	6312	58.8	20.9	9.93	22.1	25.1	27.8
central rural	21.3	9069	34.3	9.7	3.94	16.6	15.2	14.2
central urban	8.7	16875	11.5	2.8	0.95	2.3	1.8	1.4
east rural	26.3	6427	56.8	19.4	8.75	33.9	37.1	38.9
east urban	2.2	12012	24.8	6.9	2.68	1.3	1.1	1.0
west rural	23.7	7230	43.2	11.1	4.08	23.3	19.2	16.4
west urban	1.2	13368	19.9	4.6	1.64	0.6	0.4	0.3
north rural	15.4	6021	60.7	21.6	10.31	21.2	24.3	26.8
north urban	1.2	10194	32.6	10.6	4.93	0.9	0.9	1.0

Table 10.5.2: Poverty rates in the MS-4 (relative to the food poverty line only)

Sector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	Contribution to P1	Contribution to P2
national	100	8280	25.1	6.3	2.39	100	100	100
rural	86.7	7225	28.0	7.1	2.69	96.6	97.5	97.7
urban	13.3	15151	6.5	1.2	0.41	3.4	2.5	2.3
central	30.0	11327	13.0	2.7	0.97	15.5	13.0	12.2
east	28.5	6867	34.2	9.3	3.56	38.8	41.7	42.5
west	24.9	7534	21.1	4.2	1.29	21.0	16.5	13.5
north	16.5	6312	37.6	11.1	4.59	24.7	28.9	31.8
central rural	21.3	9069	16.6	3.7	1.32	14.1	12.4	11.8
central urban	8.7	16875	4.1	0.4	0.13	1.4	0.6	0.5
east rural	26.3	6427	36.2	9.9	3.81	37.8	40.9	42.0
east urban	2.2	12012	11.2	2.2	0.57	1.0	0.8	0.5
west rural	23.7	7230	21.9	4.3	1.33	20.6	16.2	13.2
west urban	1.2	13368	6.4	1.3	0.41	0.3	0.2	0.2
north rural	15.4	6021	39.3	11.6	4.77	24.0	28.0	30.7
north urban	1.2	10194	15.6	4.7	2.18	0.7	0.9	1.1

Table 11: T-test statistics for hypothesis of equality of poverty statistics in IHS and MS-4

	Poverty			Food poverty		
	P0	P1	P2	P0	P1	P2
national	14.29	18.74	18.84	14.44	17.92	17.27
rural	10.52	14.62	14.95	11.34	14.34	13.97
urban	11.43	10.77	9.18	6.75	7.71	6.15
central	12.68	14.25	13.21	11.02	12.31	10.74
east	3.25	5.27	6.12	3.92	5.88	6.48
west	6.61	12.09	13.39	9.00	13.41	13.12
north	6.74	7.81	7.25	6.34	6.67	6.32
central rural	9.70	11.32	10.65	9.00	10.08	8.92
central urban	6.36	6.26	5.27	3.12	4.16	2.85
east rural	2.15	4.03	4.79	3.08	4.66	5.17
east urban	7.09	6.10	5.67	4.00	5.15	5.30
west rural	5.16	9.80	10.97	7.22	10.99	10.84
west urban	4.31	3.70	2.84	2.94	2.28	1.61
north rural	4.94	5.88	5.52	4.71	5.06	4.88
north urban	6.38	6.88	6.10	5.94	5.80	4.78

Table 12: Mean consumption per adult equivalent at each decile (1989 shillings per month)

a) National

Decile	IHS	MS1	MS2	MS3	MS4
1	2453	2920	2898	2802	3164
2	3234	3627	3682	3650	3991
3	3955	4319	4403	4492	4798
4	4687	5004	5143	5214	5593
5	5474	5777	5919	6097	6442
6	6384	6745	6792	7114	7535
7	7556	7962	8064	8538	9019
8	9294	9745	9937	10636	10945
9	12237	12946	13748	14905	14503

b) Rural

Decile	IHS	MS1	MS2	MS3	MS4
1	2382	2787	2777	2688	3072
2	3092	3443	3544	3506	3810
3	3777	4096	4222	4267	4531
4	4418	4765	4909	4962	5293
5	5155	5407	5583	5658	6081
6	5941	6256	6391	6529	6961
7	6958	7194	7381	7604	8066
8	8402	8566	8857	9415	9705
9	10724	10815	11751	12487	12575

c) Urban

Decile	IHS	MS1	MS2	MS3	MS4
1	4121	4804	4467	4688	5179
2	5414	6304	6206	6487	6969
3	6679	7810	7360	8213	8650
4	8112	9604	8964	9688	9935
5	9748	11505	10732	11812	11873
6	11435	13453	13484	13816	13577
7	13761	15941	16421	16647	16121
8	17648	19950	20997	20575	21199
9	24513	26723	31006	28338	29873

Table 13: Gini coefficients for Uganda

	Rural	Urban	National
IHS	0.333	0.434	0.382
MS-1	0.303	0.385	0.358
MS-2	0.331	0.415	0.379
MS-3	0.339	0.400	0.385
MS-4	0.317	0.368	0.358

Table 14: Decomposing the change in poverty into growth and distribution components

	Poverty Statistics		Contribution to change in statistics due to		
	IHS	MS-4	Growth	Distribution	Residual
Poverty					
P0	0.5553	0.44	0.1004	0.0133	0.0016
P1	0.2036	0.1371	0.05	0.016	0.0005
P2	0.0994	0.0591	0.0285	0.013	-0.0012
Poverty defined relative to the food poverty line only					
P0	0.3577	0.2514	0.0896	0.0233	-0.0065
P1	0.111	0.0635	0.0331	0.0152	-0.0007
P2	0.0486	0.0239	0.0165	0.01	-0.0017

Table 15.1: poverty by sector of household head, IHS

Sector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to		
						P0	P1	P2
national	100	7108	55.5	20.4	9.94	100	100	100
food crop	47.2	5692	63.7	24.6	12.37	54.1	57.0	58.7
cash crop	23.4	6081	60.1	20.5	9.55	25.3	23.6	22.5
non-crop agricult	2.7	6787	52.8	22.3	11.35	2.5	2.9	3.0
mining	0.1	9467	31.5	0.9	0.03	0.0	0.0	0.0
manufacturing	3.7	8211	44.8	15.7	7.61	3.0	2.9	2.8
public utilities	0.1	9203	33.6	5.8	1.63	0.1	0.0	0.0
construction	1.3	11161	38.2	11.6	4.40	0.9	0.8	0.6
trade	6.7	12682	25.9	7.5	3.22	3.1	2.5	2.2
hotels	0.5	9933	30.4	8.4	3.25	0.3	0.2	0.2
transport/comm.	1.5	10377	31.5	11.1	5.15	0.9	0.8	0.8
misc services	1.6	13763	26.2	10.1	4.96	0.8	0.8	0.8
gov services	6.8	11204	35.0	10.2	4.39	4.3	3.4	3.0
not working	4.3	6917	60.2	24.3	12.45	4.6	5.1	5.4

CPAE = consumption per adult equivalent

Table 15.2: Poverty by sector of household head, MS-3

ector	Pop. share	Mean CPAE	P0	P1	P2	Contribution to P0	P1	P2
national	100	8094	48.5	16.3	7.64	100	100	100
food crop	44.2	5926	62.2	22.5	11.01	56.6	60.8	63.7
cash crop	26.7	7799	43.7	11.7	4.45	24.1	19.2	15.6
non-crop agric.	2.1	8555	39.8	14.2	6.90	1.7	1.8	1.9
mining	0.2	5853	74.2	13.2	2.83	0.3	0.1	0.1
manufacturing	3.3	10854	27.4	8.7	3.62	1.9	1.8	1.6
public utilities	0.1	13609	11.1	1.5	0.21	0.0	0.0	0.0
construction	1.1	9838	34.7	8.3	2.90	0.8	0.5	0.4
trade	6.9	14157	19.4	4.3	1.56	2.8	1.8	1.4
hotels	1.0	11922	19.9	5.1	1.70	0.4	0.3	0.2
transport/comm.	1.9	15210	14.9	6.6	3.23	0.6	0.8	0.8
misc services	2.2	11650	29.1	10.8	4.98	1.3	1.4	1.4
gov services	5.5	12732	28.0	7.1	2.51	3.2	2.4	1.8
not working	4.9	7869	63.4	29.8	17.29	6.5	9.0	11.2

CPAE = consumption per adult equivalent

Table 16: Sectoral decomposition of changes in poverty between IHS and MS-3

	Percentage contribution to:		
	P0	P1	P2
food crop	10.1	24.4	27.7
cash crop	54.4	51.1	51.7
non-crop agriculture	4.9	5.4	5.2
mining	-0.5	-0.2	-0.1
manufacturing	9.1	6.4	6.4
public utilities	0.3	0.1	0.1
construction	0.7	1.1	0.9
trade	6.2	5.2	4.8
hotels	0.8	0.4	0.4
transport/comm.	3.6	1.7	1.3
misc services	-0.7	-0.3	-0.0
gov services	6.8	5.3	5.6
not working	-2.0	-5.9	-9.0
total intra-sectoral	93.8	94.7	94.8
total inter-sectoral	2	3.1	3.5
total interaction	4.2	2.2	1.7

Appendix Table 1: Survey details

	Integrated Household Survey, IHS	First Monitoring Survey, MS-1	Second Monitoring Survey, MS-2	Third Monitoring Survey, MS-3	Fourth Monitoring Survey, MS-4
Duration	Februrary 1992 to March 1993	August 1993 to February 1994	July 1994 to March 1995	September 1995 to June 1996	March 1997 to February 1998
Sample size (usable observatons)	9924	5038	4910	5435	6494
Major omissions in geographic coverage	None	None	Omitted Kitgum district	Omitted Kitgum district	Omitted Kitgum, Kasese, Gulu and Bundibugyo,
Minor differences in geographic coverage	Omitted some rural areas of Kabale district		Omitted parts of Kotido, Moroto, Kasese and Kisoro		
Intended panel feature	Base round	Half of the sample intended to be from same enumeration areas and of these half intended to be same households	As MS-1	As MS-2	No panel element
Non-standard features of household questionnaire	Sections covering many topics, eg anthropometrics			Some qualitative measures of poverty	Some qualitative measures of poverty
Other questionnaires	Household enterprise questionnaires; community questionnaires	Household enterprise questionnaires; community questionnaires		Crop questionnaire; community questionnaire	Labour force questionnaire

Appendix Table 2: Summary of changes in mean consumption per adult equivalent, poverty and inequality

		IHS	MS-1	MS-2	MS-3	MS-4
Mean CPAE	national	7108	7422	7855	8091	8280
	rural	6160	6365	6820	6936	7225
	urban	13806	14741	15162	15493	15151
P0	national	55.5	52.2	50.1	48.5	44
	rural	59.4	56.7	54	53	48.2
	urban	28.2	20.6	22.3	19.5	16.3
P1	national	20.4	17	16.3	16.3	13.7
	rural	22.1	18.7	17.7	18.1	15.2
	urban	8.3	5.4	6.4	5.4	4.3
P2	national	9.94	7.59	7.3	7.64	5.91
	rural	10.86	8.4	7.95	8.5	6.56
	urban	3.46	1.99	2.71	2.13	1.65
Gini	national	0.382	0.358	0.379	0.385	0.358
	rural	0.333	0.303	0.331	0.339	0.317
	urban	0.434	0.385	0.415	0.4	0.368

CPAE = consumption per adult equivalent (1989 shillings per month)

Figure 1: Poverty incidence curves 1992-1997