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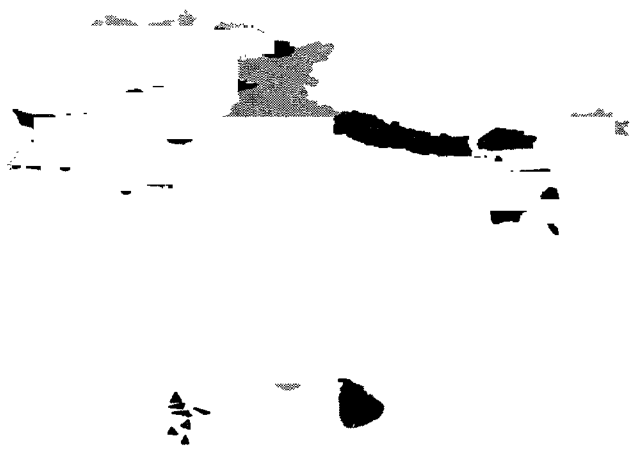

A PROFILE OF POVERTY IN BANGLADESH: 1983-1992

Quentin T. Wodon

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A PROFILE OF POVERTY IN BANGLADESH: 1983-1992

Quentin T. Wodon[1]

University of Namur (F.U.N.D.P.) and Policy Research Department, The World Bank

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Summary

This paper provides an account of the evolution and the determinants of poverty in Bangladesh using four rounds of the unit level data from the Household Expenditure Surveys of the Bangladesh Bureau of Statistics. The surveys cover the period 1983 to 1992, during which poverty increased nationally and in the rural sector, although it decreased in the urban sector. Poverty decompositions indicate that the changes in inequality over the whole period contributed to the rise in poverty. However, over the last three years, a slightly lower inequality dampened the negative impact of the fall in the levels of per capita consumption. For all years, poverty measures are much lower in the urban than in the rural sector. Yet, within each sector, large variations in poverty rates by geographical area are observed. At the household level, land ownership in the rural sector, and occupation and education in the urban sector, are the strongest determinants of poverty. From a methodological point of view, the paper argues in favor of the cost of basic needs method in setting poverty lines as compared to the food energy intake method.

[1] This paper was written while working in the Poverty and Human Resources Division of the Policy Research Department at The World Bank under the supervision of Martin Ravallion. The Bangladesh Bureau of Statistics provided the data used in the paper. The help and/or comments of Shaohua Chen, Gaurav Datt, Andrew Foster, Jyotsna Jalan, Robert Lerman, Martin Ravallion, Binayak Sen, Shekhar Shah, Erik Thorbecke and Qing-hua Zhao are gratefully acknowledged. The author remains sole responsible for the opinions expressed in this paper and any potential errors.

A PROFILE OF POVERTY IN BANGLADESH: 1983-1992

TABLE OF CONTENTS

LIST OF TABLES

Data and Methodology

Changes over Time

Univariate Poverty Profile

Multivariate Poverty Profile

Appendix II

LIST OF FIGURES

Multivariate Poverty Profile

Appendix II

LIST OF MAIN SYMBOLS

Household Characteristics

n_i	size of household i
x_i	per capita food consumption of household i
$\mathbf{x}_i$	vector of characteristics of household i in probit and tobit regressions
x_{iA}	characteristic A of household i (may be continuous or dummy)
Y_i	total consumption of all members of household i
y_i	per capita total consumption of household i

Poverty Decompositions

μ^t	mean level of per capita consumption at time t
P_i^t	poverty among household group i at time t
P_L	poverty with lower poverty line
P_r	poverty in rural sector
P_u	poverty in urban sector
P_U	poverty with upper poverty line
π^t	lorenz curve at time t
w_i	population share of group i

Poverty Lines

γ	food energy intake
S_{ki}	share of non food expenditure for household i in area k
z	poverty line
Z_{kf}	food poverty line in area k
Z^L_{kn}	lower provision for non food consumption in area k
Z^U_{kn}	upper provision for non food consumption in area k
Z^L_k	lower poverty line in area k
Z^U_k	upper poverty line in area k
z_L	lower poverty line (subscript k omitted)
z_U	upper poverty line (subscript k omitted)

Poverty Measures

H	headcount index of poverty
P_α	poverty measure of the FGT class
P_1	poverty gap index
P_2	squared poverty gap index

Poverty Regressions

h_{iL} headcount index for household i (1 if poor, 0 if non poor) with the lower poverty line
h_{iL} headcount index for household i (1 if poor, 0 if non poor) with the upper poverty line
pg_{iL} poverty gap of household i with the lower poverty line
pg_{iU} poverty gap of household i with the upper poverty line
ϕ normal density function
Φ cumulative normal density function
spg_{iL} squared poverty gap of household i with the lower poverty line
spg_{iU} squared poverty gap of household i with the upper poverty line

Subscripts and Superscripts

i household subscript
j food item subscript
k area subscript
L lower poverty line subscript or superscript
r rural subscript
t time superscript
u urban subscript
U upper poverty line subscript or superscript

Unit Values Regressions

δ_{jk} coefficient of area dummy k in unit in the value regression for food item j
P_{jr} median price of food item j in area the reference area
P_{jk} expected price of food item j in area k
P_{ji} implicit price of food item j payed by household i
Q_{ji} quantity of food item j consumed by household i
V_{ji} value of the quantity of food item j consumed by household i

Appendix II

P_i poverty measure of area i;
n number of areas;
μ mean poverty measure over all areas (weighted by population shares);
s_i normalized poverty measure of area i;
R_i rank of area i among all area ranked by the poverty measure;
F_i normalized rank of area i (F_i takes a value between 0 and 1);

Introduction

What is the extent of poverty in Bangladesh? How has it evolved over time? Who are the poor? Why are they poor? For many years, only partial answers could be provided to these questions due to the unavailability of the unit level data from the Household Expenditure Surveys of the Bangladesh Bureau of Statistics (BBS). These data have been made available for this study. The result is a much more precise profile of poverty in the country over the period 1983 to 1992.

Poverty in Bangladesh is worth studying. The country is one of the poorest and most populated in the world. Despite its progress toward macroeconomic stability and growth, it still has a per capita GDP of only $220. Infant and child mortality rates are high, although they are declining. Life expectancy at birth is 57 years. Two thirds of the children under six years of age suffer from moderate to severe malnutrition. Illiteracy prevails among the adult population.

While the extent of deprivation in Bangladesh makes it all the more important to monitor its evolution, a consensus has yet to emerge on the trends in poverty since the early 1980's. These trends have been the subject of a lasting debate which started with contributions from The World Bank and Rahman and Haque (1988). According to these early studies, from the mid 1970's to the mid 1980's, the country experienced a steady growth in per capita income, a relatively stable income distribution, and thereby a decline in poverty. Concerns remained, however, about the very poor. Some evidence led Khan (1990) and Osmani (1990) to argue that extreme poverty increased towards the second half of the 1980's. Chowdhury (1992) rejected Khan and Osmani's arguments, but the ensuing debate between Chowdhury (1993) and Osmani (1993a, 1993b) did not resolve the dispute. Moreover, as noted by Ravallion (1990) and Ravallion and Sen (1996), differences in methods contributed to the fact that various authors reached different conclusions.

New studies have been recently conducted on poverty in Bangladesh. Some studies are based on grouped data published by the BBS. These studies indicate that in both rural and urban areas, poverty tended to increase in the second part of the 1980's and/or in the early 1990's (Khundker, Mahmud, Sen, and Ahmed, 1994; Hossain and Sen, 1992; Ravallion and Sen, 1996). Other studies are based on a smaller scale but more in depth survey conducted by the Bangladesh Institute of Development Studies (see the essays edited by Rahman and Hossain, 1995). The studies and the official measures of poverty published by the BBS (1995b) confirm that little or no progress was achieved over the last few years in reducing the incidence of poverty (Table 1).

Our investigation includes four Household Expenditure Surveys spanning the years 1983 to 1992. Because of the availability of unit level data, we are able to take into account in the construction of our poverty lines not only differences in the cost of living between the urban and rural sectors, but also differences between geographical areas within each sector. Moreover, we are able to analyze not only the extent and evolution of poverty, but also its main determinants.

The paper is organized as follows (see Figures 1 to 4 for a methodological overview of our approach.) The first section describes the data and the methodology adopted for the definition of the poverty lines and the choice of the poverty measures. The second section analyses the changes in poverty measures over time at the national, urban, and rural levels, and presents the results of poverty decompositions to account for these changes. The third section presents a poverty profile of the country with univariate tabulations by, among others, geographical area, demographic characteristics, education level, occupation, and land ownership. The fourth section presents the results of probit and tobit multivariate regressions and compares these results with those obtained with univariate tabulations. We conclude with a summary of the findings. It should be pointed out at the outset that this paper is devoted to measurement issues, not to policy analysis. Some of the policy implications of our findings are discussed elsewhere (Wodon, 1996a, 1996b, 1996c; Ravallion and Wodon, 1996). Also, on broader policy issues, the reader is referred to other publications (e.g. World Bank, 1990, 1995.)

1. Data and Methodology

1.1. Data. Four rounds of the Household Expenditure Surveys of the Bangladesh Bureau of Statistics (hereafter BBS) are used, corresponding to the years 1983/84, 1985/86, 1988/89, and 1991/92. The survey for 1981/1982 is not included because it is not comparable to the other years (Khan, 1990; Ravallion and Sen, 1995). The four rounds cover from 3,840 to 5,760 households. A number of tests were applied to the data to check for anomalies (see Appendix I). Only 5 to 25 households were deleted per survey year following these tests. In 1985/86 however, more than 250 households with the same consumption information appeared to be duplicated (most random samples of 16 households seem to include a duplicated household). Because these households span the whole spectrum of per capita expenditures, they do not severely affect the estimates of poverty for that year. Yet, there is little doubt that they should be deleted.

1.2. Geographical Areas. In each of the four rounds, information is provided as to the geographical location of the households according to four (or five in 1991/92) divisions comprising twenty regions, and according to four strata, three urban and one rural. Out of all the potential combinations of regions and strata, fourteen geographical areas were defined for the poverty profile. The choice of these fourteen areas resulted from two constraints: each area had to represent a meaningful aggregate, and to have a reasonable sample size. The sample sizes after data cleaning for the fourteen areas are provided in Table 2. The first and fifth areas, labeled Dhaka 1 and Chittagong 1, consist of the Dhaka and Chittagong Standard Metropolitan Areas. The second and sixth areas, Dhaka 2 and Chittagong 2, include the other urban households in the Dhaka and Chittagong divisions. The remaining urban households, wether they live in the two last Standard Metropolitan Areas or in other urban areas, are grouped in the Kuhlna 1 and Rajshahi 1 areas. Finally, in each of the four divisions, the rural households have been allocated to two sub-areas according to their geographical proximity and level of economic development.

I.3. Poverty Lines. Two main methods are used in the literature to compute poverty lines: the food energy intake method and the cost of basic needs method (Ravallion, 1994). Traditionally, the Bangladesh Bureau of Statistics has relied on the food energy intake method. If we denote by γ the food energy intake of a household, γ^{ref} the normatively determined food requirement, y the total consumption of the household, and $E(\gamma|y)$ the expected value across the households of the food energy intake conditional on total consumption, the method consists in finding the value of the poverty line z for which $E(\gamma|z) = \gamma^{ref}$. By contrast, the cost of basic needs method is based on the estimation of the price of a bundle of goods that meets pre-determined basic needs. Ravallion (1994), Ravallion and Bidani (1994) and Ravallion and Sen (1995) have presented arguments against the food energy intake method and in favor of the cost of basic needs approach[1]. Further arguments and illustrations of the advantages of the cost of basic needs method in the specific case of Bangladesh are presented in Appendix II. The cost of basic needs method is therefore used here. Three steps are needed to implement it.

The first step for the cost of basic needs method consists in the definition of a bundle of food items meeting an exogenously defined normative nutritional requirement. Following Alamgir (1974), Ahmad and Hossain (1984), Rahman and Haque (1988), Ravallion and Sen (1995), Sen (1995), Hossain and Sen (1995), and a number of others, we have set nutritional requirements at the level of 2,112 calories and 58 gm of protein per day and per person, in accordance with the FAO standards for South Asian countries. Many food bundles could provide these nutritional requirements. Our own food bundle follows that of previous authors and is presented in Table 3.

The second step consists in an estimate of the cost of the food bundle. Food prices may vary across geographical areas and rural prices are often not available. To compare prices across areas, some researchers have proposed to estimate rural prices on the basis of the published urban prices discounted by a fixed factor. To compare prices across time, broad cost of living indices such as the CPI have been used. In the case of Bangladesh, both methods seem flawed. Using only two indices for the rural and urban areas does not take into account price differences within the rural and urban sectors. And using the CPI to update urban prices appears inappropriate because the CPI includes more than 100 items, many of which are not affordable for the poor.

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[1] One of the main drawbacks of the food energy method is that it may yield poverty lines which do not correspond to similar levels of well being across sectors or geographical areas. If urban households are better off than rural households, they may (a) buy better quality food, and (b) have the opportunity to spend more on non food items. Thereby, urban households may meet their food requirements at higher levels of per capita consumption than rural households, not so much because of relative price differences, but because of differences in variables such as income or tastes, in which case the urban poverty lines will be overestimated.

The alternative method adopted in this paper for this second step consists in the computation of implicit prices or unit values by geographical area for each of the components of the normative food bundle. For a given household, the unit values for the various food items in the food bundle are obtained by dividing the reported food expenditure by the quantity consumed. One may be tempted to simply estimate the mean unit values for the various food items by geographical area, but this may yield biased estimates of the food prices encountered by the poor. For example, if the quality of the food purchased is a normal good, the mean unit values will tend to increase with the mean consumption level of the households. Then, at the aggregate level in each geographical area, a rise in the standards of living of, say, the better-off will raise the mean prices of food, and thereby the food poverty line. If the poor keep buying lower level food items whose price may not have risen, the estimated poverty line will result in an overestimation of poverty. Moreover, if the characteristics of the households differ by geographical areas, the estimated mean unit values will be affected by these characteristics, and they will not accurately represent the food price differentials confronted by poor households in different areas. Once again, we will lack an adequate index of the relative area price differences.

To compute prices controlling for households characteristics, we defined for household i the unit value for the food category j as $P_{ji} = V_{ji}/Q_{ji}$, where Q_{ji} is the quantity purchased and V_{ji} is the value of the consumption for item j. Following Chen and Ravallion (1996), for each food item j, we then regressed the unit values against area dummies and household characteristics:

$$\text{Log}P_{ji}=\alpha_j+\beta_{1j}\log(Y_i/n_i)+\beta_{2j}[\log(Y_i/n_i)]^2+\delta'_j\mathbf{D}_i+\Gamma'_j\mathbf{X}_i+\pi'_j\mathbf{W}_i+\Omega'_j\mathbf{E}_i+\varepsilon_{ji} \quad (1)$$

where Y_i is the consumption expenditure of the household, n_i is the household size, **D** is a vector of dummy variables for the geographical areas, **W** is a vector of dummy variables for the highest education level among the members of the household, **X** is a vector of dummy variables for the employment status of the head of the household, and **E** is a vector of demographics. Note that we excluded from the computation of total expenditures for each household the amount spent on ceremonial activities for marriages, funerals, and birthdays because these tend to be non-recurrent.

The regression coefficients on the area dummy variables can be used to estimate the differences in food prices purged of quality differences. The expected food price payed for item j in area k by a household with the characteristics corresponding to the omitted dummy variables in the unit values regressions will be $P_{jk} = \exp(\delta_{jk})\, P_{jr}$ where r is the reference area omitted in the regression. Two points should be mentioned here. First, the omitted dummies in the regression should be representative of the poor. In our analysis, we excluded the dummy variables corresponding to illiterate and landless or near landless household heads working in the agricultural sector. Second, because the prices of the reference area P_{jr} carry with them the household characteristics of that area, the area should be representative of the country as a whole. If the Dhaka Standard Metropolitan Area had been chosen as the reference area, even controlling for household characteristics, the prices P_{jr} would have been those of relatively well off households as compared to the national distribution. The reference area we chose corresponds to the households living in the rural stratum of the old districts of Dhaka and Mymensingh. Having estimated the prices of each of the items in our normative food bundle for each of the geographical areas and for the four years of data, the corresponding food poverty lines are computed as $Z_{kf} = \Sigma_j P_{jk}F_j$, where F_j is the per capita quantity of food item j in the bundle[2].

Our method to compute the food poverty lines for each of the fourteen geographical areas could be challenged on several grounds. It could be argued that using a common food bundle for the whole country is inadequate because cultural consumption patterns of households may vary across areas (e.g. households in coastal areas may eat more fish). Because households may reach their nutritional requirements with different bundles, using a unique bundle may lead to bias in the estimates of the cost of food basic needs. Moreover, if prices vary by area, using a fixed food bundle does not allow for substitution by the households. Other difficulties such as seasonality in food prices, potential omitted variables or selectivity bias in the choice of food items consumed, or errors of measurement in the database for the imputation of food produced and consumed at home, may lead to bias in the estimates of food prices. Yet, for practical purposes, these considerations should not worry us. As shown in Table 3, the food poverty lines are relatively close to each other across all areas. Or at least, as we shall now see, they are closer to each other than the estimates of the non-food allowances, for which assumptions matter far more.

Once the food component of the poverty lines has been estimated, the third step in the construction of the area poverty lines consists in the estimation of a reasonable allowance for non food consumption. Without unit level data, this allowance may have to be determined somewhat arbitrarily. In the case of Bangladesh, the allowance for non food goods was set at 30 percent of a food poverty line in rural areas by Hossein and Sen (1992), and at 40 percent of a food poverty line in urban areas by Sen and Islam (1993). Rahman and Haque (1988) used 25 percent in both sectors, while Ravallion and Sen (1996) used 35 percent. Here, because of the availability of unit level data, we follow a methodology based on the actual non food expenditures for households with per capita consumption near the poverty line (Ravallion, 1994, appendix 1). Two cases, each of them corresponding to a different definition of "near the poverty line", are considered.

In the first case, the amount of non-food expenditures for the households (in geographical area k) whose *total* consumption is equal to the regional food poverty line Z_{kf} is computed. Because these households have a *total* per capita expenditure near the food poverty line, any amount they spend on non food items must be deducted from the budget necessary to fulfill the

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[2] Our estimates of the prices of the items in our normative food bundle appear to be good. For example, our food prices for the Dhaka SMA in 1991/1992 are slightly lower than those reported for 1991 in the 1992 Statistical Yearbook of Bangladesh (BBS, 1993: 545, Table 10.16), which is consistent with the fact that we have controlled for household characteristics through our unit values regressions.

normative nutritional requirements of the members of the household. That is, these households do *not* meet the nutritional requirements. The amount spent on non-food items by these households is denoted by Z^L_{kn}. Algebraically, denoting by y_i the total per capita expenditure of household i, and by x_i its per capita food expenditure, we thus have $Z^L_{kn} = E[y_i - x_i \mid y_i = Z_{kf}]$.

In the second case, the share of the non-food expenditures for the households whose *food* expenditure is equal to the food poverty line is computed. On average, the households in this group are thus exactly able to meet their basic nutritional requirements. Algebraically, the amount spent on non-food items by these households, denoted by Z^U_{kn}, corresponds to $Z^U_{kn} = E[y_i - x_i \mid x_i = Z_{kf}]$. Because the households who spend Z^U_{kn} on non food items are able to meet their nutritional requirements, while the households who spend Z^L_{kn} are not, we would expect that the mean income of the upper group is larger than that of the lower group. Moreover, because households with higher incomes tend to spend more on non food items than households with lower incomes, we would expect Z^U_{kn} to be larger than Z^L_{kn}, which is indeed observed.

Having estimated in each geographical area a food poverty line Z_{kf} and two non food poverty lines Z^L_{kn} and Z^U_{kn}, we may add these two components to obtain two overall poverty lines for each geographical area. It may be worth emphasizing that both poverty lines are defined in such a way that the households with the corresponding level of per capita expenditures should be able to meet their normative nutritional requirements. The difference between the two lines lies only in the generosity of the allowance for non food consumption. Specifically, we have:

Lower poverty line: $Z^L_k = Z_{kf} + Z^L_{kn}$, where $Z^L_{kn} = E[y_i - x_i \mid y_i = Z_{kf}]$ (2.1)

Upper poverty line: $Z^U_k = Z_{kf} + Z^U_{kn}$, where $Z^U_{kn} = E[y_i - x_i \mid x_i = Z_{kf}]$ (2.2.)

Two methods, one parametric and one non-parametric, were used to estimate the non-food components Z^L_{kn} and Z^U_{kn}. In the parametric case, denoting by S_{ki} the share of the food expenditure for household i in area k, food Engle curves were estimated:

$$S_{ki}=\alpha_{k0}+\alpha_{k1}B_{ki}+\alpha_{k2}C_{ki}+\alpha_{k3}A_{ki}+\beta_{k1}Log(x_{ki}/Z_{kf})+\beta_{k2}[Log(x_{ki}/Z_{kf})]^2+\varepsilon_{ki} \quad (3)$$

where B_{ki}, C_{ki}, and A_{ki} represent the number of babies (below age 5), children (between 6 and 14) and adults (above 15) in the household, and x_{ki} represents as before the food expenditures of the household. If we write $\alpha_k = \alpha_{k0} + \alpha_{k1} B_{ki} + \alpha_{k2} C_{ki} + \alpha_{k3} A_{ki}$, then α_k denotes the food share of a household in area k whose total expenditure is just equal to the food poverty line (the two logarithmic terms are equal to zero when x_{ki} is equal to Z_{kf}). The lower poverty line is then $Z^L_k = Z_{kf}(2 - \alpha_k)$, which is the sum of the allowance for food consumption Z_{kf}, and the allowance for non-food consumption $Z_{kf}(1 - \alpha_k)$. The upper poverty line $Z^L{}_k$ can also be computed from equation (3) using approximation methods such as Newton's (see Ravallion, 1994: 122).

In the non-parametric case, the average expenditures on non-food items were computed for the households whose total expenditures fell in ten intervals in the neighborhood of, respectively, $x_i = Z_{kf}$ and $y_i = Z_{kf}$. For the lower poverty line, the ten intervals were defined by taking into account the households with a total consumption equal to the food poverty line plus or minus 1, 2, ..., 10 percent. For the upper poverty line, the same procedure was applied for the households with a food expenditure equal to the food poverty line plus or minus 1, 2, ... 10 percent. The mean values across the ten intervals were taken as the estimate of the non-food components for the lower and upper poverty lines (this places the highest weight on the non-food consumption of the households in the 1 percent interval because they are also included in the nine other intervals). Because the non-parametric method proved more stable than the parametric one, the chosen estimates for the non-food components were the non-parametric ones.

The final lower and upper poverty lines by geographical area (which shall as of now simply be denoted by z_L and z_U for simplicity) are given in Table 4. A few comments are worth making about these final poverty lines. As mentioned earlier, the households with a per capita consumption equal to the lower poverty line are not, on average, meeting their nutritional requirements, while the households with a per capita consumption equal to the upper poverty line are exactly, on average, meeting their nutritional requirements. The differences between the two poverty lines are large (Figure 5.) In 1991/92, on average, across geographical areas, the lower and upper poverty line are equal, respectively, to 1.28 and 1.57 times the food poverty line. The provision for non food expenditures is thus twice as high with the upper than with the lower poverty line. This illustrates how the value of final poverty lines is sensitive to underlying assumptions even within a given methodology (cost of basic needs.) Yet, as we shall see, the rankings by household characteristics obtained through poverty comparisons are similar with the two poverty lines. In other words, despite the variability in the poverty lines, our poverty comparisons appear to be robust. Also note that the two poverty lines provide an interval in which the poverty lines used by other authors tend to fall. We would thus expect to obtain estimates of poverty which also provide an interval in which the estimates of poverty of other authors fall, as is indeed the case with the various estimates provided in Table 1.

Not only the two poverty lines, but also the differences between the lower and upper poverty lines are much larger for the urban than for the rural geographical areas. The later difference is largely due to the fact that urban households tend to (or have to) spend a larger fraction of their income on non food items. In Chittagong, the upper poverty line is 90 percent higher than the food poverty line (compare with the national average of 57 percent cited earlier), while the lower poverty line is only 36 percent higher (compare with the national average of 28 percent cited earlier). This reflects the higher cost of non food items in urban areas. In 1991, according to the 1992 Statistical Yearbook of Bangladesh (BBS, 1993: 451, Table 10.12 - 10.14), Chittagong was an area where the cost of non food items was high and rising rapidly.

I.4. Poverty Measures. Three poverty measures are used for the poverty profile. The incidence of poverty is measured by the head-count index H, which is simply the percentage of the population living in households with a consumption per capita below the poverty line. The depth of poverty is measured by the poverty gap index P_1, which estimates the average distance separating the poor from the poverty line as a proportion of that line (the mean is taken over the whole sample with a zero distance allocated to the households who are not poor.) The severity of poverty is measured by the squared poverty gap index P_2, which takes into account not only the distance separating the poor from the poverty line, but also the inequality among the poor. These three poverty measures are part of the FGT (Foster-Greer-Thorbecke, 1984) class. Denoting by y the total per capita expenditure, by f(y) the density function of y, and by z the poverty line, our poverty measures can be obtained for values of α equal to 0, 1, and 2 in the following equation:

$$P_\alpha = \int_0^z [(z-y)/z]^\alpha f(y)dy \text{ for } \alpha \geq 0$$

I.5. Expansion Factors (Weights). The sampling frame for the surveys has been based on the division of the country in four strata (two strata in 1983/84). The first stratum corresponds to the four Statistical Metropolitan Areas of Dhaka, Chittagong, Khulna, and Rajshahi. The second stratum corresponds to pourashavas which existed in 1981 but were not included in the SMA's. The third stratum corresponds to pourashavas created after 1981. The last stratum corresponds to rural areas. The primary sampling units for each stratum have been chosen with probability proportional to size, and within each unit, sixteen household have again been chosen randomly.

The Bangladesh Bureau of Statistics has computed two sets of expansion factors for the four years of data, one for the urban areas, and one for the rural areas. Because the expansion factors for the urban and rural areas appeared, respectively, too low and too high when compared to the real size of the urban and rural populations, we computed for the 1991/1992 HES our own expansion factors for the urban and rural sectors on the basis of the 1991 population census. We did the same for the other years, using a geometrical projection of the population growth between the censii of 1981 and 1991 to estimate the size of the two sectors at various dates.

I.6. Standard Errors of Poverty Measures and Statistical Tests. As shown by Howes and Lanjouw (1995), the sampling design should be taken into account when computing the standard errors of poverty measures. Stratification reduces standard errors, but clustering increases them. The estimates of standard errors that take into account both stratification and clustering are typically larger than those who are based on the assumption of random sampling. Unfortunately, while we do have information in the Household Expenditure Surveys on the strata to which the households belong, we do not know to which clusters they belong. Rather than taking into account stratification alone, which would have resulted in much too low standard errors, we used Kakwani's (1993) formulae for the Foster-Greer-Thorbecke class of measures. Treating each sub-group for which a poverty measure is computed as a simple random sample, and denoting by n its sample size, we may estimate the variance of its poverty measure as:

$$var(P_\alpha) = (P_{2\alpha} - P_\alpha^2) / n$$

These estimates of the standard deviations of poverty measures have not been adjusted for household size as standard methods to do so would have again reduced their magnitude. Yet, the estimates can be used to perform hypothesis tests as to the statistical significance of differences in poverty measures among various household groups. Denoting the poverty rates in groups A and B by P_A and P_B, the level of significance of (P_A - P_B) can be computed using the test statistic:

$$t = \frac{P_A - P_B}{\sqrt{var(P_A) + var(P_B)}}$$

II. Changes over Time

II.1. Overall Changes. Table 7 and Figures 6 and 7 provides estimates of poverty at the national level and by urban/rural sector. Consider first the year 1983/84. Our estimates of the national poverty rate are 40.17 percent with the lower poverty line, and 58.78 percent with the upper poverty line. Within the urban sector, the poverty rates are, respectively, 28.04 and 50.78 percent. These estimates provide an interval which is centered around 40 percent, which is itself the estimate of poverty for the urban sector reported by Rahman and Haque (1988), Sen and Islam (1993) and Ravallion and Sen (1996). Similarly, for the rural sector, our two estimates of 42.58 and 60.36 percent encompass those of about 50 percent reported by these authors.

As mentioned earlier, the fact that our estimates of poverty encompass the estimates of most other authors should not be surprising due to the large differences between our two poverty lines. While the common food component of our poverty lines is very close, for example, to that computed by Ravallion and Sen (1996), our non food components provide an interval in which Ravallion and Sen's provision for non food consumption falls. As a result, our poverty measures not only for 1983/84, but also for all subsequent survey years, encompass theirs. By contrast, our poverty estimates diverge from those of the BBS (1995b), especially in the urban sector. The BBS's higher measures for the urban sector result from its food energy method which tends to over-estimate the cost of living differential between sectors in the definition of the poverty lines (more details on the comparison of our results with the BBS results are provided in Appendix II).

From 1983/84 to 1985/86, we observe a drop of 10 to 14 percentage points in the national, urban, and rural poverty rates. While this drop is also reported by other authors, its is open to question. The decline in rural poverty is consistent with the increase in real agricultural wages in the mid 1980's (Ravallion and Sen, 1996). However, as noted by Ravallion (1990), at the national level, this decrease assumes a much higher rate of growth than that which can be computed on the basis of the National Accounts of Bangladesh[3].

At the national level, between 1988/89 to 1991/92 and with the lower poverty line, the headcount, poverty gap, and squared poverty gap indices increased from 40.55 to 42.89, 9.64 to 10.77, and 3.34 to 3.81 percent. The standard errors of these poverty measures turn out to be the same for the two years (note that the two years have similar sample sizes.) The standard errors of the differences between the poverty rates of the two years are respectively 0.92, 0.30, and 0.14, implying that the changes in all three poverty measures are significant at the 5 percent level of confidence. The changes in poverty measures remain significant within the urban and rural sectors, except for the change in the headcount index in the urban sector which is not significant.

Figures 8 and 9 illustrate the differences in poverty measures observed between the urban and rural sectors for the four survey years. A ratio of 2 for a poverty measure in 1991/92 indicates that the corresponding poverty measure is twice higher in the rural sector than in the urban sector for that year. The higher the ratio, the larger the difference in poverty between the two sectors. Overall, the two figures indicate rising differences in poverty between the two sectors over the years and larger differences for higher order poverty measures across most years.

II.2. Sectoral Decompositions. From 1983/84 to 1991/92, the headcount index of poverty increased at the national level from 40.17 to 42.89 percent with the lower poverty line, and from 58.78 to 59.39 percent with the upper poverty line. To account for such changes, decompositions based on the additive property of the FGT class of poverty measures can be used. This property ensures that any FGT poverty measure for a group is equal to the sum of the poverty measures of its subgroups weighted by the population shares of the subgroups. Denoting the poverty measures and population shares of the subgroups by P_i and w_i, we have for the group:

$$P = \Sigma_i \, w_i \, P_i$$

Two poverty decompositions based on this property have been widely used in applied work to better understand the dynamics of poverty in a country. The first decomposition is sectoral (Ravallion and Huppi, 1991). It looks at the contributions of the urban and rural sectors to changes in the national poverty rate P^t between two dates t_1 and t_2. Denote by P_i^t the poverty measure for sector i (i =u, r) in year t, and by w_i^t the population share of sector i in t. We have:

$$P^{t2} - P^{t1} = w_u^{t1} (P_u^{t2} - P_u^{t1}) + w_r^{t1} (P_r^{t2} - P_r^{t1}) + \Sigma_i^{u,r} (w_i^{t2} - w_i^{t1}) P_i^{t1} + \Sigma_i^{u,r} (w_i^{t2} - w_i^{t1})(P_i^{t2} - P_i^{t1})$$

[3] Because of the difficulty in interpreting the 1985/86 data, in section III, we will concentrate for the most part our analysis to the evolution of poverty as of 1988/89.

The first two terms in this equation capture the intra-sectoral changes in poverty between the two years. The third term captures the effect of intersectoral population shifts. The fourth term is a covariance measure of the interaction between intra-sectoral and intersectoral effects.

The results of the sectoral decomposition for the period 1983/84 to 1991/92 are provided in Table 8. Because poverty decreased (resp. increased) over that period in the urban (resp. rural) sector, the intra-sectoral contribution of the urban (resp. rural) sector is negative (resp. positive). The population shift component is also negative as the migration from rural to urban areas where poverty is lower tended to decrease the national poverty rate (for an analysis of the link between poverty and migration, see Ravallion and Wodon, 1996). It is interesting to contrast these results with those obtained for the period 1988/89 to 1991/92, as provided in Table 9. In the later period, poverty rose in both sectors, yielding two positive intra-sectoral effects. Nevertheless, even in then later period, the rural sector accounted for most of the national increase in poverty.

Figure 10 summarizes the results of the sectoral decompositions for the two time periods considered (the covariance terms have been omitted from the figure.) We can see that the rise in poverty in the rural sector was responsible for the most, if not all of the national rise in poverty. The contribution of the urban sector is mixed, while that of migration is poverty reducing.

II.3. Growth and Redistribution Decompositions. The second decomposition consists in analyzing the contribution of growth and inequality to the change in the poverty measures within each of the two urban and rural sectors. Following Ravallion and Huppi (1991) and Datt and Ravallion (1992), write poverty measures as a function of the mean income and the Lorenz curve, such that $P^t = P(\mu^t, \pi^t)$, where μ^t denotes the mean income over the households at time t and π^t denotes the Lorenz curve. Then define the growth component of a change in poverty between two dates as the change due to a change in mean consumption holding the Lorenz curve constant. The redistribution component is the change due to a change in the Lorenz curve holding mean consumption constant. Denoting by R the residual of the decomposition, we have:

$$P(\mu^{t2}, \pi^{t2}) - P(\mu^{t1}, \pi^{t1}) = [P(\mu^{t2}, \pi^{t1}) - P(\mu^{t1}, \pi^{t1})] + [P(\mu^{t1}, \pi^{t2}) - P(\mu^{t1}, \pi_i^{t1})] + R$$

The results of this decomposition are provided separately for the urban and rural sectors in Table 10 for the period 1983/84 to 1991/92, and in Table 11 for the period 1988/89 to 1991/92. For the whole decade, the growth components of the urban (rural) sector are negative (positive), indicating that the mean level of per capita consumption increased (decreased) in the urban (rural) sector. Moreover, the positive values of most redistribution terms indicate that inequality increased in both sector (at least over the bottom part of the distribution which is taken into account in this decomposition), thereby increasing poverty. The impact of the change in inequality on poverty measures is larger in urban than in rural areas. Also note that the growth components are larger in absolute value than the redistribution components.

If we look at the decomposition for the last three years only, a somewhat different picture emerges. All growth components are now positive, indicating that the mean per capita consumption levels decreased between 1988/89 and 1991/92 in both sectors. By contrast, most redistribution components are negative, indicating that the overall changes in inequality[4] tended to decrease the incidence of poverty between 1988/89 and 1991/92. The only exception is that of the impact of redistribution on the squared poverty gap in the urban sector for the lower poverty line which is positive, but close to zero. As was the case for the whole decade however, the redistribution components are smaller in absolute value than the growth components.

The above results are summarized in Figures 11 and 12. In these figures, the numbers refer to changes in poverty. A positive (resp. negative) number for growth relates to an increase (resp. decrease) in poverty due to a decrease (resp. increase) in the mean level of per capita consumption. Similarly, a positive (resp. negative) number for distribution relates to an increase (resp. decrease) in poverty due to an increase (resp. decrease) in the level of inequality. It is striking that in the urban sector, periods of economic growth have been associated with rising inequality, while "recessions" have been associated with diminishing inequality. By contrast, in the rural sector which witnessed recessions over the two periods, inequality increased as well.

II.4. Nested Decomposition. The sectoral and growth/redistribution decompositions may be nested. The growth and redistribution decomposition can be applied to the urban and rural sectors separately so that each of the intra-sectoral effects in the sectoral decomposition be further decomposed into a growth and a redistribution components, plus a residual. The results of this nested decomposition are provided in Table 12 for the period 1988/89 to 1991/92. One of the potential interpretations of the results is as follows: with the lower poverty line, without the decrease in inequality and the population shift from the rural to the urban sector, the growth components of the urban (41 percent) and rural (187 percent) sectors would have resulted in an increase in the national poverty rate twice as high (228 percent) as that actually observed.

II.5. Multiple Poverty Lines. The choice of the poverty line may have an impact on the results of poverty decompositions. Consider the case of the period 1988/1989 to 1991/92. In Table 11, the redistribution components of the growth and redistribution decompositions are larger in absolute terms with the upper poverty line than with the lower poverty line. In Table 10, the intra-sectoral effect of the urban sector is ten times higher with the lower poverty line than with the upper poverty line. To analyze the sources of these differences, we may denote by

[4] That inequality decreased between 1988/89 and 1991/92 is confirmed by an analysis of the national Gini indices for the two years (Wodon, 1996b, 1996c). The analysis also shows that Gini indices are higher in urban than in rural areas. Moreover, using multidimensional decompositions, it appears that education is associated with more inequality than occupation or land ownership.

P_L and by P_U the poverty measures corresponding to the two poverty lines z_L and z_U. Any change in poverty observed with the upper poverty line from t_1 to t_2 can be decomposed as:

$$P_U^{t2} - P_U^{t1} = (P_U^{t2} - P_L^{t2}) - (P_U^{t1} - P_L^{t1}) + (P_L^{t2} - P_L^{t1})$$

Consider the national headcount index. Using Table 7, the change in poverty from with z_U ($P_U^{t2} - P_U^{t1} = 2.13$ percent) is entirely due to the change with z_L ($P_L^{t2} - P_L^{t1} = 2.34$ percent.) Less people had per capita incomes between z_U and z_L in 1991/1992 ($P_U^{t2} - P_L^{tt2} = 16.50$ percent) than in 1988/89 ($P_U^{t1} - P_L^{t1} = 16.71$ percent). The decomposition shows that the change in poverty between the two years effected the lower end of the distribution of per capita consumption. That is, a shift downward of the distribution of consumption as a whole may have occurred. This type of result appears relatively robust across time periods and poverty measures, as shown in Figure 13. Because the changes in our three poverty measures with the lower poverty lines account for a large part of the changes in our poverty measures with the higher poverty line for the two periods considered, we can be confident in asserting that the bottom part of the population were effected.

The multiple poverty lines decomposition can be combined with any of the two other decompositions. Consider the larger intra-sectoral effect of the urban sector observed with the lower poverty line mentioned above. Denoting by P_{Lu}, P_{Lr}, P_{Uu}, and P_{Ur}, the poverty rates in the urban and rural sectors with z_L and z_U, the intra-sectoral effects have been computed using:

$$P_L^{t2} - P_L^{t1} = w_u^{t1}(P_{Lu}^{t2} - P_{Lu}^{t1}) + w_r^{t1}(P_{Lr}^{t2} - P_{Lr}^{t1}) + \Sigma_i^{u,r}(w_i^{t2} - w_i^{t1}) P_{Li}^{t1} + \Sigma_i^{u,r}(w_i^{t2} - w_i^{t1})(P_{Li}^{t2} - P_{Li}^{t1})$$

$$P_U^{t2} - P_U^{t1} = w_u^{t1}(P_{Uu}^{t2} - P_{Uu}^{t1}) + w_r^{t1}(P_{Ur}^{t2} - P_{Ur}^{t1}) + \Sigma_i^{u,r}(w_i^{t2} - w_i^{t1}) P_{Ui}^{t1} + \Sigma_i^{u,r}(w_i^{t2} - w_i^{t1})(P_{Ui}^{t2} - P_{Ui}^{t1})$$

The urban intra-sectoral effect with z_L and z_U are respectively $w_u^{t1}(P_{Lu}^{t2} - P_{Lu}^{t1}) = 0.43$, and $w_u^{t1}(P_{Uu}^{t2} - P_{Uu}^{t1}) = 0.04$. Using the decomposition for multiple poverty lines, we have:

$$w_u^{t1}(P_{Uu}^{t2} - P_{Uu}^{t1}) - w_u^{t1}(P_{Lu}^{t2} - P_{Lu}^{t1}) = w_u^{t1}[(P_{Uu}^{t2} - P_{Lu}^{t2}) - (P_{Uu}^{t1} - P_{lu}^{t1})]$$

The difference in intra-sectoral effects with the two poverty lines is due to the larger part of the urban population living between the two lines in 1988/89 ($P_{Uu}^{t1} - P_{Lu}^{t1} = 22.40$ percent) than in 1991/92 ($P_{Uu}^{t2} - P_{Lu}^{t2} = 20.37$ percent.) In simpler terms, because the headcount indices in the urban sector with the upper poverty lines are similar in both years, there is no intra-sectoral effect with z_U. This is not so with the lower poverty line where the headcount indices differ.

While this last result may be relatively straightforward because sectoral decompositions are intuitive, the broader point made here is that poverty decompositions are sensitive to the choice of the poverty line. This may be important for the growth and redistribution decomposition when various poverty lines are not straight multiples of each other because they represent different cost of living indices. This is case with our two poverty lines z_L and z_U, to which correspond for any household group and for each of the two years, two mean per capita consumption and two Lorenz curves. At the national or sectoral level, in comparing any two years t_1 and t_2, we could decompose each of the four terms $(P_U^{t2} - P_U^{t1})$, $(P_U^{t2} - P_L^{t2})$, $(P_U^{t1} - P_L^{t1})$, and $(P_L^{t2} - P_L^{t1})$ into growth and redistribution components. While this has not been done here (i.e. we have not decomposed $(P_U^{t2} - P_L^{t2})$ and $(P_U^{t1} - P_L^{t1})$ into growth and redistribution components), it might provide interesting results in the context of a detailed analysis of the sensitivity of decompositions not only to the choice of the reference period (as shown by the example of the two periods considered), but also to the choice of the reference poverty line.

III. Univariate Poverty profile

III.1. Tabulations by Geographical Areas. From the previous section, we learned that over the decade 1983/84 to 1991/92, poverty decreased in the urban sector, and increased in the rural sector. By contrast, over the last few years covering the 1988/89 and 1991/92 surveys, poverty increased in both sectors, and more so in percentage terms in the urban than in the rural sector. Beyond this broad picture, the question remains as to what happened within each sector.

In terms of *changes over time*, sharp differences can be observed within each sector by geographical areas, as shown in Tables 13 and 14. Consider first the trend in poverty measures. Over the 1983/84 to 1991/92 period and with the lower poverty line, the three poverty measures decreased by one third to one half in all urban areas except those of the Chittagong division, where poverty doubled. For the period 1988/89 to 1991/92, because poverty increased in most urban areas, the differences in performance between areas are less striking. Yet, even in this latter period, the urban areas of the Chittagong division performed more poorly than the others (within the Chittagong division, the poverty measures obtained with the upper poverty line indicate that over a broader segment of the income distribution, the Chittagong SMA did better than smaller towns.) Within the rural areas, we observe exactly the reverse ranking in the performance over time of the four divisions. The rural areas of the Chittagong division are the only ones for which poverty decreased over the whole decade. This urban/rural contrast in the performance over time between the Chittagong division and the other divisions is so striking that it would deserve further investigation using alternative data sets such as series in wages before being taken as granted.

In terms of *levels* of poverty, differences can also be observed within each sector between geographical areas, as illustrated by Figure 14. The Dhaka and Chittagong SMA's have lower poverty measures than the other urban areas of the same divisions (no similar comparison has been made between the SMA's and the other urban areas within the Khulna and Rajshahi divisions due to limited sample sizes). Within the rural sector, the areas corresponding to the old districts of Sylhet, Comilla, Noakhali and Chittagong have the lowest poverty measures, followed by the areas corresponding to the old districts of Dhaka, Mymensingh, Khulna, Jessore, and Kushtia. The areas corresponding to the old districts of Barisal and Patuakhali, and especially those of Faridpur, Tangail, Jamalpur, Rajshahi, and Pabna, all appear to have higher poverty rates.

Table 6 provides estimates of the mean welfare ratios by geographical area, where the welfare ratio of a household is defined as its total per capita consumption divided by the regional poverty line. The mean welfare ratios give results similar to those obtained for the poverty measures. The households living in the Dhaka and Chittagong SMA's, as well as those living in other urban areas, enjoy the highest mean welfare ratios. The lowest mean welfare ratios are observed in the rural areas of the Khulna and, even more so, of the Rajshahi divisions, as well as in the rural areas of the old districts of Faridpur, Tangail, and Jamalpur within the Dhaka division.

III.2. Tabulations by Household Characteristics. Tables 15 to 21 present poverty measures by household characteristics for 1988/89 and 1991/92 at the national level. The results are similar for the two years. They are illustrated for the headcount index in Figures 15 to 18.

Sex and Marital Status. The sex of the head of the household does not have a large impact on poverty at the national level, although, as shown in Table 22, if the urban and rural sectors are considered separately, the headcount index for female headed households with the lower poverty line is significantly higher than that of male headed households in urban areas. In terms of marital status, unmarried heads are less poor than married heads, and married heads are less poor than widowed and divorced heads[5]. The position of households with widowed and divorced heads has worsened more than that of the other groups between 1988/89 and 1991/92.

Religion, Age, and Household Size. Muslims appear poorer than non-muslims, at least for the lower poverty line, but the large gap that existed in 1988/89 between the members of the two religions has tended to vanish in recent years. There seems to be an inverted "U" relationship between the poverty rate and the age of the head. Poverty rises up to 40 years old heads and declines thereafter, but younger heads for 1988/89 are an exception to this rule. Poverty also increases with the size of the household. In 1991/92, with the lower poverty line, the headcount rises from 15.32 percent for the households with a single member to 48.38 percent for the households with seven members. Beyond a size of seven, poverty decreases, perhaps because of the presence of additional adults in the households. Note that following standard

[5] Our equivalence scale of one raises poverty measures among households with children by not taking into account the potential economies of scale achieved in these household. Hence, the lower poverty measures observed among unmarried heads may be due to the fact that these heads rarely have children. For more details on the assumptions behind our equivalence scale, see footnote 6.

practice for developing countries, we used an equivalence scale of one placing an equal weights on all household members. With another scale taking into account economies of scale within the household as the number of its members increases, the relationship between household size and poverty might have been eliminated or even reversed (Lanjouw and Ravallion, 1995)[6]. Note also that over time, Bangladesh made progress toward lower fertility rates. Without this progress, it can be shown that poverty rates would have been higher in 1991/92 than observed.

Land and Education. Land ownership and education appear to be two variables with a large impact on poverty. In 1991/92 for example, with the lower poverty line, there is a continuous decline in the headcount index from 54.87 to 8.17 percent as the amount of land owned rises from less than 0.05 acres to more than 7.50 acres. The decline in the headcount index as the educational level of the head of the household rises is as dramatic, from 56.56 percent for the illiterate to 4.09 percent for those with higher education. The same trends are observed with the upper poverty line. Three fourth of the illiterate and landless or near landless are poor. By contrast, the headcount indices for large land owners and highly educated heads are below 20 percent (poverty rates for large land owners are not close to zero due to the fact that we used 2.50 acres as the threshold for defining them, versus 7.50 acres in some previous work).

Occupation. In terms of main occupations, the results are also as we would expect. In the agricultural sector, there is a marked hierarchy across both years and both poverty lines from the owner farmers to the tenant farmers, the workers in fisheries, forestry, and live stock, the agricultural workers with family land, and finally the landless agricultural workers and day-laborers. The poverty measures among the latter group are very high, almost reaching respectively 80 and 90 percent for the headcount index with the lower and upper poverty line. Note that the poverty rates of the owner farmers are three times higher that those of the largest land owners. This is because many owner farmers cultivate only small parcels of land.

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[6] As noted by Erik Thorbecke, a distinction must be made in choosing an equivalence scale between taking into account on the one hand different consumption requirements for different household members, and on the other hand economies of scale. Denoting babies by B, children by C, and adults by A, a standard method to compute equivalent consumption is to use $y = C/(\theta B + \kappa C + A)^e$, where y is the equivalent consumption, C is household consumption, $0 \leq \theta$, $\kappa \leq 1$ account for the lesser consumption requirements of babies and children as compared to adults, and $0 \leq e \leq 1$ accounts for economies of scale. In this paper, we used $\theta=\kappa=e=1$. Our rationale for doing so is that other researchers and the BBS have used per capita consumption as their measure of well-being. For our results to be comparable to previous research, we need to use per capita consumption as well. Nevertheless, using multivariate regressions, we tested for the robustness of the negative impact of demographic variables on poverty by computing the equivalence elasticity e for which a larger household size (obtained as the key variable when $\theta=\kappa=1$) has no adverse impact on equivalent consumption. The threshold value was 0.55 in the urban sector and 0.56 in the rural sector. For any higher value of e, a larger household size has a negative impact on equivalent consumption.

In the non-agricultural sector, most high level employees (executives, officials, professionals, teachers), as well as a majority of small businessmen and petty traders escape poverty even with the higher poverty line. Factory workers and artisans rank third, followed by the two categories of the salesmen, service workers, and brokers, and of the transport and communications workers. Servants and day-laborers have relatively higher poverty rates, especially with the lower poverty line. Households with non-working heads, which include retired people and students, do relatively well, probably because other sources of income enable these heads to be non working. Finally, the household heads who have a second occupation tend to be poor, which suggests that they have this second occupation out of necessity. The only exception is that of the heads whose second occupation is owner farmer.

Farm versus Non Farm. There is currently a debate as to the standard of living of farm versus non-farm workers living in the rural sector. The general perception is that the growth of the rural non-farm sector despite its low productivity is a sign of weakness rather than strength. If such were the case, rural non-farm workers would be employed in residual activities and their wages would barely enable them to survive. Under such circumstances, the poverty rates among rural non farm workers should be pretty high. Table 26 provides estimates of poverty measures by main occupation of the head within the rural sector. The poverty measures in Table 26 obtained for the agricultural sector occupations of households living in the rural sector are very similar to those of Table 20 obtained for the country as a whole, but the corresponding two sets of poverty measures for the non agricultural occupations diverge. It is clear from a comparison of Tables 20 and 26 that non-farm workers do fare less well in the rural sector than nationally. For example, servants and day-laborers in the rural sector have a headcount index of poverty of 65.07 percent with the lower poverty line in 1991/92, as compared to 55.67 percent nationally. Moreover, poverty tended to increase more for non farm than for farm rural workers between 1988/89 and 1991/92. These findings provide support for the hypothesis that non farm rural workers do not fare as well as their urban counterparts. Yet, within the rural sector, the poorest households remain those whose head is an agricultural worker without land. With the lower and upper poverty line, these households have headcount indices of respectively 79.04 and 89.04 percent in 1991/92. Therefore, promoting the rural non-farm sector may remain an attractive policy option (these questions will be analyzed in detail in further research).

III.3. Additivity. As mentioned in the section devoted to changes in poverty over time and to poverty decompositions, an advantage of the poverty measures of the FGT class is their additivity. This additive property can be used to analyze which segments of the population contribute the most to the national or sectoral poverty rates. But it can also be misused, especially when the analyst tries to infer definite causal relationship from univariate tabulations.

Tables 23 and 24 and Figures 19 to 24 use the additive property of the FGT poverty measures to analyze which segments of the population contribute the most to poverty at the national level. Tables 23 and 24 provide measures of poverty by education sub-group within the rural and urban sectors. Using the population shares of these sub-groups, we can compute the contributions of the various education sub-groups to the urban and rural poverty measures. This is done for the headcount index in Table 25 with the upper poverty line[7]. Households with an illiterate head represent, respectively, 24 percent (4.93/20.14) and 49 percent (39.18/79.85) of the urban and rural populations, but they are accountable for 41 percent (3.69/9.11) and 58 percent (29.39/50.27) of the urban and rural headcount indices. Because of its high poverty rate and its large population share, the sub-group of households with an illiterate head living in the rural sector fully accounts for 49 percent (29.39/(9.11 + 50.27)) of the national poverty rate.

It is clear from Tables 23 and 24 that the poverty measures by education level for the upper poverty line are very similar between sectors. For the urban and rural poverty rates to be different, it must be that the weights of the educational subgroups differ between the two sectors. And indeed, the illiterate population of the rural sector is eight times larger than that of the urban sector, while the overall population of the rural sector is only four times larger than that of the urban sector. If the educational levels of rural households were raised to the levels of urban households, could it be that poverty measures would also be the same across the two sectors?

Table 25 may seem to provide clues to the answer. If the urban educational weights were applied to the rural educational headcount indices, the headcount index in the rural sector with the upper poverty line would drop from 62.96 to 50.04 percent. By contrast, if the rural educational weights were applied to the urban educational headcount indices, the headcount index in the urban sector would increase from 45.24 to 60.85 percent. According to this exercise, a large part of the difference in poverty rates between the urban and rural sector for the upper poverty line appears to be explained by differences in educational levels. Yet, we will challenge this conclusion below by using poverty regressions that enable us to control for other variables.

III.4. Dominance Analysis. Poverty comparisons may be sensitive to the choice of the poverty line. Atkinson (1987) applied the concept of stochastic dominance to poverty analysis to assess the sensitivity of poverty comparisons to the choice of alternative poverty lines.

Consider the case a poverty comparison between the urban and rural sectors. The poverty incidence curves of the urban and rural sectors plot on the vertical axis the headcount indices of poverty in the two sectors as functions, on the horizontal axis, of the poverty line. Identically, one can conceive of the poverty incidences curve as being graphs of the cumulative density functions of per capita consumption in both sectors. For a given range of poverty lines, the urban sector will be said to first order dominate the rural sector if its poverty incidence curve lies everywhere below that of the rural sector. First order dominance implies not only that the headcount index of poverty, but also a number of other poverty measures including those of the

[7] Using the lower poverty line, Figures 19 to 24 compare by land ownership, education, and occupation categories, the sample based population shares to the shares of the poor. Figure 20 shows for example that a majority of the country's poor comprise of rural households with an illiterate head (a finding similar to that reported in Table 25 for the upper poverty line.)

Foster-Greer-Thorbecke class, will be lower in the urban than in the rural sector. If first order dominance does not obtained, one can check for higher orders of dominance (Ravallion, 1994.)

The poverty incidence curves of the urban and rural sectors for 1991/92 using our two poverty lines are drawn in Figures 25 and 26 That is, Figures 25 and 26 plot the headcount indices of poverty in the urban and rural sectors as functions of multiples of, respectively, of z_L and z_U (z_L and z_U are not themselves multiple of each other.) Whether we use z_L or z_U, we reach the same conclusion: the urban sector, whose poverty incidence curves lies everywhere below that of the rural sector, dominates the rural sector. Note that the gap between the two poverty incidence curves is lower for multiples of the upper poverty line than for multiples of the lower poverty line. This is because the upper line provides for larger potential differences in the cost of living for non food items between the areas of the two sectors, and thereby reduces the observed difference in poverty measures between the two sectors.

Dominance analysis can also be performed to compare poverty rates between year. While the poverty incidence curves with multiples of z_L for 1988/89 and 1991/92 are extremely close to each other (and therefore not reproduced here), it can be shown that 1991/92 dominates 1988/89 over the whole range of poverty lines considered. Poverty increased between the two years.

As another application of dominance analysis, Figures 27 and 28 provide poverty incidence curve by education and land ownership for 1991/92. In each case, five categories are considered. (The two most favorable categories of Tables 18 and 19 have been regrouped for the analysis into household heads with education above class 9 and households with more than 2.50 acres of land ownership). Dominance of each higher level of education over the lower level is observed for education, but not for land ownership for which the poverty incidence curves of the first three categories (less than 0.05 acres, 0.05 to 0.49 acres, and 0.50 to 1.49 acres) intersect.

IV. Multivariate Poverty Profile

IV.1. Probits. Univariate tabulations and poverty incidence curves provide a good overview of the impact of various household characteristics on poverty measures, but they may be misleading. We mentioned in the previous section that the lower poverty rates observed in the urban sector could be due to the better education levels among urban household rather than to fixed effects at the urban level. Following standard practice, we may use poverty regressions as a tool to summarize the impact of various household characteristics on the probability of being poor (for a comparison of probit and consumption regressions in levels, see Appendix III).

Consider first the case of probits and logits. Denoting by y_i^* the difference between the poverty line z and the per capita consumption y_i of a household i, so that $y_i^* = z - y_i$, we could estimate the regression $y_i^* = \beta'\mathbf{x}_i + \varepsilon_i$. When we run a probit or tobit however, we pretend not to observe the y_i*'s. We act as if we only observed a set of characteristics $\mathbf{x_i}$ of the households and a dummy variable h_i which takes the value 1 if $y_i^* > 0$ and 0 if $y_i^* < 0$. The probability that a household is poor is:

$$Prob[h_i = 1] = Prob[y_i < z] = Prob[\varepsilon_i > - \beta'\mathbf{x_i}] = 1 - F(-\beta'\mathbf{x_i})$$

The parameter vector β can be estimated by maximum likelihood provided a density function is assumed for the residuals. The value of the probability of being poor will depend on this density function. For a probit, the probability is $P = 1 - \Phi(-\beta'\mathbf{x_i}) = \Phi(\beta'\mathbf{x_i})$, where Φ denotes the standard normal cumulative density. For a tobit, it is $P = \exp(-\beta'\mathbf{x_i})/[1 + \exp(-\beta'\mathbf{x_i})]$.

For poverty comparisons, a households with characteristics $\mathbf{x_1}$ will have a lower expected probability of being poor than another household with characteristics $\mathbf{x_2}$ if the score of the first household $\beta'\mathbf{x_1}$ is lower than that of the second household $\beta'\mathbf{x_2}$. Moreover, if we are interested in analyzing the impact of one characteristic x_{iA} on the probability of being poor, while controlling for all other characteristics, we simply need to analyze the estimate of its coefficient β_A.

Two cases arise. If x_{iA} is a continuous variable, the marginal impact on the probability of being poor due to a change in x_{iA} is $\partial P/\partial x_{iA} = f(-\beta'\mathbf{x_i})\beta_A$. Because of the presence of $f(-\beta'\mathbf{x_i})$ in $\partial P/\partial x_{iA}$, the marginal impact of a change in x_{iA} depends on the overall score of the household i. It is customary to compute $f(-\beta'\mathbf{x_i})$ at the estimated mean of the sample, but whatever the chosen reference point, as $f(-\beta'\mathbf{x_i})$ is positive, if the estimate of β_A is negative, then a household with a higher value for x_{iA} will have a lower probability of being poor than a household with a lower value for x_{iA}. If x_{iA} is a dummy variable, we cannot speak of a "marginal" impact of a change in $x_{iA.}$ Yet, while the corresponding concept is that of a discrete change in the probability of being poor, a negative estimate of β_A still implies that, controlling for other characteristics, a household with, say, education level A has a lower probability of being poor than a household with the education level excluded from the regression. When comparing two households with the same characteristics except for their education levels A and B, the first household will have a lower expected probability of being poor if the estimate of the difference $(\beta_A - \beta_B)$ is less than zero.

Two probit regressions corresponding to our lower and upper poverty lines have been estimated for the year 1991/92. The following household characteristics were used for the regressions: the location of the household along the two sectors and fourteen geographical areas (represented below by the vector of dummy variables GL); the religion and the demographic characteristics of the household such as the number of babies, children, and adults, as well as the square of the number of babies, children, and adults (DM); the family structure of the household, such as a married head with a spouse, a married head without a spouse, a single head, and a divorced or widowed head (FS); the age of the household head and its square (AG); the education level of the household head (EH), of his spouse (ES), and of other members of the household (ED represents the difference between the highest education level in the household and the maximum of the education level of the head and of the spouse — or of the head only when there is no spouse); the household head's main occupation or field of employment (OH); the household's amount of land owned along four categories (LO); and a number of interaction effects between these variables (INT). Noting that the value of the dependent variable and of parameter estimates depend on the choice of the poverty lines, the two probabilities of being poor are given by:

$$\text{Prob}[h_{iL} = 1] = \text{Prob}[y_i < z_L] = \Phi(\alpha_L + \beta_{1L}'\mathbf{GL}_i + \beta_{2L}'\mathbf{DM}_i + \beta_{3L}'\mathbf{AG}_i + \beta_{4L}'\mathbf{FS}_i + \beta_{5L}'\mathbf{EH}_i + \beta_{6L}'\mathbf{ES}_i + \beta_{7L}'\mathbf{ED}_i + \beta_{8L}'\mathbf{OH}_i + \beta_{9L}'\mathbf{LO}_i + \beta_{10L}'\mathbf{INT}_i)$$

$$\text{Prob}[h_{iU} = 1] = \text{Prob}[y_i < z_U] = \Phi(\alpha_U + \beta_{1U}'\mathbf{GL}_i + \beta_{2U}'\mathbf{DM}_i + \beta_{3U}'\mathbf{AG}_i + \beta_{4U}'\mathbf{FS}_i + \beta_{5U}'\mathbf{EH}_i + \beta_{6U}'\mathbf{ES}_i + \beta_{7U}'\mathbf{ED}_i + \beta_{8U}'\mathbf{OH}_i + \beta_{9U}'\mathbf{LO}_i + \beta_{10U}'\mathbf{INT}_i)$$

IV.2. Using Parameter Estimates. The results of the probit regressions are provided in Table 27. At first sight, they tend to confirm the findings of the univariate poverty profile. Yet, due to the estimation of dF/dx at the mean of the sample and due to the presence of interaction effects[8], the information given in Table 27 must be analyzed with care before drawing conclusions.

[8] Interaction effects in poverty regressions render the interpretation of parameter estimates more difficult, but they are justified on at least three grounds. First, interaction effects reduce the risks of mispecification which, in the case of qualitative or censored regressions, lead to biased and inconsistent estimators. Second, interaction effects provide additional information on the determinants of poverty, especially when the urban and rural households are pooled together in a single regression. If we had run separate regressions for the urban and rural sectors as is commonly done, (a) many interaction effects such as those between land ownership and education, or education and occupation, would have had to be dropped due to the lower sample sizes; and (b) some variables would have become perfect predictors of the poor/non poor status of some households, thereby resulting in the deletion of these households and variables from one or the other sectoral regression. Third, if we add run separate probit regressions for the urban and rural sectors, we would not have been able to directly compare the estimates of, say, the impact of the education of the head in the two sectors because in each regression, the standard error of the residuals would have been normalized to one. In the absence of estimates of the true variances of the error terms (identification problem for the probit), any inference as to the comparative statistical significance of the impact of household characteristics in the two sectors would be misleading. Only ratios of coefficient estimates could be compared from one regression to the other. It is thus better to pool the urban and rural sectors together. Now, in pooling urban and rural households together, we must of course enable a number of parameter estimates to vary by sector, which is done through the inclusion of the sectoral interaction effects.

Consider first an *example with no interaction effects*. We want to predict the impact of a change in the education of the head on the probability of being poor for a household with characteristics corresponding to the excluded dummy variables in the regressions. These characteristics are: (a) geographical area: rural Dhaka/Mymensingh (area # 3); (b) religion: Muslim; (c) family structure: married with the spouse present; (d) education of the head: illiterate; (e) education of the spouse: illiterate; (f) education differential: none; (g) land ownership: less than 0.05 acres; and (h) occupation: landless agricultural worker. We will further assume that our household comprises of one baby, two children, two adults, and that the head is 40 years old.

Using the lower poverty line, the score of the household $\beta'\mathbf{x}_i$ is the constant (-0.06) plus the contribution of the household size variables and of the age of the head (0.58 - 0.09 + 2*0.54 - 4*0.07 +2*0.19 - 4*0.01 + 40*0.00 + 1600*0.00) plus the impact of the education dummy. Depending on the education level of the head, the contribution of the education dummy varies from 0 to - 0.83. Overall, for the various educational levels of the head, the score of the household is 1.57 (illiterate), 1.28 (below class 5), 1.22 (class 5), 0.92 (class 6 to 9) and 0.74 (higher level). To these scores correspond probabilities of being poor $\Phi(\beta'\mathbf{x}_i)$ of 94, 90, 89, 82, and 77 percent. If we were to use the upper poverty line, the contributions to the score of the household in the case of an illiterate head would be (0.50 + 0.56 - 0.08 + 2*0.51 - 4*0.06 + 2 *0.26 - 4*0.02 - 40*0.01 + 1600*0.00), for a total of 1.8. With higher education levels, the score of the household would drop to 1.34 (below class 5), 1.61 (class 5), 1.45 (class 6 to 9), and 1.40 (higher level). The household's probability of being poor would be above 90 percent in all cases.

The standard errors of these probabilities could be computed[9], but it is clear that for most education levels, with either the lower or the upper poverty lines, the differences in probabilities

[9] Observing for a continuous variable x_{iA} that the estimate of β_A is negative and significant does not mean that a household with a high value for x_{iA} will have a significantly lower probability of being poor than a household with a low value for x_{iA}. Whether the probabilities of being poor of the two households will be statistically different will depend on the magnitude of the difference in their endowment of x_{iA}. Similarly, for two dummy variables, observing that the estimate of $(\beta_A - \beta_B)$ is negative and statistically different from zero does not imply that a household with, say, occupation A will have a significantly lower probability of being poor than a household with occupation B. The hypothesis that two households with characteristics $\mathbf{x}_1$ and $\mathbf{x}_2$ have the same probability of being poor is $H_0 : [1 - F(-\beta'\mathbf{x}_1)] - [1 - F(-\beta'\mathbf{x}_2)] = F(-\beta'\mathbf{x}_2) - F(-\beta'\mathbf{x}_1) = 0$. To test if the observed difference ΔP between the two probabilities is statistically different from zero, we need an estimate of the standard error of ΔP. Noting that ΔP is a function of $\mathbf{b}$, the estimate of β, we may approximate ΔP by Taylor expansion around β and estimate var(ΔP) as $\mathrm{var}(\Delta P) \simeq [f(-\mathbf{b}'\mathbf{x}_1)]^2\, \mathbf{x}_1'\mathrm{var}(\mathbf{b})\mathbf{x}_1 + [f(-\mathbf{b}'\mathbf{x}_2)]^2\, \mathbf{x}_2'\mathrm{var}(\mathbf{b})\mathbf{x}_2 - 2f(-\mathbf{b}'\mathbf{x}_1)f(-\mathbf{b}'\mathbf{x}_2)\, \mathbf{x}_1'\mathrm{var}(\mathbf{b})\mathbf{x}_2$. In the comparison of two households 1 and 2, with identical characteristics except for their dummy variables x_{1A} and x_{2B}, we have (with $x_{1k} = x_{2k}$ for all k's not equal to A or B): $\mathrm{var}(\Delta P) \simeq [f(-b_A - \Sigma_{k\neq A} b_k x_{1k})]^2\ [\mathrm{var}(b_A) + \Sigma_{k\neq A} x_{1k}^2\ \mathrm{var}(b_k)] + [f(-b_B - \Sigma_{k\neq B} b_k x_{2k})]^2 [\mathrm{var}(b_B) + \Sigma_{k\neq B} x_{2k}^2\ \mathrm{var}(b_k)] - 2f(-b_A - \Sigma_{k\neq A} b_k x_{1k})f(-b_B - \Sigma_{k\neq B} b_k x_{2k})\ [\Sigma_{k\neq A,B}\ x_{1k} x_{2k} \mathrm{cov}(b_A, b_B)]$. Now, if one is willing to rely

are not going to be significant. In fact, as the coefficients of the first two education of the head dummies are not significant with the lower poverty line, they could be assumed to be zero (the same applies to the last three education of the head coefficients with the upper poverty line.)

Two additional points are worth emphasizing about our first example. First, the changes computed above in the expected probabilities of being poor due to a change in the educational level of the head are conditional on holding all other household characteristics constant. Second, the computed differences in probabilities are small as compared to the dF/dx estimates provided in Table 27. This is because the marginal impacts of Table 27 are computed at the mean expected score of the sample. For the analysis of the impact of various household characteristics on the probability of being poor of the least advantaged, these summary values may be misleading. Technically, we observe differences because the impact of a change in the score $\beta \mathbf{x}_i$ on the value of the cumulative normal distribution is smaller at the tail of the distribution than at its mean.

That the estimated changes in the probability of being poor in Table 27 may not be fully representative of the benefit, for the poorest, of various changes in characteristics does not mean that these estimates are wrong. Controlling for the impact of other characteristics, the dF/dx values provide estimates, at the mean of the predicted probability of being poor in the sample, of the impact of characteristics on the headcount index of poverty. On average, living in the Dhaka SMA as opposed to rural Dhaka or Mymensingh reduces the probability of being poor by 21 percent (-0.21 = 0.12 - 0.33, where 0.12 and -0.33 are the estimates of dF/dx for the urban sector and Dhaka SMA dummies.) More generally, Figure 29 presents the expected changes in the probability of being poor at the mean of the sample due to changes in geographical area.

With the above background in mind, we may review our main results more rapidly. Let us start with the *first order effects (without interactions).* While controlling for other variables, religion, as well as demographic variables appear to play a role in the probability of being poor. The age of the head does not and the impact of family structure is mixed. All coefficients for the land ownership and most coefficients for the occupation dummies are significant. By contrast, only some of the coefficients for the head and spouse education dummies are significant. This suggests that at the national level, without interaction with other variables, education in itself is not a sufficient guarantee against poverty (note that in such a statement, we do not look at the impact that education may have on, say, occupational choice; this would require the specification of a complete structural model). Still, for education as well as for land ownership and occupation, higher levels of achievement tend to be associated with larger estimated reductions in the expected probability of being poor (the higher the dummy, the larger the negative coefficient).

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on asymptotic properties, testing whether two parameter estimates differ from each other is equivalent to testing if the probabilities differ from each other.

A number of coefficients for the *sectoral interaction effects* are not significant, but it is remarkable that the coefficients have the expected sign. Controlling for other variables, education has a larger impact in the urban sector (negative sign for most interaction dummies), while land ownership has a larger impact in the rural sector (positive sign for most interaction dummies.) This is illustrated in Figure 30, which presents in both sectors the expected changes in the probability of being poor at the mean of the sample due to a change in the education level of the head or in the level of land ownership (the numbers in the figure correspond to the dF/dx for the education or land dummy plus, in the urban sector only, the dF/dx for the interaction dummy.)

To illustrate the relative impact of education and land ownership in urban and rural areas without relying on the mean probability of being poor in the sample, consider again our previous household which had, depending on the education level of the head, scores of 1.57 (illiterate), 1.28 (below class 5), 1.22 (class 5), 0.92 (class 6 to 9) and 0.74 (higher level) with the lower poverty line. If this household were to live in an urban area of the Khulna division, we would have to add to its score not only -0.34 for the Kuhlna urban dummy and +0.30 for the urban sector dummy (yielding a net decrease of only -0.04), but also, depending on the education level of the head, from -0.01 to -0.23 for the interaction dummy between the head's education level and the urban sector dummy. The lower total scores of the household at 1.53 (illiterate), 1.10 (below class 5), 1.10 (class 5), 0.65 (class 6 to 9) and 0.69 (higher level) would be due in large part to the stronger impact on poverty of education in the urban sector. By contrast, due to the positive coefficients for the land and urban sector interaction dummies, the reduction in the probability of being poor due to an increase in land ownership is weakened in the urban sector.

What can be learned from the *other interaction effects* between the education of the head dummies and, respectively, the land ownership and occupation of the head dummies? While most coefficient estimates are again not significant, their sign makes intuitive sense. In a nutshell, the synergy between land and education appears to be of a lesser extent than the synergy which exists between education and occupation. This is evidenced by the positive (resp. negative) coefficients observed for the land and education (resp. occupation and education) interaction dummies.

To conclude this section, consider an example where both *sectoral and other interaction effects* are taken into account. Our household head is a non farm rural worker such as a salesman, service worker, middleman or broker with the same other characteristics as our previous rural household in terms of demographics, geographical location, family structure, and age. Because of the negative coefficient -0.48 associated with the salesman occupation, the starting score in period 1 of the household is 1.57 - 0.48 = 1.09, corresponding to a probability of being poor of 86 percent. In period 2, let us assume that the household has from 0.05 to 0.49 acres of land, and that the head has the "Below class 5" level of education. Between periods 1 and 2, the overall score of the household is reduced by -0.40, from 1.09 to 0.69, and its expected probability of being poor is reduced by -11 percent points, from 86 to 75 percent points.

We can decompose the change in the score in four terms: (a) a reduction of -0.38 due to the land effect; (b) a reduction of -0.29 due to the education effect; (c) an increase of 0.37 due to the interaction between education and land; and (d) a reduction of -0.10 due to the interaction between education and occupation (note that the sum of the four estimates of dF/dx at the mean of the sample does not match the expected change in the probability of being poor because this household is not located at the mean of the sample). The interpretation of this decomposition could be as follows. While the household gains from having a better educated head and more land, the combined reduction in the score of these two changes (-0.38 - 0.29 + 0.37 = -0.30) is less than the sum of the reductions of each change (-0.38 - 0.29 = -0.67) due to the relative lack of synergy between the two changes for this household[10]. By contrast, perhaps because the head of the household might be able to use his better education in his salesman job, we have a small net additional reduction in the score (-0.10) due to the interaction effect between education and occupation, which seems to indicate a positive synergy between education and occupation.

The above scores of 1.09 and 0.69 can be found as the first two elements on the diagonal of the rural sector part of Table 28. Table 28 also provides estimates of the probability of being poor for our household with other combinations of education and land, in both the rural and urban sectors. Within the urban sector, the household has been assigned to the geographical area of urban Khulna, so that the difference in scores due to the combination of this geographical area and the sector without other interaction effects is low, at -0.04. In other words, the differences in the probabilities in Table 28 can be considered as due to the impact of education and land (taking into account the interaction effects between these two characteristics and the urban sector.)

The overall trend in Table 28 is toward a decrease in the probability of being poor in both sectors when the education level of the head and/or the amount of land owned by the household increase. Comparing the probabilities along a given row, one can see that for the household considered here, land ownership tends to have a larger impact on poverty in the rural than in the urban sector. On the other hand, there are few differences between the two sectors in the impact

[10] Poverty comparisons based on many interaction effects should not be pushed too far, especially if the coefficient estimates of the interaction effects involved are not significant. Moreover, a special case of the application of interaction effects should be mentioned. In modifying the education level as well as the level of land ownership of a previously landless household head working in the agricultural sector, care should be attached to the education/occupation interaction dummy. Due to the definition of occupations in the household surveys, the change in land ownership may result in a new classification of the head of the household as an agricultural worker with land (and not anymore as an agricultural worker without land). In such case, the new score of the household should include the coefficient estimate for the interaction dummy between the level of education, say, Below class 5, and the new definition of the head's occupation. As seen from Table 27, this coefficient estimate is negative, large, and significant for the lower poverty line (-0.53). In this special but important case, there seems to be a synergy between education and land ownership (as land ownership is linked to the head's occupation as an agricultural worker) Overall though, across all occupations, there seems to be less synergy between education and land than education and occupation.

of education. The reader interested in other household groups can construct similar tables and plot the resulting probabilities in a two dimensional graph to yield a surface such as that shown on Figure 31 in which the shaded areas correspond to different levels in the probability of being poor.

IV.3. Tobits. While probit regressions can be used to analyze the determinants of the headcount index of poverty in a multivariate setting, tobit regressions can be used to analyze the determinants of higher order poverty measures of the FGT class. In the probit model, denoting by y_i^* the difference between the poverty line z and the per capita consumption y_i of a household i, such that $y_i^* = z - y_i$, we pretended not to observe the y_i^*'s and defined $h_i = 1$ when $y_i^* \geq 0$, and $h_i = 0$ when $y_i^* < 0$. In the tobit model, we pretend not to observe the y_i^*'s which are negative. For the poverty gap, we define $pg_i = y_i^*/z$ when $y_i^* \geq 0$, and $pg_i = 0$ when $y_i^* < 0$. For the squared poverty gap, we define $spg_i = (y_i^*/z)^2$ when $y_i^* \geq 0$, and $spg_i = 0$ when $y_i^* < 0$. Using the normal specification, the likelihood functions can against be maximized to provide estimates, for each of the two poverty measures, of the parameter vectors β_L and β_U for the two poverty lines z_L and z_U.

The results of these four regressions are provided in Table 29[11]. Broadly speaking, the household characteristics which had an impact on the probability of being poor in the probit regressions are also those with an impact on the poverty and squared poverty gaps in the tobit regressions. This should not be surprising given the properties of the tobit model. Consider the tobit regression for the poverty gap with the lower poverty line. Denoting by ϕ and Φ the density and cumulative density functions of the standard normal distribution, and by s_i the value of $(\beta_L'\mathbf{x}_i)/\sigma$ where σ is the standard deviation of the error term in the tobit regression, we have:

$$\text{Prob}[\, y_i \leq z_L] = \Phi(s_i)$$

$$E(pg_{iL}) = (\beta_L'\mathbf{x}_i)\, \Phi(s_i) + \sigma\phi(s_i)$$

$$E(pg_{iL} \mid y_i \leq z_L) = (\beta_L'\mathbf{x}_i) + \sigma\phi(s_i)/\, \Phi(s_i)$$

To use the first of these three equations, consider again the case of a household with one baby, two children, two adults, a head aged 40, and other characteristics corresponding to the excluded dummy variables. Using the coefficients of the poverty gap regression, we can estimate s_i through (-0.013 + 0.125 - 0.019 + 2*0.107 - 4*0.014 + 2*0.035 - 4*0.003 + 40*0.002 - 1600*0.00003)/0.220 = 1.59. This number is very close to the score of 1.57 computed using

[11] The results of tobit regressions are provided for illustration only. Although we could have tested for heteroscedasticity and normality, as suggested by Pagan and Vella (1989), this has not been done here. It will be done with a model with fewer interaction effects in a subsequent work devoted to an assessment of alternative models designed to take into account potential non-linearities and various poverty lines.

the coefficients from the probit model (note that the scores obtained by adding the coefficients of the dummies for higher educational levels for the head are not as close to the probit estimates). This example illustrates the links between the two models and why, in many cases, a characteristic associated in the probit with a decrease in the probability of being poor as indicated by a negative value of its coefficient estimate is also likely, in the tobit, to have a negative coefficient estimate.

The point of the tobit model is however less to predict the probability of being poor of a household than to estimate the impact of various household characteristics on the poverty gap (or squared poverty gap). It can be shown that the change in the expected poverty gap for a household with characteristics $\mathbf{x}_i$ due to a marginal change in a continuous variable x_{iA} is given by:

$$\partial E(pg_{iL})/\partial x_{iA} = \beta_A \Phi(s_i)$$

This last results shows that for ordinal poverty comparisons in terms of the poverty gap, all we need is the sign of β_A for a continuous variable x_{iA} (the same holds for dummy variables, and a similar derivation could be done for the squared poverty gap regression). The reader can check that virtually all coefficients for the tobit regressions have the same sign as those obtained for the probit regressions (exceptions tend to be associated with non significant coefficients). The rankings obtained by comparing the size of the coefficients of the educational, land ownership, and occupation dummies (as well as their interactions) also tend to be preserved. In simple terms, this indicates that the impact of household characteristics on consumption levels below the poverty line is similar to their impact around the poverty line. The main differences lie in the significance levels of the coefficients of a handful of variables. For example, being divorced or widowed affects the poverty and squared poverty gaps more than the probability of being poor[12].

IV.4. Determinants of Poverty. We may summarize the main results of our univariate tabulations and multivariate regressions for 1991/92, and highlight some difference in results.

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[12] In assessing the impact of household characteristics on the expected poverty gap, a decomposition proposed by McDonald and Moffitt (1980) is useful. For a continuous variable x_{iA}, we have: $\partial E(pg_{iL})/\partial x_{iA} = [\partial Prob[y_i \leq z_L]/\partial x_{iA}]\ E(pg_{iL} \mid y_i \leq z_L) + Prob[y_i \leq z_L]\ [\partial E(pg_{iL} \mid y_i \leq z_L)/\partial x_{iA}]$. The expected change in the poverty gap brought about by a marginal change increase in the value of the characteristic x_{iA} is the sum of two terms: the change in the probability of being poor weighted by the expected poverty gap conditional on being poor, and the change of the expected poverty gap conditional on being poor weighted by the probability of being poor. The two partial derivatives can be estimated using the coefficients from the tobit regression as follows: $\partial Prob[y_i \leq z_L]/\partial x_{iA} = \phi(s_i)\beta_A/\sigma$ and $\partial E(pg_{iL} \mid y_i \leq z_L)/\partial x_{iA} = \beta_A\ [1 - s_i\, \phi(s_i)/\Phi(s_i) - \phi(s_i)^2/\ \Phi(s_i)]$.

- *Sectors and Geographical Areas.* According to univariate tabulations and dominance analysis, sectoral effects are highly significant for a wide range of poverty lines. This conclusion is weakened in multivariate regressions. Once we control for the geographical areas within each sector as well as for other household characteristics, living in the urban versus the rural sector makes less difference in terms of our three poverty measures (at least with our two poverty lines.) To have a significantly lower expected probability of being poor, poverty gap, or squared poverty gap, living in the urban sector is often not enough. A household is more likely to be better off if, apart from living in the urban sector, it also comes from a specific geographical area within this sector and/or benefits from one or several of the interaction effects between this sector and other characteristics.

- *Religion and Demographics.* According to univariate tabulations, religion does not matter. Once we control for other variables in multivariate regressions, it does matter slightly, if only for the headcount index. The conclusion is reversed for the age of the head which seemed to matter in univariate tabulations, but has no significant impact on poverty measures in the multivariate setting. A common result between the univariate and multivariate poverty profiles (with our equivalence scale of one) is that the household size in the univariate case, and the numbers of babies, children, and adults in the multivariate case, all have a significant impact on all poverty measures, although at a decreasing rate.

- *Family Structure.* Differences in poverty measures are observed in univariate tabulations by marital status of the head and, to some extent in the urban sector, by sex of the head. These results tend to be corroborated in the multivariate setting. A number of coefficients are statistically different from zero, and the absence of a spouse is more of a disadvantage in urban areas. It should be noted, however, that due to sample size constraints, we did not define family structure in the regressions in the same way as we did in the univariate tabulations. The comparison of the results is thus less straightforward.

- *Education.* Education is a key determinant of poverty according to univariate tabulations. Overall, this result remains valid in multivariate regressions. Controlling for other characteristics, higher education levels are associated with lower expected poverty measures. Yet, some coefficients for the education dummies of the head and the spouse are not significant, which tends to indicate that the impact of education by itself in rural areas may be less strong than expected. In urban areas, the returns to education appear to be higher[13]. An observation common to both urban and rural areas is, however, that education, when combined with some occupations, tends to be more poverty reducing.

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[13] Another way to investigate the difference in the impact of education and land ownership in the urban and rural sectors is to look at the predictive power of these variables using ROC analysis. In urban areas, education is a very good predictor of poverty. In rural areas, it is not. The situation is

- *Land Ownership.* Land ownership is highly significant in both univariate tabulations and multivariate regressions. It is associated with the largest estimates of the marginal impacts on the probability of being poor. Yet, as expected, some of this impact is lost in urban areas. Moreover, it may be conjectured that the extent of the synergy between education and land ownership is lower than that existing between education and occupation.

- *Occupation.* As for land ownership, in both univariate tabulations and multivariate regressions, occupation has a large impact on poverty. All but one estimate of the coefficients of agricultural occupations are significant, and all estimates for non agricultural occupations are. Interestingly, occupation and education seem to work hand in hand in reducing poverty as the coefficients of their interaction effects are negative.

Conclusion

This paper has provided an account of the evolution and the determinants of poverty in Bangladesh. Two periods were considered to analyze the changes in poverty measures over time: the 1983-1992 decade, and the last three years of the decade. Over the whole decade, poverty decreased in the urban sector and increased in the rural sector, while over the last three years, it increased in both sectors. Due to the larger part of the population living in rural areas, poverty increased at the national level over both time periods. Poverty decompositions indicate that the changes in inequality tended to contribute to the rise in poverty over the whole decade, but not over the last three years during which a slightly lower inequality dampened the negative impact of the fall in the levels of per capita consumption in both sectors. Migration from rural to urban areas may also have reduced the increase in poverty observed between 1988/89 and 1991/92.

For all survey years, poverty has been much higher in the rural than in the urban sector. However, within each sector, large variations in poverty rates have been observed by geographical area. Within the urban sector, the Dhaka and Chittagong SMA's have the lowest poverty measures. Within the rural sector, the geographical areas corresponding to the old districts of Faridpur, Tangail, and Jamalpur in the Dhaka division, and Rajshahi and Pabna in the Rajshahi division, have the highest poverty measures. Regressions confirm that to escape poverty, living in the urban sector is often not enough. A household is more likely to have a higher per capita consumption if, apart from living in the urban sector, it also lives in a favorable geographical area.

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reversed for land ownership, which is a good indicator of poverty in rural areas, but not in urban areas (Wodon, 1996a).

In the rural sector, a lack of land ownership remains the foremost determinant of poverty. In the urban sector, occupation and education have more of an impact. With our choice of equivalence scale, poverty tends to increase as the household size increases. The differences in poverty measures according to other household characteristics such as those of family structure, sex of the household head, age of the head, and religion of the head are small in most cases.

From a methodological point of view, we have tried to highlight the limits of the results obtained with univariate tabulations, as compared to those obtained with multivariate regressions. For the more substantial issue of poverty alleviation in Bangladesh, it will be important to check if progress has been achieved since 1992. The country has improved its macroeconomic performance over the last few years. The results of the Household Expenditure Survey to be completed in 1995 should enable us to assess if this better performance has benefited the poor.

Appendix I. Cleaning the data sets

A number of programs were used to clean the data sets for the four HES surveys. Apart from standards descriptive statistics and summation tests for internal consistency between various parts of the data sets for each year, three additional cleaning tests are worth mentioning here.

Test 1: Check the number of expenditures observations for each household

Objective: To avoid keeping households which may not have reported adequately their expenditures and hence may have an artificially low level of food, non-food, or total consumption.

Methodology: Using the detailed information on food and non-food expenditures, the mean number of expenditure observations per household for food items, non food items, and all items is computed. If the number of observations for a household for food items is less than 1/3 the mean for all households, the consumption pattern of this household is checked. If the level of consumption per capita is unreasonably low, the household may be dropped from the data set. The test is also applied to non food expenditures for households with a number of observations inferior to 1/5 of the mean over the whole sample. Finally, the test is applied to all expenditure categories . In 1991/92 for example, no households were deleted following these tests.

Test 2: For the expenditures with unit values, check the unit values and the quantities

Objective: To catch mistakes in the recorded quantities and values for the expenditure categories for which a unit value may be computed (mostly food, but also some non food items.)

Methodology: Unit values are computed for each household and across all households for each item. If a) the unit value of a household for a given item is out of the confidence interval μ +/- 3σ, and b) the share of the consumption of the household spent on that item is higher than $\mu + 3\sigma$, then the expenditure is checked and the household may be deleted in case of an obvious mistake, especially if the share of the consumption allocated to the item is above 5 or 10 percent of the total expenditure for this household. In 1991/1992, 24 households were thereby deleted.

Test 3: For the expenditures without unit values, check if the observed expenses are reasonable

Objective: To catch mistakes in the recorded values for the expenditure categories for which no unit value may be computed (mostly non food items such as housing.)

Methodology: The total food expenditure is computed for each household. If any household spends on one type of goods more than twice the amount spent on food, the expenditure is checked. In 1991/1992, one household was deleted following this check.

Appendix II. Direct Caloric Intake, Food Energy Intake and Cost of Basic Needs Methods

AII.1. Three Methods. As discussed in the text, to make poverty comparisons, one must choose an indicator of well-being, propose a threshold for this indicator, and use this threshold to compute poverty measures across groups and over time. In its report on the 1991-92 Household Expenditure Survey, the BBS (1995b) chose direct caloric intake as its measure of well-being. In accordance with FAO standards for South Asian countries, the BBS adopted a national treshold of 2,122 calories per day and person, and used the headcount measure of poverty, defining as poor any household with a caloric intake of less than 2122 calories per person per day. That is, a household was deemed poor if $c \leq c^{ref}$, with c^{ref} being the direct caloric intake "poverty line":

$$\text{BBS direct caloric intake poverty line: } Z_{DCI} = c^{ref} \qquad \text{(A.1)}$$

In previous reports, the BBS chose per capita consumption as its measure of well-being, and computed poverty lines relying on the food energy intake method. The method consists in defining the poverty line as the per capita consumption at which households are expected to meet their caloric requirement. Denote by F and y the food and total per capita consumption of a household, and assume that F is a well behaved function of total consumption, such that $F = f(y)$, with f' positive and f'' negative. Also assume that c, the per capita caloric intake, is a function of food expenditures, $c = g(F)$, again with g' positive and g'' negative. In this simple model, still denoting by c^{ref} the caloric requirement, the BBS food energy intake poverty line is given by:

$$\text{BBS food energy intake poverty line: } Z_{FEI} = f^{-1}\,[g^{-1}(c^{ref})] \qquad \text{(A.2)}$$

A household was then declared poor if $y \leq Z_{FEI}$. If the functions f and g are stable over time and across groups (e.g. urban and rural sectors), we may not observe any difference in the measures of poverty obtained with the direct caloric intake and food energy intake methods. But this need not be the case. For 1988-89, we can retrieve estimates of the headcount in the urban and rural sectors with both methods using two reports of the BBS (1991, 1995b; the same value for c^{ref} was used in both sectors). The headcount increased from 44.0 to 47.6 percent in the urban sector, and decreased from 48.0 to 47.8 percent in the rural sector when shifting from the direct caloric intake to the food energy intake method. Although the BBS does not provide standard errors for its estimates, it is likely given the size of the samples that the difference between the two estimates for the urban headcount is significant at the 5 percent level of confidence.

A key argument which can be invoked in favor of using the food energy intake over the direct caloric intake method for poverty measurement is that the food energy intake method at least attempts to assess the command of households over a wide array of goods through a monetary threshold for total consumption, while the direct caloric intake considers only nutrition. Although measures of malnutrition may be interesting in their own right, they should not be confused with measures of broader indicators of well-being such as total consumption. For the years prior to 1991-92, the BBS food energy intake poverty lines are anchored in the normatively defined caloric requirement, but they do not assimilate poverty with malnutrition as is implicitly the case with the direct caloric intake. Now, if consumption is accepted as a better indicator of well-being than caloric intake, one may wonder if the food energy intake method is the most appropriate to construct poverty lines. The alternative approach used in this paper was the cost of basic needs method. As discussed in the text, three steps are needed to implement this method. The resulting lower and upper poverty lines can be expressed as functions of the food poverty line by noting that non food consumption is y - f(y). If Z_f is the food poverty line (i. e., the cost of the basic needs food bundle), the lower and upper poverty lines are defined as:

$$\text{Lower poverty line: } Z_L = 2Z_f - f(Z_f) \qquad \text{(A.3)}$$

$$\text{Upper poverty line: } Z_U = f^{-1}(Z_f) \qquad \text{(A.4)}$$

Our lower and upper poverty lines, as well as the food energy intake poverty lines of the BBS for the four survey years are given in Table A.1 (the figures for the lower and upper poverty lines are the same as those reported in Table 4; only the BBS poverty lines are new). Remember that for 1991-92, the BBS simply classified as poor the households not meeting their caloric requirement. For that year, we computed in Table 4 BBS "implicit" food energy intake poverty lines generating the same measures of poverty in the urban and rural sectors as those reported by the BBS (1995b) with the direct caloric intake. The change in method used by the BBS in 1991-92 need not worry us because we will illustrate the advantages and drawbacks of the food energy intake and cost of basic needs methods with events that happened between 1985 and 1988.

AII.2. Two Levels of Disaggregation. Apart from differences in method, the BBS has adopted a low level of disaggregation in setting poverty lines by distinguishing only the urban and rural sectors, while we have monitored differences in costs of living between a total of fourteen areas, six urban and eight rural. In 1991-92 for example, our lower and upper poverty lines are 9 and 27 percent higher in Chittagong's Standard Metropolitan Area, as compared to the other urban areas of the Chittagong division. The fact that the gap is larger for the upper poverty line is due to the larger allowance for non food items with that line, and to the higher cost of non food items in SMA's. In general, the more disaggregated the poverty lines, the better the poverty profile since differences in cost of living between areas are measured with more precision. We will not discuss in this appendix the impact of the level of geographical disaggregation on poverty lines and profiles. The reader is referred to Wodon (1996d) for a detailed analysis.

A.II.3. Headcount Indices. Table A.2 provides estimates of the headcount index of poverty nationally, in the urban and rural sectors, and by geographical area within each sector according to the lower, upper and BBS poverty lines (the results for the lower and poverty lines are the same as those provided in Tables 7, 13, and 14; the results with the BBS poverty lines are new). Although the BBS reports poverty measures only for the urban and rural sectors as a whole[14], we computed the measures by geographical area within each sector using the BBS sectoral poverty lines for the first three surveys, and our imputed BBS poverty line for 1991-92. According to the BBS, poverty rates were similar in urban and rural areas, and poverty decreased continuously over time over the decade in review (with the exception of the headcount in urban areas which is higher in 1991-92 than in 1988-89). According to our results, poverty is higher in rural than in urban areas for both the lower and upper poverty lines and for all years, and it has increased over the last few years in both sectors.

A.II.4. Consistency and Specificity. Which method and results should be used? In the literature, the debate has been framed in terms of consistency versus specificity (Ravallion and Bidani, 1994). A poverty profile will be deemed consistent when the standards of living embodied in the poverty lines used to construct the profile are the same for the various subgroups the profile attempts to compare. For rural to urban comparisons, the rural and urban poverty lines should represent the same standards of living. For comparisons over time, the poverty lines for a given geographical area should represent the same standards of living for the two years. By contrast, a poverty profile will be deemed specific if its underlying poverty lines represent local (for the rural to urban comparison) or temporal (for a comparison between years) perceptions as to what constitutes poverty. For example, if there are differences in tastes or consumption patterns between urban and rural areas or between two years, these should be taken into account in constructing specific urban and rural poverty lines.

In practice, any method for computing poverty lines is likely to make room for both consistency and specificity. Because no reliable data are available for tracking the price of non food items by area in most developing countries, and because there is no consensus on the identification of non nutritional basic needs, the cost of basic needs method has to make room for specificity in the estimation of non food allowances. In this respect, our upper poverty lines are more specific than our lower poverty lines simply because they include a larger non food allowance which does not control for area-specific tastes and consumption patterns. As for the food energy intake method, it makes room for consistency in being anchored in a nutritional requirement. The consistency and specificity of the two methods is thus a matter of degree. Each method has some advantages as well as potential drawbacks. In what follows, we argue however that the potential drawbacks of the food energy intake method can be particularly severe.

[14] Our replication of the poverty estimates of the BBS for 1991-92 is exact simply because our implicit poverty lines for the BBS in 1991-92 are defined as the urban and rural poverty lines (respectively 673 Tk/month and 443 Tk/month per person) which would have resulted in the BBS (1995b) official headcount measures (respectively 46.7 and 47.6 percent) for the urban and rural sectors. For the other years, we used the BBS poverty lines themselves to replicate their poverty measures. The replication for 1988-89 was excellent, since our urban and rural headcounts of 44.3 and 48.2 percent are close to the BBS reported measures of 44.0 and 48.0 percent. For 1985-86 and 1983-84, the replications were a little less good, but not so much as to invalidate the conclusions in terms of poverty comparisons.

AII.5. A Specific Case for the Cost of Basic Needs Method. Figure A.1 makes a case in favor of the cost of basic needs method by highlighting an actual and serious lack of consistency in the food energy intake method for poverty comparisons in Bangladesh between 1985 and 1988.

The top part of Figure A.1 describes how the poverty lines are computed using the cost of basic needs approach. In the northeast quadrant, the cost of the food bundle in the Dhaka SMA is represented in 1985 and 1988 as a function of the calories provided. The slope of the two straight lines in the quadrant are simply the total cost of the food bundle divided by the calories provided. Due to inflation, the cost of the food bundle was higher in 1988 (303 Tk/month) than in 1985 (226 Tk/month). In the northwest quadrant, the upper allowances for non food consumption are computed (the graphical illustration for the lower poverty lines is not represented on the Figure to avoid overcrowding it). The Engle curves for 1985 and 1988 represent the part of total consumption devoted to food at various levels of total consumption. The Engle curve for 1985 indicates, for example, that a household with a total consumption of 397 Tk/month is expected to spend 226 Tk/month on food per capita, which is the food poverty line for that year. The threshold of 397 Tk/month thus represents the upper poverty line for that year. Similarly, 570 Tk/month is the upper poverty line for 1988, a level of per capita consumption at which a household is expected to spend on food 303 Tk/month, the cost of the food bundle in 1988. Again, the higher poverty line for 1988 than for 1985 makes sense since there was inflation.

The upper poverty lines for the Dhaka SMA in 1985 and 1988 have been reported to the southeast quadrant in order to be compared to the poverty lines obtained by the BBS with the food energy intake method. The expected energy intake is represented as a function of total per capita consumption (the energy intakes have been represented by straight lines for the convenience of the Figure, but the functions need not be linear). From the BBS, we know that in 1985, a household was expected to meet its nutritional requirement in urban areas as a whole at a level of expenditures of 519 Tk/month. In 1988, this amount fell to 500 Tk/month. The energy intake functions corresponding to the BBS estimates are drawn in plain lines. The dashed lines represent energy intake functions which would have resulted in our upper poverty lines.

In the southwest quadrant, the cumulative density functions of per capita consumption for 1985 and 1988 have been drawn. Using our upper poverty lines, we find that the headcount increased in the Dhaka SMA from 21.01 to 42.6 percent. Using the BBS poverty lines, we find a decreasing headcount, from 41.6 to 33.7 percent. An indirect way to assess which results to trust would be to look at other informations on standards of living, such as wages. Here however, a difficulty with the BBS method can be uncovered directly. According to the BBS, households met their nutritional requirement at lower expenditure levels in 1985 than in 1988. If we rule out unlikely changes in tastes between the two periods, the fall in the BBS poverty line must have resulted from changes in absolute or relative prices or from income shifts. We do not have good price data for non food items by area, but we did estimate prices for food items in order to construct the lower and upper poverty lines. All items in our food bundle saw their price increase between the two years in the Dhaka SMA as elsewhere. Moreover, although there may have been changes in relative prices, their magnitude is not likely to have led to a decrease (holding utility constant) in the expenditure level at which households meet their nutritional needs. For example, the price increase for rice, whose consumption accounts for one third of the total cost of our food bundle, was lower than for the food bundle as a whole. This relative price change could have lead households to consume more rice. Yet, while such a substitution might have limited the increase in the cost of the food actually consumed by households, it is unlikely by itself to have resulted in a decrease in the spending on food, holding utility constant. A more likely scenario is that a negative income shock forced households to consume lower quality food in order to meet their caloric requirement. This shock resulted in a decrease in actual well-being which was captured with the lower and upper poverty lines, but not with the BBS poverty line because of the lack of consistency of the food energy method in comparing standards of living.

AII.6. The More General Case. In terms of the stylized equations (A.2) to (A.4), the consistency and specificity issue can be made explicit by noting that with the BBS poverty lines, we are comparing headcounts resulting from the poverty lines $Z_{FEI85} = f_{85}^{-1}[g_{85}^{-1}(c^{ref})]$ and $Z_{FEI88} = f_{88}^{-1}[g_{88}^{-1}(c^{ref})]$. If cheap and starchy, but more caloric intensive food is an inferior good, we may observe a rise in the caloric intake following a drop in income. This may result in $g_{85}^{-1}(c^{ref})$ being larger than $g_{88}^{-1}(c^{ref})$. Assuming for simplicity the same function f for both years, we then have Z_{FEI85} larger than Z_{FEI88}, as observed by the BBS. With the upper poverty lines based on the cost of basic needs method, we are comparing headcounts resulting from the poverty lines $Z_{U85} = f_{85}^{-1}(Z_{f\,85})$ and $Z_{U88} = f_{88}^{-1}(Z_{f\,88})$. As absolute food prices went up between the two years, we must have $Z_{f\,85}$ smaller than $Z_{f\,88}$. Then, assuming again for simplicity the same function f for the two years, we must have Z_{U88} larger than Z_{U85}. The issue of specificity in the food energy intake method relates to the use of different functions g for the two years, which represents a drawback for consistency in the measurement of standards of living. This drawback is avoided with the cost of basic needs method because it does not rely on the function g.

The above heuristic discussion and the example illustrated in Figure A.1 do not demonstrate the superiority of the cost of basic needs method, but they point out to the risk of inconsistency in poverty comparisons over time based on the food energy intake method. This inconsistency is due to the fact that the BBS poverty lines do not correspond to similar standards of living over time. The same may apply to poverty comparisons between the urban and rural sectors. If urban households are better off than rural households, they may (a) buy better quality food, which may translate into $g_{Urb}^{-1}(c^{ref})$ being larger than $g_{Rur}^{-1}(c^{ref})$; and (b) spend more on non food items, which may translate into $f_{Urb}^{-1}(.)$ being larger than $f_{Rur}^{-1}(.)$ at any given level of expenditure. While some of the gap between rural and urban food energy intake poverty lines may be warranted due to price differences for non-food items such as housing, in which case we do have $f_{Urb}^{-1}(.)$ larger than $f_{Rur}^{-1}(.)$ even with the cost of basic needs method, the full gap may not be warranted if the purchase of higher quality food by urban households is not deemed relevant from a normative and public policy point of view. That is, urban households are likely to meet their food requirements at higher levels of per capita consumption than rural households, not so much because of relative price differences between the urban and rural sectors, but because of differences in income or tastes. The urban food energy intake poverty lines will then be over-estimated, which in our own case help explain why the BBS urban poverty measures are so high.

The cost of basic needs methods may of course have its own weaknesses. For the food component of the lower and upper poverty lines as for any Laspeyres price index, the absence of the possibility of substitution in the food bundle may lead to an overstatement (understatement) of increases (decreases) in the cost of food and hence result in higher (lower) poverty lines than warranted (holding utility constant). Moreover, even if the estimation of the allowance for non food items is based on what the poor actually spend on these items, it is not anchored is a normative requirement as universally accepted as the caloric requirement. Yet, in light of the example outlined in Figure A.1, we would argue that given the limited amplitude of relative price shifts, these weaknesses for the consistency of poverty comparisons across groups and over time tend to be of a smaller order magnitude than those at risk with the energy intake method.

AII.7. Changes in Poverty Lines, Gap Narrowing and Reranking. Despite the difficulties with the food energy intake method, it could still be argued that the method should be used because the indeterminacy of the non food allowance in the cost of basic needs method poses problems of its own. After all, the differences in poverty estimates obtained with the lower and upper poverty lines tend to be on average larger than the differences in the measures obtained between the lower and the BBS poverty lines, or between the upper and the BBS poverty lines.

If we were primarily interested in levels of poverty, the indeterminacy of the allowance for non food items would indeed be worrying. Yet, for policy purposes, poverty comparisons over time or across groups tend to matter more than poverty levels per se. The question is then whether shifting from the lower to the upper poverty lines generates more differences in the ranking of, say, geographic areas than shifting from the lower or upper to the BBS poverty lines.

Figure A.2 gives a hint of what we are looking at. The fourteen areas (six urban and eight rural) have been ranked on the horizontal axis by their headcount using the lower poverty lines. The headcount obtained with the upper and BBS poverty lines are measured on the vertical axis. Consider first a change from the lower to the BBS poverty lines. If this change had no impact on poverty measures, the headcounts with the BBS poverty lines would be equal to those with the lower poverty lines, yielding a 45^0 line in the Figure. In fact, the headcounts with the BBS poverty lines tend to be above the 45^0 line for urban areas, and close to the 45^0 line for the rural areas. If there were no rerankings with the change from the lower to the BBS poverty lines, the locus of headcounts for the BBS poverty lines would be increasing monotonically in the Figure. A fall in the locus attests of a reranking. For example, the fall for the third lowest poverty measure corresponds to the reranking of the rural areas of the Sylhet and Comilla districts which fare better, as compared to other areas, with the BBS than with the lower poverty lines. In total, there are five such falls, some of which have a large magnitude. Consider now the change from the lower to the upper poverty lines. The locus for the upper poverty lines is far above the 45^0

line, indicating large gaps between the two sets of poverty measures. On the other hand, there are only four rerankings which are of a smaller magnitude than those observed for the BBS lines.

A decomposition of the Gini index can be used to measure the gap narrowing and reranking effects of the changes in method on poverty measures among areas. Let us denote:

P_i the poverty measure of area i;
n the number of areas;
P the mean poverty measure over all areas (weighted by population shares);
$s_i = P_i /P$ the normalized poverty measure of area i;
R_i the rank of area i among all area ranked by the poverty measure;
$F_i = R_i /n$ the normalized rank of area i (F_i takes a value between 0 and 1);
Using these notations, the Gini index for inequality in poverty rates among areas is[15]:

$$G = 2\mathrm{cov}(s_i, F_i) \qquad (A.5)$$

The Ginis for the lower, upper, and BBS poverty lines are given in Table A.3. The shift from the lower to the upper or the BBS poverty line entails a reduction of the Gini simply because all poverty measures are closer to unity, and hence less far apart from each other. What we are interested in is not the absolute change in the Gini, however, but the decomposition of this change. In the context of income and taxation, Lerman and Yitzhaki (1994) decomposed the difference in the Gini before and after tax in a gap-narrowing effect (holding ranks constant) through which a tax reduces or increases the differences in income among households, and a reranking effect (holding income constant) through which the rank of households is affected by taxation. To apply this decomposition here, consider the two sets of poverty measures obtained with the lower and BBS poverty lines, to which correspond the two Gini indices G_L and G_B. Dropping the area subscripts, the change in the Gini is the sum of two components:

$$G_L - G_B = 2\mathrm{cov}(s_L - s_B, F_B) + 2\mathrm{cov}(s_L, F_L - F_B) \qquad (A.6)$$

$$G_L - G_B = 2\mathrm{cov}(s_L - s_B, F_L) + 2\mathrm{cov}(s_B, F_L - F_B) \qquad (A.7)$$

On the right hand side of (A.6) and (A.7), the first components of the decompositions are the gap-narrowing effects. The second components are the reranking effects. In the first equation, the BBS ranks and the lower poverty measures are held constant. In the second equation, the lower ranks and the BBS poverty measures are held constant. The reranking term will be positive in the first equation, and negative in the second due to the properties of Lorenz

[15]The Ginis are computed as $G = 2\Sigma_i w_i (s_i - 1)(F_i - 0.5)$ where w_i is the population share of area i. Following Lerman and Yitzhaki (1989), the normalized ranks of each area F_i are computed at mid-point. For example, the Dkaha SMA had a population share (in the sample) of 6.9 percent in 1991, versus 6.2 percent according to the 1991 census (BBS, 1995a). When the Dhaka SMA is the best off area, which is the case with the lower poverty lines, the sample population share translates into a normalized rank of 0.0345.

and concentration curves. Yet, to measure the extent of reranking, what matters for us is only the absolute magnitude of the reranking effect as compared to the gap narrowing effect, or the magnitude of the reranking effect as a percentage of the observed difference in the Ginis.

Table A.3 gives the results of the two decompositions of the changes in the Ginis. The decompositions were applied not only to a change from the lower to the BBS poverty lines, but also to a change from the lower to the upper poverty lines. For the change from the lower to the upper poverty lines, the gap narrowing terms are large and the reranking terms are small. This is not true for the change from the lower to the BBS poverty lines, where reranking accounts for the biggest part of the change in the Gini. The implication of this exercise is that for policy decisions based on ordinal poverty comparisons between geographical areas, the indeterminacy of the non-food component in the cost of basic needs poverty lines need not worry us too much.

To sum up, in this appendix, it has been shown that the choice of method may have a large impact on the unconditional measurement of poverty. We illustrated this impact through a geographic profile of poverty because the differences in poverty measures will be largest for areas due to the geographic definition of the poverty lines. If we had measured poverty along the education or land ownership of households, and if education and land characteristics had been evenly distributed accross areas, then the change of method would not have resulted in any differences in the unconditional estimates of the headcount by education level or landholding class. In practice, because education and land holding patterns are not uniformally distributed among areas, the use of the cost of basic needs or energy intake methods will still have an impact on poverty measures, but his impact would be of a lesser magnitude than that observed for areas.

Appendix III. Poverty Lines and Multivariate Profile

What is the impact of method on conditional multivariate poverty profiles? To answer this question, it is convenient to structure the discussion around the distinction between consumption "levels" regressions (estimated, say, by OLS) and poverty regressions (probits and tobits).

AIII.1 Consumption Regressions. If poverty lines are geographically defined and geographic dummies are included in consumption regressions, the choice of method and poverty lines will have no impact on the assessment of the value and level of significance of the coefficient estimates of the non-geographic variables in the regression. Denoting the income of household i by y_i and the poverty line of area k in which the household lives by z_k, we can run a regression of $Log(y_i/z_k)$ on a number of variables **X** including location, education, demographics, land ownership, occupation, etc. Because the impact on poverty lines of the change from the food energy intake to the cost of basic needs method (or from the lower to the upper poverty lines within the cost of basic needs method) is area-specific, it will be fully captured in the regression constant and in the coefficients of the geographic dummies. The new constant and estimates for the geographic dummies can be directly computed for any set of poverty lines (Wodon, 1996d).

The irrelevance of method and poverty lines for the estimation of the parameters of non-geographic variables in consumption regressions when poverty lines are geographically defined and geographic dummies are included does not mean that changes in method have no bearing for the assessment of the impact of non geographical variables on the probability of being poor. If the errors follow a normal disribution with zero mean and standard deviation σ, the probability of being poor for a household with characteristics $\mathbf{X}_i$ is Prob[log $y_i / z_k < 0$] = $\Phi[- \beta'\mathbf{X}_i/\sigma]$ where Φ is the cumulative density of the standard normal and σ is the root mean squared error. Consider the impact of a non geographical characteristic x_{iA} on the probability of being poor, while controlling for other characteristics. If x_{iA} is continuous (a slightly different reasoning can be applied for dummy variables), the marginal impact on the probability of being poor due to a change in x_{iA} is $\partial P/\partial x_{iA} = -\phi\ (-\beta'\mathbf{X}_i /\sigma)\beta_A$, where ϕ is the normal density function. Even though the estimate of β_A does not depend on the method used, because of the presence of $-\phi\ (-\beta'\mathbf{X}_i /\sigma)$ in $\partial P/\partial x_{iA}$, the marginal impact of a change in x_{iA} depends on the overall score $\beta'\mathbf{X}_i$ of the household. It is customary to compute $-\phi\ (-\beta'\mathbf{X}_i /\sigma)$ at the mean of the sample. But whatever the reference point, $\beta'\mathbf{X}_i$ depends on the regression constant and the coefficients of the geographical dummies which do change with method. Only the sign of the effect will be method-independent as $-\phi\ (-\beta'\mathbf{X}_i /\sigma)$ is always negative. If the estimate of β_A is positive, then a household with a higher value for x_{iA} will have a lower probability of being poor than a household with a lower value for x_{iA}.

AIII.2 Poverty Regressions. In this paper we used probits and tobits instead of levels regressions. Let's focus on the probits. When we run a probit, we pretend not to observe the y_i's. We act as if we only observed a dummy h_i which takes the value 1 if $y_i \leq z_k$ and 0 if $y_i > z_k$. The probability that a household is poor is given by Prob[$h_i = 1$] = $\Phi(\beta'\mathbf{X}_i)$ (this is as above, except that the variance of the residuals has been normalized to one and that the sign of the score has changed due to the fact that we have defined the poor through $h_i = 1$). There is a loss of efficiency in using probits because we do not use all the information in the sample. Probits are also more sensitive to specification errors than levels regressions. They yield biased estimates if the error terms are not normally distributed. At the same time, there may be a gain in using probits rather than consumption regressions. First, while levels regressions yield unbiased estimates of mean consumption, they do not necessarily yield unbiased estimates of poverty because of the non-linearities present in the cumulative normal distribution. Second, probits relax the assumption of first order dominance embedded in levels regressions. The fact that the coefficient estimates of non-geographic variables in standard regressions do not change with a method change results from the linearity of the regression model. This linearity constraints the impact of household characteristics to remain the same at various levels of per capita consumption. In the presence of poverty traps, this may be unrealistic. Education, occupation, or land ownership may have less impact at low levels of consumption if poor households are not able to take advantage of them. With probits, the estimation of β by maximum likelihood does not impose first order dominance.

It is in part an empirical matter whether the potential gains in using poverty regressions outweight the losses of information involved. It is beyond the scope of this appendix to provide an in-depth analysis of the comparative advantages of levels regressions and probits. Yet, we ran a simple experiment. Using the 1991-92 parameter estimates of the levels regressions and probits, we predicted the national headcount for the lower and upper poverty lines for a household with the national mean characteristics. The actual headcounts are 0.43 and 0.59 (Table 7). The probit estimates at 0.38 and 0.43 were better than the levels estimates at 0.30 and 0.78. It is easy to see why the levels estimates are off mark. Consider a country with two areas and iid nominal consumption distributions $N(\mu,\sigma)$ and poverty lines $z_1 \neq z_2$. The national headcount is $\frac{1}{2}\,[\Phi((z_1 - \mu)/\sigma) + \Phi((z_2 - \mu)/\sigma)]$. With equal population in each area, mean real consumption is $\mu(z_2+z_1)/2z_1z_2$. A log regression will provide unbiased estimates of mean real consumption as $\mu(z_2+z_1)/2z_1z_2 = \exp(\beta'\mathbf{X}_N)$ where $\mathbf{X}_N$ represents national mean characteristics. Yet, this will not yield unbiased estimates of poverty because of the non-linearity of Φ. Probit estimates may be biased as well, but they may perform better than levels estimates in many instances. Thus, if we are interested in the impact of variables on poverty rather than on real consumption, using probits makes sense.

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Table 1: Estimates of the Headcount Index of Poverty in Bangladesh

	Rahman and Haque (1988)	Ahmed et al. (1991)	BBS (1991 and 1995b)	Hossein and Sen (1992)	Sen and Islam (1993)	Ravallion and Sen (1995)	This study with lower pov. line	This study with upper pov. line
Urban Poverty								
1981/1982	50.7	65.3	66.0	n.a.	48.4	n.a.	n.a.	n.a.
1983/1984	39.5	n.a.	66.0	n.a.	42.6	40.9	28.04	50.78
1985/1986	29.1	66.8	56.0	n.a.	30.6	30.8	15.93	36.95
1988/1989	n.a.	n.a.	44.0	n.a.	33.4	35.9	22.61	45.01
1991/1992	n.a.	n.a.	46.7*	n.a.	n.a.	33.6	24.87	45.24
Rural Poverty								
1981/1982	79.1	71.8	73.8	65.3	n.a	n.a.	n.a	n.a.
1983/1984	49.8	n.a.	57.0	50.0	n.a.	53.8	42.58	60.36
1985/1986	47.1	51.6	51.0	41.3	n.a.	45.9	32.03	8.66
1988/1989	n.a	n.a.	48.0	43.8	n.a.	49.7	44.78	60.15
1991/1992	n.a	n.a.	47.6*	n.a.	n.a.	52.9	47.44	62.96

Sources: Ravallion and Sen (1996), BBS (1991, 1995b) and own computations from HES unit level data. (*) The BBS measures for 1991/92 are based on a different methodology than that adopted for previous years. See Appendix II for a discussion.

Table 2: Geographical areas and sample sizes after data cleaning (1983/84 to 1991/92)

#	Division	Sector	1983/84	1985/86	1988/89	1991/92
1	Dhaka	Main City	652	620	653	688
2		Other Urban	160	144	190	188
3		Rural I (Dhaka, Mymensingh)	352	320	588	592
4		Rural II (Faridpur, Tangail, Jamalpur)	255	224	456	462
5	Chittagong	Main City	255	224	254	256
6		Other Urban	113	111	156	159
7		Rural I (Sylhet, Comilla)	319	303	576	591
8		Rural II (Noakhali, Chittagong)	224	208	367	365
9	Khulna	Urban	304	303	340	352
10		Rural I (Barisal, Patuakhali)	175	145	299	301
11		Rural II (Khulna, Jessore, Kushtia)	256	240	459	462
12	Rajshahi	Urban	240	239	269	265
13		Rural I (Rajshahi, Pabna)	239	224	507	510
14		Rural II (Bogra, Rangpur, Dinajpur)	288	272	538	544
-	**Total**		**3,832**	**3,577**	**5,652**	**5,735**

Source: Own computations from HES unit level data.

Table 3: Normative food bundle and monthly food poverty line by geographical area (1991/92)

	Daily per capita need		Price of food components by geographical area (Tk/kg) - Example of 1991/92													
	Cal.	**Gm**	**# 1**	**# 2**	**# 3**	**# 4**	**# 5**	**# 6**	**# 7**	**# 8**	**# 9**	**# 10**	**# 11**	**# 12**	**# 13**	**# 14**
Rice	1386	397	12.3	12.4	11.9	11.8	12.7	12.3	11.9	12.1	11.8	12.2	11.1	11.3	11.0	11.2
Wheat	139	40	10.8	10.6	10.0	9.9	10.6	10.8	10.5	10.4	10.2	10.5	9.5	9.6	9.4	9.9
Pulses	153	40	27.9	27.1	28.0	26.3	28.5	27.7	27.0	28.4	26.8	26.3	26.5	26.6	25.9	25.0
Milk	39	58	16.1	12.9	12.0	11.9	13.9	13.3	12.2	11.5	13.4	10.7	10.4	11.4	10.3	10.5
Oil (mustard)	180	20	52.2	52.1	55.3	53.3	53.2	53.9	54.4	54.7	56.0	54.0	53.3	52.5	51.7	52.2
Meat (beef)	14	12	54.8	45.9	48.0	48.1	60.5	57.5	55.9	44.0	43.3	40.2	39.9	42.3	41.8	37.6
Fresh water fish	51	48	28.9	26.6	25.5	27.7	26.3	27.1	25.3	30.1	28.0	25.2	26.7	27.5	27.7	27.0
Potato	26	27	7.5	7.1	7.0	7.3	7.4	7.6	7.8	7.7	7.5	6.1	6.1	7.4	6.7	7.4
Other vegetables	36	150	7.0	6.9	6.5	6.0	6.7	6.8	7.2	6.5	5.3	5.6	4.3	6.1	4.9	5.3
Sugar	82	20	31.2	31.9	30.0	31.9	30.7	32.8	29.3	30.4	30.4	30.4	31.4	31.6	30.8	30.3
Fruits (banana)	6	20	14.1	11.1	10.0	11.7	8.9	10.4	9.1	11.5	9.2	9.5	10.0	11.8	9.4	11.1
Total	**2112**	**832**	-	-	-	-	-	-	-	-	-	-	-	-	-	-
z_f (monthly)	-	-	**378**	**364**	**354**	**353**	**374**	**370**	**359**	**364**	**352**	**345**	**327**	**344**	**329**	**332**

Source: Own computations from HES unit level data. The notation z_f refers to the food poverty line.

Table 4: Lower and upper poverty lines by geographical area (1983/84 to 1991/92)

#	Division	Sector	83/84		85/86		88/89		91/92	
			z_l	z_u	z_l	z_u	z_l	z_u	z_l	z_u
1	Dhaka	Main City	249.44	341.40	295.02	397.11	398.07	570.09	488.71	660.17
2		Other Urban	255.59	315.47	288.17	398.19	395.36	442.23	460.82	506.15
3		Rural I (Dhaka, Mymensingh)	238.53	280.09	271.05	312.04	361.40	406.50	451.59	531.04
4		Rural II (Faridpur, Tangail, Jamalpur)	230.97	268.55	270.26	313.51	351.67	365.31	433.47	475.22
5	Chittag.	Main City	259.19	381.33	304.18	422.76	400.30	533.44	509.31	712.30
6		Other Urban	241.54	287.83	294.71	387.91	384.30	477.84	466.48	562.83
7		Rural I (Sylhet, Comilla)	240.75	282.73	282.64	322.52	367.22	511.25	448.39	563.09
8		Rural II (Noakhali, Chittagong)	257.92	299.12	291.26	343.10	396.09	439.23	472.42	587.57
9	Khulna	Urban	243.12	304.58	271.95	405.19	364.18	470.77	461.01	591.73
10		Rural I (Barisal, Patuakhali)	234.43	252.56	278.76	304.75	354.44	400.79	437.47	530.20
11		Rural II (Khulna, Jessore, Kushtia)	228.25	268.68	274.68	334.82	359.84	422.94	419.73	497.17
12	Rajshahi	Urban	248.90	353.70	281.75	363.17	345.40	458.72	449.07	582.20
13		Rural I (Rajshahi, Pabna)	236.31	290.21	273.44	309.65	328.63	365.12	425.15	480.83
14		Rural II (Bogra, Rangpur, Dinajpur)	237.20	302.35	261.42	312.66	344.04	391.90	421.14	479.44

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.

Table 5: Expansion Factors (1983/84 to 1991/92)

	Population		Implied annual rate of growth	Implied population		
	1981 Census	1991 Census		1983/84	1985/86	1988/89
Population (1,000)						
Urban	13,228	22,455	5.434	15,504	17,235	20,200
Rural	73,892	89,000	1.878	78,133	81,095	85,750
		1991/92		**1983/84**	**1985/86**	**1988/89**
Sample Size						
Urban		10,198		10,060	10,490	10,449
Rural		20,466		12,012	12,316	20,949
		1991/92		**1983/84**	**1985/86**	**1988/89**
Expansion Factor						
Urban		2202		1541	1643	1933
Rural		4349		6505	6585	4093

Source: Own computations from HES unit level data. Population and sample size are in terms of individuals, not households.

Table 6: Average welfare ratios by geographical area with the lower and upper poverty lines (1983/84 to 1991/92)

#	Division	Sector	83/84		85/86		88/89		91/92	
			z_l	z_u	z_l	z_u	z_l	z_u	z_l	z_u
1	Dhaka	Main City	1.86	1.36	2.47	1.83	2.11	1.47	2.11	1.56
2		Other Urban	1.27	1.03	1.56	1.13	1.47	1.32	1.38	1.26
3		Rural I (Dhaka, Mymensingh)	1.23	1.05	1.43	1.24	1.29	1.15	1.24	1.06
4		Rural II (Faridpur, Tangail, Jamalpur)	1.14	0.98	1.16	1.00	1.09	1.05	0.96	0.88
5	Chittag.	Main City	1.85	1.26	2.14	1.54	2.14	1.60	1.70	1.22
6		Other Urban	1.78	1.50	2.04	1.55	2.04	1.64	1.62	1.34
7		Rural I (Sylhet, Comilla)	1.44	1.22	1.51	1.32	1.40	1.00	1.42	1.13
8		Rural II (Noakhali, Chittagong)	1.27	1.09	1.61	1.36	1.29	1.16	1.32	1.06
9	Khulna	Urban	1.49	1.19	1.93	1.30	1.68	1.30	1.64	1.28
10		Rural I (Barisal, Patuakhali)	1.32	1.22	1.30	1.19	1.19	1.05	1.10	0.91
11		Rural II (Khulna, Jessore, Kushtia)	1.20	1.02	1.30	1.06	1.24	1.05	1.25	1.06
12	Rajshahi	Urban	1.33	0.94	1.53	1.19	1.66	1.25	1.45	1.12
13		Rural I (Rajshahi, Pabna)	1.14	0.93	1.34	1.18	1.18	1.06	0.99	0.87
14		Rural II (Bogra, Rangpur, Dinajpur)	1.15	0.90	1.23	1.03	1.24	1.09	1.04	0.92

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.

Table 7: Poverty by sector with the lower and upper poverty lines (1983/84 to 1991/92)

	83/84			85/86			88/89			91/92		
	H	**P_1**	**P_2**	**H**	**P_1**	**P_2**	**H**	**P_1**	**P_2**	**H**	**P_1**	**P_2**
With z_l												
Urban (1) (20.2%)	28.04 (1.08)	6.50 (0.33)	2.30 (0.16)	15.93 (0.90)	2.74 (0.20)	0.74 (0.08)	22.61 (0.97)	4.36 (0.24)	1.27 (0.09)	24.87 (0.99)	5.36 (0.27)	1.69 (0.11)
Rural (79.8%)	42.58 (1.08)	10.43 (0.36)	3.84 (0.19)	32.03 (1.06)	6.30 (0.28)	1.94 (0.12)	44.78 (0.81)	10.89 (0.26)	3.83 (0.13)	47.44 (0.81)	12.13 (0.27)	4.34 (0.13)
National	40.17 (0.79)	9.78 (0.26)	3.59 (0.14)	29.21 (0.76)	5.67 (0.20)	1.73 (0.08)	40.55 (0.65)	9.64 (0.21)	3.34 (0.10)	42.89 (0.65)	10.77 (0.21)	3.81 (0.10)
With z_u												
Urban (20.2%)	50.78 (1.20)	14.66 (0.47)	5.97 (0.26)	36.95 (1.19)	9.17 (0.38)	3.16 (0.17)	45.01 (1.15)	11.51 (0.40)	4.01 (0.18)	45.24 (1.14)	11.96 (0.39)	4.37 (0.19)
Rural (79.8%)	60.36 (1.07)	16.91 (0.43)	6.73 (0.24)	48.66 (1.14)	11.09 (0.36)	3.73 (0.17)	60.15 (0.80)	16.44 (0.31)	6.26 (0.16)	62.96 (0.78)	18.56 (0.32)	7.28 (0.17)
National	58.78 (0.79)	16.54 (0.32)	6.61 (0.18)	46.61 (0.83)	10.75 (0.26)	3.63 (0.12)	57.26 (0.66)	15.50 (0.25)	5.83 (0.13)	59.39 (0.65)	17.23 (0.25)	6.69 (0.13)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 8: Sectoral decomposition of change in poverty with the lower and upper poverty lines (1983/84 to 1991/92)

	Abs. Diff.						% Diff.					
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l			With z_u			With z_l			With z_u		
Intra-sectoral effects												
Urban	-0.52	-0.19	-0.10	-0.92	-0.45	-0.26	-19	-19	-46	-149	-65	-296
Rural	4.06	1.42	0.42	2.17	1.38	0.46	149	144	189	352	199	512
Population Shift	-0.52	-0.14	-0.06	-0.34	-0.08	-0.03	-19	-14	-25	-56	-12	-30
Covariance	-0.29	-0.10	-0.04	-0.29	-0.16	-0.08	-11	-10	-18	-47	-23	-86
Total change	2.72	0.99	0.22	0.62	0.69	0.09	100	100	100	100	100	100

Source: Own calculations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines (numbers may not add up due to rounding).

Table 9: Sectoral decomposition of change in poverty with the lower and upper poverty lines (1988/89 to 1991/92)

	Abs. Diff.						% Diff.					
	H	**P_1**	**P_2**	**H**	**P_1**	**P_2**	**H**	**P_1**	**P_2**	**H**	**P_1**	**P_2**
	With z_l			**With z_u**			**With z_l**			**With z_u**		
Intra-sectoral effects												
Urban	0.43	0.19	0.08	0.04	0.09	0.07	18	17	17	2	5	8
Rural	2.15	1.00	0.41	2.27	1.72	0.83	92	90	89	107	99	96
Population Shift	-0.24	-0.07	-0.03	-0.16	-0.05	-0.02	-10	-6	-6	-8	-3	-3
Covariance	0.00	0.00	0.00	-0.03	-0.02	-0.01	0	0	0	-1	-1	-1
Total change	2.34	1.12	0.46	2.13	1.73	0.86	100	100	100	100	100	100

Source: Own calculations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines (numbers may not add up due to rounding).

Table 10: Growth/redistribution decomposition of change in poverty with the lower and upper poverty lines (1983/84 to 1991/92)

	Abs. Diff.						% Diff.					
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l			With z_u			With z_l			With z_u		
Urban sector												
Growth	-6.03	-1.48	-0.57	-10.0	-3.56	-1.69	190	130	94	181	129	103
Redistribution	3.04	0.54	0.03	2.32	1.00	0.20	-96	-47	-5	-42	-36	-12
Residual	-0.18	-0.20	-0.07	2.19	-0.19	-0.15	6	17	11	-40	7	9
Total Change	-3.18	-1.14	-0.61	-5.54	-2.76	-1.63	100	100	100	100	100	100
Rural sector												
Growth	3.93	1.19	0.49	3.97	1.70	0.81	81	70	98	153	108	158
Redistribution	1.72	0.48	-0.03	-0.63	-0.16	-0.35	35	29	-5	-24	-10	-67
Residual	-0.79	0.03	0.04	-0.74	0.04	0.05	-16	2	7	-29	2	9
Total change	4.86	1.70	0.50	2.59	1.58	0.52	100	100	100	100	100	100

Source: Own calculations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines (numbers may not add up due to rounding).

Table 11: Growth/redistribution decomposition of change in poverty with the lower and upper poverty lines (1988/89 to 1991/92)

	Abs. Diff.						% Diff.					
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l			With z_u			With z_l			With z_u		
Urban sector												
Growth	4.99	1.15	0.40	2.87	1.20	0.55	220	115	94	1222	268	151
Redistribution	-1.48	-0.05	0.04	-2.86	-0.68	-0.15	-66	-5	10	-1218	-152	-40
Residual	-1.24	-0.10	-0.02	0.23	-0.07	-0.04	-55	-10	-04	97	-16	-11
Total Change	2.26	1.00	0.42	0.24	0.45	0.36	100	100	100	100	100	100
Rural sector												
Growth	4.89	1.90	0.82	6.86	3.35	1.63	184	153	159	244	158	160
Redistribution	-2.08	-0.57	-0.27	-3.43	-1.04	-0.52	-78	-46	-52	-122	-49	-51
Residual	-0.16	-0.09	-0.04	-0.62	-0.19	-0.08	-6	-7	-7	-22	-9	-8
Total change	2.66	1.25	0.51	2.81	2.13	1.02	100	100	100	100	100	100

Source: Own calculations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines (numbers may not add up due to rounding).

Table 12: Nested decomposition of change in poverty with the lower and upper poverty lines (1988/89 to 1991/92)

	Abs. Diff.						% Diff.					
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l			With z_u			With z_l			With z_u		
Intersectoral effects												
Urban growth	0.95	0.22	0.08	0.55	0.23	0.10	41	20	7	26	13	12
Urban redistribution	-0.28	-0.01	0.01	-0.55	-0.13	-0.03	-12	-1	2	-26	-8	-3
Urban residual	-0.24	-0.02	0.00	0.04	-0.01	-0.01	-10	-2	0	2	-1	-1
Rural Growth	3.96	1.54	0.66	5.56	2.72	1.32	187	147	154	261	157	153
Rural redistribution	-1.68	-0.46	-0.22	-2.78	-0.84	-0.42	-72	-41	-48	-131	-49	-49
Rural residual	-0.13	-0.07	-0.03	-0.50	-0.16	-0.07	-24	-15	-15	-23	-9	-8
Population shift	-0.24	-0.07	-0.03	-0.16	-0.05	-0.02	-10	-6	-6	-8	-3	-3
Covariance	0.00	0.00	0.00	-0.03	-0.02	-0.01	0	0	0	-1	-1	-1
Total change	2.34	1.12	0.46	2.13	1.73	0.86	100	100	100	100	100	100

Source: Own calculations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines (numbers may not add up due to rounding).

Table 13: Poverty by area with the lower poverty line (1983/84 to 1991/92)

	83/84			85/86			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l											
Dhaka 1 [(1)] (6.9%)	20.60 (1.58)	4.26 (0.42)	1.31 (0.17)	6.02 (0.95)	0.95 (0.18)	0.21 (0.05)	16.49 (1.45)	2.96 (0.33)	0.79 (0.12)	14.48 (1.34)	2.32 (0.26)	0.54 (0.08)
Dhaka 2 (2.0%)	44.07 (3.93)	10.84 (1.32)	3.97 (0.74)	33.33 (3.93)	7.29 (1.11)	2.31 (0.45)	45.20 (3.61)	9.81 (1.09)	3.23 (0.49)	46.18 (3.64)	10.62 (1.13)	3.53 (0.52)
Dhaka 3 (12.0%)	46.10 (2.66)	11.61 (0.96)	4.57 (0.53)	31.22 (2.59)	6.26 (0.71)	2.00 (0.33)	40.03 (2.02)	9.42 (0.63)	3.24 (0.30)	47.71 (2.05)	11.79 (0.68)	4.13 (0.33)
Dhaka 4 (9.2%)	52.04 (3.13)	13.10 (1.08)	4.70 (0.52)	43.79 (3.31)	9.51 (1.00)	3.15 (0.46)	62.71 (2.26)	17.03 (0.88)	6.46 (0.47)	63.69 (2.24)	18.53 (0.89)	7.11 (0.47)
Chittagong 1 (3.0%)	12.18 (2.05)	1.54 (0.33)	0.30 (0.09)	8.46 (1.86)	0.34 (0.12)	0.03 (0.03)	12.95 (2.11)	1.81 (0.39)	0.42 (0.12)	19.43 (2.47)	2.80 (0.48)	0.66 (0.17)
Chittagong 2 (1.8%)	13.50 (3.19)	3.84 (1.08)	1.50 (0.53)	20.49 (3.83)	2.32 (0.53)	0.37 (0.10)	21.47 (3.29)	5.42 (1.01)	1.87 (0.45)	32.16 (3.70)	8.34 (1.24)	3.15 (0.57)
Chittagong 3 (13.8%)	28.21 (2.52)	5.48 (0.66)	1.68 (0.28)	21.52 (2.36)	3.60 (0.51)	0.91 (0.17)	30.50 (1.92)	7.66 (0.60)	2.65 (0.26)	25.72 (1.80)	5.16 (0.45)	1.47 (0.18)
Chittagong 4 (8.7%)	41.79 (3.30)	8.37 (0.91)	2.56 (0.40)	22.30 (2.89)	4.22 (0.75)	1.33 (0.31)	43.03 (2.58)	9.94 (0.82)	3.48 (0.40)	31.29 (2.43)	5.81 (0.59)	1.60 (0.21)

Source: Own computations from HES unit level data. The notation z_l refers to the lower poverty line.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 13 - Continued: Poverty by area with the lower poverty line (1983/84 to 1991/92)

	83/84			85/86			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
With z_l												
Khulna 1 (1) (3.6%)	39.65 (2.81)	8.17 (0.81)	2.65 (0.36)	19.94 (2.30)	3.39 (0.52)	0.92 (0.21)	29.62 (2.48)	5.52 (0.59)	1.49 (0.22)	30.81 (2.46)	6.68 (0.67)	2.02 (0.27)
Khulna 2 (6.4%)	33.70 (3.57)	7.20 (0.99)	2.25 (0.43)	35.98 (3.99)	5.33 (0.81)	1.23 (0.26)	51.89 (2.89)	12.12 (0.92)	4.00 (0.42)	55.90 (2.86)	14.79 (0.98)	5.05 (0.46)
Khulna 3 (9.5%)	44.92 (3.11)	11.83 (1.14)	4.73 (0.69)	33.67 (3.05)	8.14 (0.95)	2.81 (0.42)	46.49 (2.33)	10.12 (0.69)	3.22 (0.31)	44.88 (2.31)	9.96 (0.69)	3.21 (0.31)
Rajshahi 1 (2.8%)	46.52 (3.21)	13.97 (1.28)	5.87 (0.67)	30.28 (2.97)	6.13 (0.77)	1.78 (0.32)	22.50 (2.55)	4.20 (0.63)	1.23 (0.23)	28.98 (2.79)	8.26 (0.94)	3.00 (0.41)
Rajshahi 2 (9.7%)	48.78 (3.23)	13.48 (1.21)	5.32 (0.65)	28.46 (3.01)	5.45 (0.76)	1.60 (0.31)	46.87 (2.22)	12.14 (0.79)	4.63 (0.46)	61.70 (2.15)	18.82 (0.87)	7.44 (0.46)
Rajshahi 3 (10.8%)	45.85 (2.94)	12.24 (1.07)	4.66 (0.55)	41.80 (2.99)	7.76 (0.79)	2.30 (0.34)	45.42 (2.15)	10.58 (0.68)	3.59 (0.31)	57.81 (2.12)	15.19 (0.80)	5.81 (0.43)

Source: Own computations from HES unit level data. The notation z_l refers to the lower poverty line.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 14: Poverty by area with the upper poverty line (1983/84 to 1991/92)

	83/84			85/86			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
With z_u												
Dhaka 1 [(1)] (6.9%)	42.82 (1.94)	11.65 (0.69)	4.42 (0.34)	21.01 (1.64)	4.11 (0.40)	1.18 (0.15)	42.61 (1.94)	10.99 (0.64)	3.90 (0.30)	36.15 (1.83)	8.31 (0.53)	2.64 (0.22)
Dhaka 2 (2.0%)	64.94 (3.77)	19.20 (1.60)	7.78 (0.95)	56.78 (4.13)	18.46 (1.67)	7.43 (0.89)	55.63 (3.60)	14.13 (1.26)	4.99 (0.62)	57.30 (3.61)	14.42 (1.26)	5.07 (0.63)
Dhaka 3 (12.0%)	60.75 (2.60)	17.87 (1.09)	7.38 (0.65)	43.85 (2.77)	10.34 (0.88)	3.54 (0.43)	53.39 (2.06)	13.53 (0.73)	4.96 (0.37)	62.43 (1.99)	18.41 (0.80)	7.19 (0.43)
Dhaka 4 (9.2%)	64.42 (3.00)	19.32 (1.25)	7.71 (0.67)	58.29 (3.29)	15.16 (1.20)	5.52 (0.61)	66.83 (2.20)	18.80 (0.91)	7.30 (0.50)	73.50 (2.05)	22.94 (0.95)	9.40 (0.54)
Chittagong 1 (3.0%)	48.77 (3.13)	10.29 (0.90)	3.13 (0.37)	30.32 (3.07)	5.36 (0.67)	1.29 (0.20)	38.58 (3.05)	8.54 (0.82)	2.44 (0.32)	45.85 (3.11)	11.57 (1.00)	3.89 (0.43)
Chittagong 2 (1.8%)	21.77 (3.85)	6.02 (1.37)	2.51 (0.72)	40.40 (4.66)	9.23 (1.28)	2.67 (0.44)	37.29 (3.87)	10.31 (1.37)	3.99 (0.69)	48.13 (3.96)	14.00 (1.53)	5.68 (0.81)
Chittagong 3 (13.8%)	48.21 (2.80)	10.27 (0.85)	3.37 (0.40)	33.70 (2.72)	6.44 (0.69)	1.85 (0.26)	65.73 (1.98)	19.22 (0.85)	7.84 (0.48)	48.02 (2.06)	11.90 (0.67)	4.04 (0.31)
Chittagong 4 (8.7%)	59.73 (3.28)	14.45 (1.11)	4.83 (0.54)	38.81 (3.38)	8.22 (0.98)	2.68 (0.45)	51.11 (2.61)	13.58 (0.93)	5.03 (0.48)	57.18 (2.59)	13.25 (0.85)	4.38 (0.38)

Source: Own computations from HES unit level data. The notations z_u refers to the upper poverty line.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 14 - Continued: Poverty by area with the upper poverty line (1983/84 to 1991/92)

	83/84			85/86			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
With z_u												
Khulna 1 [(1)] (3.6%)	58.30 (2.83)	16.14 (1.08)	6.12 (0.56)	48.59 (2.87)	13.56 (1.03)	5.08 (0.51)	50.32 (2.71)	13.55 (0.93)	4.75 (0.42)	47.92 (2.66)	14.02 (0.98)	5.33 (0.47)
Khulna 2 (6.4%)	47.19 (3.77)	9.62 (1.11)	3.10 (0.51)	50.00 (4.15)	8.32 (1.00)	2.14 (0.36)	64.14 (2.77)	17.42 (1.05)	6.36 (0.53)	74.64 (2.51)	23.80 (1.15)	9.65 (0.64)
Khulna 3 (9.5%)	60.73 (3.05)	17.91 (1.30)	7.56 (0.81)	55.38 (3.21)	14.97 (1.19)	5.67 (0.62)	65.67 (2.22)	17.09 (0.83)	6.09 (0.43)	58.41 (2.29)	16.58 (0.85)	6.12 (0.43)
Rajshahi 1 (2.8%)	69.60 (2.96)	26.64 (1.62)	13.40 (1.05)	54.89 (3.22)	14.31 (1.14)	5.10 (0.55)	47.34 (3.04)	11.92 (1.01)	4.16 (0.48)	53.26 (3.06)	15.71 (1.25)	6.63 (0.68)
Rajshahi 2 (9.7%)	70.16 (2.95)	22.20 (1.39)	9.56 (0.85)	46.01 (3.33)	9.05 (0.95)	2.82 (0.42)	57.61 (2.19)	16.11 (0.87)	6.43 (0.51)	69.88 (2.03)	24.30 (0.95)	10.54 (0.55)
Rajshahi 3 (10.8%)	70.57 (2.69)	22.45 (1.25)	9.57 (0.76)	65.63 (2.88)	15.38 (1.00)	5.09 (0.49)	57.09 (2.13)	15.59 (0.79)	5.78 (0.40)	68.71 (1.99)	21.08 (0.88)	8.64 (0.51)

Source: Own computations from HES unit level data. The notations z_l and z_u refers to the upper poverty line.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 15: Poverty by sex, religion, and marital status of the head with the lower and upper poverty lines (1988/89 and 1991/92)

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Sex of Head [1]												
Male (94.9%)	40.63 (0.67)	9.62 (0.21)	3.33 (0.10)	42.74 (0.68)	10.68 (0.22)	3.75 (0.11)	57.32 (0.67)	15.48 (0.25)	5.81 (0.13)	59.36 (0.67)	17.12 (0.26)	6.61 (0.14)
Female (5.1%)	39.93 (3.14)	10.44 (1.07)	3.88 (0.57)	45.63 (2.44)	12.47 (0.89)	4.85 (0.47)	56.15 (3.18)	16.57 (1.29)	6.77 (0.72)	59.95 (2.40)	19.37 (1.03)	8.18 (0.59)
Religion												
Muslim (89.9%)	41.86 (0.70)	9.99 (0.22)	3.46 (0.11)	43.19 (0.69)	10.99 (0.23)	3.93 (0.11)	58.73 (0.70)	16.04 (0.27)	6.06 (0.14)	59.46 (0.68)	17.43 (0.27)	6.84 (0.14)
Other (10.1%)	31.92 (1.74)	7.34 (0.53)	2.53 (0.25)	40.24 (2.07)	8.76 (0.59)	2.71 (0.25)	47.55 (1.86)	11.92 (0.64)	4.35 (0.32)	58.75 (2.08)	15.44 (0.74)	5.42 (0.36)
Status of Head												
Married (93.4%)	40.84 (0.69)	9.70 (0.22)	3.35 (0.10)	42.86 (0.69)	10.68 (0.22)	3.75 (0.11)	57.73 (0.69)	15.61 (0.26)	5.87 (0.14)	59.52 (0.68)	17.16 (0.27)	6.62 (0.14)
Unmarried/Single (3.3%)	30.76 (2.97)	6.52 (0.87)	2.28 (0.48)	31.86 (2.98)	7.77 (0.91)	2.65 (0.39)	43.36 (3.19)	11.24 (1.08)	4.10 (0.59)	49.15 (3.20)	13.09 (1.14)	4.89 (0.56)
Widowed/Divorced (3.2%)	43.20 (2.94)	11.07 (1.01)	4.11 (0.54)	55.21 (2.96)	16.32 (1.20)	6.73 (0.66)	57.84 (2.93)	16.74 (1.17)	6.70 (0.66)	66.35 (0.28)	23.57 (1.33)	10.54 (0.81)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.

(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 16: Poverty by age of the head with the lower and upper poverty lines (1988/89 and 1991/1992)

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Less than 20 [1] (0.6%)	47.84 (5.85)	11.42 (1.89)	3.91 (0.96)	29.94 (7.15)	9.64 (2.83)	4.21 (1.42)	66.17 (5.54)	17.76 (2.15)	6.53 (1.15)	44.92 (7.77)	13.78 (3.18)	6.04 (1.73)
Between 20 and 29 (9.8%)	40.91 (1.75)	9.47 (0.55)	3.27 (0.27)	43.25 (1.74)	10.82 (0.57)	3.80 (0.27)	59.93 (1.77)	14.76 (0.65)	5.53 (0.35)	60.84 (1.72)	17.13 (0.67)	6.57 (0.35)
Between 30 and 39 (27.7%)	43.77 (1.22)	11.00 (0.40)	3.92 (1.96)	48.25 (1.18)	12.87 (0.41)	4.74 (0.21)	59.84 (1.20)	17.22 (0.48)	6.72 (0.25)	65.06 (1.12)	19.89 (0.48)	8.03 (0.26)
Between 40 and 49 (28.6%)	43.31 (1.30)	10.65 (0.42)	3.71 (2.02)	46.02 (1.30)	11.68 (0.44)	4.20 (0.21)	60.42 (1.28)	16.97 (0.49)	6.46 (0.26)	60.83 (1.27)	18.39 (0.51)	7.28 (0.27)
Between 50 and 59 (16.7%)	37.30 (1.62)	8.47 (0.50)	2.95 (2.47)	38.20 (1.70)	9.17 (0.51)	2.98 (0.22)	54.10 (1.67)	13.84 (0.60)	5.10 (0.31)	54.02 (1.74)	15.21 (0.64)	5.62 (0.31)
More than 60 (16.6%)	34.82 (1.70)	7.46 (0.49)	2.41 (2.19)	33.47 (1.68)	7.31 (0.49)	2.42 (0.23)	51.98 (1.78)	12.92 (0.61)	4.58 (0.31)	52.48 (1.78)	13.03 (0.61)	4.65 (0.31)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 17: Poverty by household size with the lower and upper poverty lines (1988/89 and 1991/92)

Number of individuals	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
1 [(1)] (0.4%)	12.52 (3.05)	1.97 (0.63)	0.50 (0.22)	15.32 (3.42)	3.10 (0.97)	1.14 (0.47)	20.87 (3.74)	3.84 (0.90)	1.11 (0.36)	22.71 (3.98)	5.03 (1.18)	1.80 (0.58)
2 (2.4%)	13.66 (1.88)	3.33 (0.61)	1.36 (0.35)	20.74 (2.10)	4.68 (0.59)	1.49 (0.24)	25.67 (2.40)	5.65 (0.74)	2.15 (0.41)	32.39 (2.43)	7.61 (0.75)	2.65 (0.33)
3 (8.6%)	31.63 (1.78)	6.23 (0.47)	1.92 (0.21)	34.08 (1.60)	8.24 (0.50)	2.85 (0.23)	45.05 (1.90)	10.49 (0.59)	3.47 (0.27)	49.07 (1.68)	13.14 (0.60)	4.88 (0.30)
4 (14.4%)	37.22 (1.53)	8.75 (0.47)	2.95 (0.22)	45.23 (1.55)	11.57 (0.52)	4.14 (0.26)	52.02 (1.58)	13.70 (0.56)	5.05 (0.28)	59.34 (1.53)	17.74 (0.61)	6.94 (0.32)
5 (15.5%)	42.81 (1.58)	10.49 (0.52)	3.76 (0.26)	47.33 (1.62)	12.52 (0.57)	4.62 (0.28)	59.42 (1.57)	16.44 (0.61)	6.32 (0.33)	63.35 (1.56)	19.29 (0.65)	7.73 (0.35)
6 (17.1%)	47.99 (1.74)	11.82 (0.57)	4.10 (0.27)	45.81 (1.69)	12.51 (0.59)	4.65 (0.29)	65.77 (1.65)	18.56 (0.66)	7.06 (0.35)	63.62 (1.63)	19.44 (0.69)	7.90 (0.38)
7 (13.5%)	46.37 (1.95)	10.74 (0.61)	3.54 (0.28)	48.38 (2.05)	12.30 (0.69)	4.31 (0.32)	63.76 (1.88)	17.56 (0.73)	6.52 (0.38)	65.41 (1.95)	19.42 (0.80)	7.58 (0.42)
8 (9.4%)	44.18 (2.40)	10.08 (0.75)	3.42 (0.36)	46.98 (2.63)	11.03 (0.84)	3.78 (0.40)	62.15 (2.35)	16.77 (0.91)	6.33 (0.48)	64.31 (2.53)	18.61 (1.01)	7.13 (0.53)
9 (6.6%)	35.96 (3.04)	8.67 (0.97)	3.10 (0.46)	41.23 (3.30)	10.44 (1.07)	3.65 (0.49)	57.08 (3.13)	14.92 (1.14)	5.47 (0.60)	58.68 (3.30)	16.98 (1.29)	6.61 (0.66)
10 or more (13.1%)	35.76 (2.47)	9.00 (0.82)	3.33 (0.44)	34.34 (2.57)	7.00 (0.69)	2.13 (0.30)	51.70 (2.57)	14.21 (0.98)	5.61 (0.55)	52.67 (2.70)	13.1 (0.91)	4.53 (0.44)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.

[(1)] The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 18: Poverty by education level of the head with the lower and upper poverty lines (1988/89 and 1991/92)

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Illiterate [(1)] (44.1%)	56.56 (0.96)	14.07 (0.33)	4.95 (0.17)	58.89 (0.98)	15.70 (0.36)	5.76 (0.18)	73.62 (0.86)	21.43 (0.37)	8.29 (0.21)	75.00 (0.86)	23.70 (0.40)	9.62 (0.23)
Below class 5 (20.3%)	-	-	-	42.35 (1.49)	10.79 (0.49)	3.82 (0.23)	-	-	-	60.63 (1.48)	17.43 (0.59)	6.81 (0.31)
Passed class 5 (10.5%)	35.77 (1.28)	8.03 (0.39)	2.73 (0.18)	35.16 (2.01)	7.56 (0.56)	2.36 (0.25)	54.38 (1.33)	13.75 (0.47)	5.06 (0.24)	54.20 (2.09)	13.70 (0.72)	4.78 (0.34)
Passed class 6 to 9 (1.8%)	23.93 (1.61)	4.87 (0.42)	1.47 (0.17)	27.72 (1.73)	4.91 (0.41)	1.34 (0.16)	40.84 (1.86)	9.40 (0.57)	3.16 (0.26)	44.92 (1.92)	10.12 (0.57)	3.17 (0.24)
Below graduate (8.7%)	13.10 (1.40)	2.33 (0.38)	0.89 (0.24)	12.60 (1.41)	2.54 (0.36)	0.77 (0.15)	26.85 (1.84)	5.10 (0.50)	1.70 (0.29)	27.69 (1.91)	5.61 (0.51)	1.75 (0.22)
Graduate or higher (4.5%)	4.09 (1.18)	1.09 (0.37)	0.41 (0.15)	5.51 (1.26)	1.24 (0.35)	0.42 (0.14)	8.84 (1.68)	1.97 (0.48)	0.69 (0.21)	12.89 (1.85)	2.51 (0.49)	0.85 (0.22)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 19: Poverty by land ownership with the lower and upper poverty lines (1988/89 and 1991/92)

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Less than 0.05 acres [1] (23.3%)	49.24 (1.29)	13.55 (0.47)	5.14 (0.24)	54.87 (1.16)	16.06 (0.44)	62.22 (0.23)	67.05 (1.21)	20.75 (0.53)	8.57 (0.31)	70.19 (1.06)	23.82 (0.49)	10.17 (0.29)
0.05 to 0.49 acres (28.0%)	50.90 (1.18)	12.83 (0.41)	4.64 (0.21)	54.24 (1.24)	14.09 (0.44)	5.11 (0.22)	67.05 (1.11)	19.63 (0.47)	7.78 (0.26)	72.18 (1.11)	22.00 (0.50)	8.81 (0.28)
0.50 to 1.49 acres (19.2%)	44.40 (1.67)	10.04 (0.51)	3.27 (0.23)	41.52 (1.54)	9.27 (0.45)	2.94 (0.20)	62.30 (1.63)	16.44 (0.60)	5.94 (0.30)	59.46 (1.54)	15.99 (0.55)	5.68 (0.27)
1.50 to 2.49 acres (10.6%)	32.43 (2.19)	5.97 (0.52)	1.59 (0.20)	28.81 (2.04)	5.85 (0.51)	1.64 (0.19)	51.65 (2.33)	11.13 (0.69)	3.41 (0.29)	48.74 (2.25)	10.65 (0.67)	3.37 (0.29)
2.50 to 7.49 acres (14.4%)	25.58 (1.59)	4.53 (0.38)	1.39 (0.15)	24.57 (1.74)	4.42 (0.42)	1.26 (0.16)	42.97 (1.80)	8.72 (0.49)	2.60 (0.21)	37.60 (1.96)	8.43 (0.57)	2.69 (0.24)
7.50 acres or more (4.5%)	10.09 (1.94)	1.84 (0.43)	0.48 (0.16)	8.17 (2.26)	1.07 (0.36)	0.20 (0.08)	16.99 (2.42)	3.53 (0.61)	1.01 (0.23)	18.73 (0.32)	2.59 (0.59)	0.58 (0.17)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 20: Poverty by main occupation of the head with the lower and upper poverty lines (1988/89 and 1991/92)

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Agric. Sector [(1)]												
Owner farmer (25.2%)	30.40 (1.69)	5.62 (0.43)	1.67 (0.18)	31.94 (1.43)	5.92 (0.35)	1.62 (0.13)	46.28 (1.83)	10.29 (0.55)	3.27 (0.24)	48.28 (1.53)	11.02 (0.46)	3.46 (0.19)
Tenant farmer (6.0%)	40.29 (2.06)	8.61 (0.58)	2.69 (0.29)	48.35 (2.89)	10.53 (0.86)	3.32 (0.39)	61.61 (2.04)	14.93 (0.72)	5.14 (0.38)	72.95 (2.57)	18.75 (1.01)	6.57 (0.52)
Fisheries, forestry, live stock (2.7%)	55.18 (4.12)	13.93 (1.42)	4.90 (0.74)	58.31 (4.31)	14.64 (1.47)	4.97 (0.71)	74.53 (3.61)	20.73 (1.62)	8.11 (0.92)	77.24 (3.66)	23.26 (1.64)	8.95 (0.91)
Agricultural worker with land (5.4%)	49.10 (2.91)	12.19 (0.98)	4.33 (0.50)	60.55 (2.84)	16.63 (1.09)	6.26 (0.56)	68.40 (2.70)	18.37 (1.10)	6.94 (0.61)	74.72 (2.53)	24.29 (1.16)	9.92 (0.67)
Agricultural worker without land (12.4%)	71.90 (1.48)	20.08 (0.62)	7.62 (.34)	78.49 (1.48)	25.34 (0.73)	10.48 (0.43)	85.22 (1.17)	28.06 (0.65)	11.78 (0.40)	89.46 (1.11)	34.15 (0.72)	15.61 (0.49)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 20 - Continued: Poverty by main occupation of the head with the lower and upper poverty lines (1988/89 and 1991/92)

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Non-Agr. Sector [1]												
Executive, official, prof., teacher (9.1%)	16.53 (1.42)	3.86 (0.43)	1.40 (0.19)	13.30 (1.34)	2.93 (0.38)	1.00 (0.17)	29.45 (1.75)	7.12 (0.56)	2.62 (0.27)	28.78 (1.79)	5.95 (0.51)	2.03 (0.24)
Businessman, petty trader (11.6%)	25.98 (1.76)	6.33 (0.54)	2.23 (0.25)	33.44 (1.77)	7.64 (0.51)	2.44 (0.21)	40.45 (1.97)	10.71 (0.68)	4.03 (0.35)	48.73 (1.87)	13.25 (0.66)	4.85 (0.32)
Factory worker, artisan (6.1%)	38.77 (2.69)	8.37 (0.79)	2.72 (0.35)	41.08 (3.33)	9.78 (1.02)	3.41 (0.40)	56.39 (2.74)	13.94 (0.96)	4.94 (0.48)	60.68 (3.10)	17.13 (1.22)	6.54 (0.59)
Salesman, services, broker (3.6%)	42.62 (2.55)	9.87 (0.78)	3.26 (0.35)	51.47 (2.76)	12.49 (0.93)	3.88 (0.42)	65.15 (2.46)	18.09 (0.99)	6.93 (0.52)	68.27 (2.49)	20.32 (1.09)	7.47 (0.57)
Transport and com. worker (4.3%)	39.65 (2.76)	7.89 (0.72)	2.27 (0.29)	53.70 (2.42)	13.50 (0.77)	4.62 (0.37)	60.29 (2.76)	15.63 (0.97)	5.41 (0.47)	71.76 (2.40)	22.34 (0.93)	8.89 (0.50)
Servant, day-laborer (4.4%)	48.22 (2.92)	11.35 (0.92)	3.79 (0.45)	55.67 (2.84)	15.34 (1.03)	5.61 (0.51)	66.21 (2.77)	18.86 (1.12)	7.19 (0.59)	73.04 (2.54)	23.45 (1.16)	9.63 (0.65)
Retired, student, not working (9.1%)	37.87 (2.67)	9.47 (0.90)	3.58 (0.48)	34.22 (2.02)	8.19 (0.63)	2.87 (0.30)	52.37 (2.75)	14.54 (1.04)	5.70 (0.58)	53.25 (2.12)	14.22 (0.78)	5.36 (0.41)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 21: Poverty by second occupation of the head with the lower and upper poverty lines (1988/89 and 1991/92)

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Agricultural [1]												
Owner farmer (3.1%)	-	-	-	30.31 (4.02)	7.43 (1.16)	2.32 (0.46)	-	-	-	51.21 (4.37)	12.20 (1.42)	4.11 (0.65)
Other (2.7%)	-	-	-	63.25 (4.09)	16.49 (1.54)	6.03 (0.81)	-	-	-	76.90 (3.57)	24.32 (1.66)	9.73 (0.97)
Non-Agric. [1]												
Executive, official, prof., teacher (0.6%)	-	-	-	44.64 (8.93)	11.67 (3.32)	4.77 (1.63)	-	-	-	54.96 (8.94)	17.28 (3.80)	7.46 (2.03)
Businessman, petty trader, sales (4.6%)	-	-	-	42.55 (3.32)	9.00 (0.95)	2.79 (0.40)	-	-	-	59.03 (3.31)	14.61 (1.16)	5.11 (0.55)
Other (1.6%)	-	-	-	42.88 (5.43)	11.90 (1.83)	4.20 (0.81)	-	-	-	55.11 (5.46)	16.97 (2.16)	6.75 (1.09)
No Second Occup. (87.4%)	-	-	-	42.70 (0.69)	10.77 (0.23)	3.83 (0.11)	-	-	-	59.26 (0.69)	17.33 (0.27)	6.77 (0.14)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines. [1] The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding). Estimations were not reliable for 88/89

Table 22: Poverty by sex of the head with the lower and upper poverty lines (1988/89 and 1991/1992) - Urban and Rural

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Urban [1]												
Male (19.2%)	22.35 (0.99)	4.27 (0.24)	1.24 (0.10)	24.46 (1.02)	5.25 (0.28	1.65 (0.11)	44.87 (1.18)	11.42 (0.39)	3.95 (0.18)	45.22 (1.18)	11.83 (0.40)	4.29 (0.19)
Female (1.0%)	33.00 (5.36)	7.71 (1.47)	2.27 (0.52)	32.86 (4.20)	7.45 (1.28)	2.60 (0.55)	46.67 (5.69)	15.36 (2.26)	6.31 (1.08)	45.71 (4.46)	14.50 (1.75)	5.94 (0.91)
Rural												
Male (75.7%)	44.94 (0.83)	10.88 (0.27)	3.82 (0.13)	47.37 (0.84)	12.05 (0.28)	4.29 (0.14)	60.25 (0.82)	16.44 (0.31)	6.25 (0.17)	62.94 (0.81)	18.46 (0.33)	7.20 (0.18)
Female (4.1%)	41.52 (3.83)	11.09 (1.35)	4.27 (0.75)	48.63 (2.92)	13.65 (1.09)	5.37 (0.59)	58.42 (3.83)	16.86 (1.56)	6.88 (0.90)	63.29 (2.82)	20.51 (1.24)	8.71 (0.72)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the national population for 1991/92 (numbers may not add up due to rounding).

Table 23: Poverty by education level of the head with the lower and upper poverty lines (1988-89 and 1991-92) - Urban

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Illiterate [(1)] (24.5%)	43.41 (2.12)	9.13 (0.60)	2.78 (0.25)	50.76 (2.21)	12.11 (0.71)	4.06 (0.32)	72.07 (1.92)	21.03 (0.79)	7.87 (0.42)	74.88 (1.92)	23.37 (0.87)	9.37 (0.48)
Below class 5 (16.8%)	-	-	-	30.41 (2.60)	7.01 (0.74)	2.23 (0.31)	-	-	-	56.92 (2.79)	15.73 (1.04)	5.86 (0.52)
Passed class 5 (9.8%)	26.01 (2.08)	4.56 (0.48)	1.23 (0.18)	27.78 (3.25)	4.91 (0.78)	1.40 (0.31)	54.74 (2.36)	13.39 (0.78)	4.47 (0.35)	58.78 (3.57)	13.02 (1.17)	4.27 (0.54)
Passed class 6 to 9 (15.9%)	19.62 (2.30)	3.38 (0.53)	0.95 (0.21)	17.85 (2.25)	2.77 (0.45)	0.66 (0.14)	44.12 (2.87)	10.16 (0.87)	3.29 (0.39)	37.91 (2.85)	8.31 (0.79)	2.48 (0.31)
Below graduate (17.7%)	3.90 (1.05)	0.60 (0.20)	0.13 (0.06)	8.46 (1.52)	1.27 (0.31)	0.33 (0.11)	19.74 (2.15)	3.21 (0.45)	0.80 (0.16)	23.55 (2.33)	4.41 (0.56)	1.22 (0.22)
Graduate or higher (15.3%)	1.99 (0.93)	0.37 (0.25)	0.14 (0.13)	1.80 (0.81)	0.44 (0.24)	0.15 (0.10)	3.90 (1.29)	1.03 (0.42)	0.40 (0.21)	9.11 (1.75)	1.44 (0.39)	0.43 (0.18)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the urban population for 1991/92 (numbers may not add up due to rounding).

Table 24: Poverty by education level of the head with the lower and upper poverty lines (1988-89 and 1991-92) - Rural

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Illiterate [(1)] (49.1%)	58.25 (1.08)	14.71 (0.38)	5.22 (0.19)	59.91 (1.09)	16.15 (0.41)	5.97 (0.21)	73.82 (0.96)	21.48 (0.42)	8.35 (0.24)	75.01 (0.96)	23.75 (0.45)	9.65 (0.26)
Below class 5 (21.2%)	-	-	-	44.74 (1.78)	11.54 (0.60)	4.14 (0.29)	-	-	-	61.38 (1.74)	17.77 (0.70)	7.00 (0.37)
Passed class 5 (10.7%)	37.75 (1.56)	8.74 (0.49)	3.04 (0.23)	36.86 (2.48)	8.17 (0.71)	2.58 (0.32)	54.31 (1.60)	13.83 (0.58)	5.18 (0.31)	53.15 (2.57)	13.86 (0.89)	4.89 (0.43)
Passed class 6 to 9 (10.8%)	25.34 (2.17)	5.36 (0.58)	1.63 (0.23)	31.41 (2.38)	5.71 (0.58)	1.60 (0.24)	39.77 (2.44)	9.15 (0.75)	3.12 (0.34)	47.55 (2.56)	10.80 (0.77)	3.43 (0.34)
Below graduate (6.5%)	19.05 (2.56)	3.45 (0.73)	1.37 (0.49)	15.46 (2.45)	3.42 (0.66)	1.07 (0.29)	31.46 (3.02)	6.32 (0.89)	2.28 (0.55)	30.54 (3.12)	6.44 (0.88)	2.11 (0.39)
Graduate or higher (1.8%)	7.20 (3.34)	2.14 (1.13)	0.81 (0.43)	13.37 (4.55)	2.94 (1.26)	0.98 (0.51)	16.13 (4.75)	3.35 (1.29)	1.11 (0.53)	20.86 (5.43)	4.78 (1.64)	1.73 (0.73)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the rural population for 1991/92 (numbers may not add up due to rounding).

Table 25: Poverty by education level of the head with the lower and upper poverty lines (1991-92) - Nested

	Urban			Rural			Mixed	
	H_u	w_u*100	H_uw_u	H_u	w_u*100	H_uw_u	H_uw_r	H_rw_u
Illiterate [(1)]	74.88	4.93	3.69	75.01	39.18	29.39	29.39	3.70
Below class 5	56.92	3.38	1.92	61.38	16.91	9.63	10.38	2.07
Passed class 5	58.78	1.97	1.16	53.15	8.55	5.03	4.54	1.05
Passed class 6 to 9	37.91	3.21	1.22	47.55	8.58	3.25	4.08	1.53
Below graduate	23.55	3.57	0.84	30.54	5.17	1.22	1.58	1.09
Graduate or higher	9.11	3.08	0.28	20.86	1.46	0.13	0.30	0.64
$\Sigma_i w_i$	-	20.14	-	-	79.85	-	-	-
$\Sigma_i H_i w_i$	-	-	9.11	-	-	50.27	-	-
$\Sigma_i H_i w_i$ / $(\Sigma_i w_i)$	-	-	45.24	-	-	62.96	-	-
$\Sigma_i H_i w_j$ / $(\Sigma_i w_j)$	-	-	-	-	-	-	60.85	50.04

Source: Own computations from HES unit level data. The headcount indices and shares of the populations are the H_i's and w_i's.

Table 26: Poverty by main occupation of the head with the lower and upper poverty lines (1988-89 and 1991-92) - Rural

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Agric. Sector [(1)]												
Owner Farmer (30.6%)	30.39 (1.74)	5.65 (0.44)	1.68 (0.19)	32.30 (1.48)	5.99 (0.36)	1.64 (0.13)	46.14 (1.89)	10.23 (0.56)	3.25 (0.25)	48.27 (1.58)	11.04 (0.47)	3.47 (0.20)
Tenant Farmer (6.9%)	41.31 (2.19)	8.90 (0.63)	2.79 (0.32)	48.52 (3.11)	10.67 (0.93)	3.39 (0.42)	61.47 (2.17)	15.02 (0.77)	5.23 (0.41)	72.61 (2.77)	18.66 (1.09)	6.54 (0.56)
Fisheries, forestry, live stock (3.1%)	57.28 (4.55)	15.00 (1.62)	5.34 (0.85)	59.97 (4.61)	15.29 (1.58)	5.16 (0.77)	75.61 (3.95)	21.30 (1.83)	8.51 (1.06)	76.77 (3.97)	23.55 (1.79)	9.15 (0.98)
Agricultural worker with land (6.5%)	49.96 (3.03)	12.55 (1.03)	4.48 (0.53)	61.27 (2.93)	16.98 (1.13)	6.44 (0.58)	69.18 (2.80)	18.70 (1.15)	7.08 (0.64)	74.18 (2.63)	24.43 (1.21)	10.06 (0.70)
Agricultural worker without land (14.8%)	72.14 (1.56)	20.53 (0.67)	7.89 (0.36)	79.04 (1.54)	25.72 (0.76)	10.69 (0.45)	85.25 (1.23)	28.11 (0.69)	11.88 (0.43)	89.34 (1.17)	34.27 (0.75)	15.72 (0.52)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the rural population for 1991/92 (numbers may not add up due to rounding).

Table 26: Continued: Poverty by main occupation with the lower and upper poverty lines (1988-89 and 1991-92) - Rural

	88/89			91/92			88/89			91/92		
	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2	H	P_1	P_2
	With z_l						With z_u					
Non-Agr. Sector [1]												
Executive, official, prof., teacher (5.3%)	22.75 (2.85)	5.71 (0.93)	2.20 (0.44)	16.67 (2.79)	4.09 (0.84)	1.44 (0.37)	32.51 (3.18)	8.43 (1.09)	3.30 (0.56)	33.98 (3.54)	7.02 (1.06)	2.52 (0.51)
Businessman, petty trader (8.6%)	*35.99* (2.88)	*9.24* (0.94)	3.33 (0.45)	*41.85* (2.82)	*9.81* (0.85)	*3.15* (0.36)	*50.09* (3.00)	*14.00* (1.13)	*5.51* (0.60)	*56.28* (2.84)	*15.65* (1.04)	*5.75* (0.50)
Factory worker, artisan (4.8%)	41.76 (4.07)	8.56 (1.09)	2.48 (0.44)	48.82 (3.64)	12.47 (1.26)	4.54 (0.63)	54.19 (4.11)	13.25 (1.35)	4.44 (0.62)	62.80 (3.52)	18.76 (1.45)	7.48 (0.81)
Salesman, services, broker (3.2%)	42.97 (3.63)	9.50 (1.09)	3.13 (0.49)	64.31 (4.29)	15.75 (1.39)	4.90 (0.57)	58.30 (3.62)	14.34 (1.27)	5.05 (0.64)	73.95 (3.93)	23.47 (1.62)	8.78 (0.80)
Transport and com. worker (3.2%)	49.06 (4.27)	11.35 (1.33)	3.71 (0.60)	60.40 (4.27)	16.22 (1.57)	5.86 (0.72)	62.81 (4.13)	17.59 (1.65)	6.81 (0.87)	75.81 (3.74)	23.85 (1.75)	9.71 (0.94)
Servant, day-laborer (3.6%)	55.96 (3.86)	13.11 (1.28)	4.44 (0.65)	65.07 (3.91)	18.14 (1.52)	6.71 (0.80)	70.64 (3.55)	20.06 (1.50)	7.74 (0.82)	79.73 (3.29)	25.77 (1.63)	10.62 (0.96)
Retired, student, not working (9.3%)	42.14 (3.34)	10.94 (1.18)	4.23 (0.64)	37.16 (2.43)	8.94 (0.77)	4.54 (0.37)	55.31 (3.37)	15.50 (1.32)	6.23 (0.76)	57.76 (2.48)	15.34 (0.93)	5.77 (0.49)

Source: Own computations from HES unit level data. The notations z_l and z_u refer to the lower and upper poverty lines.
(1) The percentages represent the computed sample shares of the rural population for 1991/92 (numbers may not add up due to rounding).

Table 27: Probit regressions with the lower and upper poverty lines (1991/92)

	Lower Poverty Line			Upper Poverty Line		
	Coef.	**St. Er.**	**dF/dx**	**Coef.**	**St. Er.**	**dF/dx**
	First Order Effects					
Sector/Area						
Urban sector	0.30	0.19	0.12	0.17	0.20	0.06
Dhaka SMA	-1.19	* 0.18	-0.33	-0.60	* 0.16	-0.23
Dhaka rural II	0.52	* 0.09	0.20	0.40	* 0.09	0.14
Chittagong SMA	-1.13	* 0.20	-0.31	-0.44	* 0.19	-0.17
Chittagong other urban	-0.70	* 0.21	-0.22	-0.53	* 0.21	-0.21
Chittagong rural I	-0.77	* 0.08	-0.25	-0.49	* 0.08	-0.19
Chittagong rural II	-0.66	* 0.09	-0.22	-0.33	* 0.09	-0.13
Khulna urban	-0.34	+ 0.18	-0.12	-0.13	0.18	-0.05
Khulna rural I	0.38	* 0.10	0.15	0.54	* 0.10	0.18
Khulna rural II	-0.06	0.08	-0.02	-0.10	0.09	-0.04
Rajshahi urban	-0.55	* 0.19	-0.18	0.01	0.19	0.01
Rajshahi rural I	0.37	* 0.08	0.14	0.20	* 0.09	0.07
Rajshahi rural II	0.28	* 0.08	0.11	0.20	* 0.08	0.07
Religion/Demographics						
Non-muslim	0.15	* 0.07	0.06	0.18	* 0.07	0.07
Number of babies	0.58	* 0.05	0.22	0.56	* 0.04	0.21
Number of babies squared	-0.09	* 0.01	-0.03	-0.08	* 0.01	-0.03
Number of children	0.54	* 0.04	0.20	0.51	* 0.04	0.19
Number of children squared	-0.07	* 0.01	-0.03	-0.06	* 0.01	-0.02
Number of adults	0.19	* 0.04	0.07	0.26	* 0.04	0.10
Number of adults squared	-0.01	* 0.00	-0.01	-0.02	* 0.00	-0.01
Age of head	0.00	0.01	0.00	-0.01	0.01	0.00
Age of head squared	0.00	0.00	0.00	0.00	0.00	0.00
Family Structure						
No spouse, married	-0.36	* 0.13	-0.13	-0.30	* 0.12	-0.12
No spouse, single	-0.19	0.14	-0.07	-0.30	* 0.14	-0.12
No spouse, divorced/widowed	0.19	0.13	0.07	0.13	0.14	0.05
Education of Head						
Below class 5	-0.29	0.18	-0.11	-0.46	* 0.20	-0.18
Class 5	-0.35	0.24	-0.13	-0.19	0.29	-0.07
Class 6 to 9	-0.65	* 0.26	-0.22	-0.35	0.29	-0.14
Higher level	-0.83	* 0.31	-0.27	-0.40	0.32	-0.16

Education of Spouse						
Below class 5	-0.11	0.07	-0.04	0.05	0.07	0.02
Class 5	-0.41	* 0.10	-0.14	-0.40	* 0.09	-0.16
Class 6 to 9	-0.49	* 0.13	-0.17	-0.42	* 0.11	-0.17
Higher level	-0.05	0.24	-0.02	-0.22	0.21	-0.08
Education Differential						
One level higher	-0.26	* 0.06	-0.09	-0.34	* 0.06	-0.13
Two levels higher	-0.48	* 0.08	-0.17	-0.42	* 0.08	-0.16
Three levels higher	-0.55	* 0.09	-0.19	-0.54	* 0.09	-0.21
Four/more levels higher	-0.53	* 0.16	-0.18	-0.54	* 0.15	-0.21
Land Ownership						
0.05 to 0.49 acres	-0.38	* 0.08	-0.14	-0.32	* 0.09	-0.12
0.50 to 1.49 acres	-0.64	* 0.10	-0.22	-0.69	* 0.11	-0.27
1.50 to 2.49 acres	-1.11	* 0.14	-0.33	-1.01	* 0.14	-0.38
2.50 acres or more	-1.36	* 0.14	-0.40	-1.49	* 0.14	-0.54
Main Occupation						
Agricultural worker with land	-0.09	0.13	-0.03	-0.17	0.15	-0.06
Fisheries/forestry/live stock worker	-0.65	* 0.16	-0.21	-0.56	* 0.18	-0.22
Tenant farmer	-0.47	* 0.13	-0.16	-0.39	* 0.14	-0.15
Owner farmer	-0.50	* 0.11	-0.18	-0.43	* 0.13	-0.17
Servant, day-laborer	-0.46	* 0.15	-0.16	-0.36	* 0.17	-0.14
Transportation, communication worker	-0.81	* 0.14	-0.25	-0.68	* 0.15	-0.26
Salesman, service worker, borker, middleman	-0.48	* 0.14	-0.16	-0.49	* 0.16	-0.19
Factory worker, artisan	-0.62	* 0.18	-0.20	-0.35	0.22	-0.14
Petty trader, small businessman	-0.63	* 0.13	-0.21	-0.79	* 0.14	-0.31
Executive, official, professional, teacher	-1.00	* 0.29	-0.30	-1.07	* 0.29	-0.41
Retired person, student, non working person	-0.08	0.14	-0.03	-0.21	0.15	-0.08
	Interaction Effects					
Education of Head/Sector						
Below class 5/urban	-0.14	0.17	-0.05	0.02	0.17	0.01
Class 5/urban	-0.08	0.21	-0.03	0.10	0.21	0.04
Class 6 to 9/urban	-0.23	0.21	-0.08	-0.33	0.20	-0.13
Higher level/urban	-0.01	0.26	0.00	-0.30	0.23	-0.12
Education of Spouse/Sector						
Below class 5/urban	-0.06	0.16	-0.02	-0.09	0.16	-0.04
Class 5/urban	-0.08	0.22	-0.03	0.33	+ 0.19	0.12
Class 6 to 9/urban	-0.15	0.24	-0.05	-0.08	0.20	-0.03
Higher level/urban	-1.94	* 0.60	-0.38	-0.58	* 0.29	-0.23

Education Differential/Sector						
One level/urban	-0.07	0.15	-0.03	0.20	0.14	0.07
Two levels/urban	0.08	0.19	0.03	-0.12	0.18	-0.05
Three levels/urban	-0.20	0.25	-0.07	-0.05	0.22	-0.02
Four or more levels/urban	-1.39	* 0.63	-0.33	-0.86	* 0.38	-0.33
Land ownership/Sector						
0.05 to 0.49 acres/urban	0.02	0.15	0.01	0.02	0.15	0.01
0.50 to 1.49 acres/urban	0.35	+ 0.18	0.14	0.33	+ 0.17	0.12
1.50 to 2.49 acres/urban	0.06	0.31	0.02	-0.04	0.26	-0.02
More than 2.50 acres/urban	0.54	* 0.25	0.21	0.36	+ 0.21	0.13
Family Structure/Sector						
No spouse, married/urban	0.09	0.28	0.03	-0.21	0.24	-0.08
No spouse, single/urban	0.22	0.33	0.08	0.38	0.31	0.13
No spouse, divorced/widowed/urban	0.18	0.29	0.07	-0.36	0.29	-0.14
Land Ownership/Education						
0.05 to 0.49 acres/Below class 5	0.37	* 0.15	0.14	0.40	* 0.16	0.14
0.05 to 0.49 acres/Class 5	0.42	* 0.21	0.17	0.57	* 0.22	0.19
0.05 to 0.49 acres/Class 6 to 9	0.62	* 0.22	0.24	0.48	* 0.21	0.16
0.05 to 0.49 acres/Higher level	0.15	0.27	0.06	-0.06	0.22	-0.02
0.50 to 1.49 acres/Below class 5	0.28	0.18	0.11	0.39	* 0.18	0.14
0.50 to 1.49 acres/Class 5	0.36	0.23	0.14	0.53	* 0.23	0.18
0.50 to 1.49 acres/Class 6 to 9	0.57	* 0.23	0.23	0.55	* 0.22	0.18
0.50 to 1.49 acres/Higher level	0.36	0.30	0.14	0.34	0.24	0.12
1.50 to 2.49 acres/Below class 5	0.54	* 0.24	0.21	0.49	* 0.23	0.17
1.50 to 2.49 acres/Class 5	0.34	0.27	0.13	0.35	0.26	0.12
1.50 to 2.49 acres/Class 6 to 9	0.32	0.28	0.13	0.54	* 0.26	0.18
1.50 to 2.49 acres/Higher level	0.74	* 0.33	0.29	0.50	+ 0.27	0.17
More than 2.50 acres/Below class 5	0.57	* 0.22	0.23	0.52	* 0.22	0.17
More than 2.50 acres/Class 5	-0.12	0.27	-0.05	0.21	0.26	0.08
More than 2.50 acres/Class 6 to 9	0.27	0.25	0.11	0.42	+ 0.24	0.15
More than 2.50 acres/Higher level	0.20	0.29	0.08	0.28	0.24	0.10
Education/Occupation						
Below class 5/Agricultural worker with land	-0.53	* 0.27	-0.18	-0.32	0.29	-0.13
Below class 5/Fisheries, forestry, live stock	0.07	0.34	0.03	-0.15	0.36	-0.06
Below class 5/Tenant farmer	-0.55	* 0.25	-0.18	-0.11	0.27	-0.04
Below class 5/Owner farmer	-0.50	* 0.22	-0.17	-0.42	+ 0.24	-0.17
Above class 5/Agricultural worker with land	-0.57	+ 0.30	-0.19	-0.86	* 0.34	-0.33
Above class 5/Fisheries, forestry, live stock	0.93	* 0.40	0.36	0.57	0.47	0.19
Above class 5/Owner farmer	-0.13	0.24	-0.05	-0.66	* 0.28	-0.26
Below class 5/Servant, day laborer	-0.04	0.30	-0.01	-0.13	0.33	-0.05

Below class 5/Transport, communic. worker	0.11	0.26	0.04	-0.19	0.27	-0.07
Below class 5/Salesman, services, broker	-0.10	0.29	-0.04	-0.23	0.31	-0.09
Below class 5/Factory worker, artisan	0.31	0.29	0.12	0.07	0.33	0.03
Below class 5/Petty trader, small businessman	-0.43	+ 0.22	-0.15	-0.25	0.24	-0.10
Below class 5/Executive, official, prof., teacher	0.08	0.40	0.03	0.06	0.40	0.02
Below class 5/Retired, student, non working	-0.68	* 0.24	-0.22	-0.34	0.25	-0.13
Above class 5/Servant, day laborer	-0.25	0.29	-0.09	-0.67	* 0.33	-0.26
Above class 5/Transport, communic. Worker	0.06	0.27	0.02	-0.49	0.31	-0.19
Above class 5/Salesman, services, broker	-0.32	0.30	-0.12	-0.63	+ 0.34	-0.25
Above class 5/Factory worker, artisan	-0.22	0.32	-0.08	-0.99	* 0.36	-0.38
Above class 5/Petty trader, small businessman	-0.30	0.24	-0.11	-0.57	* 0.29	-0.22
Above class 5/Executive, offic., prof., teacher	-0 20	0.36	-0.07	-0.27	0.39	-0.10
Above class 5/Retired, student, non working	-0.61	* 0.26	-0.20	-0.64	0.29	-0.25
Constant	-0.06	0.24		0.50	0.24	

Note: Number of observations: 5735. Specification: Probit. Log likelihood of -2519.62 with z_l and -2275.25 with z_u. The observed and predicted probabilities of being poor are respectively 0.43 and 0.38 percent with z_l and 0.59 and 0.63 percent with z_u. The symbol * indicates significance at the 5% level of confidence ($^+$ for the 10% level of confidence.) The same levels of significance apply to the changes in probability dF/dx computed at the mean of the predicted probabilities. For dummy variables, dF/dx measures the impact of a discrete change from 0 to 1. For continuous variables, dF/dx measures the impact of a one unit change in the variable. The excluded categories for the dummy variables are the rural sector, the rural area I of the Dhaka division (area # 3), the muslim religion, the married head with a spouse family structure, the illiterate head, the illiterate spouse, the zero education differential between other household members and the maximum educational level between the head and the spouse (or the head only if he has no spouse), the landless household, and landless agricultural worker.

Table 28: Using probit parameter estimates for the lower poverty line: land ownership and education (1991/92)

	Urban Sector					**Rural Sector**				
	Less than 0.05 acres	**From 0.05 to 0.49 acres**	**From 0.50 to 1.49 acres**	**From 1.50 to 2.49 acres**	**More than 2.50 acres**	**Less than 0.05 acres**	**From 0.05 to 0.49 acres**	**From 0.50 to 1.49 acres**	**From 1.50 to 2.49 acres**	**More than 2.50 acres**
Illiterate	1.05 (85%)	0.69 (75%)	0.76 (78%)	0.00 (50%)	0.23 (59%)	1.09 (86%)	0.71 (76%)	0.45 (67%)	-0.02 (49%)	-0.27 (39%)
Below class 5	0.52 (70%)	0.53 (70%)	0.51 (70%)	0.01 (50%)	0.27 (61%)	0.70 (76%)	0.69 (75%)	0.34 (63%)	0.13 (55%)	-0.09 (46%)
Passed class 5	0.30 (62%)	0.36 (64%)	0.37 (64%)	-0.41 (34%)	-0.64 (26%)	0.42 (66%)	0.46 (68%)	0.14 (56%)	-0.35 (36%)	-1.06 (14%)
Passed class 6 to 9	-0.15 (44%)	0.11 (54%)	0.13 (55%)	-0.88 (19%)	-0.70 (24%)	0.12 (64%)	0.36 (64%)	0.05 (52%)	-0.67 (25%)	-0.97 (17%)
Higher level	-0.11 (46%)	-0.32 (37%)	-0.04 (48%)	-0.42 (34%)	-0.73 (23%)	-0.06 (48%)	-0.29 (39%)	-0.34 (37%)	-0.43 (33%)	-1.22 (11%)

Source: Own calculations from HES unit level data (cf. probit parameter estimates from Table 27). The numbers (e.g. 1.05) are the scores of the households ($\beta' x_i$). The predicted probabilities of being poor are given in parentheses (e.g. 85%).

Table 29: Tobit regressions with the lower and upper poverty lines (1991/92)

	Poverty gap				Squared poverty gap			
	β_L		β_U		β_L		β_U	
	Coef.	St. Er.	Coef.	St. Er.	Coef.	St. Er.	Coef.	St. Er.
	First Order Effects							
Sector/Area								
Urban sector	0.030	0.034	-0.008	0.030	0.007	0.016	-0.015	0.016
Dhaka SMA	-0.250 *	0.032	-0.094 *	0.027	-0.113 *	0.016	-0.046 *	0.015
Dhaka rural II	0.110 *	0.014	0.060 *	0.013	0.053 *	0.007	0.032 *	0.007
Chittagong SMA	-0.256 *	0.038	-0.065 *	0.031	-0.116 *	0.018	-0.034 *	0.017
Chittagong other urban	-0.104 *	0.039	-0.050	0.034	-0.040 *	0.019	-0.016	0.018
Chittagong rural I	-0.163 *	0.015	-0.107 *	0.013	-0.075 *	0.007	-0.056 *	0.007
Chittagong rural II	-0.145 *	0.017	-0.092 *	0.014	-0.068 *	0.008	-0.050 *	0.008
Khulna urban	-0.057 +	0.033	0.026	0.029	-0.026	0.016	0.018	0.016
Khulna rural I	0.077 *	0.017	0.094 *	0.015	0.032 *	0.008	0.048 *	0.008
Khulna rural II	-0.022	0.015	-0.025 +	0.014	-0.011	0.007	-0.015 *	0.007
Rajshahi urban	-0.065 +	0.035	0.044	0.030	-0.025	0.017	0.033 *	0.016
Rajshahi rural I	0.090 *	0.014	0.052 *	0.013	0.043 *	0.007	0.030 *	0.007
Rajshahi rural II	0.053 *	0.014	0.028 *	0.013	0.028 *	0.007	0.015 *	0.007
Religion/Demographics								
Non-muslim	0.008	0.013	0.020 +	0.011	0.000	0.006	0.005	0.006
Number of babies	0.125 *	0.008	0.118 *	0.007	0.058 *	0.004	0.062 *	0.004
Number of babies squared	-0.019 *	0.002	-0.017 *	0.002	-0.008 *	0.001	-0.009 *	0.001
Number of children	0.107 *	0.008	0.101 *	0.007	0.049 *	0.004	0.051 *	0.004
Number of children squared	-0.014 *	0.002	-0.013 *	0.001	-0.006 *	0.001	-0.007 *	0.001
Number of adults	0.035 *	0.007	0.040 *	0.006	0.015 *	0.004	0.019 *	0.003
Number of adults squared	-0.003 *	0.001	-0.003 *	0.001	-0.001 *	0.000	-0.001 *	0.000
Age of head	0.002	0.002	0.001	0.002	0.001	0.001	0.001	0.001
Age of head squared	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Family Structure								
No spouse, married	-0.073 *	0.025	-0.063 *	0.021	-0.032 *	0.012	-0.031 *	0.011
No spouse, single	-0.024	0.027	-0.047 *	0.023	-0.010	0.013	-0.020	0.013
No spouse, divorced/widowed	0.065 *	0.023	0.055 *	0.021	0.039 *	0.011	0.037 *	0.011
Education of Head								
Below class 5	-0.069 *	0.027	-0.073 *	0.025	-0.027 *	0.013	-0.037 *	0.013
Class 5	-0.062	0.040	-0.060 +	0.036	-0.031	0.019	-0.035 +	0.019
Class 6 to 9	-0.100 *	0.046	-0.084 *	0.040	-0.043 +	0.022	-0.047 *	0.022
Higher level	-0.099 +	0.058	-0.081 +	0.046	-0.036	0.028	-0.033	0.025

Education of Spouse												
Below class 5	-0.032	*	0.013	-0.014		0.011	-0.017	*	0.006	-0.012	+	0.006
Class 5	-0.093	*	0.018	-0.083	*	0.016	-0.042	*	0.009	-0.045	*	0.009
Class 6 to 9	-0.119	*	0.025	-0.102	*	0.021	-0.057	*	0.012	-0.056	*	0.011
Higher level	-0.023		0.050	-0.048		0.040	-0.011		0.025	-0.023		0.022
Education Differential												
One level higher	-0.060	*	0.011	-0.060	*	0.010	-0.030	*	0.005	-0.032	*	0.005
Two levels higher	-0.095	*	0.015	-0.088	*	0.013	-0.045	*	0.007	-0.046	*	0.007
Three levels higher	-0.111	*	0.018	-0.106	*	0.015	-0.050	*	0.009	-0.052	*	0.008
Four or more levels higher	-0.119	*	0.031	-0.108	*	0.026	-0.051	*	0.015	-0.054	*	0.014
Land Ownership												
0.05 to 0.49 acres	-0.080	*	0.013	-0.077	*	0.012	-0.039	*	0.006	-0.045	*	0.006
0.50 to 1.49 acres	-0.137	*	0.017	-0.133	*	0.016	-0.068	*	0.008	-0.077	*	0.008
1.50 to 2.49 acres	-0.221	*	0.025	-0.207	*	0.021	-0.104	*	0.012	-0.110	*	0.012
2.50 acres or more	-0.283	*	0.024	-0.285	*	0.022	-0.129	*	0.012	-0.148	*	0.012
Main Occupation												
Agricultural worker with land	-0.039	+	0.020	-0.035	+	0.019	-0.022	*	0.010	-0.026	*	0.010
Fisheries/forestry/live stock worker	-0.147	*	0.026	-0.135	*	0.024	-0.071	*	0.013	-0.079	*	0.013
Tenant farmer	-0.125	*	0.021	-0.113	*	0.019	-0.064	*	0.010	-0.070	*	0.010
Owner farmer	-0.130	*	0.019	-0.115	*	0.018	-0.068	*	0.009	-0.072	*	0.009
Servant, day-laborer	-0.072	*	0.024	-0.070	*	0.022	-0.034	*	0.011	-0.038	*	0.012
Transportation, communication worker	-0.150	*	0.024	-0.142	*	0.022	-0.069	*	0.012	-0.077	*	0.012
Salesman, services, broker, middleman	-0.089	*	0.023	-0.085	*	0.022	-0.048	*	0.011	-0.050	*	0.011
Factory worker, artisan	-0.138	*	0.030	-0.116	*	0.027	-0.075	*	0.014	-0.075	*	0.015
Petty trader, small businessman	-0.135	*	0.021	-0.144	*	0.019	-0.071	*	0.010	-0.082	*	0.010
Executive, official, prof., teacher	-0.142	*	0.051	-0.167	*	0.046	-0.060	*	0.025	-0.079	*	0.024
Retired person, student, non working	-0.020		0.023	-0.029		0.021	-0.014		0.011	-0.022	*	0.011
	Interaction effects											
Education of Head/Sector												
Below class 5/urban	-0.010		0.032	-0.002		0.027	-0.003		0.015	0.000		0.015
Class 5/urban	-0.003		0.040	0.001		0.034	0.004		0.020	0.003		0.018
Class 6 to 9/urban	-0.050		0.041	-0.058	+	0.034	-0.018		0.020	-0.025		0.018
Higher level/urban	-0.041		0.050	-0.064		0.039	-0.020		0.025	-0.038	+	0.021
Education of Spouse/Sector												
Below class 5/urban	-0.001		0.031	-0.012		0.026	0.003		0.015	-0.002		0.014
Class 5/urban	-0.017		0.043	0.026		0.033	-0.006		0.021	0.015		0.018
Class 6 to 9/urban	-0.016		0.049	-0.031		0.037	-0.002		0.024	-0.006		0.020
Higher level/urban	-0.416	*	0.130	-0.172	*	0.057	-0.186	*	0.064	-0.079	*	0.031

Education Differential/Sector								
One level/urban	-0.008	0.028	0.016	0.023	0.001	0.014	0.009	0.012
Two levels/urban	0.036	0.035	0.008	0.030	0.022	0.017	0.014	0.016
Three levels/urban	-0.048	0.049	-0.026	0.039	-0.024	0.024	-0.014	0.021
Four or more levels/urban	-0.285 *	0.128	-0.218 *	0.074	-0.126 *	0.064	-0.098 *	0.040
Land ownership/Sector								
0.05 to 0.49 acres/urban	0.009	0.027	0.008	0.023	0.006	0.013	0.006	0.012
0.50 to 1.49 acres/urban	0.091 *	0.035	0.082 *	0.029	0.042 *	0.017	0.047 *	0.016
1.50 to 2.49 acres/urban	0.034	0.063	0.010	0.046	0.022	0.031	0.012	0.025
More than 2.50 acres/urban	0.118 *	0.050	0.090 *	0.037	0.051 *	0.025	0.046 *	0.020
Family Structure/Sector								
No spouse, married/urban	0.023	0.054	-0.031	0.044	0.011	0.026	-0.009	0.024
No spouse, single/urban	0.069	0.063	0.076	0.052	0.039	0.030	0.046 +	0.028
No spouse, divorced/widowed/urban	-0.002	0.052	-0.044	0.046	-0.009	0.025	-0.026	0.025
Land Ownership/Education								
0.05 to 0.49 acres/Below class 5	0.089 *	0.026	0.089 *	0.023	0.044 *	0.012	0.054 *	0.012
0.05 to 0.49 acres/Class 5	0.100 *	0.038	0.107 *	0.033	0.052 *	0.018	0.062 *	0.018
0.05 to 0.49 acres/Class 6 to 9	0.109 *	0.041	0.094 *	0.035	0.046 *	0.020	0.049 *	0.019
0.05 to 0.49 acres/Higher level	0.032	0.053	0.007	0.039	0.017	0.026	0.009	0.021
0.50 to 1.49 acres/Below class5	0.077 *	0.031	0.074 *	0.028	0.042 *	0.015	0.050 *	0.015
0.50 to 1.49 acres/Class 5	0.093 *	0.041	0.098 *	0.036	0.050 *	0.020	0.061 *	0.019
0.50 to 1.49 acres/Class 6 to 9	0.106 *	0.044	0.091 *	0.037	0.050 *	0.022	0.054 *	0.020
0.50 to 1.49 acres/Higher level	0.024	0.059	0.029	0.042	0.010	0.029	0.017	0.023
1.50 to 2.49 acres/Below class 5	0.107 *	0.043	0.094 *	0.037	0.048 *	0.021	0.055 *	0.020
1.50 to 2.49 acres/Class 5	0.066	0.050	0.057	0.043	0.033	0.025	0.034	0.023
1.50 to 2.49 acres/Class 6 to 9	0.069	0.055	0.083 *	0.045	0.034	0.027	0.055 *	0.024
1.50 to 2.49 acres/Higher level	0.103	0.065	0.076	0.049	0.041	0.032	0.037	0.027
More than 2.50 acres/Below class 5	0.123 *	0.041	0.097 *	0.035	0.058 *	0.020	0.061 *	0.019
More than 2.50 acres/Class 5	0.001	0.051	0.022	0.042	0.008	0.025	0.025	0.023
More than 2.50 acres/Class 6 to 9	0.044	0.049	0.043	0.041	0.026	0.024	0.036	0.022
More than 2.50 acres/Higher level	0.008	0.058	0.018	0.043	0.002	0.028	0.012	0.024
Education/Occupation								
Below class 5/Agric. worker with land	-0.061	0.044	-0.056	0.040	-0.028	0.021	-0.027	0.021
Below class 5/Fish., forestry, live st.	0.040	0.059	0.007	0.053	0.004	0.028	0.006	0.029
Below class 5/Tenant farmer	-0.087 *	0.043	-0.047	0.038	-0.049 *	0.021	-0.033 +	0.020
Below class 5/Owner farmer	-0.074 *	0.037	-0.071 *	0.034	-0.036 *	0.018	-0.037 *	0.018
Above class 5/Agric. Worker with land	-0.113 *	0.052	-0.130 *	0.047	-0.055 *	0.025	-0.065 *	0.025
Above class 5/Fish., forestry, live st.	0.172 *	0.066	0.141 *	0.061	0.059 +	0.032	0.059 +	0.033
Above class 5/Tenant farmer	-0.078	0.050	-0.068	0.044	-0.029	0.024	-0.026	0.024
Above class 5/Owner farmer	-0.044	0.041	-0.071 +	0.037	-0.023	0.020	-0.037 +	0.020

Below class 5/Servant, day laborer	-0.065	0.049	-0.056	0.045	-0.046 *	0.024	-0.046 +	0.024
Below class 5/Transport, com. Worker	0.002	0.043	-0.015	0.039	-0.014	0.021	-0.015	0.021
Below class 5/Salesman, services,	-0.061	0.048	-0.060	0.044	-0.034	0.023	-0.040 +	0.023
Below class 5/Factory worker, artisan	0.064	0.047	0.044	0.044	0.024	0.023	0.022	0.023
Below class 5/Petty trader, small bus.	-0.088 *	0.038	-0.072 *	0.034	-0.043 *	0.018	-0.040 *	0.018
Below class 5/Executive, off., teacher	-0.041	0.069	-0.033	0.061	-0.032	0.034	-0.029	0.033
Below class 5/Retired, stud., non work.	-0.126 *	0.041	-0.106 *	0.036	-0.064 *	0.020	-0.058 *	0.019
Above class 5/Servant, day laborer	-0.085 +	0.050	-0.096 *	0.045	-0.051 *	0.024	-0.054 *	0.024
Above class 5/Transport, com. Worker	-0.049	0.047	-0.067	0.042	-0.028	0.023	-0.039 +	0.022
Above class 5/Salesman, services	-0.114 *	0.052	-0.120 *	0.046	-0.055 *	0.025	-0.062 *	0.025
Above class 5/Factory worker, artisan	-0.051	0.056	-0.094 +	0.049	-0.026	0.027	-0.045 +	0.027
Above class 5/Petty trader, small bus.	-0.088 *	0.041	-0.094 *	0.037	-0.039 +	0.020	-0.046 *	0.020
Above class 5/Executive, off., teacher	-0.145 *	0.064	-0.100 +	0.056	-0.078 *	0.031	-0.063 *	0.030
Above class 5/Retired, stud., non work.	-0.159 *	0.045	-0.130 *	0.039	-0.076 *	0.022	-0.069 *	0.021
Constant	-0.013	0.044	0.129	0.039	-0.020	0.022	0.040	0.021
Ancillary parameter (σ)	0.220	0.003	0.212	0.003	0.105	0.002	0.112	0.001

Note: Number of observations: 5735. Specification: Tobit. Log likelihood for the poverty gap of -1184.40 with z_l and -953.75 with z_u. Log likelihood for the squared poverty gap of 804.01 with z_l and 1397.05 with z_u. The symbol * indicates significance at the 5% level of confidence ($^+$ for the 10% level of confidence.) The excluded categories for the dummy variables are the rural sector, the rural area I of the Dhaka division (area # 3), the muslim religion, the married head with a spouse family structure, the illiterate head, the illiterate spouse, the zero education differential between the educational level of the other household members and the maximum educational level between the head and the spouse (or the head only if he/she has no spouse), the landless household, and landless agricultural worker.

Table A. 1: Lower, upper, and BBS poverty lines by geographical area (1983/84 to 1991/92)

Area	83/84			85/86			88/89			91/92		
	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}
Dhaka SMA	249	341	439	295	397	519	398	570	500	489	660	673
Other urban in Dhaka division	256	315	439	288	398	519	395	442	500	461	506	673
Rural Dhaka, Mymensingh	239	280	300	271	312	331	361	407	370	452	531	443
Rural Faridpur, Tangail, Jamalpur	231	269	300	270	314	331	352	365	370	433	475	443
Chittagong SMA	259	381	439	304	423	519	400	533	500	509	712	673
Other urban in Chittagong division	242	288	439	295	388	519	384	478	500	466	563	673
Rural Sylhet, Comilla	241	283	300	283	323	331	367	511	370	448	563	443
Rural Noakhali, Chittagong	258	299	300	291	343	331	396	439	370	472	588	443
Urban in Khulna division	243	305	439	272	405	519	364	471	500	461	592	673
Rural Barisal, Patuakhali	234	253	300	279	305	331	354	401	370	437	530	443
Rural Khulna, Jessore, Kushtia	228	269	300	275	335	331	360	423	370	420	497	443
Urban in Rajshahi division	249	354	439	282	363	519	345	459	500	449	582	673
Rural Rajshahi, Pabna	236	290	300	273	310	331	329	365	370	425	481	443
Rural Bogra, Rangpur, Dinajpur	237	302	300	261	313	331	344	392	370	421	479	443

Source: Own computations from HES unit level data, and BBS (1988a, 1988b, 1991) for the BBS poverty lines. See text of appendix II for the definition of the 1991-92 BBS "implicit" poverty line. The notations z_L, z_U, and z_{BBS} refer to the lower, upper, and BBS poverty lines.

Table A.2: Headcount indices with the lower, upper, and BBS poverty lines (1983/84 to 1991/92)

Sector and Areas	83/84			85/86			88/89			91/92		
	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}
Urban areas	28.04 (1.08)	50.78 (1.20)	70.53 (1.10)	15.93 (0.90)	36.95 (1.19)	56.58 (1.22)	22.61 (0.97)	45.01 (1.15)	44.35 (1.15)	24.87 (0.99)	45.24 (1.14)	46.67 (1.14)
Rural areas	42.58 (1.08)	60.36 (1.07)	65.70 (1.03)	32.03 (1.06)	48.66 (1.14)	53.10 (1.13)	44.78 (0.81)	60.15 (0.80)	48.16 (0.81)	47.44 (0.81)	62.96 (0.78)	47.58 (0.81)
All areas (national)	40.17 (0.79)	58.78 (0.79)	66.50 (7.62)	29.21 (0.76)	46.61 (0.83)	53.71 (0.83)	40.55 (0.65)	57.26 (0.66)	47.43 (0.66)	42.89 (0.65)	59.39 (0.65)	47.39 (0.66)
Dhaka SMA	20.60 (1.58)	42.82 (1.94)	59.09 (1.92)	6.02 (0.95)	21.01 (1.64)	41.56 (1.98)	16.49 (1.45)	42.61 (1.94)	33.73 (1.85)	14.48 (1.34)	36.15 (1.83)	33.82 (1.80)
Other urban in Dhaka division	44.07 (3.93)	64.94 (3.77)	87.54 (2.61)	33.33 (3.93)	56.78 (4.13)	69 66 (3.83)	45.20 (3.61)	55.63 (3.60)	63.75 (3.49)	46.18 (3.64)	57.30 (3.61)	70.80 (3.32)
Rural Dhaka, Mymensingh	46.10 (2.66)	60.75 (2.60)	67.29 (2.50)	31.22 (2.59)	43.85 (2.77)	50.37 (2.80)	40.03 (2.02)	53.39 (2.06)	41.66 (2 03)	47.71 (2.05)	62.43 (1.99)	44.98 (2.04)
Rural Faridpur, Tangail, Jamalpur	52.04 (3.13)	64.42 (3.00)	71.22 (1.34)	43.79 (3.31)	58.29 (3.29)	65.06 (3.19)	62 71 (2.26)	66.83 (2.20)	67.40 (2.20)	63.69 (2.24)	73.50 (2.05)	65.77 (2.21)

Source: Own computations from HES unit level data. The notations z_L, z_U and z_{BBS} refer to the lower, upper and BBS poverty lines.

Table A.2 - Continued: Headcount indices with the lower, upper, and BBS poverty lines (1983/84 to 1991/92)

Sector and Areas	83/84			85/86			88/89			91/92		
	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}	z_L	z_U	z_{BBS}
Chittagong SMA	12.18 (2.05)	48.77 (3.13)	68.13 (1.06)	8.46 (1.86)	30.32 (3.07)	47.81 (3.34)	12.95 (2.11)	38.58 (3.05)	34.82 (2.99)	19.43 (2.47)	45.85 (3.11)	36.43 (3.01)
Other urban in Chittagong div.	13.50 (3.19)	21.77 (3.85)	60.67 (4.56)	20.49 (3.83)	40.40 (4.66)	58.15 (4.68)	21.47 (3.29)	37.29 (3.87)	40.57 (3.93)	32.16 (3.70)	48.13 (3.96)	52.42 (3.96)
Rural Sylhet, Comilla	28.21 (2.52)	48.21 (2.80)	54.16 (2.79)	21.52 (2.36)	33.70 (2.72)	36.76 (2.77)	30.50 (1.92)	65.73 (1.98)	31.23 (1 93)	25.72 (1.80)	48.02 (2.06)	24.33 (1.76)
Rural Noakhali, Chittagong	41.79 (3.30)	59.73 (3.28)	60.77 (3.26)	22.30 (2.89)	38.81 (3.38)	35.31 (3.31)	43.03 (2 58)	51.11 (2.61)	34.67(2.48)	31.29 (2.43)	57.18 (2.59)	23.92 (2.23)
Urban in Khulna division	39.65 (2.81)	58.30 (2.83)	81.87 (2.21)	19.94 (2.30)	48.59 (2.87)	67.94 (2.68)	29.62 (2 48)	50.32 (2.71)	54.36 (2.70)	30.81 (2.46)	47.92 (2.66)	53.18 (2.66)
Rural Barisal, Patuakhali	33.70 (3.57)	47 19 (3.77)	57.44 (3.74)	35.98 (3.99)	50.00 (4.15)	63.90 (3.99)	51.89 (2 89)	64 14 (2.77)	55.80 (2.87)	55.90 (2.86)	74.64 (2 51)	56.87 (2.85)
Rural Khulna, Jessore, Kushtia	44.92 (3.11)	60.73 (3.05)	70.24 (2.86)	33 67 (3 05)	55.38 (3.21)	54 91 (3.21)	46.49 (2.33)	65.67 (2.22)	50.21 (2 33)	44.88 (2.31)	58.41 (2.29)	49.07 (2.33)
Urban in Rajshahi division	46.52 (3.21)	69.60 (2.96)	83.17 (2.41)	30.28 (2.97)	54.89 (3.22)	79.49 (2.61)	22 50 (2.55)	47.34 (3.04)	55.33 (3.03)	28.98 (2.79)	53.26 (3.06)	60.21 (3.01)
Rural Rajshahi, Pabna	48.78 (3.23)	70.16 (2.95)	73.50 (2.85)	28.46 (3.01)	46.01 (3.33)	51.30 (3.34)	46.87 (2.22)	57.61 (2.19)	59.79 (2.18)	61.70 (2.15)	69.88 (2.03)	63.75 (2.13)
Rural Bogra, Rangpur, Dinajpur	45.85 (2.94)	70.57 (2.69)	70.57 (2.67)	41.80 (2.99)	65.63 (2.88)	72.55 (2.71)	45.42 (2.15)	57.09 (2.13)	52.08 (2.15)	57.81 (2.12)	68.71 (1.99)	61.71 (2.08)

Source: Own computations from HES unit level data. The notations z_l, z_u and z_b refer to the lower, upper and BBS poverty lines.

Table A.3: Gap Narrowing and Reranking

	Gini before change	Gini after change	Difference in Gini	Equation (6)		Equation (7)	
				Gap-narrowing	Reranking	Gap-narrowing	Reranking
z_L to z_U	20.93	10.57	10.36	9.76	0.56	10.70	-0.37
z_L to z_{BBS}	20.93	18.51	2.42	-1.33	3.77	5.63	-3.19

Source: Own computations from HES. Numbers may not add up due to rounding.

FIGURE 1

BUILDING A POVERTY PROFILE

1. PREPARING DATA SETS

1.1 Summary statistics
1.2. Cleaning tests
1.3. Geographical areas

→

2. CONSTRUCTING POVERTY LINES

2.1. Food poverty lines
2.2. Non food poverty lines
2.3. Total poverty lines

→

3. MAKING POVERTY COMPARISONS

3.1. Comparisons over time
3.2. Comparisons across groups
3.2.1. Univariate
3.2.2. Multivariate

FIGURE 2

CONSTRUCTING POVERTY LINES

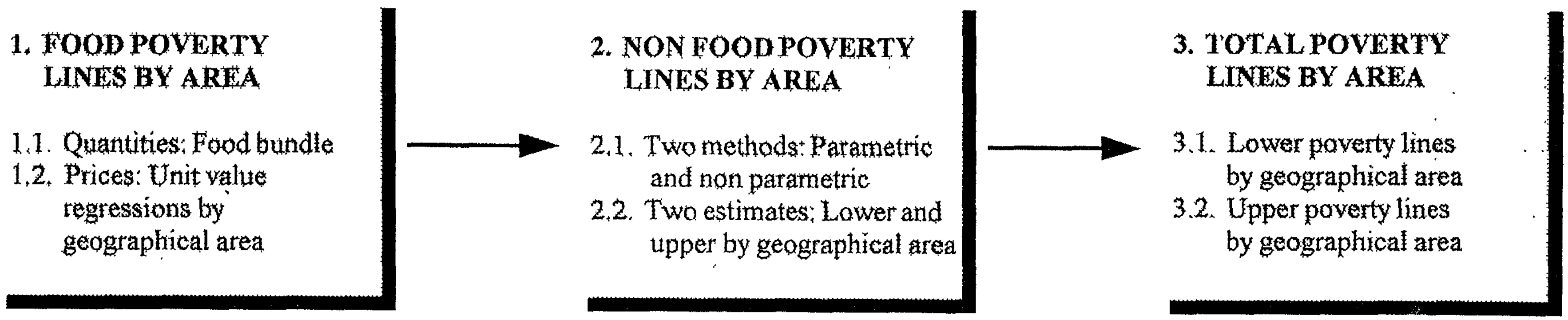


FIGURE 3

MAKING POVERTY COMPARISONS OVER TIME (POVERTY DECOMPOSITIONS)

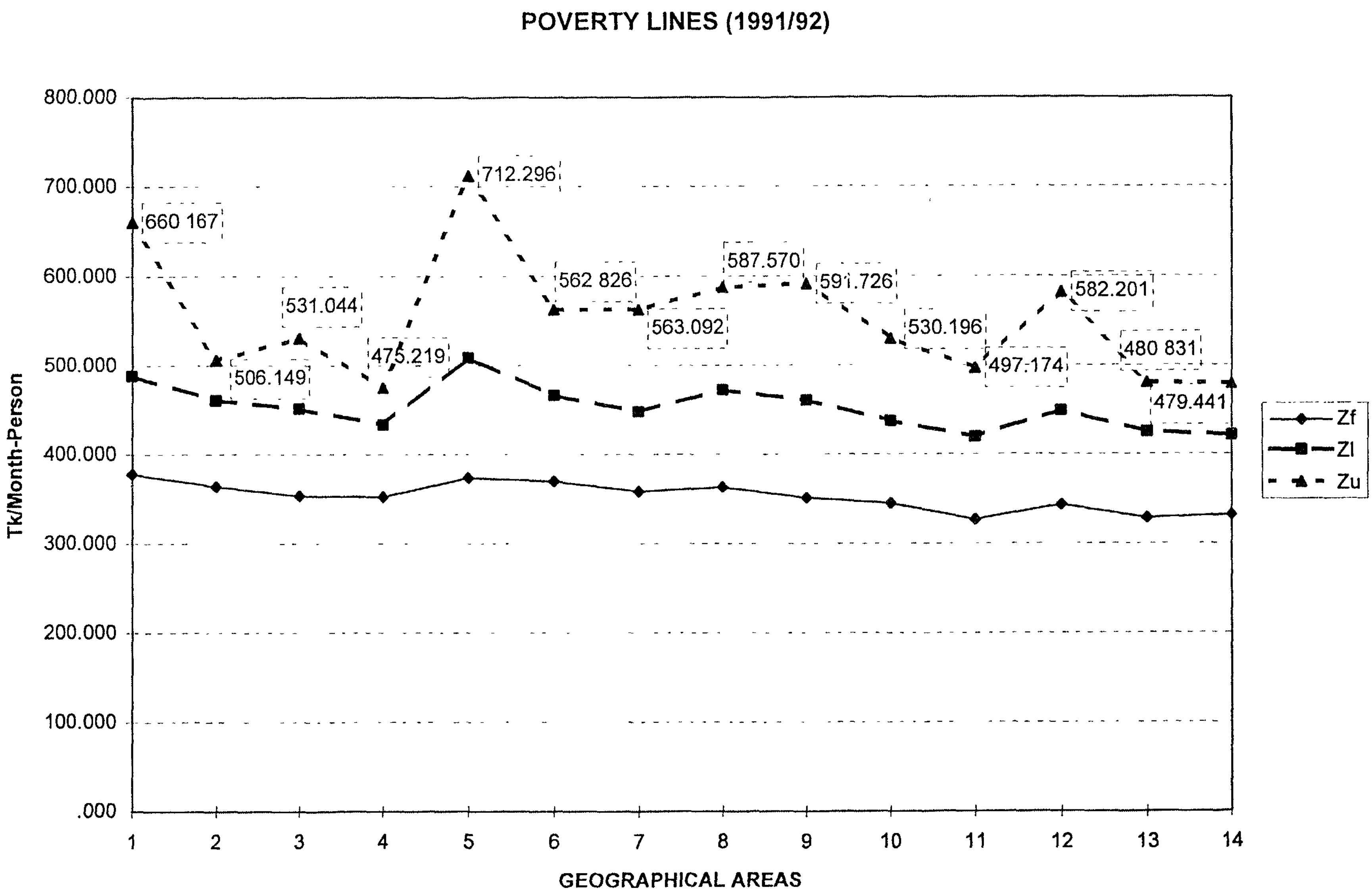
	WHOLE PERIOD (1983-1992)	**SUB-PERIOD (1988-1992)**
STANDARD DECOMPOSITIONS 1. Sectoral 2. Growth/Redistribution	Tables [illegible] Figures 10-12	Tables 10-11 Figures 10-12
EXTENSIONS 1. Nested 2. Multiple poverty lines	Figure 13	Table 12 Figure [illegible]

FIGURE 4

MAKING POVERTY COMPARISONS ACROSS GROUPS
(POVERTY TABULATIONS AND REGRESSIONS)

	UNIVARIATE	MULTIVARIATE
HEADCOUNT	[illegible]	Tables 27-28 Figures 29-31
POVERTY GAP AND SQUARED POVERTY GAP	Tables 7 & 13-26 Figures 6-9	[illegible]

FIGURE 5



POVERTY LINES (1991/92)
800.000
700.000
600.000
500.000
400.000
300.000
200.000
100.000
.000
Tk/Month-Person
1
2
3
4
5
6
7
8
9
10
11
12
13
14
GEOGRAPHICAL AREAS
660 167
506.149
531.044
475.219
712.296
562 826
563.092
587.570
591.726
530.196
497.174
582.201
480 831
479.441
Zf
Zl
Zu

FIGURE 6

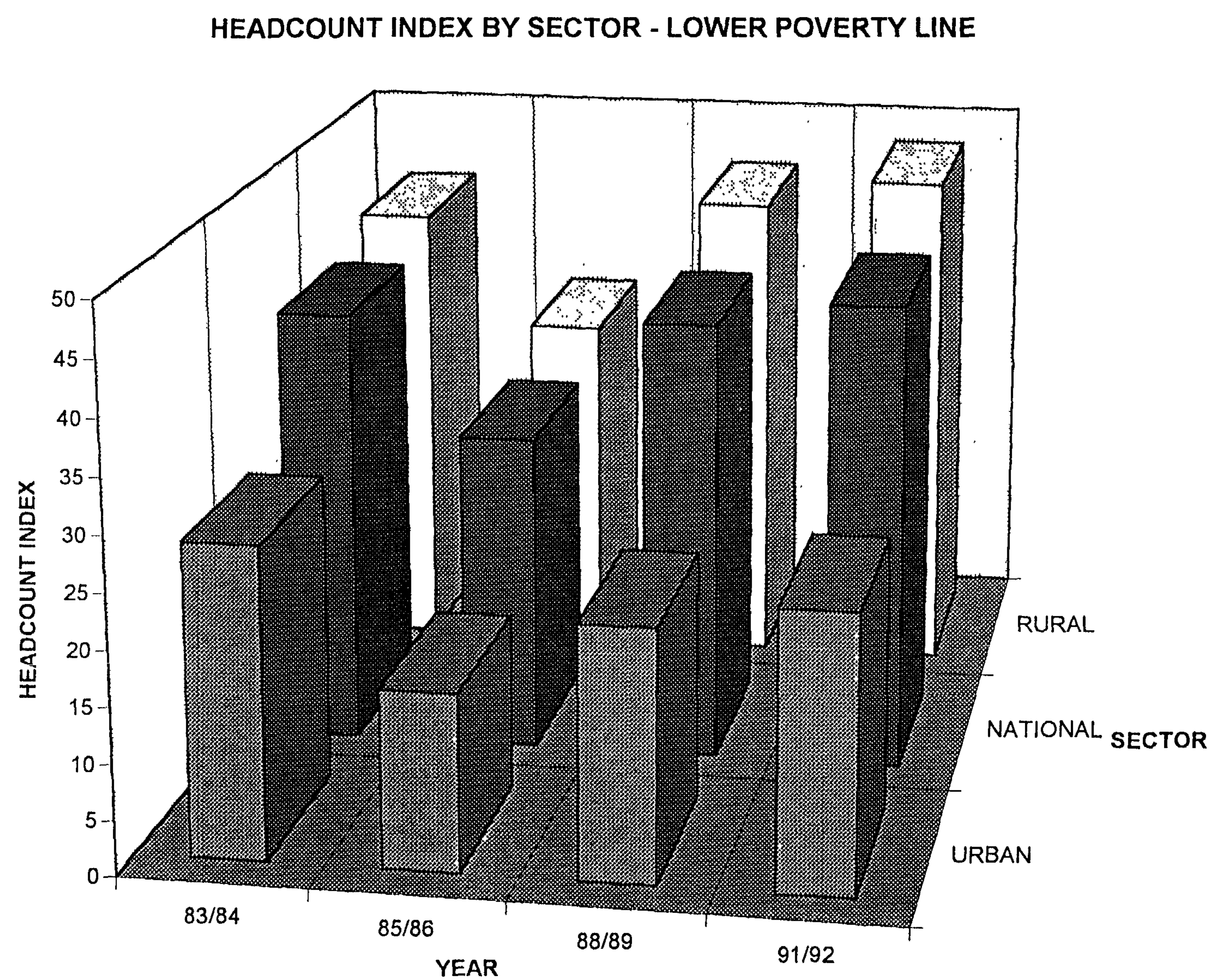

HEADCOUNT INDEX BY SECTOR - LOWER POVERTY LINE
HEADCOUNT INDEX
50
45
40
35
30
25
20
15
10
5
0
83/84
85/86
88/89
91/92
YEAR
RURAL
NATIONAL
URBAN
SECTOR

FIGURE 7

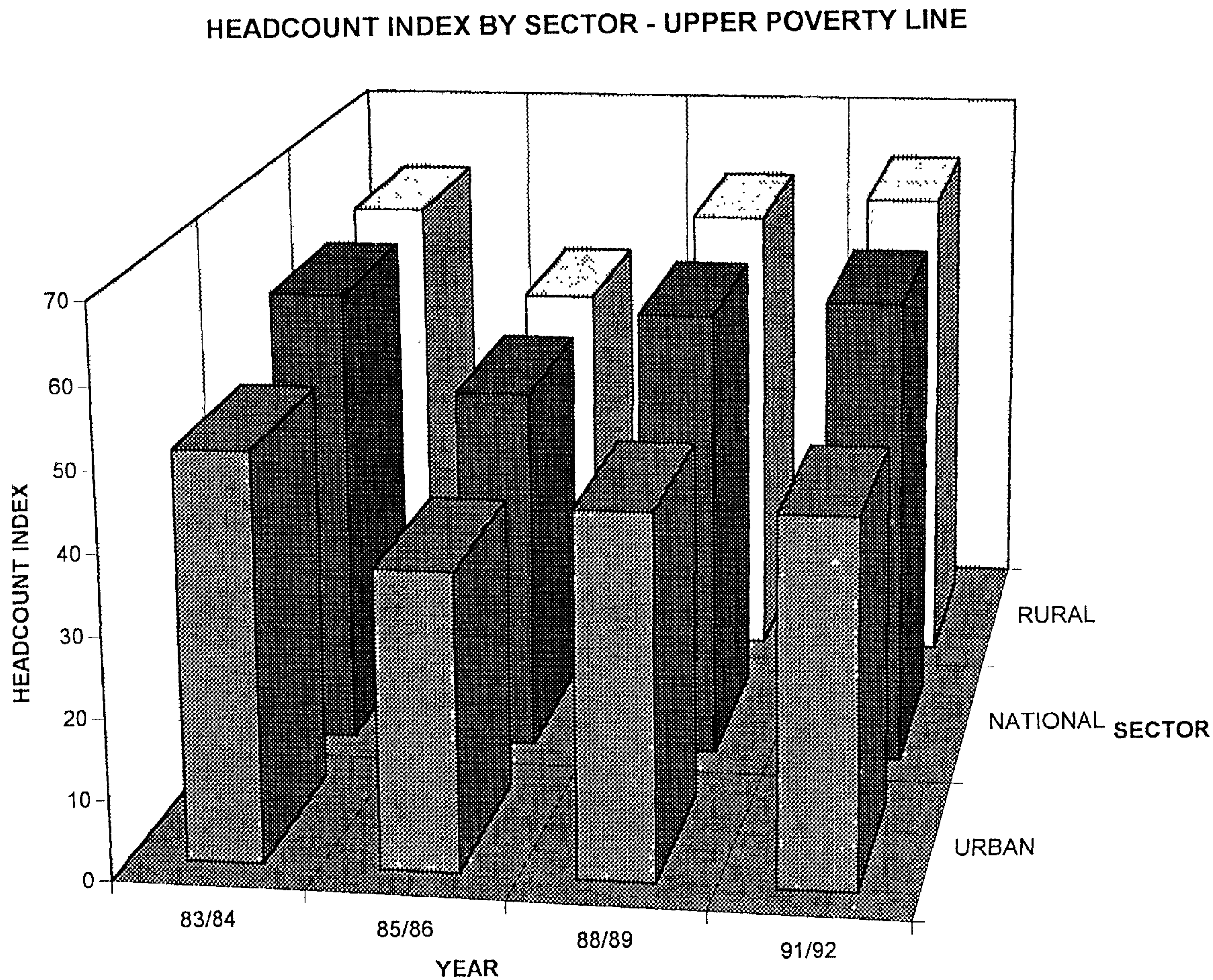

HEADCOUNT INDEX BY SECTOR - UPPER POVERTY LINE
HEADCOUNT INDEX
70
60
50
40
30
20
10
0
83/84
85/86
88/89
91/92
YEAR
RURAL
NATIONAL
URBAN
SECTOR

FIGURE 8

RATIO OF RURAL VERSUS URBAN POVERTY - LOWER POVERTY LINE

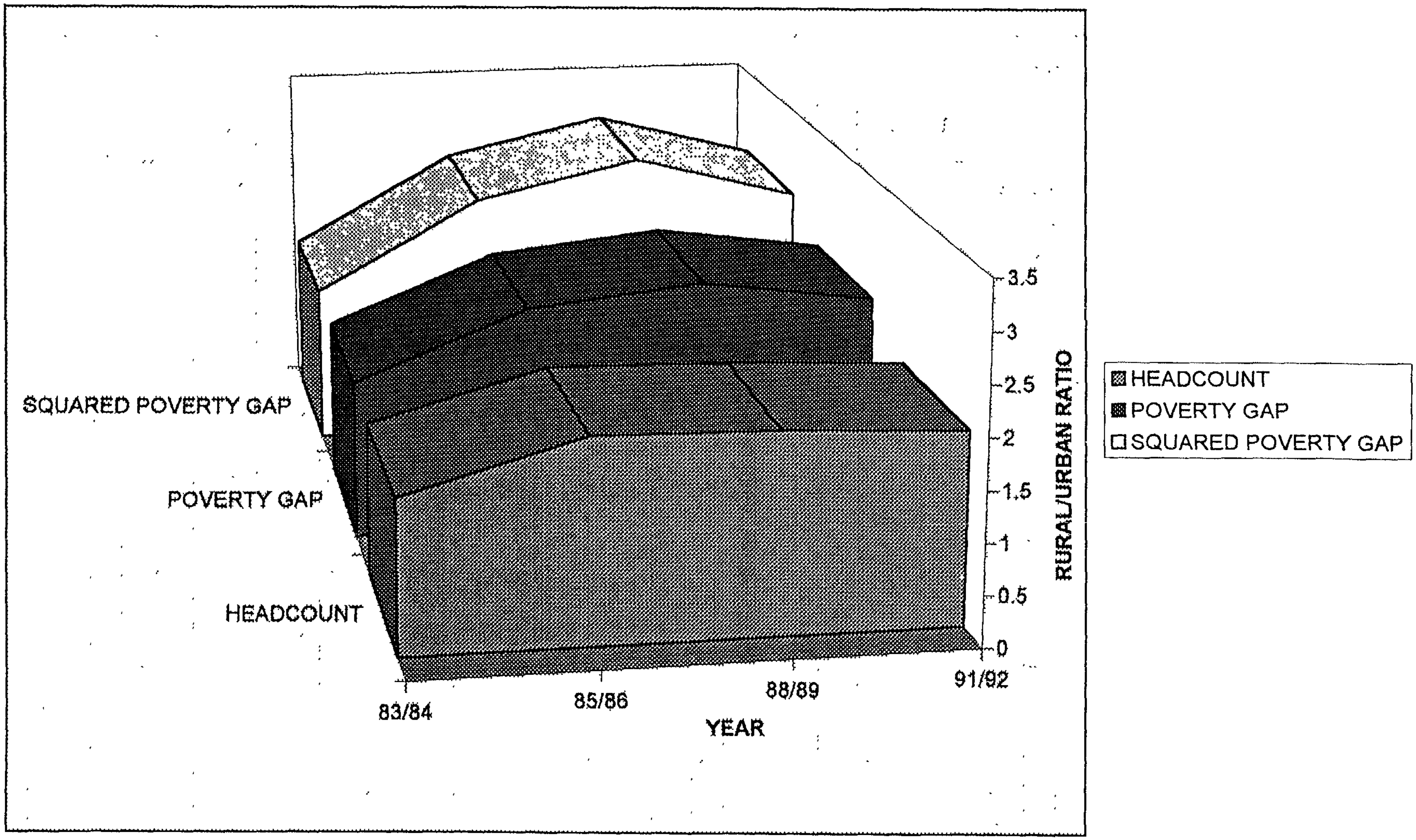


FIGURE 9

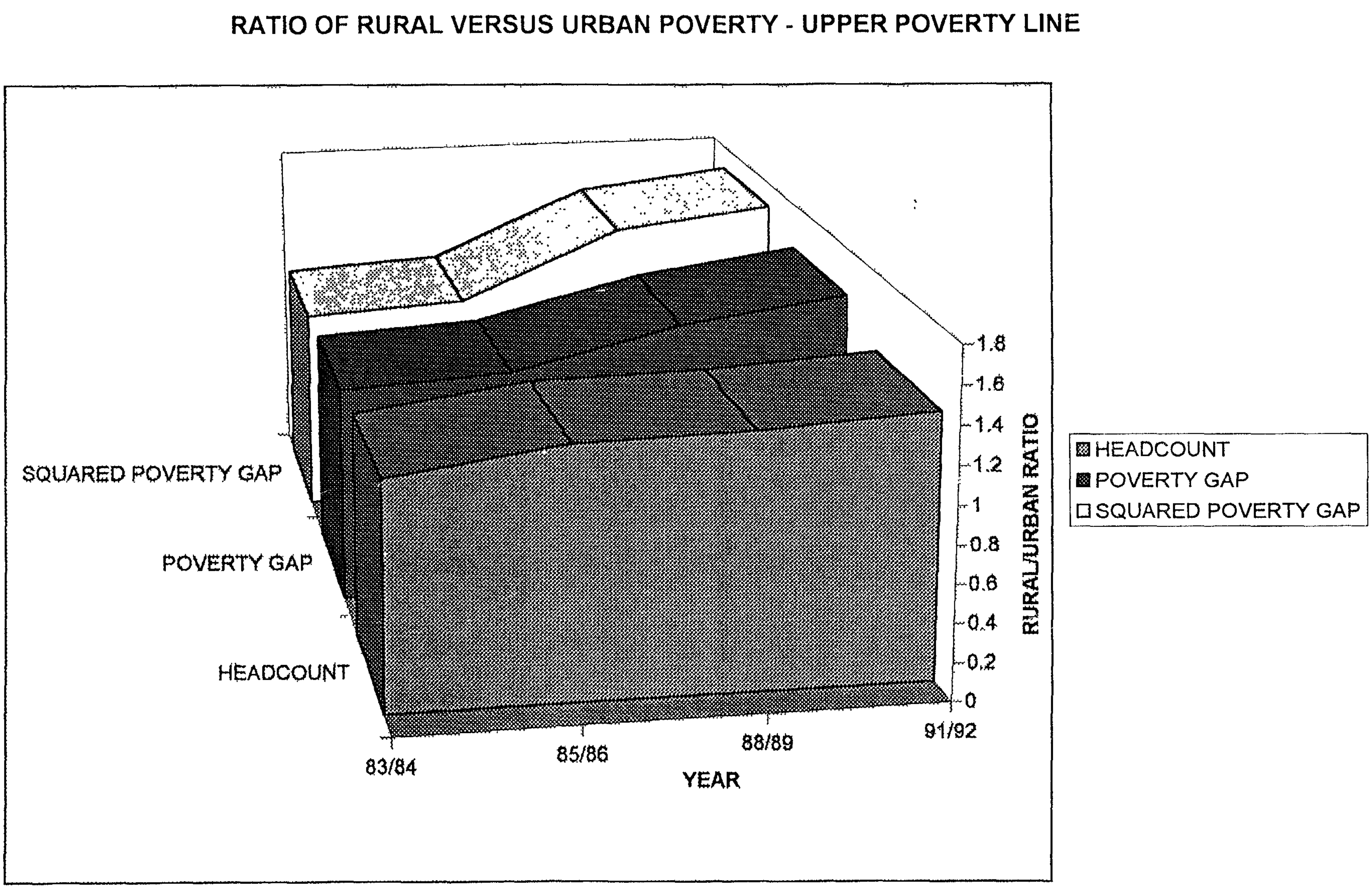

RATIO OF RURAL VERSUS URBAN POVERTY - UPPER POVERTY LINE
SQUARED POVERTY GAP
POVERTY GAP
HEADCOUNT
1.8
1.6
1.4
1.2
1
0.8
0.6
0.4
0.2
0
RURAL/URBAN RATIO
83/84
85/86
88/89
91/92
YEAR
HEADCOUNT
POVERTY GAP
SQUARED POVERTY GAP

FIGURE 10

SECTORAL DECOMPOSITIONS FOR HEADCOUNT INDEX

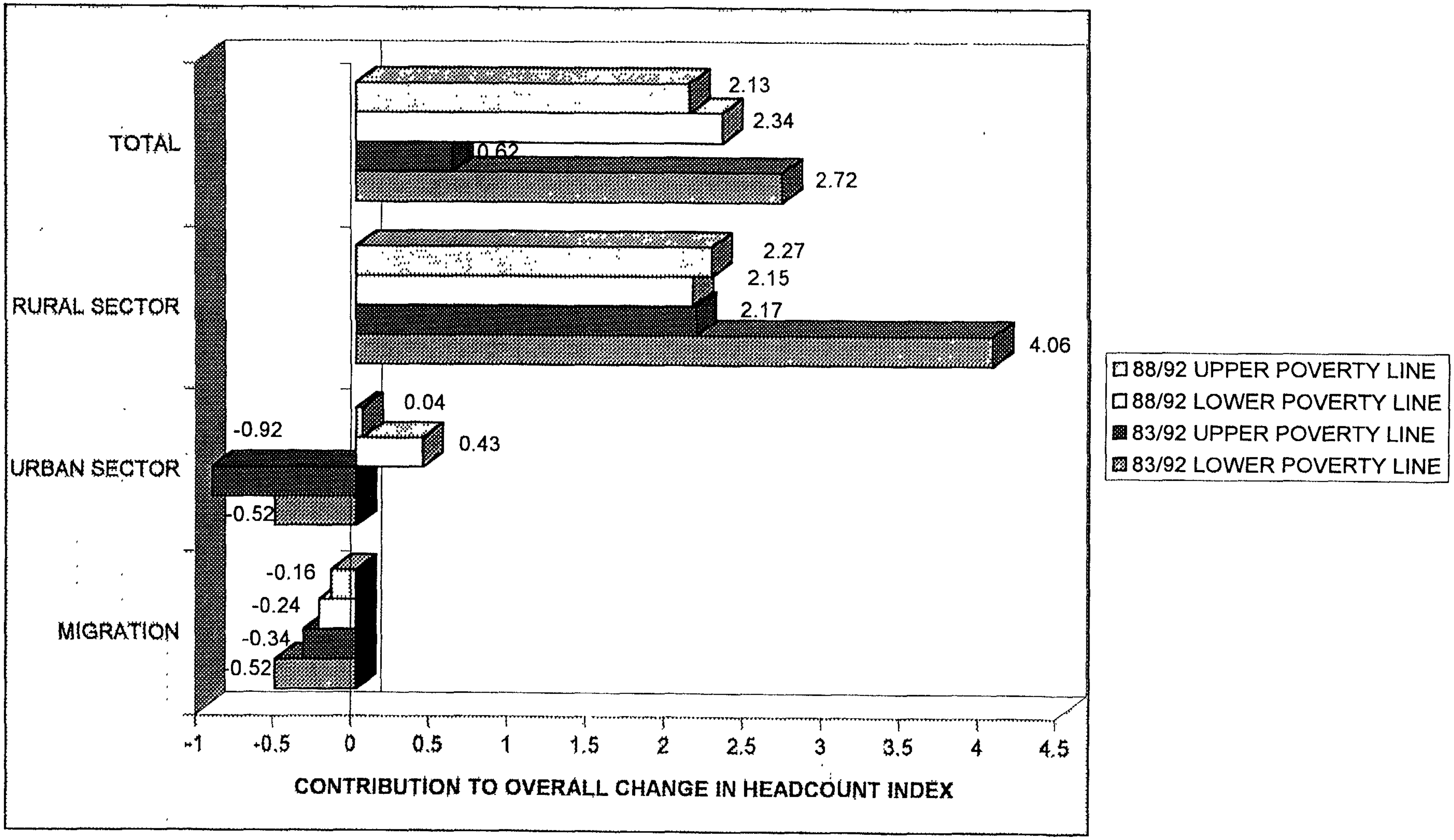


FIGURE 11

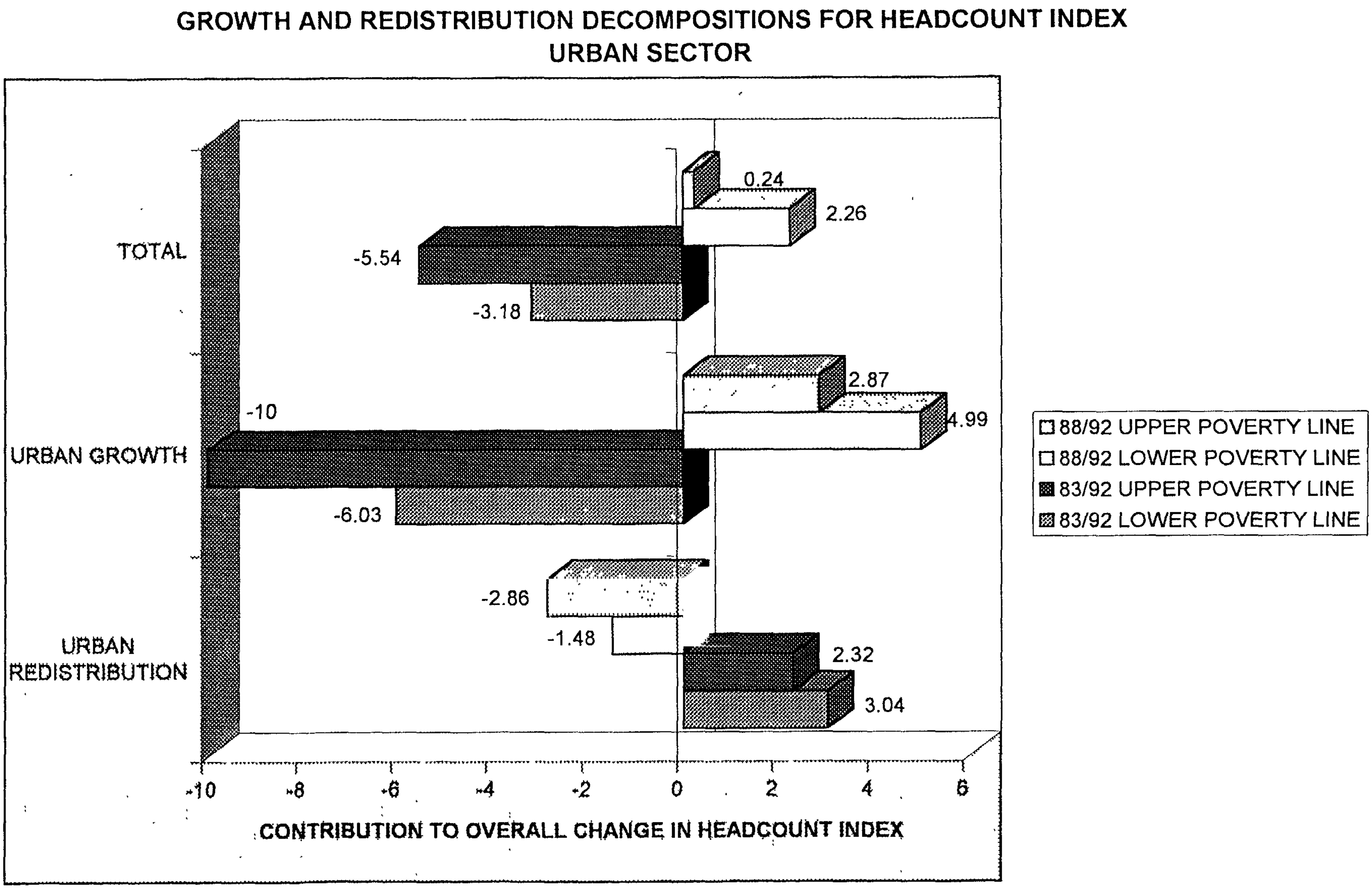

GROWTH AND REDISTRIBUTION DECOMPOSITIONS FOR HEADCOUNT INDEX
URBAN SECTOR
TOTAL
URBAN GROWTH
URBAN
REDISTRIBUTION
0.24
2.26
-5.54
-3.18
2.87
4.99
-10
-6.03
-2.86
-1.48
2.32
3.04
-10
-8
-6
-4
-2
0
2
4
6
CONTRIBUTION TO OVERALL CHANGE IN HEADCOUNT INDEX
88/92 UPPER POVERTY LINE
88/92 LOWER POVERTY LINE
83/92 UPPER POVERTY LINE
83/92 LOWER POVERTY LINE

FIGURE 12

GROWTH AND REDISTRIBUTION DECOMPOSITIONS FOR HEADCOUNT INDEX
RURAL SECTOR

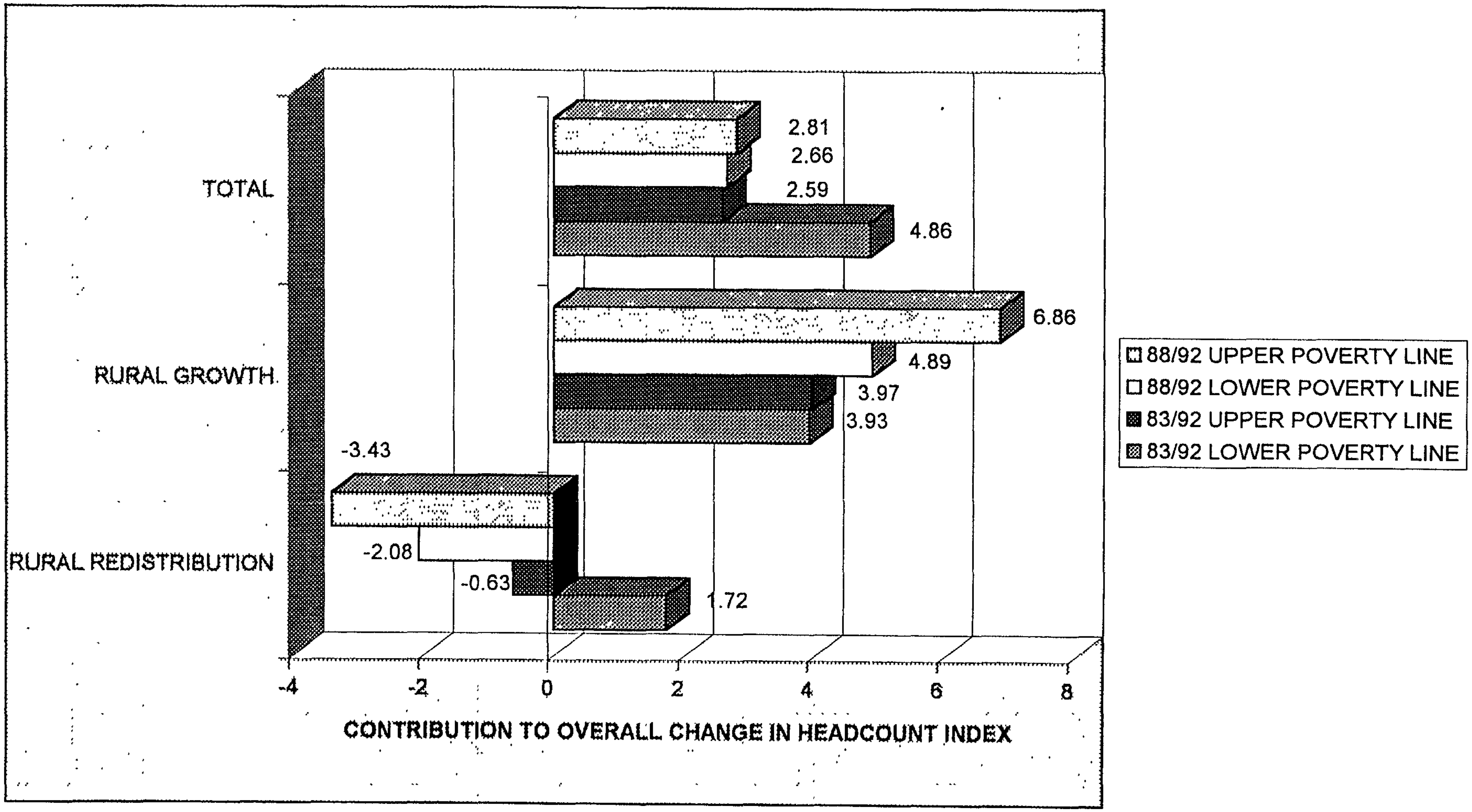


FIGURE 13

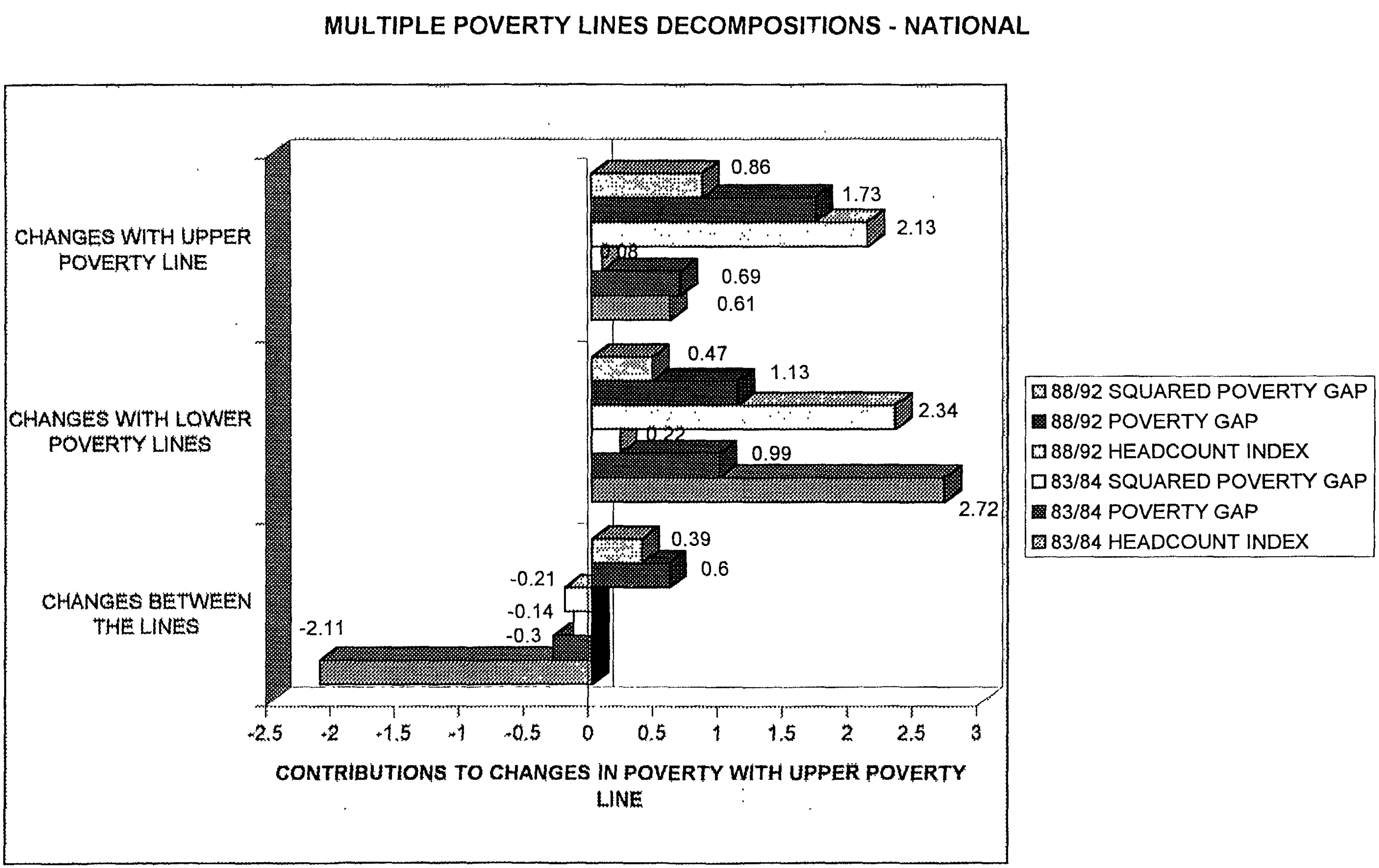

MULTIPLE POVERTY LINES DECOMPOSITIONS - NATIONAL
CHANGES WITH UPPER POVERTY LINE
CHANGES WITH LOWER POVERTY LINES
CHANGES BETWEEN THE LINES
0.86
1.73
2.13
0.08
0.69
0.61
0.47
1.13
2.34
0.22
0.99
2.72
0.39
0.6
-0.21
-0.14
-0.3
-2.11
-2.5
-2
-1.5
-1
-0.5
0
0.5
1
1.5
2
2.5
3
CONTRIBUTIONS TO CHANGES IN POVERTY WITH UPPER POVERTY LINE
88/92 SQUARED POVERTY GAP
88/92 POVERTY GAP
88/92 HEADCOUNT INDEX
83/84 SQUARED POVERTY GAP
83/84 POVERTY GAP
83/84 HEADCOUNT INDEX

FIGURE 14

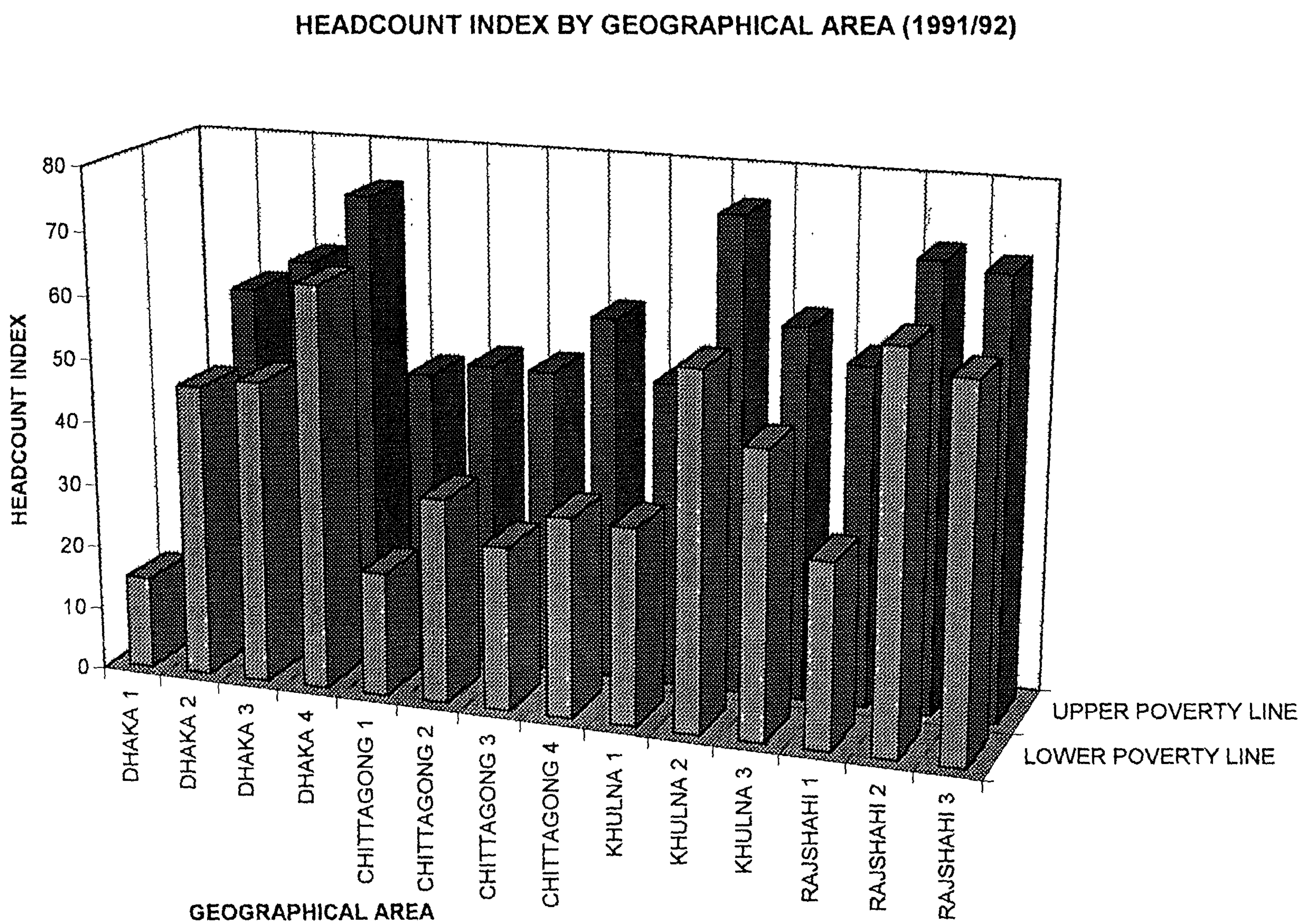

HEADCOUNT INDEX BY GEOGRAPHICAL AREA (1991/92)
HEADCOUNT INDEX
80
70
60
50
40
30
20
10
0
DHAKA 1
DHAKA 2
DHAKA 3
DHAKA 4
CHITTAGONG 1
CHITTAGONG 2
CHITTAGONG 3
CHITTAGONG 4
KHULNA 1
KHULNA 2
KHULNA 3
RAJSHAHI 1
RAJSHAHI 2
RAJSHAHI 3
GEOGRAPHICAL AREA
UPPER POVERTY LINE
LOWER POVERTY LINE

FIGURE 15

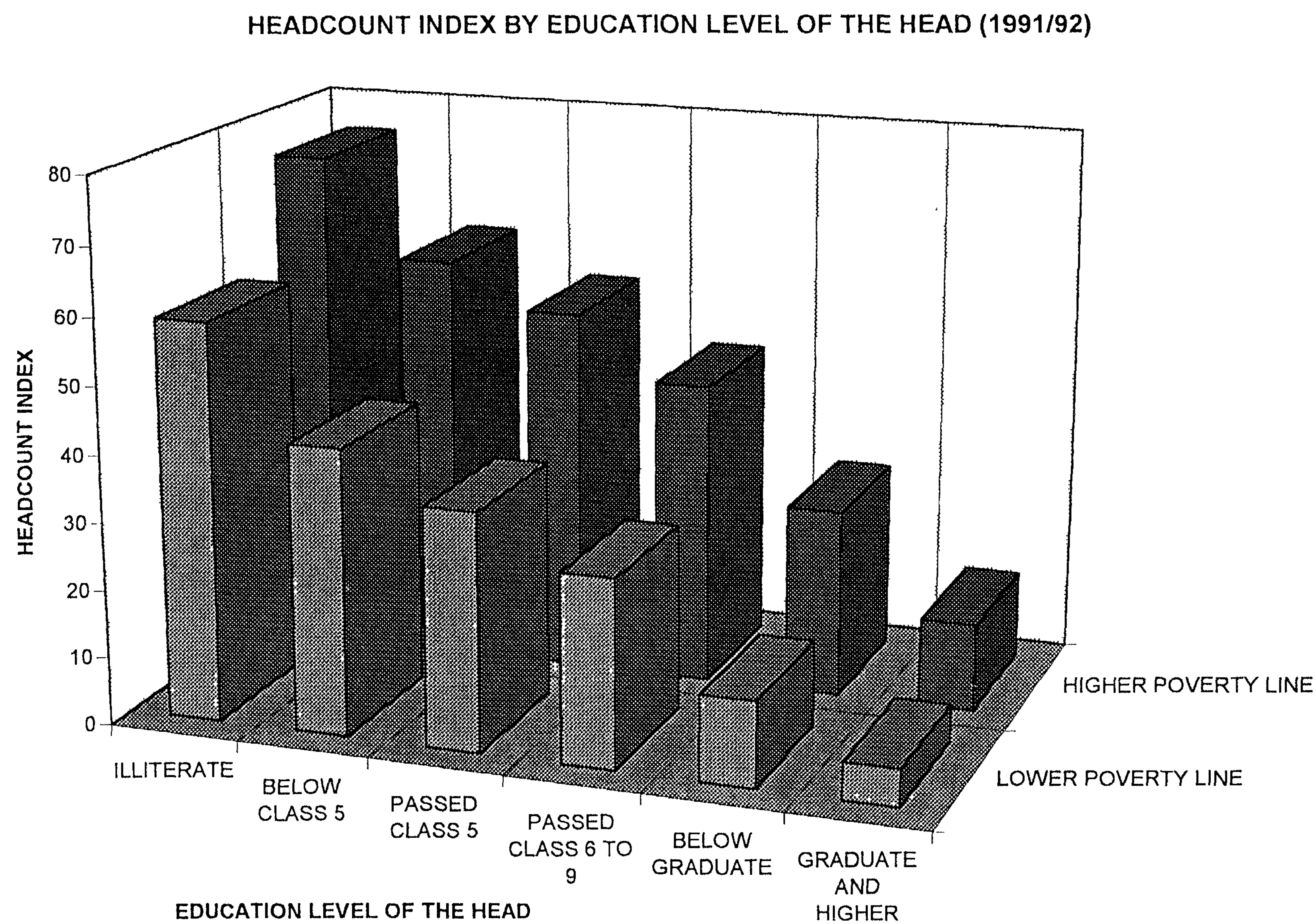

HEADCOUNT INDEX BY EDUCATION LEVEL OF THE HEAD (1991/92)
80
70
60
50
40
30
20
10
0
HEADCOUNT INDEX
ILLITERATE
BELOW CLASS 5
PASSED CLASS 5
PASSED CLASS 6 TO 9
BELOW GRADUATE
GRADUATE AND HIGHER
EDUCATION LEVEL OF THE HEAD
HIGHER POVERTY LINE
LOWER POVERTY LINE

FIGURE 16

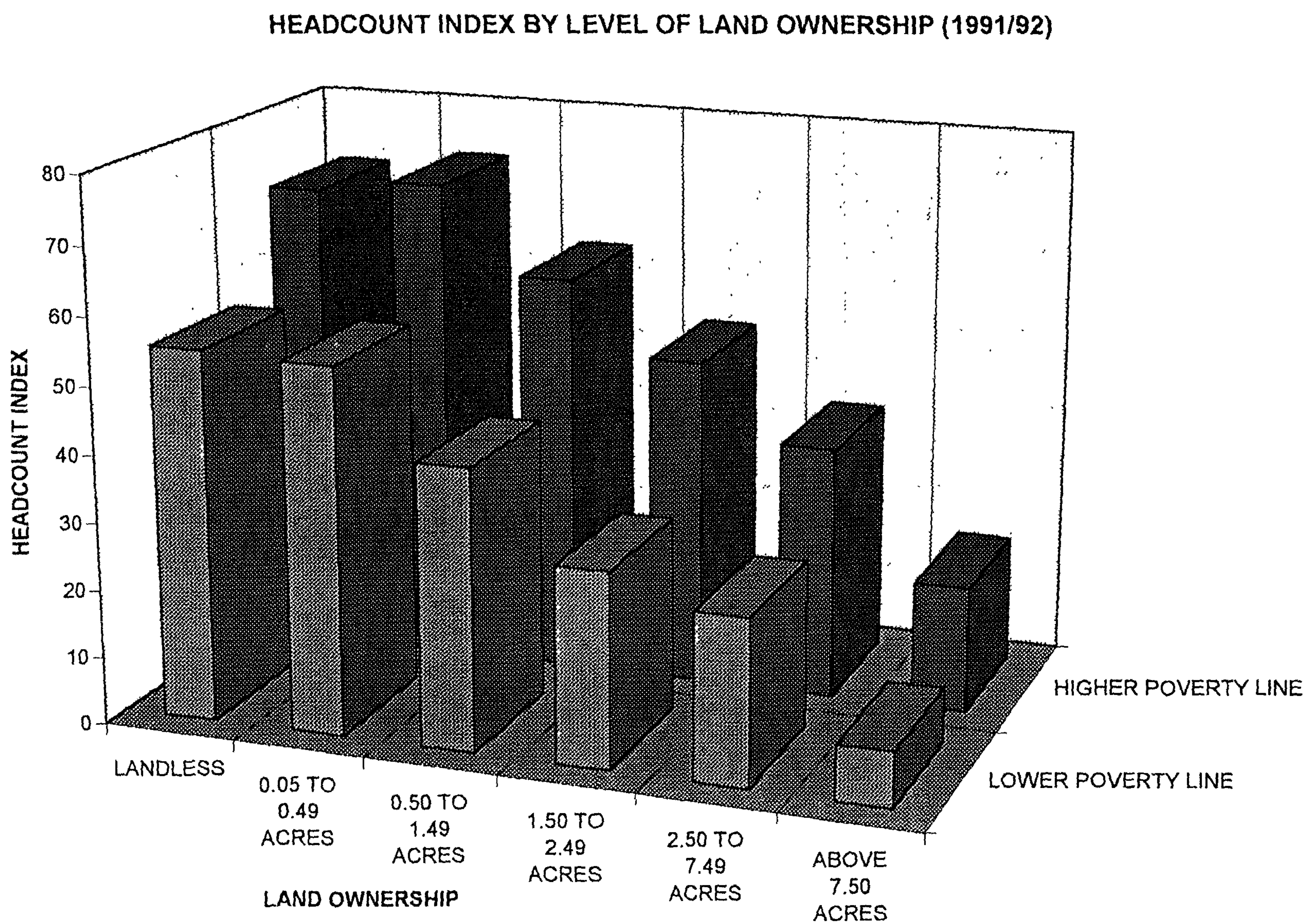

HEADCOUNT INDEX BY LEVEL OF LAND OWNERSHIP (1991/92)
HEADCOUNT INDEX
80
70
60
50
40
30
20
10
0
LANDLESS
0.05 TO 0.49 ACRES
0.50 TO 1.49 ACRES
1.50 TO 2.49 ACRES
2.50 TO 7.49 ACRES
ABOVE 7.50 ACRES
LAND OWNERSHIP
HIGHER POVERTY LINE
LOWER POVERTY LINE

FIGURE 17

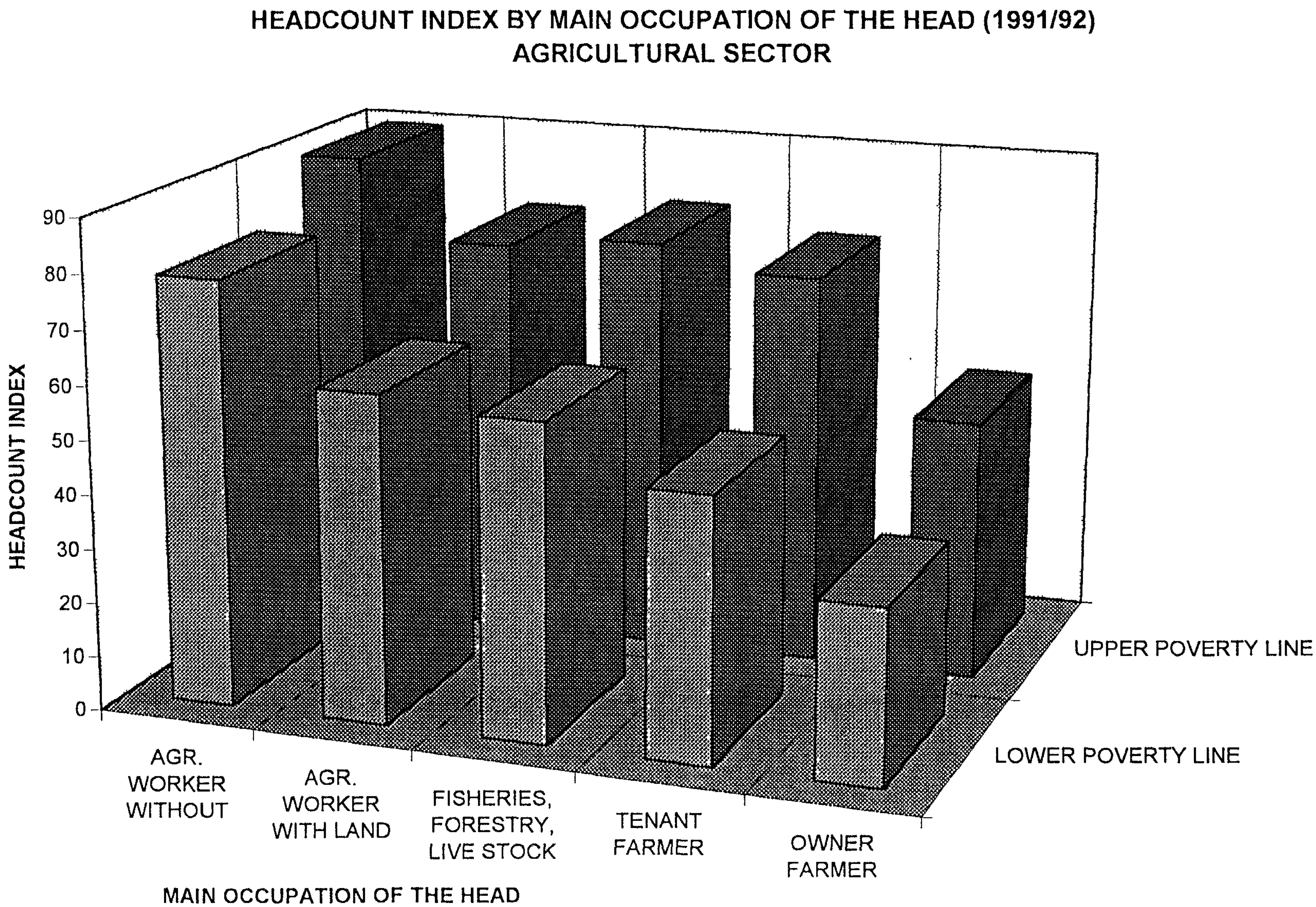

HEADCOUNT INDEX BY MAIN OCCUPATION OF THE HEAD (1991/92)
AGRICULTURAL SECTOR
HEADCOUNT INDEX
90
80
70
60
50
40
30
20
10
0
AGR. WORKER WITHOUT
AGR. WORKER WITH LAND
FISHERIES, FORESTRY, LIVE STOCK
TENANT FARMER
OWNER FARMER
MAIN OCCUPATION OF THE HEAD
UPPER POVERTY LINE
LOWER POVERTY LINE

FIGURE 18

HEADCOUNT INDEX BY MAIN OCCUPATION OF THE HEAD (1991/92) NON AGRICULTURAL SECTOR

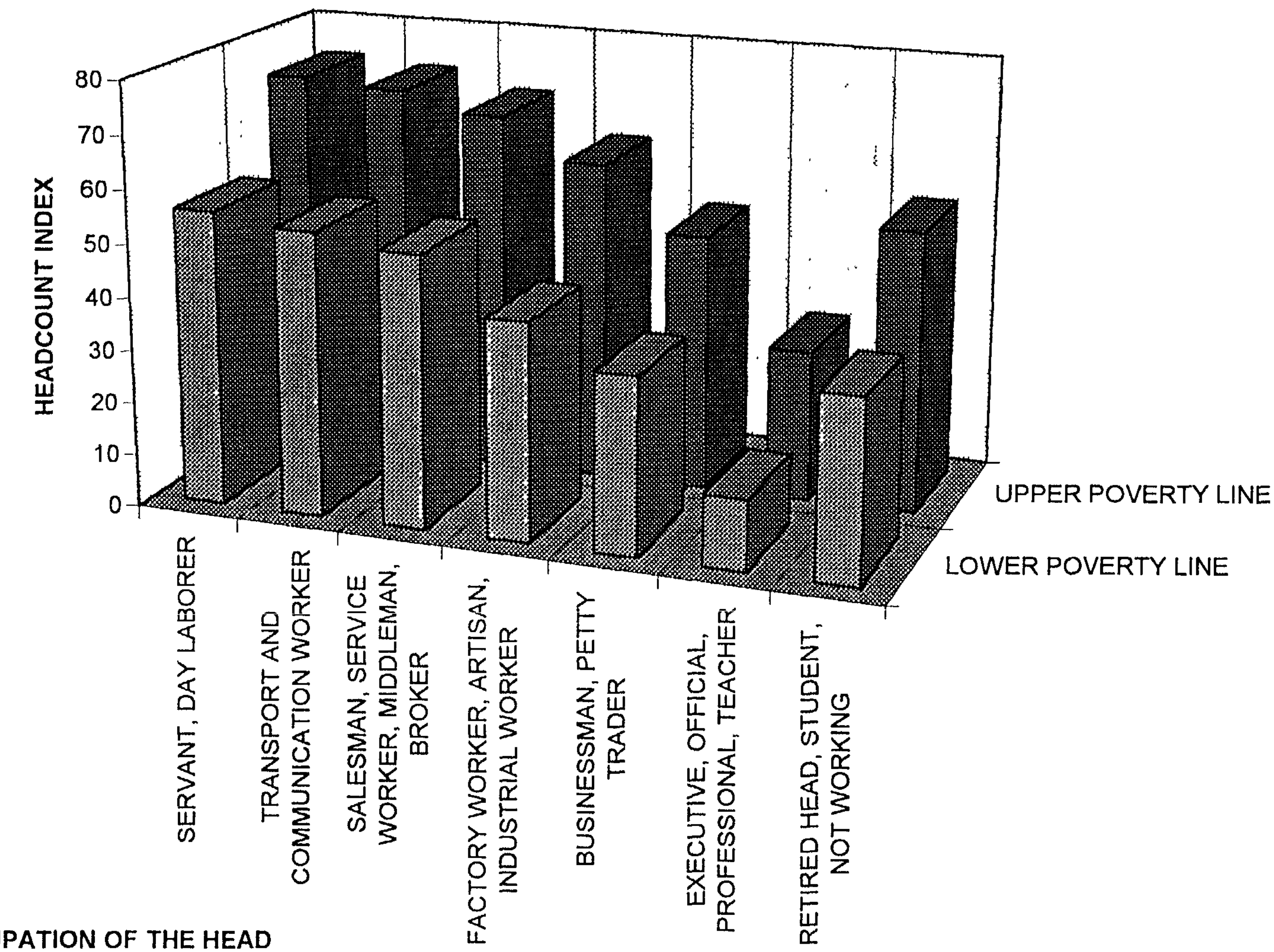


FIGURE 19

POPULATION SHARES BY LAND OWNERSHIP (1991/92)

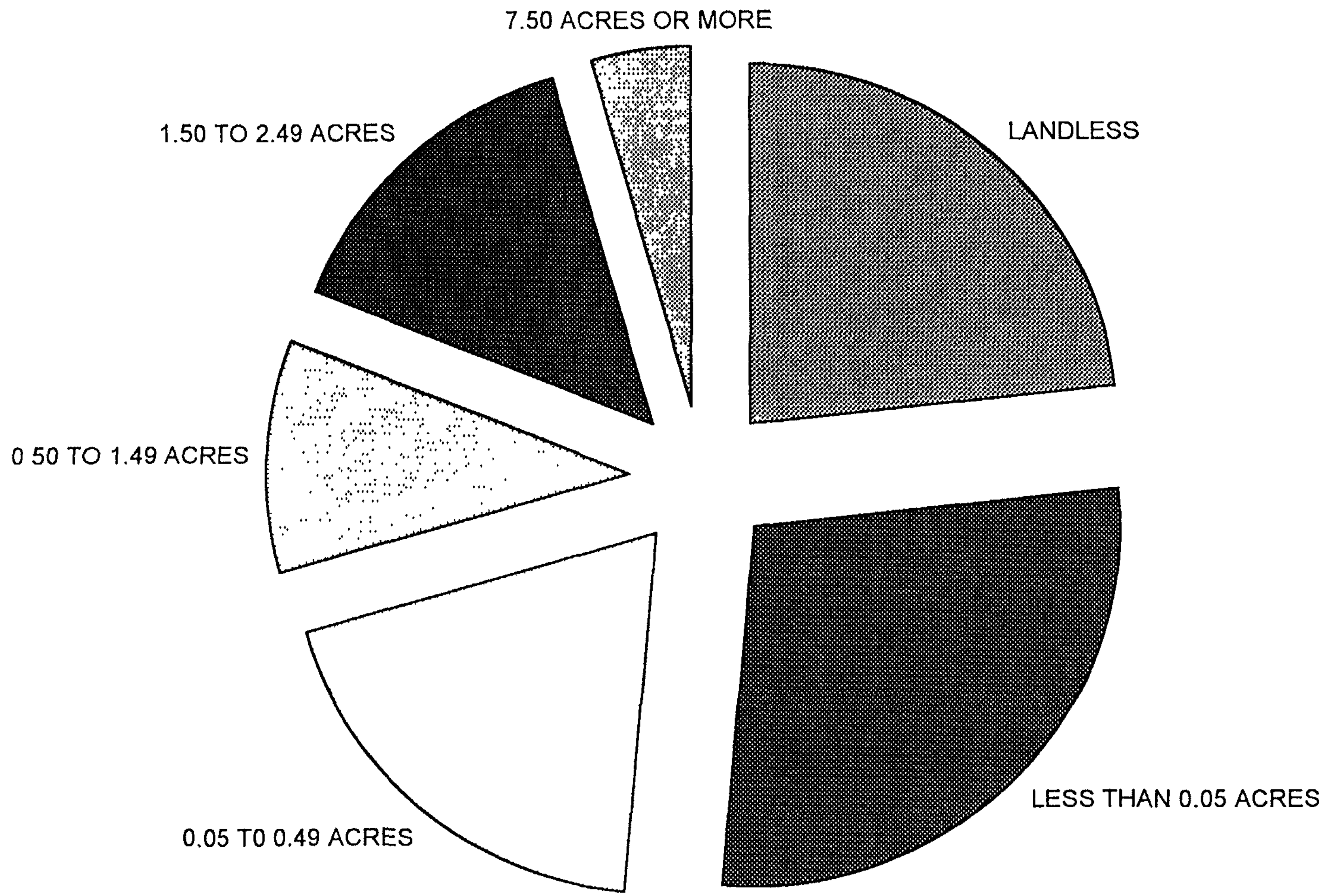


FIGURE 20

HEADCOUNT SHARES BY LAND OWNERSHIP (1991/92, LOWER POV. LINE)

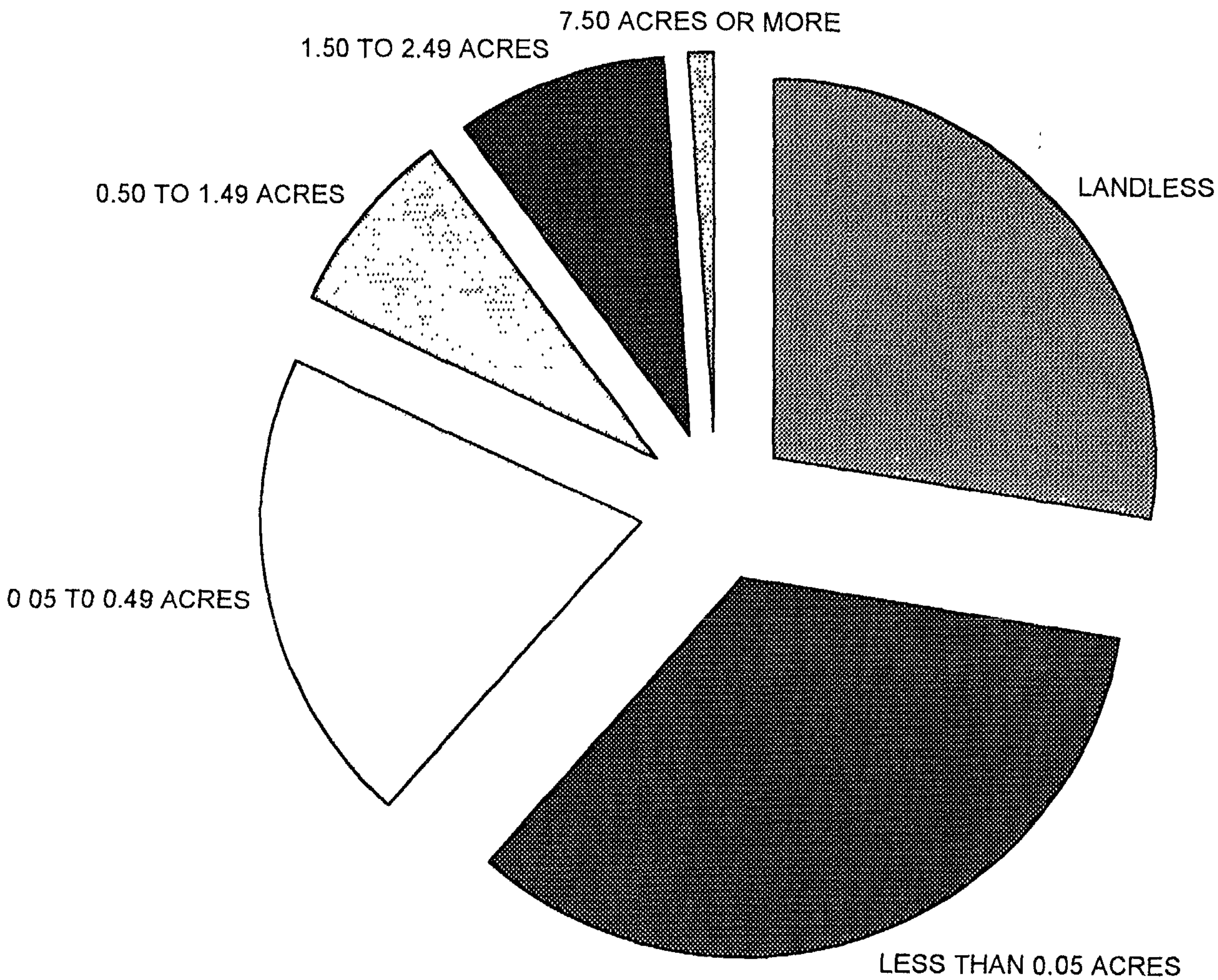


FIGURE 21

POPULATION SHARES BY EDUCATION AND SECTOR (1991/92)

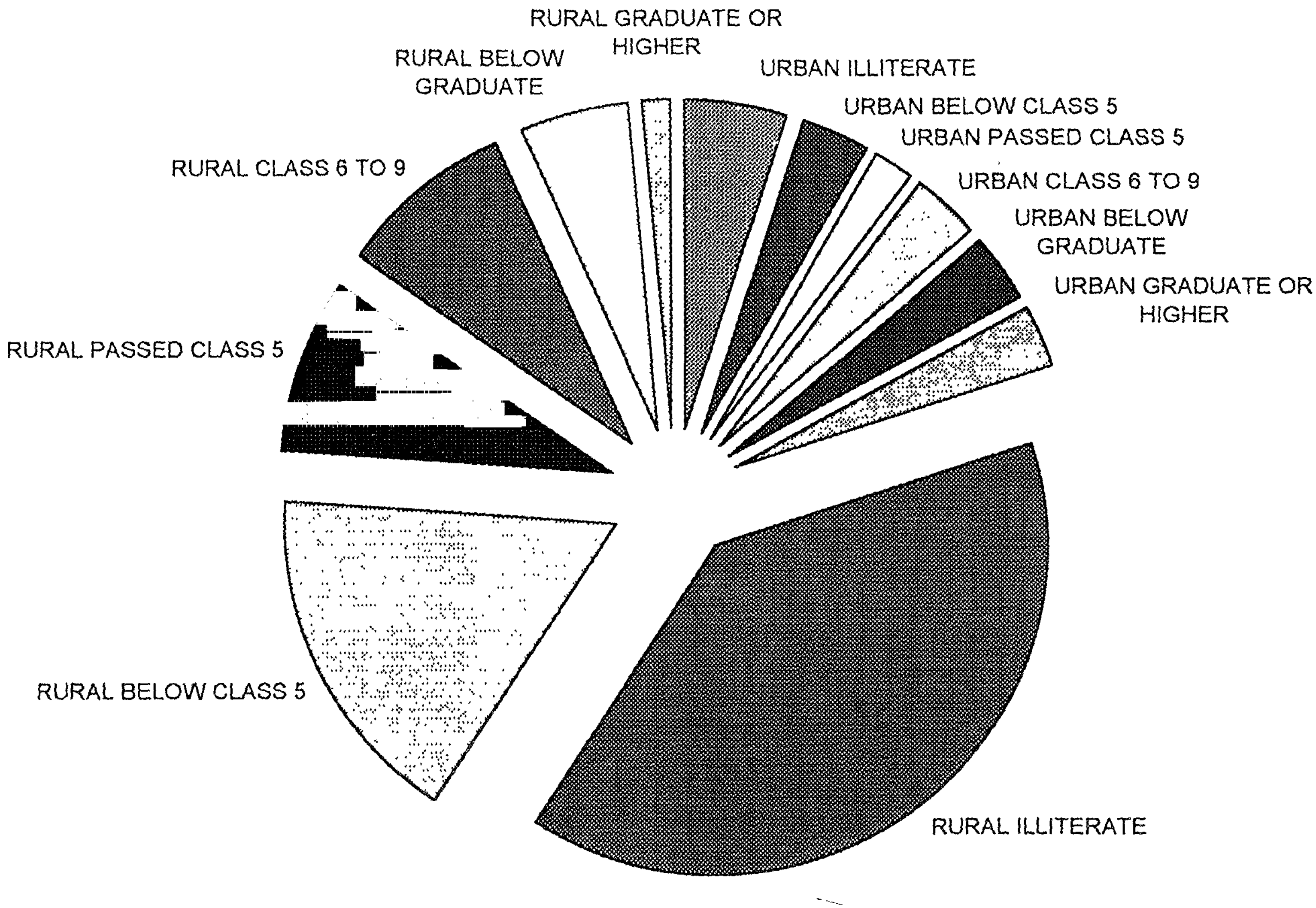


FIGURE 22

HEADCOUNT SHARES BY EDUCATION AND SECTOR (1991/92, LOWER POV. LINE)

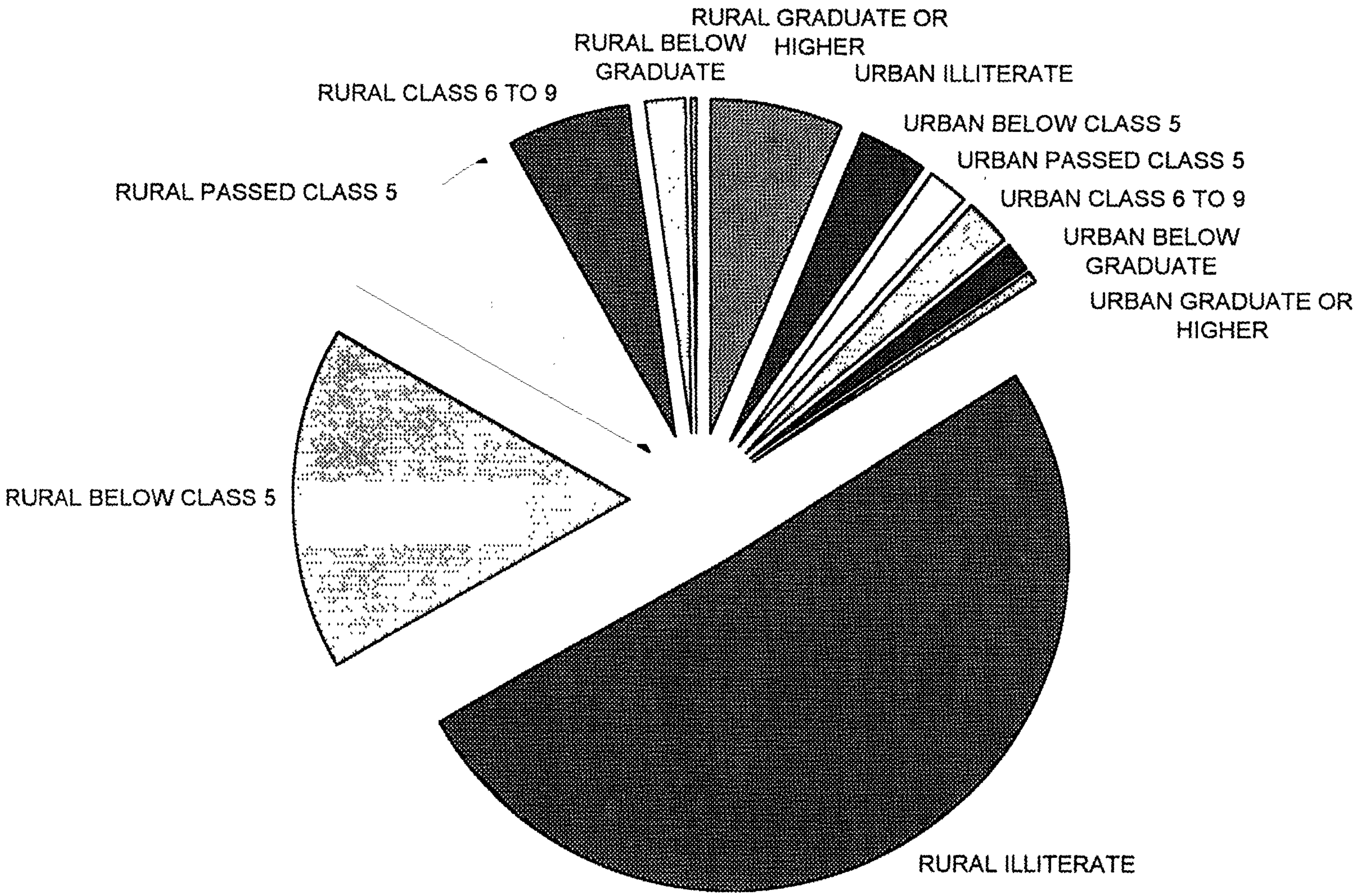


FIGURE 23

POPULATION SHARES BY OCCUPATION (1991/92)

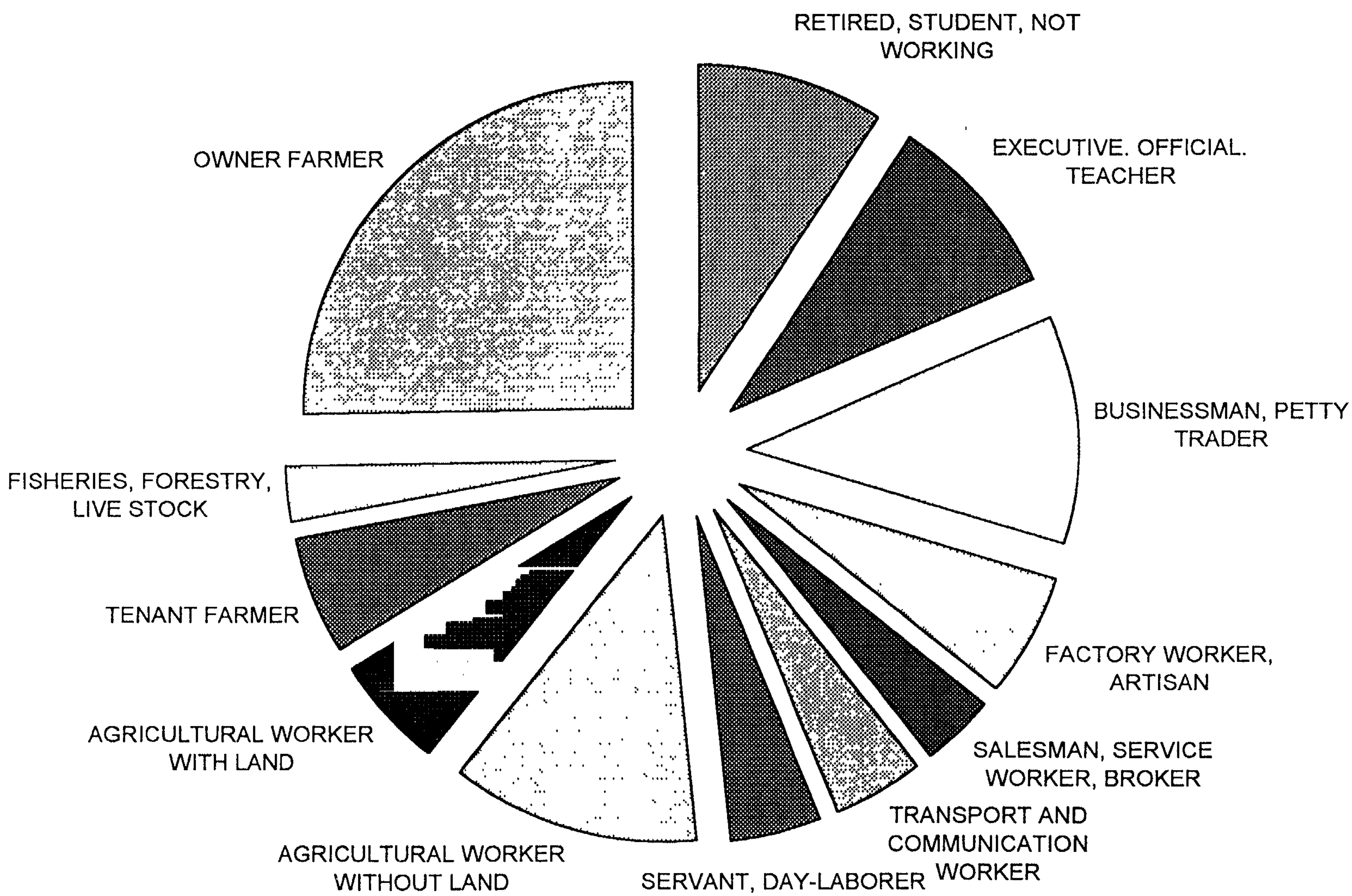
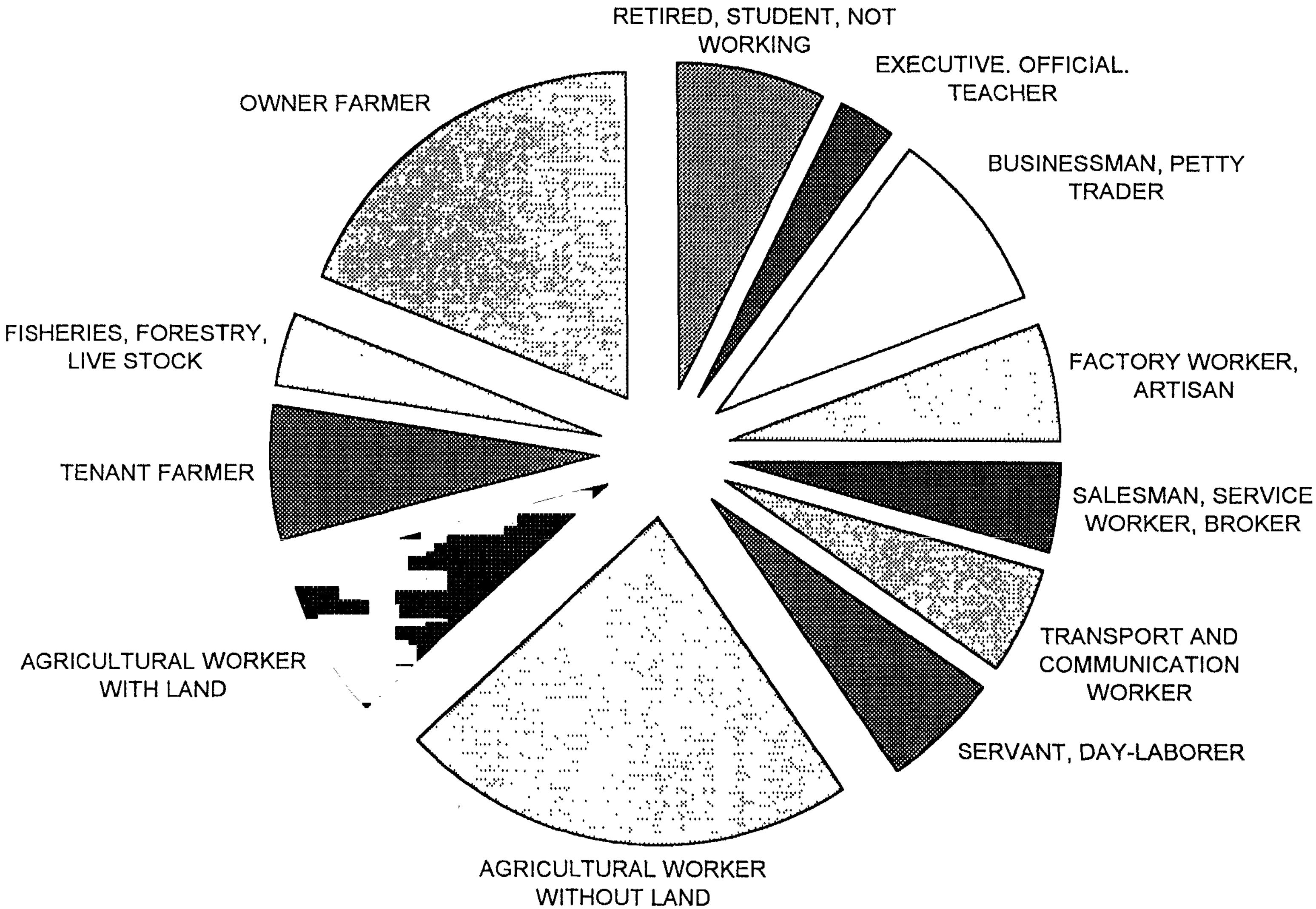
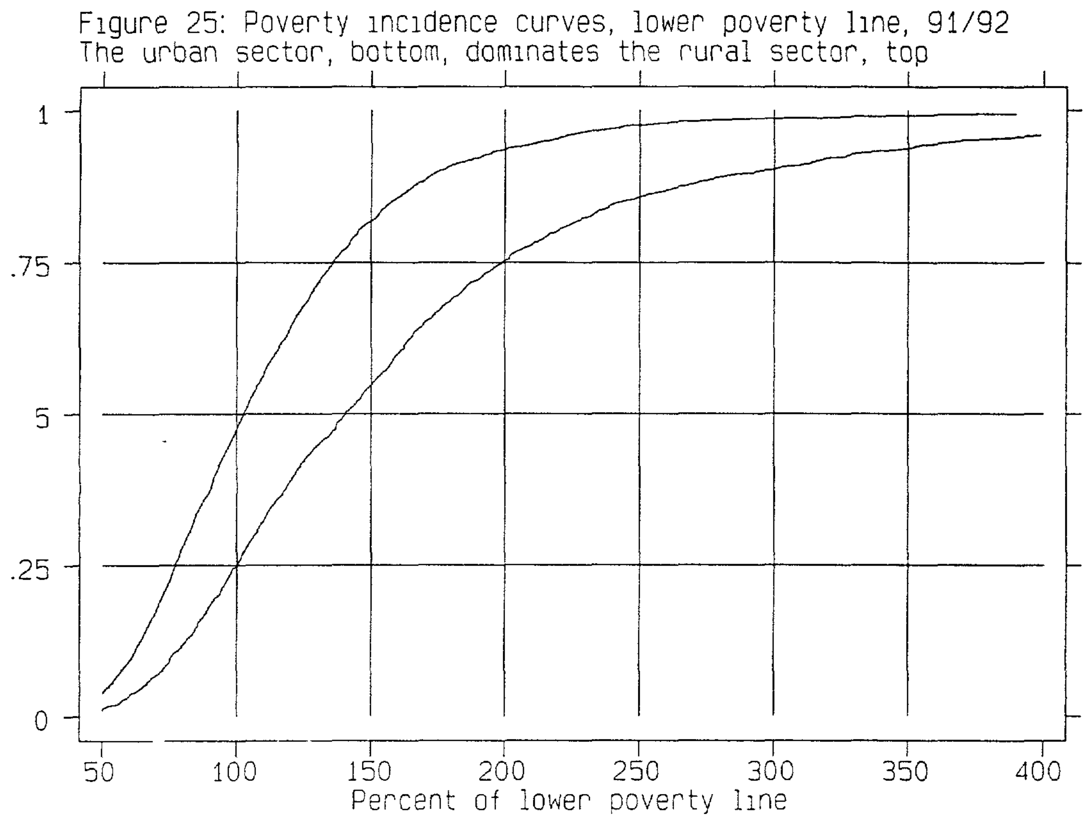


FIGURE 24

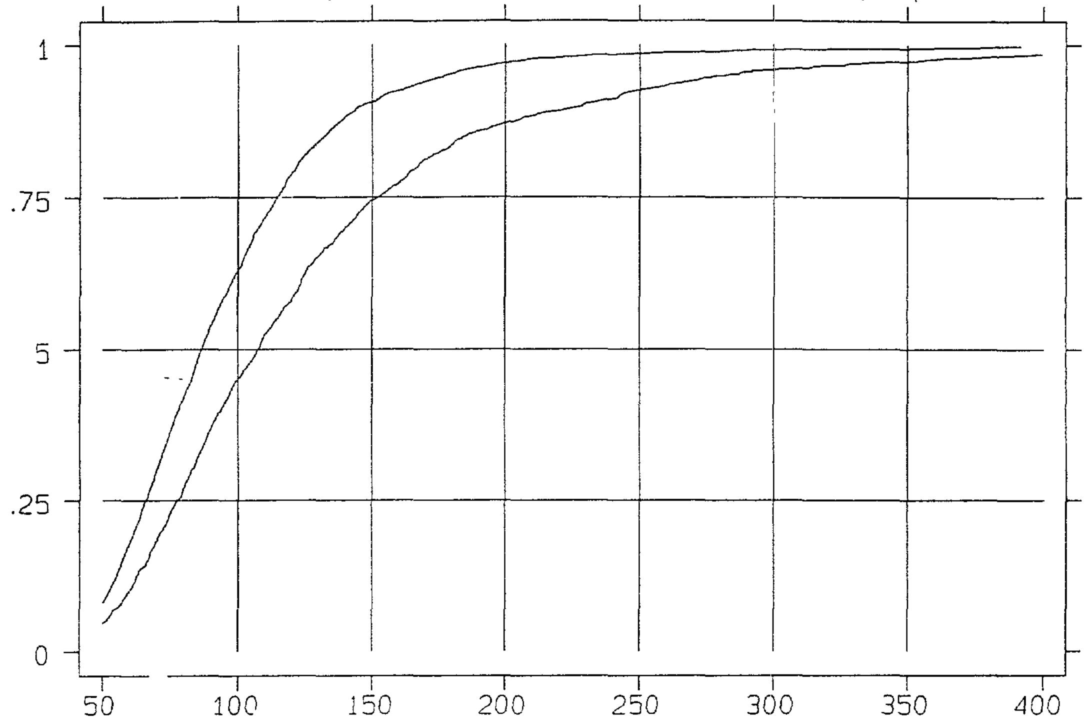
HEADCOUNT SHARES BY OCCUPATION (1991/92, LOWER POV. LINE)





Dominance Analysis: Comparing Sectors

Figure 26: Poverty incidence curves, upper poverty line, 91/92
The urban sector, bottom, dominates the rural sector, top



Dominance Analysis. Comparing Sectors

Figure 27: Poverty incidence curves, lower poverty line, 91/92
Each higher education group dominates the lower ones

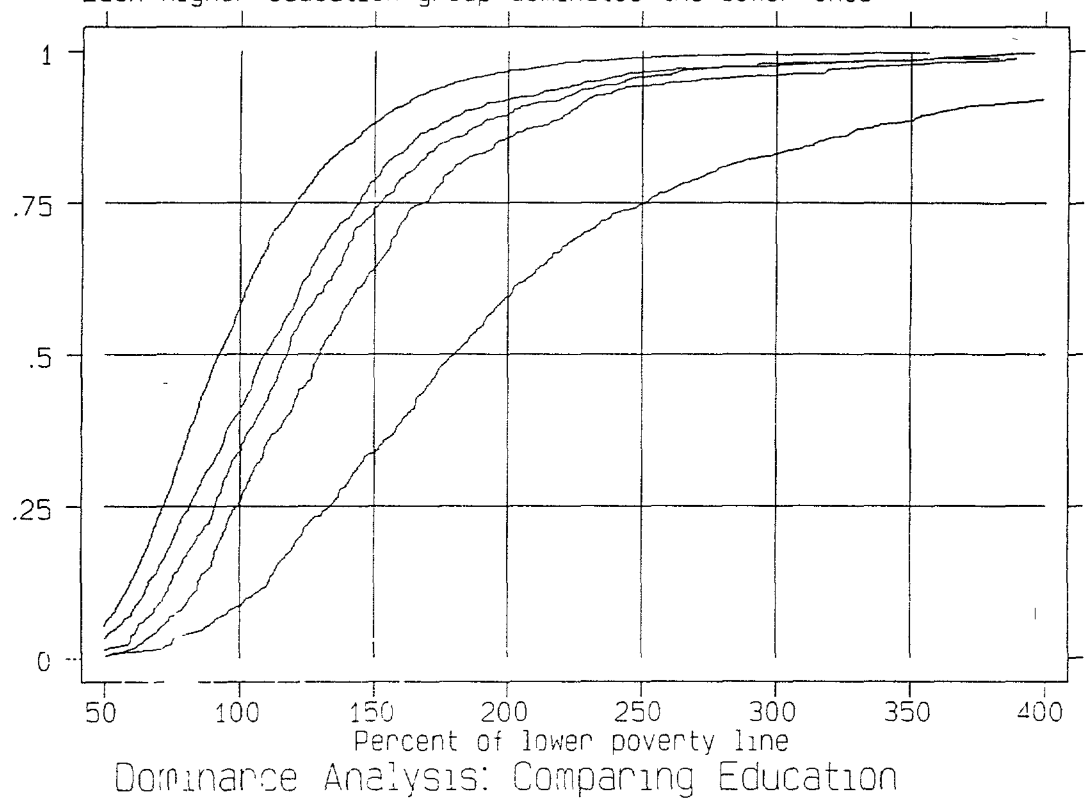
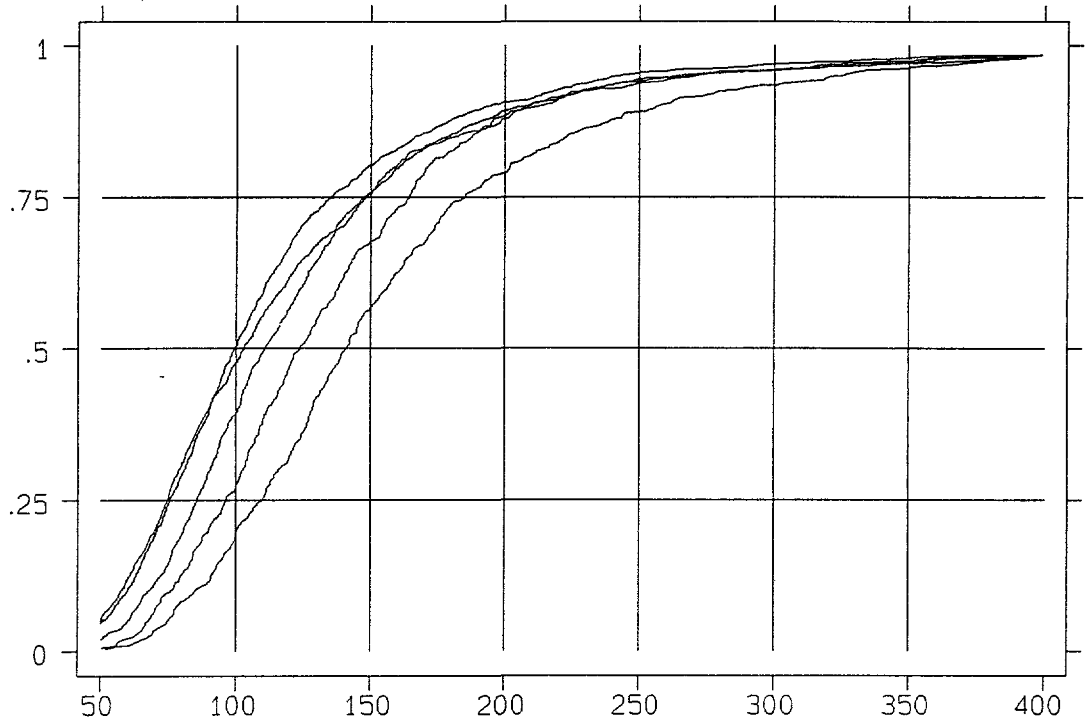


Figure 28: Poverty incidence curves, lower poverty line, 91/92
Groups with little land do not dominate each other



Dominance Analysis: Comparing Land Ownership

Stata™

FIGURE 29

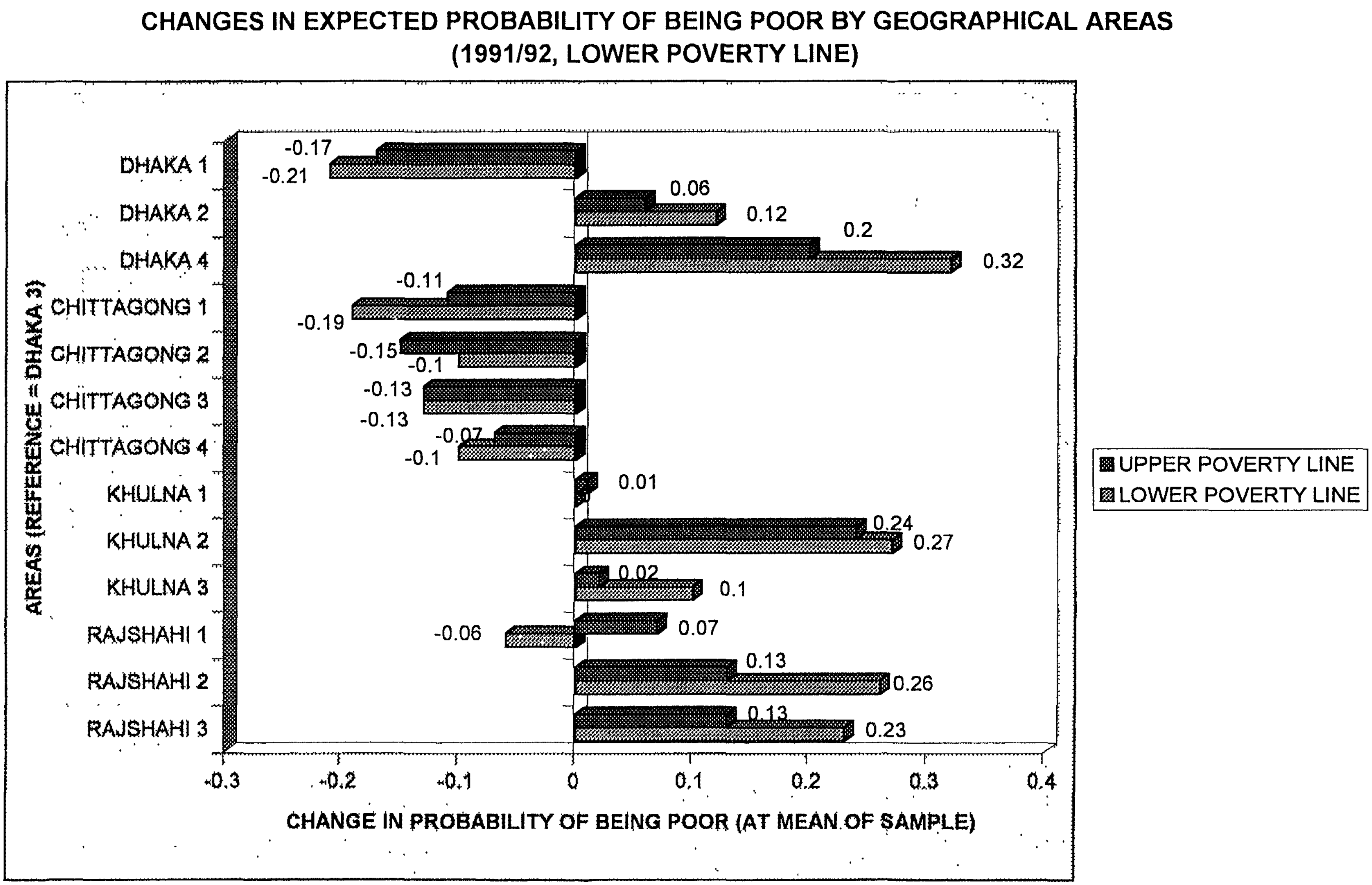
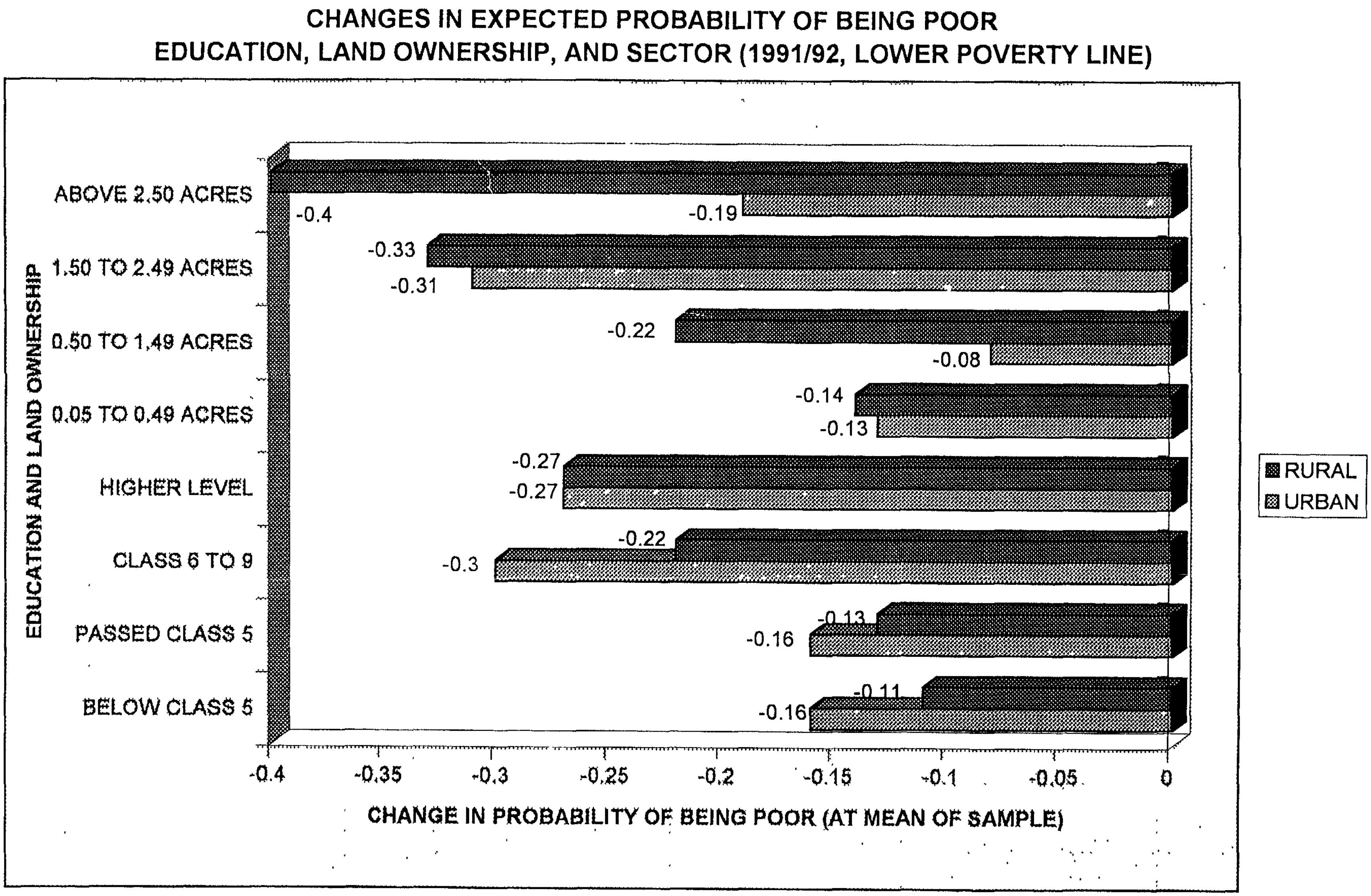
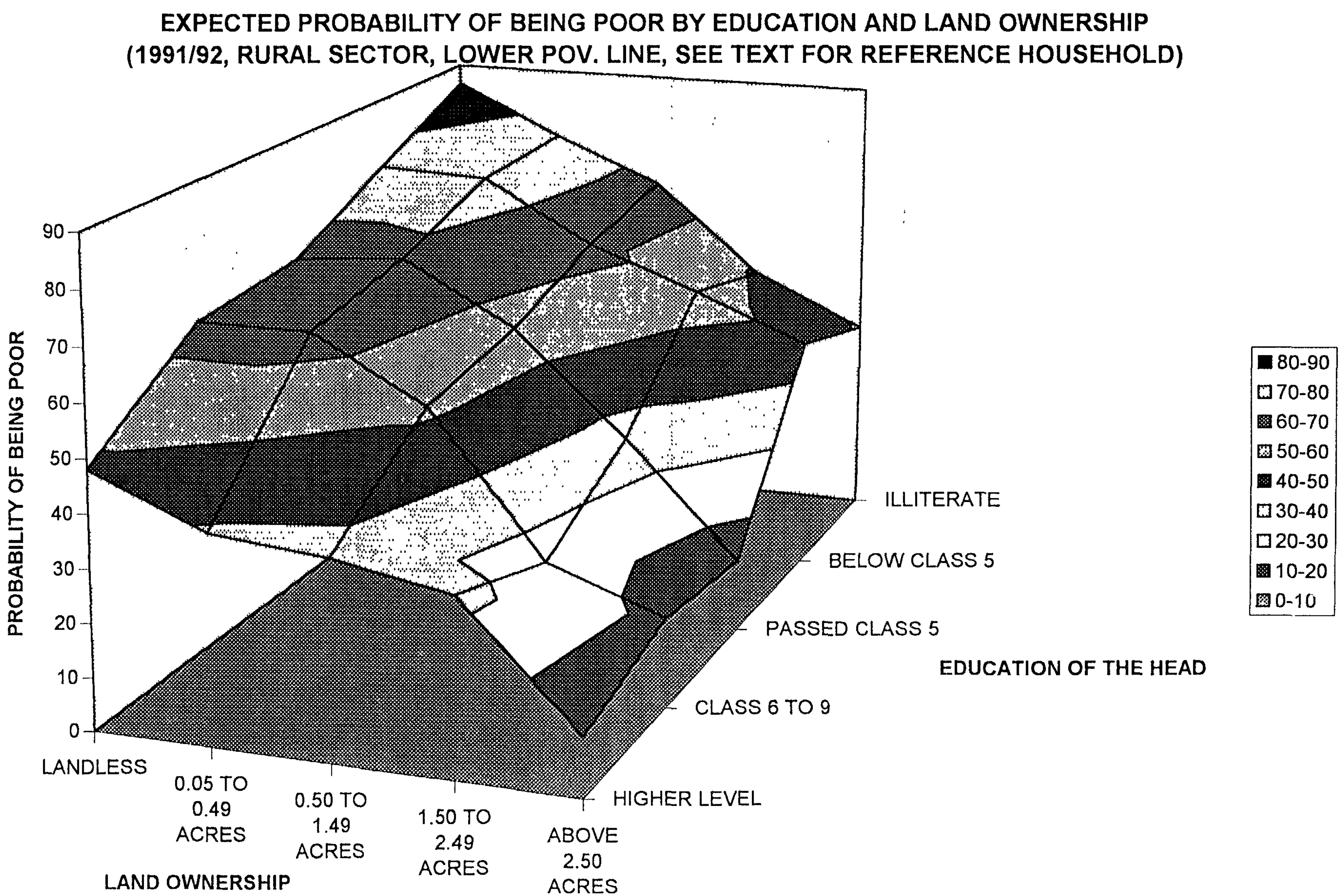

CHANGES IN EXPECTED PROBABILITY OF BEING POOR BY GEOGRAPHICAL AREAS
(1991/92, LOWER POVERTY LINE)
DHAKA 1
-0.17
-0.21
DHAKA 2
0.06
0.12
DHAKA 4
0.2
0.32
CHITTAGONG 1
-0.11
-0.19
CHITTAGONG 2
-0.15
-0.1
CHITTAGONG 3
-0.13
-0.13
CHITTAGONG 4
-0.07
-0.1
KHULNA 1
0.01
KHULNA 2
0.24
0.27
KHULNA 3
0.02
0.1
RAJSHAHI 1
-0.06
0.07
RAJSHAHI 2
0.13
0.26
RAJSHAHI 3
0.13
0.23
AREAS (REFERENCE = DHAKA 3)
-0.3
-0.2
-0.1
0
0.1
0.2
0.3
0.4
CHANGE IN PROBABILITY OF BEING POOR (AT MEAN OF SAMPLE)
UPPER POVERTY LINE
LOWER POVERTY LINE

FIGURE 30



CHANGES IN EXPECTED PROBABILITY OF BEING POOR
EDUCATION, LAND OWNERSHIP, AND SECTOR (1991/92, LOWER POVERTY LINE)
EDUCATION AND LAND OWNERSHIP
ABOVE 2.50 ACRES
1.50 TO 2.49 ACRES
0.50 TO 1.49 ACRES
0.05 TO 0.49 ACRES
HIGHER LEVEL
CLASS 6 TO 9
PASSED CLASS 5
BELOW CLASS 5
-0.4
-0.19
-0.33
-0.31
-0.22
-0.08
-0.14
-0.13
-0.27
-0.27
-0.22
-0.3
-0.13
-0.16
-0.11
-0.16
-0.4
-0.35
-0.3
-0.25
-0.2
-0.15
-0.1
-0.05
0
CHANGE IN PROBABILITY OF BEING POOR (AT MEAN OF SAMPLE)
RURAL
URBAN

FIGURE 31



EXPECTED PROBABILITY OF BEING POOR BY EDUCATION AND LAND OWNERSHIP
(1991/92, RURAL SECTOR, LOWER POV. LINE, SEE TEXT FOR REFERENCE HOUSEHOLD)
PROBABILITY OF BEING POOR
90
80
70
60
50
40
30
20
10
0
LANDLESS
0.05 TO 0.49 ACRES
0.50 TO 1.49 ACRES
1.50 TO 2.49 ACRES
ABOVE 2.50 ACRES
LAND OWNERSHIP
ILLITERATE
BELOW CLASS 5
PASSED CLASS 5
CLASS 6 TO 9
HIGHER LEVEL
EDUCATION OF THE HEAD
80-90
70-80
60-70
50-60
40-50
30-40
20-30
10-20
0-10

Figure A.1. Poverty lines and headcount indices for the Dhaka SMA

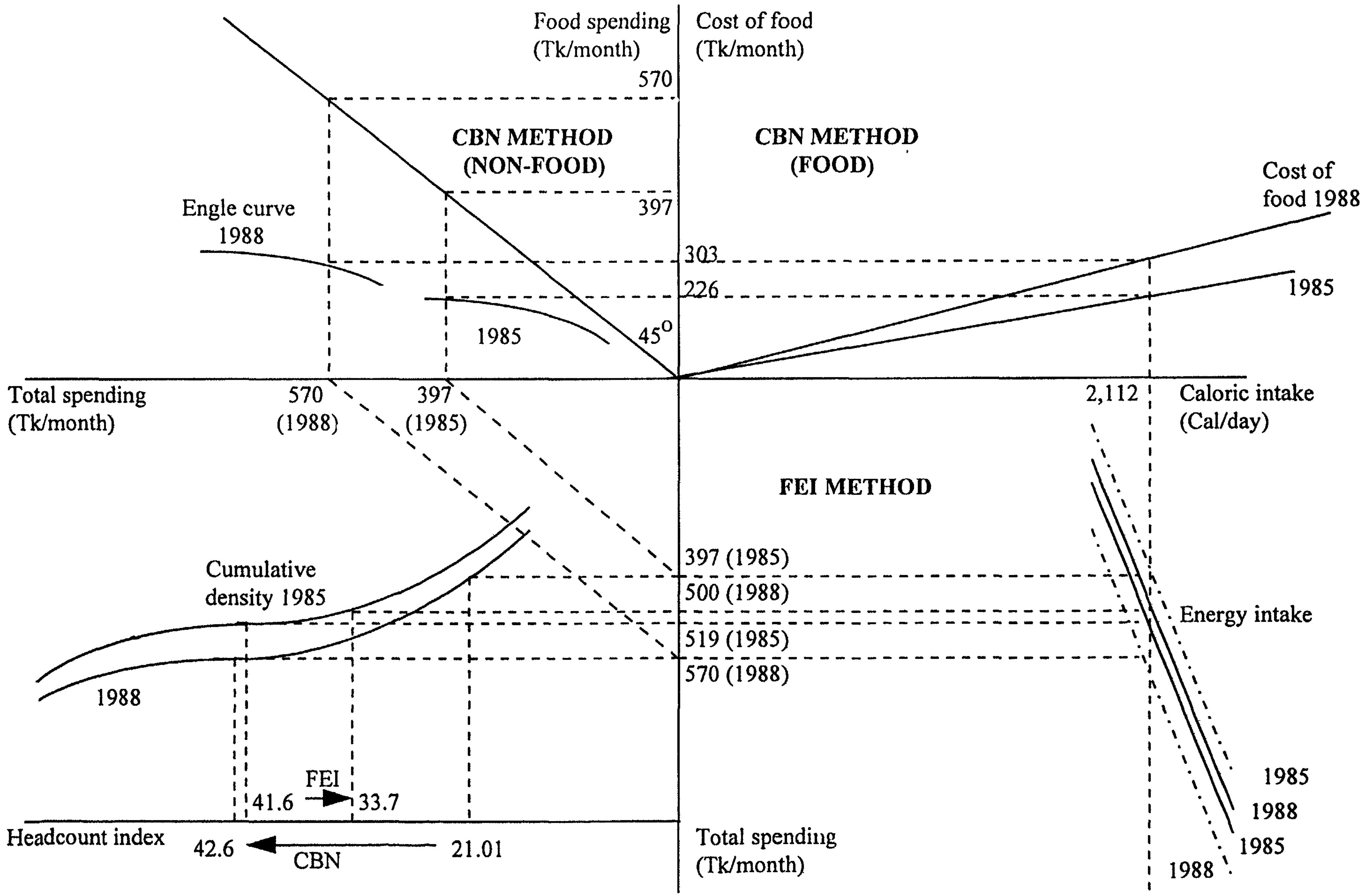
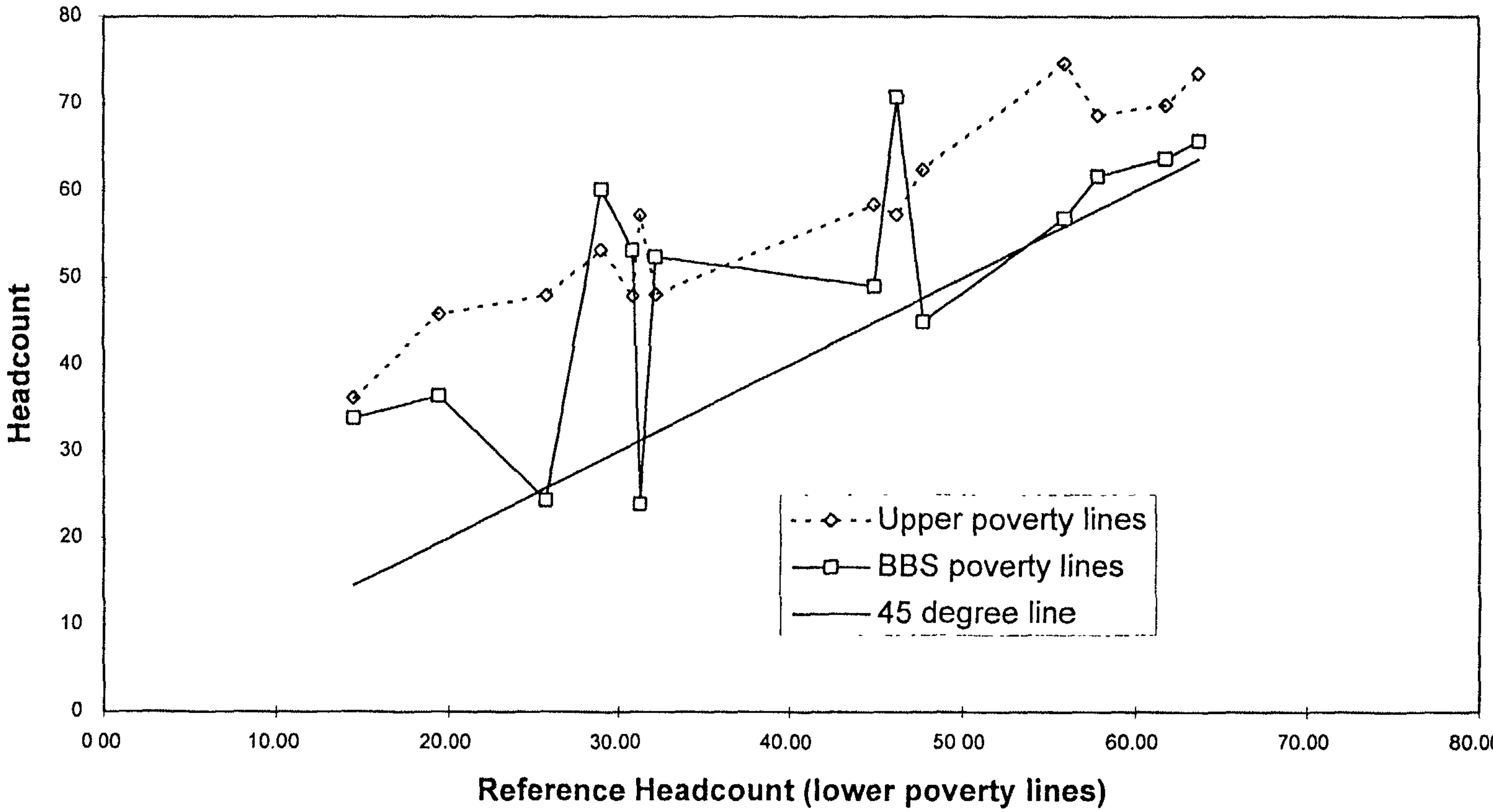


Figure A.2. Gap-narrowing and reranking effects



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