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ARE WOMEN OVERREPRESENTED AMONG THE POOR? AN ANALYSIS OF POVERTY IN TEN DEVELOPING COUNTRIES

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ABSTRACT

This paper presents new evidence on the proportion of women in poverty in ten developing countries. It compares poverty measures for males and females and male- and female-headed households, and investigates the sensitivity of these measures to the use of per-capita and per-adult equivalent units and different definitions of the poverty line. While poverty measures are higher for female-headed households and for females, the differences are significant in only a fifth to a third of the datasets. Due to their low population share, the contribution of female-headed households to aggregate poverty is less than that of females. Stochastic dominance analysis reveals that differences between male- and female-headed households, and between males and females, are often insignificant, except for Ghana and Bangladesh, where females are consistently worse off. These results suggest that cultural and institutional factors may be responsible for higher poverty among women in these countries. Our results point to the need to analyze determinants of household income and consumption, using multivariate methods and to give greater attention to the processes underlying female headship.

CONTENTS

TABLES

FIGURE

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1. INTRODUCTION

It is frequently asserted that 70 percent of the world's poor are women (UNDP 1995; United Nations 1996). This distribution implies that, globally, there are 900 million poor females and 400 million poor males. Some consider this "excess" of 500 million poor females implausible (see Marcoux 1998). Surprisingly, robust evidence supporting this distributional assumption is scarce.[1] Much of the literature on gender and poverty is impressionistic and anecdotal, due in large part to the failure of many surveys to disaggregate and present information by gender (McGuire and Popkin 1990). Moreover, a focus on male- and female-headed households has perhaps distracted researchers and policymakers from a more general concern about the link between gender and poverty. As a result, two basic questions remain unaddressed. First, do women contribute disproportionately to overall poverty? Second, do female-headed households contribute disproportionately to overall poverty? A related question is implied by the answers to these two questions: does measuring poverty in male- and female-headed households serve as a good proxy for the poverty suffered by individuals within households?

This paper brings together a number of household surveys to address the above questions. We present new evidence on the association between gender and poverty, based on an empirical analysis of datasets from ten developing countries (six datasets from Sub-Saharan Africa, three from Asia, and one from Latin America). The paper computes income- and expenditure-based poverty measures and investigates their

[1] Visaria (1980a) and Visaria (1980b) are exceptions that we will discuss later.

sensitivity to the use of per-capita and per-adult equivalent units, and different specifications of the poverty line. It also tests for differences in poverty measures between individual males and females, and between households headed by males and females, using the Foster-Greer-Thorbecke poverty measures and stochastic dominance analysis.[2] Stochastic dominance analysis allows distributions to be compared with respect to poverty without having to specify a poverty line (Foster and Shorrocks 1988) or choose a specific poverty measure (Atkinson 1987). By conducting the comparison on two levels—individual and household—and using more robust measures of comparison, this paper provides more rigorous evidence on the gender dimensions of poverty. Section 2 summarizes the key literature on gender and poverty and highlights some of the outstanding measurement and conceptual issues. Section 3 discusses the poverty measures and the theory of stochastic dominance. Section 4 describes the data and presents empirical results. Section 5 presents conclusions and discusses their relevance for policy and research.

2. POVERTY AND GENDER: SOME MEASUREMENT ISSUES

We divide the empirical literature on gender and poverty in developing countries into subsections corresponding to our two main areas of investigation: (1) comparisons of

[2] On the use of dominance conditions in ranking distributions in terms of measures of poverty, see Atkinson (1987) and Foster and Shorrocks (1988). A good exposition is given in Ravallion (1992; 1994). We use the stochastic dominance software in Howes (1995).

male and female poverty and (2) comparisons of the poverty of male- and female-headed households.

There are very few empirical comparisons of male and female poverty using survey data. One of the earliest analyses of the association between women and poverty was conducted by Visaria (1980a, 1980b), using data from the two Indian states of Gujarat and Maharashtra, Nepal, Peninsular Malaysia, Sri Lanka, and Taiwan. Tables show the percentage of females in households that are ranked by deciles using a variety of income measures. Visaria (1980a, 202) concludes about women that "In terms of their living standards measured in per capita terms, however, they do not seem to be heavily overrepresented among the poor." A study in Ghana (Haddad 1991) calculated poverty indices for groups of individuals classified according to whether they were in households containing more, the same number, or fewer adult males than adult females. While the poverty share of each group was close to their representation in the sample, the largest discrepancies occurred for individuals from households with more adult females than males. While these households accounted for 39 percent of the sample, their share of overall poverty was approximately 46 percent. This result was robust to the poverty index used and the poverty line selected, but the statistical significance of the difference was not established. In their reading of the literature, Lipton and Ravallion (1995) conclude

that females are not generally overrepresented in consumption-poor households, nor that female-headed households are more likely to be poor.[3]

Comparisons of the income and poverty levels of female- and male-headed households are far more numerous. A recent review by Buvinic and Gupta (1997) finds that 38 of 61 studies that examined the relationship between headship and poverty conclude that woman-headed households are overrepresented among the poor. However, because each study of gender and poverty responds differently to a wide range of conceptual and measurement issues, cross-study comparisons are impossible. These conceptual issues include (1) the accurate measurement of the nonleisure time of men and women; (2) the different sizes of households headed by males or females; (3) the different composition of households headed by males or females; and (4) the definition of headship.

First, using cash income as the sole measure of household income will underestimate the welfare of subsistence households. This is less of an issue with recent household surveys that impute the value of home production. Consumption expenditure is also commonly used as a measure of welfare, since total expenditure is considered a reasonable approximation of "permanent income." Typically, values are imputed to the consumption of home-produced goods and services as well as those received as wages, gifts, and loans in coming up with a measure of total expenditure.

[3] They do state, however, that "even if it were true that consumption-poverty incidence is on average no greater amongst women, they are severe victims of poverty in other respects" (Lipton and Ravallion 1995, 2589). Women perform more work and enjoy less leisure for the same level of income due to the "double day" that women work, and suffer from a more chronic form of poverty, due to educational deprivation that impedes upward mobility of labor.

However, income or expenditure measures do neglect differences in men and women's time use. Reviews of formal time allocation studies confirm that, on average, women in developing countries engage in more hours per day in nonleisure activities than do men (e.g., Juster and Stafford 1991; Brown and Haddad 1995). In addition, low-income women have longer working days than higher-income women, often to the detriment of their health and nutritional status.[4] Compared to a measure that incorporates leisure (through detailed time allocation data) into the definition of welfare, expenditure measures may therefore understate poverty for households heavily reliant on female labor.[5] A "full income" measure that accounts for the value of time will therefore be a better index of welfare. Due to the scarcity of detailed time allocation data, however, most studies on gender and poverty (including this one) rely on standard income or total expenditure measures that ignore potential gender-differentiation in leisure time.

Second, household size enters into the debate on gender and poverty in at least two ways. The first issue relates to analyses that rely on ranking households by their per-capita consumption and then measuring the percentage of households below the poverty line. These kinds of analyses, which are common in the gender and development literature, will overstate the proportion of poverty contributed by smaller households—

[4]Competing responsibilities and demands on women's time might also constrain them to accept lower paid part-time jobs or employment such as "piecework" that allows for flexible hours (Buvinic and Gupta 1997).

[5]For example, female-headed households may have a greater demand for processed foods and market-provided services to save on time and services such as childcare. Male-headed households do not have to pay for these good and services, since they can rely on their spouses to do household tasks, such as cooking and child rearing, without having to financially compensate them (Alice Carloni 1994, personal communication). If female-headed households are too poor to pay for these goods and services, they would have to sacrifice their own leisure or rely more on other household members for domestic chores.

such as female-headed households—because they tend to contain fewer individuals (Ravallion 1992). The second issue relates to the economies of scale in consumption achieved by larger households (Lanjouw and Ravallion 1995; Deaton and Paxson 1998). This research suggests that the per-capita consumption of smaller households—again we can use female-headed households as an example—might need to be achieved with more resources per capita than in larger households. This would tend to understate the poverty contribution of individuals from these smaller households. An analysis of poverty incidence in male- and female-headed households using a number of datasets from Sub-Saharan Africa (Ye 1998) shows that assumptions on economies of scale make a difference when comparing poverty measures of male- and female-headed households—even if economies of scale are not allowed to vary according to the gender of the household head.

Third, households with more adult women typically have more children. Because the male partner is absent, female-headed households tend to have higher dependency ratios, defined as the number of persons under 15 and over 65 years of age, as a proportion of persons 15–65. Hence per-capita measures, which are based on household size, would tend to overstate poverty for large households and female-headed households. For example, Louat, van der Gaag, and Grosh's (1997) analysis of female headship and poverty in Jamaica finds that when per-capita total expenditure is used as a measure of welfare, 9 percent of people living in male-headed households are found to be below the 10th percentile poverty line, compared with 11 percent in female-headed households, a small, but statistically significant, difference. When adult equivalents are used to adjust

total expenditure, however, no difference is significant for the 10-percentile poverty line. But adult equivalent scales may also mask dependency burdens by assigning a weight less than 1 to females and children, on the assumption that their consumption needs are less than those of adult men (Ravallion 1992). Such scales are usually based on individuals' actual consumption as measured from household surveys (e.g., Deaton and Muellbauer 1986), which could reflect the outcome of intrahousehold bargaining or lack of information about consumption requirements rather than actual biological needs. Moreover, the use of the same adult-equivalent scales for all countries neglects the cross-country variation in the costs of raising children (for instance, in some countries, parents may need to pay more for their children's education; in others, parents may have to spend for dowries or bride wealth).

Fourth, for male female comparisons that rely on headship, there is the thorny issue of what headship means. That the labels *male-* and *female-headed households* bestow only a veneer of homogeneity is convincingly presented by Rosenhouse (1989). The intent of questions regarding headship is to identify the person responsible for most household decisions. However, most surveys identify female-headed households as households where no husband or adult male is present. Households where both spouses or partners are present but the wife's responsibility, authority, and economic contribution are greater (Batista 1994) tend to be classified as male-headed households. Attempts to rectify such situations have led to constructs such as the “working head” (the household member most heavily engaged in income-generating activities [Rosenhouse 1989]) and the “cash head” (the individual with the greatest individual contribution to household

cash income [Lloyd and Gage-Brandon 1991]). Results do differ when the working head or the self-reported definition is used. For example, Handa (1994) compares male- and female-headed households, based on self-reported status as well as the degree of participation in market work in Jamaica. Based on per-adult equivalent expenditure figures, self-reported female-headed households achieve a consumption level 88 percent of that of their male counterparts, but working female-headed households attain a consumption level 97 percent of that of their male counterparts. This suggests that a female working head is also likely to be the main decisionmaker and source of financial support for her household in Jamaica.

A less data-intensive approach disaggregates self-declared female headship into de facto and de jure female-headed households. De facto female-headed households are those where the self-declared male head is absent for a large proportion of the time (usually at least half). Labor migration studies suggest that this type of female-headed household is increasingly common in Africa (Buvinic and Youssef 1978; Buvinic, Lycette, and McGreevey 1983). In these households, husbands or other male relatives may still play a role in basic decisionmaking and contribute to household incomes. De jure female-headed households are those in which a woman is considered the legal and customary head of household. De jure households are usually headed by widows (often the grandmothers of the children in the household) or unmarried, divorced, or separated women.

These distinctions among female heads make it clear that the category is not homogeneous. Indeed, the incidence of poverty among female-headed households is

sensitive to the definition of headship. For example, Kennedy and Haddad (1994), using household survey data from Kenya, found that de facto female-headed households are significantly poorer than other types of households, but de jure female-headed households are only slightly poorer than male-headed households. DeGraff and Bilsborrow (1992) found that female-headed households in Ecuador, as a whole, have per-capita household income 10 percent lower than male-headed households. However, when female-headed households are disaggregated by marital status, divorced and widowed groups have a higher per-capita income than male-headed households.

Due to data limitations, we do not address all the issues raised here. We do try, however, to make consistent assumptions across our datasets and analyses so as to maximize the comparability of our results. Specifically, (1) the consumption and income measures are comparable in that none of them try to incorporate the negative individual welfare effects of different male-female working hours; (2) we attempt to control for household size and composition by constructing both per-capita and per-adult equivalent measures of income or consumption for each dataset; and (3) for the male- and female-headed household comparisons, we rely on self-reported headship definitions in all datasets.

3. POVERTY MEASURES AND STOCHASTIC DOMINANCE

This section describes our empirical approach. First, for a series of poverty lines, we construct poverty incidence, depth, and severity indicators for different groups of

individuals or households. Then we test for statistical differences between males and females, and between male- and female-headed households. However, the robustness of poverty comparisons using summary measures can be compromised by errors in household survey data, unknown differences between households at similar consumption levels, and uncertainty and arbitrariness about both the poverty line and the precise poverty measure (Ravallion 1992). Hence, our second approach is to examine entire distributions of per-capita (or per-adult equivalent) consumption (or income) for males and for females and for male- and female-headed households with stochastic dominance techniques.

POVERTY MEASURES

The Foster, Greer, and Thorbecke (1984) P_α class of poverty measures is useful for its ability to capture a range of value judgments on the incidence and depth of poverty. If real per-capita household expenditures, y_i, are ranked as follows,

$$y_1 \leq y_2 \ldots y_q \leq z < y_{q+1} \ldots . \leq y_n \,, \tag{1}$$

where z is the poverty line, n is the total population, and q is the number of poor, then P_α is given by

$$P_\alpha = 1/n \sum [(z - y_i)/z]^\alpha \,;\ \alpha \geq 0, \text{ for } y < z \,. \tag{2}$$

The parameter α reflects the policymaker's degree of aversion to inequality among the poor. If $\alpha = 0$ is chosen, no concern is exhibited about the depth of poverty, and P_0 corresponds to the fraction of individuals falling below the poverty line (the Headcount Index). If $\alpha = 1$, P_1 is the aggregate poverty deficit of the poor relative to the poverty line (the Poverty Gap Index), or the mean depth of poverty as a proportion of the poverty line multiplied by the headcount index. Values of α greater than 1 in P_α calculations give more weight to the average income shortfalls of the poorest of the poor. Thus, the P_2 measure, the sum of squared proportional shortfalls from the poverty line, is commonly interpreted as an index of the severity of poverty.

To test whether the P_α measures differ significantly between groups, we use the hypotheses testes developed by Kakwani (1993).[6] The null hypotheses are (1) observed poverty differences between male- and female-headed households are not statistically significant, and (2) observed poverty differences between males and females are not significant.

We also investigate various poverty lines. We first use an absolute poverty line of US$1 per person per day in 1985, converted to local currency using the official exchange

[6] The standard error is P_α is $\{(P_{2\alpha} - P_\alpha^2)/n\}^{1/2}$ (Ravallion 1992). Denote the P_α measure for males (or male-headed households) as P_m and that for females (or female-headed households) as P_f. These are estimates of a poverty measure P^* computed on the basis of two random samples of m and f groups, corresponding either to the distribution of males and females, or the distribution of male-headed and female-headed households. Let s_m^2 and s_f^2 be the sample estimators of the variances of the asymptotic distributions of $P_m\sqrt{m}$ and $P_f\sqrt{f}$. $(P_f - P_f)$ will be

$$SE(P_m - P_f) = (s_m^2/m + s_f^2/f)^{1/2}$$

and the statistic

$$\eta = (P_m - P_f)/SE(P_m - P_f)$$

will be asymptotically normally distributed with zero mean and unit variance.

rate in 1985 and converted to the survey year using the CPI. An alternative method of computing the local currency equivalent uses purchasing power parity conversions (Penn World Tables 5.6) for the survey year.[7] We also use a 33-percentile poverty line for the combined distributions of males and females and for male-headed and female-headed households. In using a 33-percentile poverty line, we are therefore in the domain of *relative* poverty comparisons within countries, not cross-country comparisons of absolute poverty.

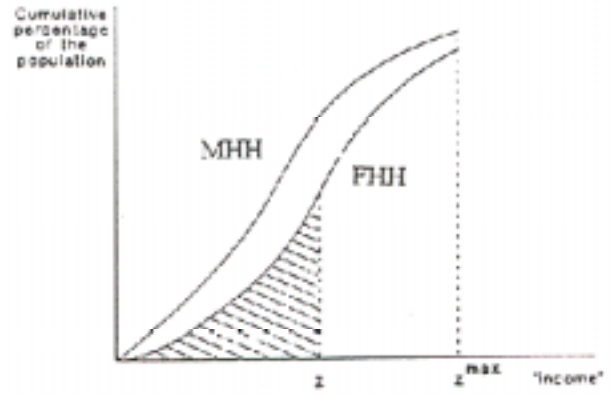
STOCHASTIC DOMINANCE ANALYSIS

We want to compare two distributions of per-capita household expenditure, one for males (or male-headed households) and the other for females (or female-headed households). For ease of exposition, this section will refer to the distributions of male-headed households, denoted by MHH, and female-headed households, FHH.[8] The poverty incidence curse is a cumulative distribution function that shows on the vertical axis the proportion of the population consuming less than the per-capita household expenditure amount on the horizontal axis (Figure 1a). The area under this curve is the poverty deficit curve, and each point on the vertical axis corresponds to the value of the poverty gap P_1 times the poverty line z (Figure 1b). If one again calculates the area under

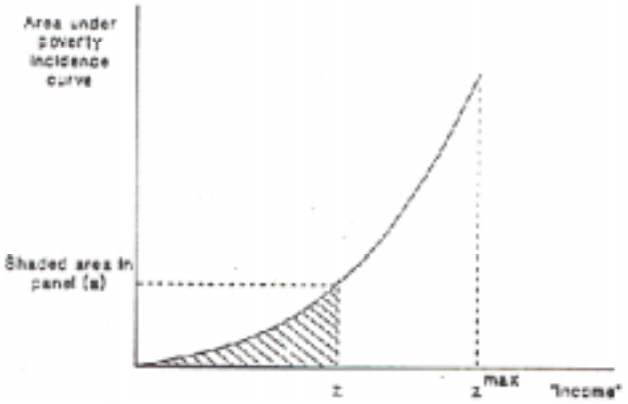
[7] While purchasing power parity conversions account for cross-country differences in the cost of living, their usefulness for making international poverty comparisons has been criticized (Ravallion and Chen 1996).

[8] This discussion draws heavily from Atkinson (1987) and its exposition in Ravallion (1992).

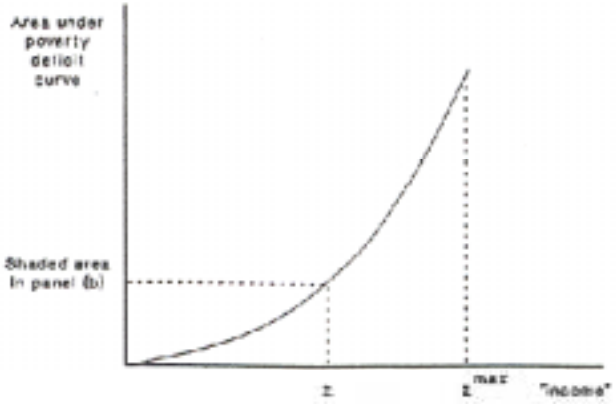
Figure 1—The three poverty curves



(a) Poverty incidence curves for two distributions MHH and FHH



(b) Poverty deficit curve for distribution FHH



(c) Poverty severity curve for distribution FHH

Source: Adapted from Ravallion 1992.

the poverty deficit curve, each point on the new curve—the poverty severity curve—is directly proportional to P_2 (Figure 1c). We do not know the precise value of the poverty line, but are sure that it does not exceed z_{max}. (We can interpret z_{max} as the upper bound on the set of reasonable poverty lines.) Even if we do not know the precise poverty measure, but know that it is a monotonic transformation of an additive measure, it can be shown that poverty is lower among MHH than FHH if the poverty incidence curve for MHH is somewhere below and nowhere above that of FHH, up to z_{max}.[9] This is the *First Order Stochastic Dominance Condition* (FSD). (Alternatively, the distribution MHH dominates FHH.)

If we then examine additive measures that reflect the depth of poverty such as P_1 and P_2 (excluding P_0), we can use a *Second Order Stochastic Dominance Condition* (SSD). One distribution dominates the other if the former's poverty deficit curve is somewhere below and nowhere above the deficit curve of the latter. In our context, MHH dominates FHH in the sense of SSD if the poverty deficit curve of male-headed households fulfills the above criterion.

It has been suggested that stochastic dominance be analyzed with upper or lower limits (or bounds) to avoid conclusions being unduly influenced by a small number of observations in the tails of the distributions (Howes 1994). Specifying an upper bound implies that we are not concerned with changes beyond a certain income level or

[9] Additive measures follow the general form: $P = \Sigma\, p(z, y_i)/n$, summed over $i = 1$ to n, where $p(z, y_i)$ is the individual poverty measure, taking the value of zero for the nonpoor, and some positive number for the poor (Ravallion 1992, 41).

percentage of the population; for example, redistributions among the very rich will not affect poverty comparisons. Similarly, specifying a lower bound is equivalent to specifying the lower limit to the range of minimum poverty lines. Below this bound, transfers within the group of the poorest no longer have an effect on the ranking.[10]

Another method uses bounds that are not imposed, but are determined "endogenously" from inspection of the data (Howes 1994). That is, we want to find out whether one variable dominates another within bounds that emerge from the analysis rather than being given exogenously. This approach specifies the minimum length (the difference between the upper and lower bounds) as the combined length in terms of the proportions of the combined sample to control for the probability of mistakenly inferring dominance within the bounds. If this length is below a suggested minimum (50 percent of the sample, according to simulations), the sample curves differ only insignificantly and dominance cannot be inferred. We discuss this in greater detail when we present the results.

In our empirical analysis, we apply stochastic dominance techniques to evaluate the income (or expenditure) measure of males and females, as well as male- and female-headed households.

[10]A higher than zero cutoff is usually specified because it may not make sense to have poverty lines that are so low that the poor are incorrectly identified as nonpoor.

4. EMPIRICAL ANALYSIS

DATA

We use household survey data from Sub-Saharan Africa (Botswana, Côte d'Ivoire, Ethiopia, Ghana, Madagascar, Rwanda), Asia (Bangladesh, Indonesia, Nepal), and Central America (Honduras) for our empirical analysis. Most of the surveys were conducted by the International Food Policy Research Institute (IFPRI) and its collaborators (such as the International Center for Research on Women) to investigate patterns and determinants of food security, with the exception of the Ghana and Côte d'Ivoire datasets, which were gathered as part of the Living Standards Measurement Study of the World Bank. The Ghana and Côte d'Ivoire datasets are nationally representative, while the IFPRI data are from rural surveys that were not designed to be nationally representative. Some surveys focused on a specific region (e.g., the Rwanda dataset), while others aimed for representativeness across agroclimatic settings, ethnic groups, and infrastructure and market access. Clusters were chosen purposively, then households within clusters were randomly selected. Most of the IFPRI datasets also consist of more than one round of data collection to capture seasonal variation. In this study, we convert the data to annual figures to allow comparison with the annualized equivalent of the $1 per person per day poverty line.

Table 1 presents summary characteristics of the data; the datasets and survey design are described more fully in the Appendix. The countries in our sample range from low-income (Ethiopia) to middle-income (Botswana). Comparison of per-capita GNP

from the World Development Indicators and per-capita income or expenditure from the household surveys reveals that most of the surveys are not representative of the country's population (although the gap between the two measures is large for the nationally representative dataset from Côte d'Ivoire). The samples from Ethiopia, Rwanda, Indonesia, and Honduras, for example, have per-capita income and expenditure figures that are much lower than per-capita GNP.

The proportion of households headed by women ranges from 6.8 percent in Nepal to 58 percent in Botswana. Again, the incidence of female headship in our samples should not be taken as representative of the country as a whole, since the datasets (aside from the Ghana and Côte d'Ivoire data) are not nationally representative.[11] The distribution of males and females, however, is less unbalanced, with the proportion of females ranging from 48.3 percent in Madagascar to 56.1 percent in Botswana. It is unfortunate that the unavailability of sampling weights for most of the datasets prevents us from correcting standard errors for sampling design, i.e., stratification, clustering, and household size. The exceptions are the Ghana and Bangladesh datasets, which were designed to be self-weighting. Since most of the samples are subnational (and purposively selected), there is a need to define the domain (the population corresponding to the sample) carefully in interpreting the results.

Table 2 compares household structure across male- and female-headed households. Household size is significantly larger in MHHs than FHHs in 9 out of 10

[11]The Botswana area, for example, is characterized by male migration to South Africa and remittances to de facto female-headed households.

datasets. MHHs also have a significantly higher number of children ages 0–5 years (7 out of 10 datasets) and a slightly higher number of children ages 6–15 years (6 out of 10 datasets). More important, MHHs have significantly more members of working age compared to FHHs in 8 out of 10 datasets, partly because the male partner is absent in most FHHs. FHHs and MHHs have equal numbers of adults over 65. It has often been argued that FHHs are more likely to be poor due to higher dependency ratios. While dependency ratios *are* higher among FHHs in 7 out of 10 datasets, the difference is statistically significant only in three datasets: Botswana, Ghana, and Honduras.

POVERTY MEASURES

Tables 3 and 4 present the poverty indices (head count, poverty gap, and P_2 indices) for male- and female-headed households and for males and females, respectively. We use three poverty lines: (1) $1 per person per day in 1985, converted to a yearly figure and to local currency using the official exchange rate; (2) $1 per person per day, converted using purchasing power parity exchange rates; and (3) a 33-percentile poverty line, defined over the combined distribution of male- and female-headed households (Table 3) and males and females (Table 4). Since we do not have information on individual incomes or expenditures, we assume a uniform distribution of household income per capita (or per-adult equivalent) among all household members.[12] This therefore abstracts from issues of intrahousehold income and may lead to the misranking

[12]We used the adult equivalent conversions from Deaton and Muellbauer (1986): 0.2 for children ages 0–6; 0.3 for children ages 7–12; 0.5 for those ages 13–18; and 1.0 for those age 18 and over.

of the poverty of individuals from different household groups if those different groups differ significantly in the way in which they distribute income within the household (Haddad and Kanbur 1990).[13]

For both sets of analyses, whether disaggregated by gender of the household head or by gender of the individual, poverty levels are higher when the $1 per day poverty line is converted using the official exchange rate rather than purchasing power parity conversions. Since most of our datasets are rural, purchasing power parity conversions may capture the cost of living more realistically. Regardless of conversion factors used, absolute poverty incidence in our samples is high. Close to 100 percent of MHHs and FHHs earn less than $365 per person per year in Ethiopia and Rwanda, and over 90 percent earn less than $365 per person per year in Nepal. The lowest poverty incidence is observed in Botswana, the country with the highest per-capita income among our study countries.

Absolute Poverty of Male- and Female-Headed Households

Table 3a summarizes the detailed results in Table 3 for male- and female-headed households. Of 180 comparisons, 45 are statistically significant at the 5 percent level. Of these 45 significant differences, 39 show FHH poverty higher than MHH poverty, with 6 showing the opposite result.

[13] It is quite likely that consumption and income are unequally distributed within male- and female-headed households (Haddad, Hoddinott, and Alderman 1997).

When an official exchange rate conversion is used, for the per-capita expenditure (income) measure, a greater proportion (P_0) of female-headed households lie below the $1 per person per day poverty line in 5 out of 10 datasets (significant in Ghana and Bangladesh), while the poverty gap (P_1) is larger for female-headed households in 7 out of 10 datasets (significant only for Bangladesh). In Botswana, Côte d'Ivoire, and Rwanda, the poverty measures are lower for female-headed households, but only the difference for Côte d'Ivoire is statistically significant (at the 10 percent level—see Table 3). The lower poverty measures for FHH in Côte d'Ivoire are consistent with the disproportionate location of female-headed households in Abidjan and other urban areas, which are considerably richer than rural areas (Kakwani 1993, citing Glewwe 1987). The P_2 measure, which gives a larger weight to poorer families, is larger for female-headed households in 5 out of 10 datasets, with significant differences in Ghana and Bangladesh.

Using per-adult equivalent income measures and the official exchange rate conversion, the pattern of results is similar, but the poverty of FHH is greater than that of MHH—a result we would have expected, given the large number of children in FHH. For the poverty gap comparison, 8 of 10 datasets show poverty higher in FHH, but with only Ghana and Bangladesh showing a significant difference. Also using the P_2 measure, poverty is more severe for male-headed households in Botswana, Indonesia, and Rwanda, although differences between MHH and FHH are not significant.

Results are very similar when the purchasing power conversion is used. For per-capita income measures, 6 out of 10 datasets show FHHs having higher headcounts than MHHs, although only 3 of these differences are statistically significant (Ghana,

Bangladesh, and Nepal). The poverty gap is higher for FHHs in 9 out of 10 datasets, but only those differences for Ghana and Bangladesh are statistically significant. Similarly, P_2 is higher for FHHs in 8 out of 10 datasets, but differences are significant only in the same two countries. Patterns are very similar when adult equivalent measures are used. FHHs have higher headcount indices in 8 out of 10 datasets, higher poverty gap indices in 9 out of 10 datasets, and greater severity of poverty in 7 out of 10. However, in all of these cases, the differences between MHHs and FHHs are statistically significant only for Ghana and Bangladesh.

Absolute Poverty of Males and Females

Table 4a summarizes the detailed results in Table 4 for males and females. Of 180 comparisons, 28 are statistically significant at the 5 percent level. All 28 cases show poverty higher among women than among men.

To examine poverty among individuals, we apply the same poverty lines to the distribution of males and females. Using the official exchange rate to convert the $1 per person per day poverty line, for the per-capita expenditure (income) measure, a greater proportion (P_0) of females are classified as poor in 6 out of 10 datasets, and the poverty gap (P_1) is likewise larger for females in 6 out of 10 datasets (Table 4). The P_2 measure, which gives a larger weight to poorer families, is also larger for females in 7 out of 10 datasets. The exceptions where poverty measures for males are higher occur in Botswana for all three measures, Rwanda for P_0, and Nepal for P_2, although none of these differences are statistically significant. Poverty measures are significantly (5 percent or

better level of significance) larger for females in Ghana and Bangladesh using all three poverty measures. The headcount index and the poverty gap index are also significantly larger for females in Madagascar.

Using per-adult equivalent income measures, and the official exchange rate conversion, a larger proportion of females are poor in 5 out of 10 datasets, and the poverty gap index is higher in 6 out of 10 datasets. With respect to the P_2 measure, females have more severe poverty in 7 out of 10 datasets. The exceptions—where more males than females are in poverty—occur in Botswana, Côte d'Ivoire, Ethiopia, Rwanda, and Nepal for P_0; Botswana, Côte d'Ivoire, Ethiopia, and Rwanda for P_1, and Botswana, Côte d'Ivoire, and Nepal for P_2. However, the only differences between males and females that are statistically significant are from Ghana and Bangladesh, and these both show higher poverty among women.

Results are very similar using purchasing power parity conversions. For per-capita income measures, 6 out of 10 datasets show a larger proportion of females with less than $1 per day, though only the differences for Ghana and Bangladesh are statistically significant. The poverty gap is higher for females in 7 out of 10 datasets, with statistically significant differences for Ghana, Madagascar, and Bangladesh. P_2 is also higher for females in 7 out of 10 datasets, although significant only for the same three. Using purchasing power conversions, however, a smaller set of countries shows higher poverty measures for males: Côte d'Ivoire and Ethiopia for P_0, and Rwanda for P_2—none being significant at the 5 percent level. For adult equivalent measures, females have higher headcount indices in 5 out of 10 datasets, higher poverty gap indices in 6 out of 10

datasets, and greater severity of poverty in 7 out of 10. However, in all of these cases, the differences between males and females are statistically significant for all poverty measures only for Ghana and Bangladesh. While Botswana, Côte d'Ivoire, Ethiopia, and Rwanda show higher headcount indices for males, the latter three show higher poverty gap indices for males, and Rwanda exhibits a higher P_2 measure for males, none of these are significantly different from the corresponding measures for females.

Relative Poverty

We now turn to relative poverty among MHHs and FHHs (Table 3), and among males and females (Table 4), in the bottom third of the distribution. By definition, a third of the distribution will always be poor and thus the headcount ratio for the combined samples will be 33 percent. However, it is also true that this represents a weighted average of the poverty measures of MHH and FHH (or males and females), and thus may reveal differences in relative poverty among those groups for the poorest in the population.

We first examine relative poverty among MHHs and FHHs (bottom third of Table 3). Using per-capita measures, for 6 out of 10 datasets, all three poverty measures are larger for FHH. For the headcount index, this implies that the proportion of FHH in poverty is larger than 33 percent in 6 out of 10 datasets, and the proportion of MHH is lower. For P_0, more FHH are significantly below the 33 percent line in Botswana, Ghana, Madagascar, and Bangladesh. FHHs have significantly higher poverty gap measures in Ghana, Madagascar, and Bangladesh, while MHH have significantly higher P_1 in

Botswana, Côte d'Ivoire, and Rwanda. FHHs face significantly more severe poverty (P_2) in Ghana, Madagascar, and Bangladesh, but MHHs are significantly worse off using this measure in Botswana, Nepal, and Rwanda.

A larger proportion of differences between MHH and FHH is significant using adult equivalent measures. For the headcount ratio, 7 out of 10 show that FHHs are overrepresented among the bottom third, and these differences are significant for five countries (Ghana, Madagascar, Indonesia, Bangladesh, and Nepal). FHHs have higher poverty gaps in eight countries, of which these differences are significant in four (Côte d'Ivoire, Ghana, Bangladesh, and Nepal). FHHs in eight countries also experience more severe poverty, but differences between MHHs are only significantly larger in Ghana, Bangladesh, and Côte d'Ivoire. Poverty gap indices are significantly less for FHHs in Botswana, and P_2 is significantly lower for FHH in Botswana and Rwanda.

We now apply a 33-percentile line from the combined distribution of males and females (bottom third of Table 4). While the results are very similar to the previous findings for males and females, fewer differences are significant at the 5 percent level. Using per-capita income or expenditure figures, P_0 and P_1 are higher for females for 8 datasets, while P_2 is higher for females in 6 datasets. However, these differences are significant only for 2 datasets for P_1 and P_2 (Ghana and Madagascar) and only for Bangladesh for P_2 . Using adult equivalent units, P_0 and P_1 are higher for females in 8 datasets, and P_2 is higher for females in 7 out of 10 datasets. None of the differences, however, are significant for the headcount index, while for P_1 and P_2 , only the differences for Bangladesh are significant. Although Botswana, Rwanda, Ethiopia, Nepal,

and Honduras exhibit higher poverty measures for males, in no case is the difference significant.

We use the above information on relative poverty to construct poverty profiles for MHHs and FHHs, and males and females, to examine the contribution of each group to the bottom third of the population, noting that the contributions of each group to aggregate poverty will sum to 33 percent (Table 5).[14] The decompositions show that, despite higher headcount indices among FHHs, the share of overall poverty accounted for by this group is quite small, owing to the small share of FHHs in the population. (The only exception is Botswana, where FHHs account for 58 percent of households). Quite a different picture emerges when we examine the relative shares of females in aggregate poverty. Females account for about 50 percent of aggregate poverty, their contribution to aggregate poverty being close to their share of the population. Using female headship as a stratifying variable, thus, may underestimate the magnitude of poverty among females in populations where only a relatively small proportion of households are female-headed.

STOCHASTIC DOMINANCE RESULTS

Table 6 presents the application of first- and second-order stochastic dominance criteria to the per-capita expenditure (or income) curves of male- and female-headed households, while Table 7 shows similar results using adult equivalent measures. Similar results are presented for the distributions of males and females in Tables 8 and 9. We use

[14]Note that we could do a similar decomposition for $P1$ and $P2$, although the weighted sum will no longer be 33.

three criteria: sample dominance, statistical dominance, and statistical dominance with endogenous bounds. For sample dominance, we ascertain whether one sample dominates another over the entire range of values from negative to positive infinity. For statistical dominance, dominance between the two populations can be inferred if there is sample dominance and if the t-ratio between the two curves is greater in absolute value than the critical value 1.65 ($\alpha = 0.05$). Dominance is also evaluated over the range from negative to positive infinity. Lastly, when we use statistical dominance with endogenous bounds, we are determining whether one variable dominates another within bounds that emerge from the analysis rather than being determined exogenously. The length variable shows the longest range of statistically significant dominance (t-ratio greater in absolute value than the critical value 1.65) between positive and negative infinity, and gives the proportion of the combined samples that are found between the minimum and the maximum.

The most striking result in all the tables is that it is difficult to observe statistical and sample dominance of either MHH or FHH. For the First Order Stochastic Dominance Condition (FSD), using the per-capita measure, neither FHH nor MHH dominate, using statistical or sample dominance (Table 6). For statistical dominance with endogenous bounds, MHH dominate over 96 percent of the combined samples and 86 percent of the combined samples in Ghana and Bangladesh, respectively. The MHH distributions also dominate in the same two countries using the Second Order Stochastic Dominance (SSD) criterion. In the other eight countries, while one distribution may dominate the other over

some range, the range is less than 50 percent of the combined samples. Using adult equivalent measures (Table 7), for FSD, MHH distributions dominate FHH distributions in 8 out of 10 datasets, but dominance is statistically significant only for MHH in Bangladesh. For SSD, we observe sample dominance for Bangladesh, Indonesia, Nepal, and Honduras. MHHs significantly dominate FHH in Ghana, Madagascar, and Bangladesh for 74, 67, and 99 percent of the combined samples, respectively.

Results using the distributions of males and females are similar. For the majority of the datasets, using per-capita measures, the sample poverty incidence curves of males and females differ only insignificantly, such that first order stochastic dominance cannot be inferred (Table 8). When bounds are determined endogenously, the distribution of males dominates in 8 out of 10 datasets, but dominance is significant only for Ghana over 91 percent of the combined samples. For SSD, males have sample dominance in Bangladesh, Indonesia, Nepal, and Honduras, but dominance is statistically significant only for Ghana, Madagascar, and Bangladesh, for 74, 67, and 99 percent of the combined samples, respectively. Using adult equivalent measures (Table 9), females weakly dominate male distributions in 3 out of 10 datasets, and males weakly dominate in 5 out of 10. Dominance, however, is not statistically significant at a 5 percent level. For SSD, we observe sample dominance for the male distributions for Bangladesh, Indonesia, and Honduras, but SSD is statistically significant only for Ghana and Bangladesh, for 58 and 99 percent of the combined samples.

To summarize, when we examine statistical dominance using per-capita income measures, and both FSD and SSD, MHH consistently dominate in Ghana and

Bangladesh. When adult equivalent units are used, Bangladesh MHH dominate for both FSD and SSD, while MHH also dominate with respect to SSD in Madagascar and Ghana. When we analyze the poverty incidence and deficit curves of males and females using per-capita measures, males dominate significantly with respect to FSD in Ghana, and with respect to SSD in Ghana, Madagascar, and Bangladesh. Using adult equivalent measures, we observe statistically significant dominance for males with respect to SSD only in Ghana and Bangladesh. The dominance of MHH as well as male distributions in Bangladesh and Ghana is strikingly consistent: poverty among females and female-headed households is higher.

5. CONCLUSIONS

At the outset we posed the following questions: (1) do women contribute disproportionately to overall poverty?; (2) do female-headed households contribute disproportionately to overall poverty?; and (3) does a focus on male- and female-headed households serve as a good proxy measure for the poverty suffered by individuals within households?

We answer the first two questions with a “weak yes.” Similar to previous studies on gender and poverty, our results show weak evidence that females, as well as households headed by females, are overrepresented among the poor. While female-headed households are worse off in terms of a number of poverty measures, these differences are statistically significant in one-fifth to one-half of the datasets, depending

on the poverty measure used. Poverty measures are also higher for females than males; these differences are significant in a smaller proportion of the datasets (about a fifth to a third). Because female-headed households account for a small proportion of the population, their contribution to aggregate poverty is small, compared to the contribution of females to poverty.

Stochastic dominance analysis reveals that differences between male- and female-headed households (and between males and females) are insufficiently large to generalize that females are unambiguously worse off in the entire sample of 10 developing countries. Only in Ghana and Bangladesh are both female-headed households and females consistently worse off using two stochastic dominance criteria.

Why is the evidence in support of poorer female-headed households so weak? We have already noted that our samples tend to be drawn from poorer segments of the population, giving our sample per-capita incomes or expenditures lower than the national average. It is possible that differences between male- and female-headed households may not be so acute at such low-income levels. Models of family behavior also suggest that family formation and marital dissolution depend upon individual, family, and external characteristics.[15] Female headship, rather than being an exogenous category, is, in fact, endogenous: it depends upon the characteristics of the marriage market, as well as the processes that lead to marital dissolution. In cooperative bargaining models of marriage

[15] Buvinic and Gupta (1997) refer to this in passing when they note that "women with economic means" may choose such family structures, but the authors do not pay sufficient attention to the endogeneity of female headship.

(McElroy 1990; McElroy and Horney 1981), whether an individual remains in a union depends on his or her utility outside that union. This "reservation utility" or "threat point" is a function of individual characteristics, especially nonlabor income and education, and social or institutional factors that affect the attractiveness of being married.[16] It is possible that some of the female heads of households who are divorced or separated had better exit options because they had resources to live independently.

In terms of the third question, and at the risk of stating the obvious, we note that while female-headed households might be slightly overrepresented among the poor, there are many more women living in poverty in male-headed households and fewer men living in poverty in female-headed households. Female-headed households with high dependency ratios and without a steady source of income or transfers are more likely to be poor. However, it is doubtful whether female-headed households that are connected to a strong network of income earners (including her absent husband and sons) are equally vulnerable. The usefulness of headship as a universally acceptable targeting criterion is thus questionable.

There are several implications of our results. First, this work needs to be routinely replicated with nationally representative datasets. Institutions with greater access to nationally representative datasets should undertake these kinds of poverty breakdowns—at least by male and female, the results of which should be a regular feature of publications such as the World Bank's *World Development Report*, the UN Statistical

[16]These are the "extra-environmental parameters" (eeps) in McElroy's model.

Office's *World's Women*, and the United Nations Development Programme's *Human Development Report*. Only in such a way will we get a better estimate of the percentage of the poor who are women.

Second, note that income-based measures relate to only one aspect of poverty. Differences in power, nutrition, health, and time allocation may be more important indicators of differences in well-being along gender lines. Some social indicators, notably adult and infant mortality rates, may differ more widely across males and females (Sen 1998). Future studies of gender and poverty would do well to analyze these variables in addition to income-based measures.[17]

Third, more work should be done as to why men and women become poor. Indeed, the general lack of dominance in our results suggests a need for multivariate analysis. When only cross-section data are available, the determinants of poverty should be estimated and any differences in such determinants between men and women should be tested for (Datt and Jolliffe 1999; Datt et al. 1999). When panel data are available, such analyses can take on a temporal dimension: which factors are responsible for certain households becoming poor, staying poor, or moving out of poverty, and what role do women play in these different types of households?

Fourth, given that our analysis does not control for other individual and household characteristics, our results should not be taken to argue that policy interventions should not be targeted by gender. Even if there are no strong poverty differences between men

[17] Several examples of this kind of cross-country dataset analysis are available from the health and nutrition literature, where the Demographic and Health Surveys are routinely analyzed in a comparable and sex-disaggregated way (Haddad 1999).

and women, in many countries, women have lower levels of education, assets, and social indicators than do men—inequalities that, in many societies, are indirectly caused by gender (Haddad 1999). It is therefore quite remarkable that poverty differences are not large, *despite* the massive discrimination against women in terms of access to and control of resources.

Finally, a greater focus on the determinants of family structure (including female headship) will be important to understand why families form and dissolve and what role policy and programs play—knowingly and unknowingly—in that process. Although there is a growing literature on the effect of policies on family formation, especially in the context of welfare systems in industrialized countries (e.g., Schultz 1998), similar empirical analyses for developing countries are rare.[18] Neglecting the endogeneity of headship may backfire in targeting poverty-reduction programs. The compelling reason for stating that female-headed households are among the "poorest of the poor" has been to make targeting simpler for policymakers. However, if families divide temporarily to take advantage of programs targeted to female-headed households, only to regroup after the beneficiaries have been identified, the advantages of targeting by gender of the household head will be nullified.

[18]Recent exceptions are Handa (1996), in relation to female headship, and Foster and Rosenzweig (1996), Quisumbing (1998), and Maluccio, Thomas, and Haddad (1999) on the determinants of coresidence.

APPENDIX

Characteristics and Sample Design of the Datasets

Country	Year(s) of collection	Number of survey rounds	Sample size (household)	Sample design
Botswana	1993	1	349	The survey work covered eight villages identified based on their degree of participation in road work and representation of villages in the vicinity of the road work. All resident road participants were included and an equal number of nonparticipants were randomly selected from four strata of nonparticipants (female-headed households with no assets, female-headed households with assets, male-headed with assets, and male-headed without assets) (Teklu 1995).
Côte d'Ivoire	1986-87	1	1,600	The survey was undertaken in 1,600 households, in a random sample designed to be nationally representative (Grosh and Glewwe 1995).
Ethiopia	1989-90	1	550	Surveys were concluded in seven rural sites that suffered hardships (not caused by military disruption of production) between 1984-1989. Site selection was based on diversity of agroecological settings and ethnic groups and clear indication of recent food crisis at a local level. Survey locations were chosen to lie in territory administered by that government and in areas unlikely to become militarily insecure during the survey operation. The seven sites capture some of the diversity of the famine experiences in the survey regions: three sites were in the highlands, and four in the lowlands. Of the lowlands sites, one is a semi-nomadic pastoral community, while the other six are all settled farming communities (von Braun, Teklu, and Webb 1999).
Ghana	1987-88	1	3,200	This is a nationally representative survey of 3,200 households across approximately 200 enumeration areas stratified by urban/rural and by ecological zones (Grosh and Glewwe 1995).
Madagascar	1992	3	189	The survey was administered in four regions covering the major agroecological conditions in Madagascar except for those in eastern coastal and rainforest regions. Ten villages were drawn from a subsample of villages with formal community-based savings and credit associations, using stratified random sampling based on population size and region-specific distance of the village to the nearest national road. All survey households were drawn randomly from the population within each of the ten villages (Zeller 1995).
Rwanda	1985-86	3	189	The survey was undertaken in a high altitude zone of the Zaire-Nile Divide in northwest Rwanda. The survey site is landlocked, very densely populated, and has a low degree of urbanization (von Braun, de Haen, and Blanken 1991).

(continued)

Country	Year(s) of collection	Number of survey rounds	Sample size (household)	Sample design
Bangladesh	1992-93	3	553	The survey was conducted only in fully- and well-operating rural rationing locations. Based on random sampling, 553 households were chosen during the first round. The sample size was increased to 737 households in the second and third survey rounds in order to include households from the higher income groups. The survey was conducted in eight villages, two in each of the four divisions of the country. Four of the survey villages are located in distressed areas and the other four in nondistressed areas. Two distressed villages and two nondistressed villages are located in infrastructurally developed areas. The other four villages are from relatively poor infrastructure locations (Ahmed, Haggblade, and Chowdhury 2000).
Indonesia	1988-89	12	320	Two provinces were selected to represent different cropping systems most commonly found in the areas susceptible to highly seasonal climates: a relatively developed province and a comparatively underdeveloped province. In each province, a regency and district were selected that were representative of the predominant cropping system. At the district level, two villages were selected such that one village was more remote than the other, both geographically and in terms of access to markets and employment (Levin 1992).
Nepal	1991-1992	4	256	The study compares two groups of randomly selected farm households depending on their adoption of new technologies for crop production. The study was undertaken in three communities representing different agroclimatic and environment zones and have different ethnic compositions (Paolisso et al. 1999).
Honduras	1988-89	1	712	The study was carried out in six municipalities of Choluteca, the southern part of Region IV of Honduras. The survey was based on a stratified cluster sampling procedure; each cluster had about 30 households. Stratification was based on ecological characteristics (soil quality, water availability, and climate). Population consists of areas under the Honduran-German Cooperation Food for Work (COHAAT) Program. The sample size was based on the prevalence of child malnutrition in the study area as indicated in the national nutrition survey of the Ministry of Public Health (COHAAT 1990, personal communication from Herwig Hahn, March 15, 1999).

TABLES

Table 1—Summary characteristics of datasets

Country	Year of survey	Per capita GNP (US$)	Per capita income (expenditure) in sample (US$)	Number of male-headed households	Number of female-headed households	Percent of households that are female-headed	Number of males in sample	Number of females in sample	Percent females in sample
Africa									
Botswana (a)	1993	2,002.80	1,918.92	121	168	58.1	985	1,257	56.1
Côte d'Ivoire (b)	1986-1987	859.01	941.72	1,471	129	8.1	6,704	7,163	51.7
Ethiopia (a)	1989-90	120.00	71.17	232	24	9.4	884	877	49.8
Ghana (a)	1987-1988	373.10	383.33	2,106	874	29.3	4,527	4,685	50.9
Madagascar (a)	1992	209.67	356.55	170	19	10.1	598	558	48.3
Rwanda (b)	1985-1986	310.45	126.30	168	21	11.1	514	543	51.4
Asia									
South Asia									
Bangladesh (b)	1991-1993	210.96	353.46	683	61	8.2	2,267	2,265	50.0
Nepal (b)	1991-1992	197.93	137.37	246	18	6.8	984	945	49.0
Southeast Asia									
Indonesia (a)	1988-1989	481.03	192.39	221	20	8.3	611	605	49.8
Central America									
Honduras (a)	1988-1989	590.00	415.52	313	32	9.3	1,093	1,139	51.0

Sources: Per capita GNP: World Development Indicators; other: sample estimates.

Notes: 1. See Appendix for a more detailed description of the datasets.

2. (a) Income; (b) Expenditure. Per capita GNP and per capita income or expenditure are in survey year dollars.

Table 2—Household structure, by gender of household head

Country	Household size		Children 0-5		Children 6-15		Adults 16-65		Adults over 65		Dependency radio	
	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH
Africa												
Botswana	6.93	6.37	1.41	1.59	2.57	3.12**	3.01	2.95	0.47	0.32	1.57	2.00***
Côte d'Ivoire	8.29	5.67***	1.80	1.38***	2.66	1.74***	4.34	3.02***	0.24	0.19	1.19	1.28
Ethiopia	6.37	5.08**	1.58	1.00**	2.26	2.25	2.87	2.21**	0.31	0.13	1.66	2.03
Ghana	5.38	4.21***	1.19	0.90***	1.48	1.37*	2.54	1.76***	0.18	0.19	1.10	1.63***
Madagascar	6.34	4.16***	1.38	0.47***	1.74	1.68	3.02	1.84***	0.19	0.16	1.27	1.58
Rwanda	5.80	4.24***	1.54	0.57***	1.43	1.33	2.69	2.14**	0.15	0.19	1.30	1.21
Asia												
Bangladesh	6.11	4.08***	1.29	0.70***	1.90	1.33***	2.91	2.02***	0.17	0.13	1.32	1.42
Indonesia	4.72	3.63***	0.71	0.55	1.40	0.95*	2.94	2.65	0.07	0.05	0.86	0.66
Nepal	7.41	4.06***	1.54	0.39***	1.95	0.94**	3.96	2.56**	0.10	0.17	1.01	0.90
Latin America												
Honduras	6.54	5.75*	1.92	1.75	1.97	1.84	2.58	1.97***	0.08	0.19	1.71	2.51***

Notes: 1. MHH: male-headed households; FHH: female-headed households.
2. Dependence ratio is defined as the number of persons younger than 15 or older than 65, divided by persons between 15 and 16 years of age.

Table 3—Poverty measures, by gender of household head, alternative income measures (percentages)[a]

	Poverty line: $365 per person per year, in local currency, current prices[b]											
	Total expenditure (income) per capita						Total expenditure (income) per adult equivalent					
	P0		P1		P2		P0		P1		P2	
	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH	MHH	FHH
Africa												
Botswana	5.8	2.4	1.3	0.7	0.4	0.3	5.0	1.8	1.5	0.6	0.6	0.3
Côte d'Ivoire	31.7	24.0*	8.5	6.3	3.2	2.8	32.3	31.0	8.2	9.4	0.0	0.0
Ethiopia	99.6	100.0	81.4	86.0	69.1	75.5	99.6	100.0	81.6	84.7	69.5	74.1
Ghana	62.0	69.9***	30.6	36.3	19.6	24.4***	66.5	69.6	33.3	36.6**	21.4	24.5***
Madagascar	70.0	84.2	32.2	39.9	18.7	25.5	68.8	84.2*	32.6	42.9	18.5	25.3
Rwanda	99.4	100.0	70.1	66.8	51.3	46.0	99.4	100.0	71.0	70.1	52.1	50.7
Asia												
Bangladesh	63.5	85.3***	19.8	37.3***	8.4	19.8***	62.1	88.5***	19.1	38.4***	7.8	20.2***
Indonesia	87.8	85.0	57.6	58.3	99.6	99.6	80.1	85.0	42.0	49.7	99.3	99.1
Nepal	95.5	94.4	65.0	68.8	48.1	51.3	95.1	94.4	65.1	71.1	48.2	55.1
Central America												
Honduras	67.4	65.6	38.3	42.0	26.9	30.4	70.0	68.8	39.1	40.5	27.1	29.0
	Poverty line: $365 per person per year, local currency, using purchasing power parity conversion[c]											
Africa												
Botswana	0.0	0.6	0.0	0.2	0.0	0.0	0.8	0.6	0.1	0.2	0.0	0.0
Côte d'Ivoire	8.2	6.2	1.5	1.8	0.5	0.8	7.5	9.3	1.4	2.8	0.4	1.3
Ethiopia	99.6	100.0	80.2	85.0	67.4	74.1	99.6	100.0	80.4	83.6	67.9	72.6
Ghana	77.2	85.5***	42.6	49.0***	28.6	34.1***	81.1	85.8***	45.6	49.2***	31.0	34.3***
Madagascar	75.3	84.2	36.5	44.4	21.8	28.8	77.6	89.5	36.8	47.3*	21.6	29.1
Rwanda	98.8	100.0	68.3	64.8	49.1	43.6	99.4	100.0	69.3	68.3	49.8	48.4
Asia												
Bangladesh	46.0	73.8***	12.5	28.9***	4.9	13.6***	45.1	75.4***	11.9	28.8***	4.3	14.1***
Indonesia	90.5	90.0	62.1	62.9	99.7	99.6	83.7	85.0	47.8	54.8	99.4	99.2
Nepal	77.2	94.4**	39.3	41.6	23.4	23.6	77.6	88.9	39.2	48.0	23.5	29.2
Central America												
Honduras	70.3	65.6	40.6	43.7	28.7	32.2	71.6	68.8	41.4	42.6	28.9	30.7
	Poverty line: 33rd-percentile of combined distributions of MHH and FHH[c]											
Africa												
Botswana	30.2	35.3***	11.6	10.0*	6.2	4.5***	34.3	31.6	12.3	9.5***	6.6	4.0***
Côte d'Ivoire	33.4	26.1***	9.0	7.9*	3.4	3.6	32.9	37.1	8.3	11.4***	3.0	5.3***
Ethiopia	32.8	38.1	14.9	18.9	9.3	12.6	33.1	35.1	16.0	18.1	9.9	13.1
Ghana	30.7	37.9***	13.8	18.1***	8.5	11.6***	31.1	36.7***	13.9	17.0***	8.6	10.8***
Madagascar	30.6	48.1***	10.2	18.4***	4.7	8.3***	32.7	44.3***	10.2	14.2	4.6	7.1
Rwanda	33.6	23.6***	6.7	1.8**	2.0	0.3***	33.2	25.8	7.3	5.4	2.3	1.4***
Asia												
Bangladesh	27.0	68.2***	6.4	21.7***	2.2	9.0***	28.6	62.4***	6.2	21.7***	2.1	9.0***
Indonesia	31.6	45.0	9.0	11.4	3.5	4.0	30.8	55.0**	7.9	13.8*	2.7	4.1
Nepal	33.0	32.9	9.9	8.6	4.1	2.6**	32.2	43.8***	9.4	14.1***	3.9	5.5
Central America												
Honduras	33.5	30.4	16.9	18.0	11.5	13.1	33.0	32.6	16.2	17.4	11.0	12.0

[a] Observations are at the household level.
[b] Annualized poverty line of $1 per person per day in 1985, converted using purchasing power parity exchange rates and CPI to local currency in the survey year.
[c] Poverty measures are based on a 33-percentile poverty line for the combined distribution of male- and female-headed households.
* = Differences significant at 0.10.
** = Differences significant at 0.05.
*** = Differences significant at 0.01.

Table 3a—Frequency with which female-headed households have higher poverty measures than male-headed households

	Frequency with which FHH have higher poverty levels than MHH (out of 10 comparisons). The number of those differences that are significantly different at the 5 percent level are reported in parentheses.					
	Per capita measure			Per adult equivalent measure		
	P0	P1	P2	P0	P1	P2
Poverty line: $365 per person per year, local currency, current prices	5(2)	7(1)	5(2)	6(1)	8(2)	6(2)
Poverty line: $365 per person per year, local currency, PPP conversion	6(3)	9(2)	6(2)	8(2)	9(2)	7(2)
Poverty line: 33rd percentile of distribution of all individuals	6(4)	6(3)	7(3)	7(5)	8(4)	8(3)

Source: Table 3.

Table 4—Poverty measures of males and females, alternative income measures (percentages)[a]

	Poverty line: $365 per person per year, in local currency, current prices[b]											
	Total expenditure (income) per capita						Total expenditure (income) per adult equivalent					
	P0		P1		P2		P0		P1		P2	
	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females	Males	Females
Africa												
Botswana	5.0	4.1	0.7	0.6	0.5	0.4	4.4	3.5	1.2	0.8	0.5	0.3*
Côte d'Ivoire	39.1	39.1	10.8	10.8	4.2	4.2	37.9	37.0	10.1	9.7	3.9	3.7
Ethiopia	99.8	99.5	83.6	83.6	72.3	73.0	99.9	99.3	83.6	83.4	72.3	72.7
Ghana	68.3	71.8***	33.6	35.5***	20.1	21.2*	67.3	69.6**	32.6	34.1**	72.3	72.7
Madagascar	73.2	74.6	32.9	36.4**	19.2	22.1**	69.1	72.6	32.8	35.5	18.7	20.5
Rwanda	99.4	99.1	71.2	71.2	49.6	50.5	99.4	99.1	70.8	70.5	49.3	49.6
Asia												
Bangladesh	62.9	65.9**	20.1	21.7**	8.8	9.7**	61.1	63.6*	19.0	20.5**	8.0	8.8**
Indonesia	87.2	89.4	58.2	60.3	41.9	43.8	80.0	82.8	42.5	44.2	25.9	27.1
Nepal	95.7	96.4	66.5	67.2	52.7	52.6	95.3	95.0	66.2	66.6	51.8	51.4
Central America												
Honduras	69.9	70.6	40.5	42.0	28.5	30.1	70.4	72.0	40.1	41.5	27.9	29.5
	Poverty line: $365 per person per year, local currency, using purchasing power parity conversion[c]											
Africa												
Botswana	0.6	0.6	0.1	0.1	0.0	0.0	0.7	0.3	0.1	0.1	0.0	0.0
Côte d'Ivoire	10.9	10.7	2.1	2.1	0.7	0.7	9.6	9.2	1.9	1.8	0.6	0.6
Ethiopia	99.8	99.5	82.5	82.8	70.8	71.5	99.9	99.3	82.5	82.4	70.8	71.3
Ghana	84.5	87.2***	46.9	49.2***	29.6	31.0**	84.5	85.9*	45.9	47.5**	28.8	29.8*
Madagascar	78.3	79.6	37.4	40.7**	22.3	25.3**	80.4	81.4	37.1	39.7	21.8	23.9
Rwanda	99.4	99.1	71.2	71.2	50.5	50.3	99.4	99.1	69.1	68.7	49.5	49.2
Asia												
Bangladesh	45.6	49.0**	13.1	14.3**	5.2	5.9**	43.7	46.5*	12.0	13.1**	4.5	5.2**
Indonesia	90.3	92.1	62.6	65.0	46.9	48.9	83.5	85.8	48.3	50.0	31.2	32.6
Nepal	80.8	81.2	40.9	41.9	24.5	25.3	80.8	80.3	40.2	40.5	24.0	24.4
Central America												
Honduras	72.0	72.9	42.8	44.2	30.3	31.9	71.9	73.8	42.4	43.8	29.8	31.4
	Poverty line: 33rd-percentile of combined distributions of males and females[d]											
Africa												
Botswana	33.8	32.9	11.2	10.3	5.5	5.5	34.7	31.9	11.3	10.2	5.5	4.8
Côte d'Ivoire	33.1	33.1	9.0	9.3	3.4	2.5	33.6	32.7	8.7	8.3	3.3	3.1
Ethiopia	32.6	33.8	14.9	15.6	9.2	9.9	32.1	34.3	15.7	16.6	9.9	10.5
Ghana	32.0	34.1**	13.2	14.2**	7.1	7.5	32.4	33.7	12.8	13.6	6.8	7.2
Madagascar	30.3	36.0**	9.8	11.9*	4.4	5.4	32.1	33.9	9.6	11.1	4.4	5.2
Rwanda	32.7	33.5	6.3	6.2	1.9	1.8	32.9	34.1	7.1	7.2	2.2	2.2
Asia												
Bangladesh	31.8	34.3*	8.0	8.9*	2.9	3.4**	32.1	33.9	7.2	8.1**	2.5	3.0**
Indonesia	31.3	34.9	8.4	9.6	3.1	3.7	31.1	34.5	8.3	9.1	2.9	3.3
Nepal	32.5	33.5	9.5	10.2	3.9	4.3	32.8	33.7	9.2	9.9	3.9	4.2
Central America												
Honduras	32.0	34.4	16.2	17.7	10.9	10.4	31.6	34.3	15.5	17.1	10.4	11.8

[a] Observations are at the household level.
[b] $1 per person per day in 1985 converted using official exchange rate and CPI to the survey year.
[c] $1 per person per day in 1985 converted using purchasing power parity exchange rate for the survey year.
[d] 33-percentile poverty line for the combined distribution of males and females.
* = Differences significant at 0.10.
** = Differences significant at 0.05.
*** = Differences significant at 0.01.

Table 4a—Frequency with which females have a higher poverty than males

Poverty line selected	Frequency with which females have higher poverty levels than males (out of 10 comparisons). The number of those differences that are significantly different at the 5 percent level are reported in parentheses.					
	Per capita measure			Per adult equivalent measure		
	P0	P1	P2	P0	P1	P2
Poverty line: $365 per person per year, local currency, current prices	6(2)	6(3)	7(2)	5(1)	6(2)	7(1)
Poverty line: $365 per person per year, local currency, PPP conversion	6(2)	7(3)	7(3)	5(0)	6(2)	7(1)
Poverty line: 33rd percentile of distribution of all individuals	8(2)	8(1)	6(1)	8(0)	8(1)	7(1)

Source: Table 4.

Table 5—Poverty profiles for male-headed (MHH) and female-headed households (FHH) and males and females

		33-percentile of combined distribution						33-percentile of combined distribution			
Country	Share of households	Per capita P0	Share of poverty	AE P0	Share of poverty		Share of persons	Per capita P0	Share of poverty	AE P0	Share of poverty
Botswana											
MHH	41.9	30.2	38.2	34.3	43.9	Males	43.9	33.8	44.6	34.7	46.0
FHH	58.1	35.3	61.8	31.6	56.1	Females	56.1	32.9	55.4	31.9	54.0
Total	100.0	33.2	100.0	32.7	100.0		100.0	33.3	100.0	33.1	100.0
Côte d'Ivoire											
MHH	91.9	33.4	93.6	32.9	91.0	Males	48.3	33.1	48.3	33.6	49.0
FHH	8.1	26.1	6.4	37.1	9.0	Females	51.7	33.1	51.7	32.7	51.0
Total	100.0	32.8	100.0	33.2	100.0		100.0	33.1	100.0	33.1	100.0
Ethiopia											
MHH	90.6	32.8	89.2	33.1	90.1	Males	50.2	32.6	49.3	32.1	48.5
FHH	9.4	38.1	10.8	35.1	9.9	Females	49.8	33.8	50.7	34.3	51.5
Total	100.0	33.3	100.0	33.3	100.0		100.0	33.2	100.0	33.2	100.0
Ghana											
MHH	70.7	30.7	66.2	31.1	67.2	Males	49.1	32.0	47.5	32.4	48.1
FHH	29.3	37.9	33.8	36.7	32.8	Females	50.9	34.1	52.5	33.7	51.9
Total	100.0	32.8	100.0	32.7	100.0		100.0	33.1	100.0	33.1	100.0
Madagascar											
MHH	89.9	30.6	85.0	32.7	86.8	Males	51.7	30.3	47.4	32.1	50.3
FHH	10.1	48.1	15.0	44.3	13.2	Females	48.3	36.0	52.6	33.9	49.7
Total	100.0	32.4	100.0	33.9	100.0		100.0	33.1	100.0	33.0	100.0
Rwanda											
MHH	88.9	33.6	91.9	33.2	91.2	Males	48.6	32.7	48.0	32.9	47.7
FHH	11.1	23.6	8.1	25.8	8.8	Females	51.4	33.5	52.0	34.1	52.3
Total	100.0	32.5	100.0	32.4	100.0		100.0	33.1	100.0	33.5	100.0
Bangladesh											
MHH	91.8	27.0	81.6	28.6	83.7	Males	50.0	31.8	48.1	32.1	48.6
FHH	8.2	68.2	18.4	62.4	16.3	Females	50.0	34.3	51.9	33.9	51.4
Total	100.0	30.4	100.0	31.4	100.0		100.0	33.0	100.0	33.0	100.0
Indonesia											
MHH	91.7	31.6	88.6	30.8	86.1	Males	50.2	31.3	47.5	31.1	47.6
FHH	8.3	45.0	11.4	55.0	13.9	Females	49.8	34.9	52.5	34.5	52.4
Total	100.0	32.7	100.0	32.8	100.0		100.0	33.1	100.0	32.8	100.0
Nepal											
MHH	93.2	33.0	93.2	32.2	91.0	Males	51.0	32.5	50.2	32.8	50.3
FHH	6.8	32.9	6.8	43.8	9.0	Females	49.0	33.5	49.8	33.7	49.7
Total	100.0	33.0	100.0	33.0	100.0		100.0	33.0	100.0	33.2	100.0
Honduras											
MHH	90.7	33.5	91.5	33.0	90.8	Males	49.0	32.0	47.2	31.6	47.0
FHH	9.3	30.4	8.5	32.6	9.2	Females	51.0	34.4	52.8	34.3	53.0
Total	100.0	33.2	100.0	33.0	100.0		100.0	33.2	100.0	33.0	100.0

Note: Numbers may not add up to 33.0 due to rounding errors.

Table 6—Poverty comparisons using stochastic dominance methods, per capita expenditure (income), by gender of household head[a]

	First Order Stochastic Dominance[b]					
			Statistical dominance with endogenous bounds[e]			
	Sample dominance[c]	Statistical dominance[d]		Length	Minimum	Maximum
Africa						
Botswana	x	x	mhh	0.04	4,769	5,180
Côte d'Ivoire	x	x	fhh	0.18	140,000	200,000
Ethiopia	x	x	mhh	0.02	131	135
Ghana	x	x	MHH	0.96	1,867	220,000
Madagascar	x	x	mhh	0.00	530,000	530,000
Rwanda	x	x	fhh	0.09	6,332	7,628
Asia						
Bangladesh	x	x	MHH	0.86	6,261	27,000
Indonesia						
Nepal	x	x	mhh	0.04	7,161	8,511
Central America						
Honduras	x	x	mhh	0.00	5,210	7,554
	Second Order Stochastic Dominance[f]					
Africa						
Botswana	x	x	x			
Côte d'Ivoire	x	x	fhh	0.03	200,000	210,000
Ethiopia	x	x	mhh	0.00	1,025	1,025
Ghana	x	x	MHH	0.96	3,351	660,000
Madagascar	x	x	x			
Rwanda	FHH	x	fhh	0.47	4,554	9,780
Asia						
Bangladesh	x	x	MHH	0.88	6,760	100,000
Indonesia						
Nepal	x	x	fhh	0.06	1,003	1,836
Central America						
Honduras	x	x	x			

[a] Both sample dominance and statistical dominance are evaluated between negative and positive infinity.

[b] Uppercase MHH (or FHH) indicates that MHH dominates FHH (FHH dominates MHH). For FSD, one variable dominates another if its distribution function is somewhere below and nowhere above the distribution of the other variable in the relevant range. X means that neither MHH nor FHH dominates.

[c] For sample dominance, we are looking at whether one sample dominates another over the range of values from negative to positive infinity.

[d] For statistical dominance, we are looking at whether we can infer that one distribution dominates another over the range of values from negative to positive infinity. Dominance between the two populations is inferred if there is sample dominance and if the t-ratio between the two curves in the relevant range is greater in absolute value than the critical value 1.65 (at alpha = 0.05).

[e] See text for full explanation. If a capital MHH or FHH is used, the length of statistically significant dominance is greater than the minimum length criterion used, 0.5. If a small mhh or fhh is used, the length is less than the minimum length criterion. If an x is used, length, minimum, and maximum will all be missing, indicating that there is no range of statistically significant dominance. Minimum and maximum are given in terms of the analysis variables, while the length gives the proportion of the two samples combined that are found between the minimum and maximum.

[f] Uppercase MHH (or FHH) indicates that MHH dominates FHH (FHH dominates MHH). For SSD, one variable dominates another if its deficit curve is somewhere below and nowhere above the curve of the other variable in the relevant range. X means that neither MHH nor FHH dominates.

Table 7—Poverty comparisons using stochastic dominance methods, per adult equivalent expenditure (income), by gender of household head[a]

	First Order Stochastic Dominance[b]					
			Statistical dominance with endogenous bounds[e]			
	Sample dominance[c]	Statistical dominance[d]		Length	Minimum	Maximum
Africa						
Botswana	x	x	mhh	0.02	2,893	3,314
Côte d'Ivoire	x	x	mhh	0.00	1,600,000	2,000,000
Ethiopia	x	x	mhh	0.06	242	286
Ghana	x	x	mhh	0.26	74,000	170,000
Madagascar	x	x	mhh	0.08	780,000	960,000
Rwanda	x	x	fhh	0.02	7,219	8,420
Asia						
Bangladesh	x	x	MHH	0.91	8,134	45,000
Indonesia	x	x	fhh			
Nepal	x	x	mhh	0.02	9,308	10,000
Central America						
Honduras	x	x	mhh	0.00	11,000	11,000
	Second Order Stochastic Dominance (Deficit Curve)[f]					
Africa						
Botswana	x	x	fhh	0.06	3,164	4,738
Côte d'Ivoire	x	x	x			
Ethiopia	x	x	x			
Ghana	x	x	MHH	0.96	3,351	66,000
Madagascar	x	x	mhh	0.08	1,100,000	1,400,000
Rwanda	x	x	fhh	0.09	7,472	9,427
Asia						
Bangladesh	MHH	x	MHH	0.92	9,236	150,000
Indonesia	x	x	fhh			
Nepal	x	x	fhh	0.07	1,610	2,211
Central America						
Honduras	x	x	x			

[a] Both sample dominance and statistical dominance are evaluated between negative and positive infinity.

[b] Uppercase MHH (or FHH) indicates that MHH dominates FHH (FHH dominates MHH). For FSD, one variable dominates another if its distribution function is somewhere below and nowhere above the distribution of the other variable in the relevant range. X means that neither MHH nor FHH dominates.

[c] For sample dominance, we are looking at whether one sample dominates another over the range of values from negative to positive infinity.

[d] For statistical dominance, we are looking at whether we can infer that one distribution dominates another over the range of values from negative to positive infinity. Dominance between the two populations is inferred if there is sample dominance and if the t-ratio between the two curves in the relevant range is greater in absolute value than the critical value 1.65 (at alpha = 0.05).

[e] See text for full explanation. If a capital MHH or FHH is used, the length of statistically significant dominance is greater than the minimum length criterion used, 0.5. If a small mhh or fhh is used, the length is less than the minimum length criterion. If an x is used, length, minimum, and maximum will all be missing, indicating that there is no range of statistically significant dominance. Minimum and maximum are given in terms of the analysis variables, while the length gives the proportion of the two samples combined that are found between the minimum and maximum.

[f] Uppercase MHH (or FHH) indicates that MHH dominates FHH (FHH dominates MHH). For SSD, one variable dominates another if its deficit curve is somewhere below and nowhere above the curve of the other variable in the relevant range. X means that neither MHH nor FHH dominates.

Table 8—Poverty comparisons using stochastic dominance methods, per capita expenditure (income), males and females[a]

	First Order Stochastic Dominance[b]					
			Statistical dominance with endogenous bounds[e]			
	Sample dominance[c]	Statistical dominance[d]		Length	Minimum	Maximum
Africa						
Botswana	x	x	males	0.02	6,954	7,102
Côte d'Ivoire	x	x	males	0.23	260,000	420,000
Ethiopia	x	x	females			
Ghana	x	x	MALES	0.81	14,000	420,000
Madagascar	x	x	males	0.30	250,000	470,000
Rwanda	x	x	males	0.00	21,000	21,000
Asia						
Bangladesh	x	x	males	0.40	13,000	24,000
Indonesia	x	x	males	0.01	110,000	110,000
Nepal	x	x	x			
Central America						
Honduras	x	x	males	0.02	91	120
	Second Order Stochastic Dominance (Deficit Curve)[f]					
Africa						
Botswana	x	x	x			
Côte d'Ivoire	x	x	males	0.02	88,000	3,600,000
Ethiopia	x	x	x			
Ghana	x	x	MALES	0.74	17,000	66,000
Madagascar	x	x	MALES	0.67	250,000	1,300,000
Rwanda	x	x	x			
Asia						
Bangladesh	MALES	x	MALES	0.99	4,322	100,000
Indonesia	MALES	x	x			
Nepal	MALES	x	x			
Central America						
Honduras	MALES	x	x			

[a] Both sample dominance and statistical dominance are evaluated between negative and positive infinity.

[b] Uppercase MALES (or FEMALES) indicates that males dominates females (females dominates males). For FSD, one variable dominates another if its distribution function is somewhere below and nowhere above the distribution of the other variable in the relevant range. X means that neither males nor females dominate.

[c] For sample dominance, we are looking at whether one sample dominates another over the range of values from negative to positive infinity.

[d] For statistical dominance, we are looking at whether we can infer that one distribution dominates another over the range of values from negative to positive infinity. Dominance between the two populations is inferred if there is sample dominance and if the t-ratio between the two curves in the relevant range is greater in absolute value than the critical value 1.65 (at alpha = 0.05).

[e] See text for full explanation. If upper-case MALES or FEMALES is used, the length of statistically significant dominance is greater than the minimum length criterion used, 0.5. If lowercase males or females is used, the length is less than the minimum length criterion. If an x is used, length, minimum, and maximum will all be missing, indicating that there is no range of statistically significant dominance. Minimum and maximum are given in terms of the analysis variables, while the length gives the proportion of the two samples combined that are found between the minimum and maximum.

[f] Uppercase MALES (or FEMALES) indicates that males dominate females (females dominate males). For SSD, one variable dominates another if its deficit curve is somewhere below and nowhere above the curve of the other variable in the relevant range. X means that neither males nor females dominate.

Table 9—Poverty comparisons using stochastic dominance methods, per adult equivalent expenditure (income), males and females[a]

	First Order Stochastic Dominance[b]					
			Statistical dominance with endogenous bounds[e]			
	Sample dominance[c]	Statistical dominance[d]		Length	Minimum	Maximum
Africa						
Botswana	x	x	females	0.00	1,432	1,553
Côte d'Ivoire	x	x	females	0.01	130,000	130,000
Ethiopia	x	x	females	0.03	653	836
Ghana	x	x	males	0.27	51,000	85,000
Madagascar	x	x	males	0.07	780,000	820,000
Rwanda	x	x				
Asia						
Bangladesh	x	x	males	0.35	22,000	34,000
Indonesia	x	x	males	0.00	1,200,000	1,200,000
Nepal	x	x	x			
Central America						
Honduras	x	x	males	0.03	161	213
	Second Order Stochastic Dominance (Deficit Curve)[f]					
Africa						
Botswana	x	x	females	0.01	1,553	1,977
Côte d'Ivoire	x	x	males	0.00	55,000	84,000
Ethiopia	x	x	x			
Ghana	x	x	MALES	0.58	44,000	660,000
Madagascar	x	x	x			
Rwanda	x	x	x			
Asia						
Bangladesh	MALES	x	MALES	0.99	7,949	150,000
Indonesia	MALES	x	x			
Nepal	x	x	females	0.00	1,256	1,256
Central America						
Honduras	MALES	x	x			

[a] Both sample dominance and statistical dominance are evaluated between negative and positive infinity.

[b] Uppercase MALES (or FEMALES) indicates that males dominates females (females dominates males). For FSD, one variable dominates another if its distribution function is somewhere below and nowhere above the distribution of the other variable in the relevant range. X means that neither males nor females dominate.

[c] For sample dominance, we are looking at whether one sample dominates another over the range of values from negative to positive infinity.

[d] For statistical dominance, we are looking at whether we can infer that one distribution dominates another over the range of values from negative to positive infinity. Dominance between the two populations is inferred if there is sample dominance and if the t-ratio between the two curves in the relevant range is greater in absolute value than the critical value 1.65 (at alpha = 0.05).

[e] See text for full explanation. If upper-case MALES or FEMALES is used, the length of statistically significant dominance is greater than the minimum length criterion used, 0.5. If lowercase males or females is used, the length is less than the minimum length criterion. If an x is used, length, minimum, and maximum will all be missing, indicating that there is no range of statistically significant dominance. Minimum and maximum are given in terms of the analysis variables, while the length gives the proportion of the two samples combined that are found between the minimum and maximum.

[f] Uppercase MALES (or FEMALES) indicates that males dominate females (females dominate males). For SSD, one variable dominates another if its deficit curve is somewhere below and nowhere above the curve of the other variable in the relevant range. X means that neither males nor females dominate.

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