# The Poverty and Heterogeneity among Female Headed Households Revisited: The Case of Panama*

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October, 1999

(forthcoming in *World Development*)

*abstract*

Investigating whether female headed households (FHHs) are particularly disadvantaged requires more systematic ways of poverty comparisons than typically found in the past. In Panama, while FHHs as a whole appear to be *better-off* on average, such results are somewhat sensitive to assumptions about economies of scale in household consumption, and more disaggregated analysis reveals that particular segments of FHHs, particularly self-reported FHHs with common-law partners living in urban areas, are disadvantaged in both consumption and some non-consumption dimensions. Thus less systematic analysis could fail to identify such 'pockets of poverty' that might deserve special policy attention.

JEL Classification: J12, J16, O18, O54
Key words: female-headed households, poverty, gender, Latin America, Panama.

* This paper was initially written while the author was on the staff of the World Bank. He would like to thank especially Kathy Lindert and Carlos Sobrado for valuable assistance and very useful discussions. He would also like to thank Rosa Elena de De la Cruz, Edith Kowalzyk, Eudemia Perez, and Roberto Gonzalez, all of the Ministry of Planning and Economic Policy (MIPPE) of Panama, and two anonymous referees as well as the editor for very useful comments. The views expressed in this paper do not represent those of the World Bank.

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## 1. INTRODUCTION

While policy discussion regarding female headed households (FHHs) is not new, it is still a controversial issue. As household-level data sets became increasingly available in many developing countries validity of some of the empirical regularities earlier claimed, such as the higher poverty among FHHs, have been somewhat questioned[i], conventional definitions of 'household headship' have been criticized[ii] and policy implications have been debated[iii]. In this paper, we conduct an analysis of FHHs based on the 1997 Panama Living Standard Measurement Study data focusing on one of the central questions of the female headship analysis: Are female headed households proportionately over-represented among the poor, and can female headship be an appropriate targeting criterion for poverty focused policy interventions?

We will argue that in addressing this question we need more systematic ways of poverty comparisons between FHHs and non-FHHs than typically conducted in the past. Such analysis should include sensitivity analyses incorporating some methodological aspects of comparisons in consumption poverty and alternative headship definitions. It should also include non-consumption dimensions of poverty. Our findings from Panama show that the answer to the above question depends on the further disaggregation of various sub-types of FHHs, adjustments of per-capita household expenditure measures in terms of demographic composition of the household, and geographical disaggregation within Panama. We find, in particular, that while the (self-reported) FHHs as a whole appear to be *better-off* than their male headed counterparts on

average, such results are somewhat sensitive to the incorporation of economies of scale in household consumption, and, furthermore, more disaggregated analysis reveals that a particular segment of FHHs, the self-reported FHHs who have common-law partners living in urban areas, are at a great disadvantage in both consumption and some non-consumption dimensions of poverty. The use of less systematic analysis could fail to identify such vulnerable groups who might potentially deserve special policy attention.

## 2. THE POVERTY OF FHHS REVISITED: A REVIEW OF RECENT LITERATURE

A large number of empirical studies have been conducted on the relationship between female headship and poverty, measured by household consumption or income, in developing countries. In general, as a few recent reviews have concluded,[iv] female headship is often found to be associated with higher incidence of poverty. For example, Buvinic and Gupta (1997) reviewed 61 studies examining the relationship between female headship and poverty; 38 studies found that FHHs were over-represented among the poor, additional 15 studies found associations between poverty and some types of female headship, and only eight studies found no evidence of greater poverty among FHHs. Most of the studies are based on the "self-reported" headship definitions although a few had further disaggregation such as *de facto* or *de jure* FHHs[v]. Based on these findings, they argue that "headship should seriously be considered as a potentially useful criterion for targeting antipoverty interventions, especially in developing countries where means testing is not feasible." On the other hand, however, a recently conducted analysis by Quisumbing, *et al.* (1995), using household survey data sets from 10 developing countries, find that while poverty measures among FHHs[vi] tend to be higher in the majority of their sample

countries (7 out of 10), in a third to a half of them statistically significant, such evidence may not be necessarily robust; in particular, their analysis using stochastic dominance tests reveals that it is only in two countries (rural Ghana and Bangladesh) out of the ten where FHHs have *consistently* higher poverty among the bottom third of population. Their general conclusion thus is that "differences between male- and female-headed households among the very poor are not sufficiently large that one can conclude that one is unambiguously worse- or better-off."[vii] While it is difficult to draw any systematic conclusions from these studies with rather different findings,[viii] at least the latter study casts some doubts about the robustness of the often claimed association between the *general* female headship and higher poverty.

One of the main reasons behind such seemingly contradicting conclusions appears to be the fact that FHHs constitute a heterogeneous group of households with different types of FHHs with different reasons for becoming female headed. Thus the compositions of different types of FHHs are likely to be different across countries and across different areas within countries. Generally, detailed country studies tend to suggest that the relationships between female headship and poverty could differ significantly depending on the further disaggregation of reported headship by marital status and other demographic characteristics, or on alternative headship definitions.[ix] Dréze and Srinivasan (1998), for example, focus on the poverty of widow-headed households, who are found to be more disadvantaged than the more general categories of FHHs. A few studies employed alternative 'economic' definitions of female headship; while Rosenhouse (1989) finds that use of her 'working head' definition identifies stronger positive relation between female headship and greater poverty compared to the self-reported headship in

Peru, Rogers (1995), with an 'economic definition' of headship in terms of earned income, as well as Handa (1994) with the 'working headship' definition, arrives at an opposite conclusion in Dominican Republic and in Jamaica, respectively. Furthermore, as Buvinic and Gupta's review also points out, even within the same subtype of FHHs the likelihood of such households being poor differs depending on specific country situations.

In addition to the large heterogeneity among FHHs, there are also methodological issues involved in the analysis of household expenditure data that could affect the conclusions drawn regarding the association between female headship and poverty. One of such issues is the adjustment of per-capita consumption expenditure measures with adult-equivalence scales and economies of scale. Such adjustments could potentially lead to significantly different policy implications when, as is often the case, there are systematic correlations between female headship, on the one hand, and household composition and household size, on the other. Also of potential importance is the sensitivity of the female headship-poverty relationship with respect to alternative poverty measures and poverty lines. For example, both Dréze and Srinivasan (1998) in India and Bhushan and Chao (n.d.) in Ghana find that ignoring economies of scale would underestimate the poverty of FHHs enough to lead to 'rank reversals' while ignoring adult equivalent scales has relatively small quantitative effects. Louat *et al.*(1992), on the other hand, find relatively large effects of adult equivalence adjustments as well as of using alternative poverty measures. Quisumbing *et al*.(1995) find that whether or not FHHs are over-represented among the poor somewhat depends on the level of the poverty line, while Dréze and Srinivasan (1998)'s results were found to be robust across a wide range of poverty lines.

Therefore, despite the conclusions drawn by some observers, many (though with some exceptions, as noted above) past studies on the relationships between female headship and poverty were likely to be clouded by many factors, including the ambiguity in the definition of the headship concept in data, lack of distinction among very different types of female headship situations and among potentially different regional contexts within countries, and possible sensitivity of findings to alternative adjustment methods in incorporating household demographics into household expenditure (or income) measures. In order to obtain policy implications, such as the relevance of the female headship as a criterion for targeted anti-poverty interventions, we need to understand systematic relationships between different types of female headed households and poverty under different circumstances, which in turn will require more systematic analyses than generally conducted in the past, incorporating all of these factors mentioned above for each country. None of these past studies appears to have incorporated the combination of all of these possible dimensions of sensitivity analyses simultaneously. Our analysis of the Panamanian case is intended as an attempt in such a direction.

In addition, there are many non-income dimensions of poverty that need to be examined in order to obtain a fuller picture of the poverty of FHHs. Above all, the issues that have drawn particularly high attention are the 'time poverty' aspects of FHHs and intergenerational transmission of disadvantages of FHHs, mainly through the nutritional status and education of children. Because of the 'double day burden' on the female heads of economic support and household chores, it is often argued, female heads are more likely to be 'time poor' (that is, consume smaller amount of leisure time), than female or male heads of jointly-headed

households. Studies based on a few (though often incomplete) data sets do seem to suggest that female heads of households tend to consume smaller amount of leisure.[x]

Furthermore, such "substitution of work for leisure to achieve a certain level of consumption in female-headed households may signify the perpetuation of poverty into the next generation," (Buvinic and Gupta 1997). The issue of the possibility of intergenerational transmission of disadvantages in FHHs is rather complicated, since there are at least two counteracting forces in operation here. On one hand, if FHHs indeed tend to be poorer than non-FHHs in terms of income, then it implies that children's welfare may be lower in FHHs, through lower consumption (including food consumption), lower education expenditures, and so on. Furthermore, the 'double day' burden on the female heads could potentially place burden on children's time by forcing them to supplement or substitute their mothers' work, thereby leading to possibly less time for own education. On the other hand, however, there has been some evidence that women tend to allocate greater shares of household resources toward their children than men do, *cetris paribus*.[xi] If so, children within FHHs, presumably benefiting from such stronger preferences of the female head toward children, might be *better-off* than their counterpart in non-FHHs with same levels of income, because of the systematic differences in the patterns of household resource allocation as a result of differential preferences between women and men. Which of these counteracting forces tends to dominate is an empirical question. It is thus not surprising that we find mixed results from empirical studies regarding the positive or negative association between female headship and the welfare of children. For example, Buvinic and Gupta (1997)'s review finds that among the 29 studies they covered there

was "a *slight* bias toward finding more protective effects in Africa, but recent studies report this phenomenon also in Latin America and the Caribbean" (italic added) when the poverty outcomes are measured by nutritional status and educational outcomes of children.

## 3. PANAMANIAN CONTEXTS AND THE DATA

As of 1997, Panama had a per capita GDP of US$3,080 with over two million people. The 1997 Living Standard Measurement Study (LSMS) survey, conducted by the Ministry of Planning and Economic Policy (MIPPE), indicates that the nationwide headcount poverty ratio in 1997 was 0.37, that its income inequality was among world's highest with Gini coefficient of 0.6[xii], and that the headcount poverty ratio had fallen between 1983 and 1997. (World Bank 1999) In analyzing the poverty of FHHs measured by consumption expenditures, we will use the poverty line calculated by the World Bank; it is based on the minimum per-capita average daily caloric requirement of 2,280 plus a specific level of allowance for non-food items (33%) which is based on the actual expenditures by the households whose consumption expenditures are around the level of the minimum caloric requirement. The annual per capita expenditure at the poverty line thus derived is B$905.[xiii]

In Panama, gender disparity does not appear to be as pressing an issue as in some other parts of the world, such as in South Asia. For example, on average years of schooling is higher among girls than among boys (the reverse is true in indigenous areas, however). There is no evidence of gender bias against girls in child nutrition, nor is there evidence of gender discrimination in earnings after controlling for education and other observed characteristics. At the same time, however, there is some evidence that unemployment rate is higher among women,

that gender barriers exist in terms of sector of employment and of promotion within firms, that rural women are more constrained than men in access to credit and extension services, and that domestic violence could be a serious problem.[xiv]

There appears to be an increasing trend in the proportion of FHHs in many countries including Panama. (Buvunic and Gupta 1997) Regarding the poverty of FHHs in Panama, the only previous study known to the present author is the one by Sahota (1990) based on the National Socioeconomic Survey in 1983; it found that the general female headship was associated with lower consumption expenditure and higher poverty in the context of multiple regression analysis. On the other hand, more recent set of studies in Latin America (not including Panama), all based on data in the mid 1990s, indicates that FHHs are not necessarily overrepresented among the poor; among the 14 Latin American counries under study only in six of them were FHHs overrepresented among the poor.[xv]

In the rest of the paper, we will examine the poverty of FHHs in Panama using the 1997 LSMS. The interviews were conducted during the period between July and September of 1997. The total sample of households with completed questionnaires was 4,938 (representing 650,726 population households nationwide) containing 21,410 individuals (representing the population of 2,732,316 individuals nation wide), and is nationally representative for four geographic areas: urban, rural indigenous, rural remote access and rural non-indigenous.[xvi] Here an 'urban' area is defined as any area with more than 1,500 persons per kilometer.[xvii]

In our analysis of FHHs we will follow the geographical disaggregation among urban (representing 56% of total population), rural (35%) and indigenous areas (9%), as adopted by the

LSMS sampling, since dynamics of becoming FHHs and possible disadvantages among FHHs could potentially be different among these groups. In general, there may be relatively more economic opportunities and less social constraints on women in urban than in rural areas. Such factors in urban areas, in turn, may affect (weaken) the stability of marriage and may also affect (increase) the prevalence of un-married relationships, thereby affecting the prevalence of female headship in general. (e. g., Chant 1997: 93) Furthermore, Panama is often characterized by its highly dualistic development pattern with its major cities (such as Panama City and Colon) hosting the "internationally-oriented, modern, dynamic service 'enclaves,'" suggesting potentially very sharp urban-rural differences.[xviii] We can observe that both female labor force participation and the share of FHHs are higher in urban than in rural areas. In addition, the rural-urban disaggregation could be also appropriate given the way some sub-categories of FHHs may arise in each area; for example, rural-urban migration of male household heads creates *de facto* FHHs (to be defined below) in rural areas which may be economically supported by the remittances from their husbands working in urban areas while such migration could potentially induce *de jure* FHHs in urban areas if such migrants engage in extra-marital relationships in their destinations. Furthermore, while there might be more economic opportunities for women in urban areas, the level of social capital, arguably a major asset among the poor, appears to be much lower in urban areas than in rural areas. (Pena and Lindo-Fuentes 1998)

In Panama, its major indigenous population has historically been concentrated in certain geographical regions although smaller number of them live in all of Panama's provinces. These indigenous people live in rural settings, mainly engaged in agriculture, and their labor is

organized by sex and age.[xix] Although such characteristics may be similar to other (non-indigenous) rural areas, indigenous areas are characterized by very low productivity and extremely high (i. e., much higher than the other rural areas, as we will see later) incidence of poverty. In addition, in contrast with non-indigenous areas, there is a gender gap in education among children in indigenous areas. Also indigenous people appear to face discrimination in labor market, such as lower earnings after controlling for education and other worker characteristics. (World Bank 1999) At the same time, however, measures of 'social capital' in indigenous areas tend to be higher than urban or non-indigenous rural areas, and there is some indication that higher social capital may provide more possibilities for women to 'realize their potential.' (Pena and Lindo-Fuentes 1998) It appears that these various differences among urban, rural and indigenous areas could potentially affect the poverty outcomes among FHHs in different ways.

## 4. SHARES OF FHHS WITH ALTERNATIVE HEADSHIP DEFINITIONS

Before looking into the poverty of FHHs in Panama using alternative headship definitions, we will briefly examine the question: to what extent do different definitions of FHHs identify different sets of households as female headed? As we can see from Table 1, at the national aggregate level, self-reported female headed households represent a little less than one quarter (22%) of the total households. FHHs tend to have a higher share in urban area (28%) and lower shares in rural and indigenous areas (17% and 15%, respectively). Table 2 shows the degree to which alternative definitions of FHHs identify different sets of households as female headed. If the households identified as FHHs by alternative definitions do not vary much then

applying alternative definitions in analyzing the poverty of FHHs would be of little value. In our analysis, we will differentiate seven sub-categories of self-reported FHHs: 1. *de jure* FHHs (i. e., those self-reported FHHs where the reported head is either unmarried/single, divorced/separated, or widowed), further disaggregation of *de jure* FHHs according to the head's marrital status (i. e., 2. unmarried, 3. divorced or separated, and 4. widowed), 5. self-reported FHHs who have spouses ('*casada*'), 6. self-reported FHHs who have unmarried/common-law male partners ('*unida*'), and 7. *de facto* FHHs (i. e., those self-reported FHHs where the reported head has her spouse or common-law male partner but they are not physically present[xx]). In addition, we will also use three alternative (non-self reported) definitions of FHHs. Such alternative definitions of FHHs include what can be called a purely demographic definition and economic definitions. For the former, we will use 'Potential FHHs' (i. e., those households where there is no working age male –defined as between age 15 and 60– is present). The 'potential FHH' definition of FHHs has been used when analyzing a data set containing demographic compositions but not economic activities, such as in censuses.[xxi] For the 'economic definition' of FHHs, which signifies the aspect that the main economic supporter of the household is female rather than male, we follow Rosenhouse (1989)'s definition of the 'working head'; we identify the household member who contributed more than 50% of the total hours of work (including paid labor market hours, unpaid hours on farm and on family enterprises, *but excluding* household chores or child care) by all the household members combined during the week preceding the survey interview and 'working' FHHs are identified as those households where such main labor-hour contributor is a woman. Finally, we take a look at the intersection of both economic and demographic definitions of

household headship. For that purpose, we identify those FHHs, what we might call 'Core FHHs,' which qualify as female headed by both the 'working head' definition and the 'potential FHH' definition of female headship –this should identify the households that conceptually fit the prototypical notion of FHHs: i. e., the absence of any steady male partner and the female being the primary economic supporter of the household.

As we can see in Table 2, the households identified as FHHs do differ significantly depending on which definition of household headship is adopted. In most of the cases the overlap appears typically around 40 to 60%. For example, among the self-reported FHHs, only about 40% of them are also classified as female headed with the 'working head' definition while 50% of them also qualify as 'potential FHHs' (see the first column of Table 2). This seems to indicate that the degree of economic support is not as strong a factor as demographic composition in self-reported headship in Panama; this appears consistent with the view that women's economic contribution is often under-recognized in the self-definition of the headship, compared to other factors such as age, asset ownership and the conventionally assumed role (or norm) of male authority. Conversely, among the FHHs defined by the 'working head' definition, only 57% are also self-reported as FHHs and 48% are also classified as 'potential FHHs.' (last column of Table 2).

(TABLE 1 AND 2 AROUND HERE)

## 5. CONSUMPTION POVERTY OF FHHS IN PANAMA

### (a) Headcount poverty ratios by alternative female headship definitions

Table 3 reports the headcount poverty ratios, applied to per capita household

expenditures, of FHHs versus the rest of the households. At the national aggregate level, there is no evidence that FHHs, whether self-reported (without any further breakdown), or by purely demographic or economic ('working head') definition, are more likely to be poor than non-FHHs. It appears that the opposite is true; the headcount poverty ratio among self-reported FHHs is 29% while that of self-reported 'male headed' households is 40% and the difference is statistically significant.

(TABLE 3 AROUND HERE)

Given the large heterogeneity among FHHs, however, more appropriate question would be: what type of FHHs, if any, are over-represented among the poor and thus worthy of special policy attention? Once we start disaggregating self-reported FHHs by marital status, we find slightly more subtle patterns. For example, among some sub-groups of the self-reported FHHs, while those with legally married spouses (*casada*) do not have higher headcount poverty ratios in any of the area, the self-reported FHHs with common-law partners (*'unida'* category) have significantly higher headcount poverty ratios nation-wide, in urban and in indigenous areas. Such households are, however, a very small minority. We can also further disaggregate *de jure* FHHs among those headed by widows, by separated or divorced, and by single women. *De jure* FHHs headed by widows and by divorced or separated women have significantly higher headcount poverty ratios in indigenous areas but not in any other area. What really stands out in indigenous areas, however, is the overwhelmingly high incidence of poverty in indigenous areas, with mostly over 90% poor. In such a situation, gender of headship is not quite an issue since virtually every one is poor in most cases.[xxii] In fact, disaggregated analysis of the male-headed

households (not reported) reveals that there is no significant difference in the headcount poverty ratios between FHHs and male headed households in any of the disaggregated categories of headship in indigenous areas.

Now departing from the self-reported female headship definition, we turn to the headship analysis using the purely demographic and 'economic' definitions. We find again that these FHHs are significantly *less* likely to be in poverty than are the rest of the households. Our results present a sharp contrast with Rosenhouse (1989)'s findings from Peru where FHHs defined in terms of 'working head' tended to have higher headcount poverty ratios than self-reported FHHs, and are more in line with Rogers (1995)' findings from Dominican Republic and Handa (1995)'s from Jamaica that the use of 'economic' headship definitions, rather than that of self-reported headship, tends to make FHHs appear economically better off. Finally, the 'core' FHH categories also turn out to be less likely to be poor than non-FHH.[xxiii]

Such somewhat mixed patterns seem to suggest that the dynamics of becoming female heads of households and the reasons why particular sub-categories of FHHs may be poorer differ among urban, rural and indigenous areas. The higher poverty among FHHs with unmarried partners (*unida*) in urban areas, for example, might be due to the much greater economic opportunities for women which enable them to sustain FHHs and, in addition, to the existence of multiple female partners of some Panamanian men that is much more prevalent in urban than in other areas.[xxiv] In some parts of the world, such as in South Asia, widows have long been recognized as being particularly disadvantaged and poor;[xxv] in Panama, however, there is not an indication that widows are disadvantaged, in terms of consumption poverty, in non-indigenous

rural areas.

(TABLE 4, 5, 6 AND 7 AROUND HERE)

(b) Headcount poverty ratios with adult equivalence and economies of scale taken into account

In our analysis above, we have used per capita consumption expenditures as the indicator of the welfare level of the household. There are at least two additional considerations as to how, in theory, a consumption measure of household welfare could better incorporate differences in demographic composition of the households than the simple per capita measure: adult equivalence scales and economies of scale. Since the consumption needs of children may be met at lower cost than those of adults, the per capita consumption measure could understate (overstate) the welfare level of the households with larger (smaller) proportion of children, given the same total number of household members. Furthermore, if economies of scale exist in household consumption, then the per capita consumption measure could understate (overstate) the welfare level of larger (smaller) households given the same level of per capita consumption level. We conduct sensitivity analyses using a range of alternative parameter values that appear plausible for both adult equivalence scales and the economies of scale in household consumption. In general, if there are systematic differences in the household size and household composition (especially in terms of the proportion of children among the household members) between female headed and non-female headed households, then the welfare level would be systematically under- or over-stated between these two categories.

Our data from Panama show that the proportion of children among household members

tends to be smaller in self-reported FHHs than in non-FHHs. The average number of children (age 15 or below) among self-reported FHHs, for example, is 1.19 while that among non-FHH is 1.69, and average shares of children of age 15 or below in the total number of household members are 24% among self-reported FHHs and 29% among non-FHHs. Thus incorporating adult equivalence scales could potentially increase the estimated headcount poverty ratios among FHHs. Tables 4 through 7 summarize qualitative results of various sensitivity and other analyses of poverty of FHHs to be discussed in the rest of the paper. [xxvi] It turns out that incorporating adult equivalent scales has very small quantitative effects on estimates of headcount poverty ratios and thus has virtually no effect on qualitative conclusions obtained from the estimates using simple per capita measures[xxvii].

Since female headed households often tend to be of smaller size than non-female headed households, some recent studies have found that the difference in headcount poverty ratios between female headed and male headed households is sensitive to the assumption about the degree of economies of scale in household consumption,[xxviii] and that incorporating the economies of scale assumption tends to increase the headcount poverty ratios among FHHs. In our Panamanian data, the average household size among self-reported FHHs is 3.7, while that among self-reported male headed households is 4.5. Following Lanjouw and Ravallion (1995), we use the economies-of-scale-adjusted per-capita consumption expenditures ($x_i$) defined as:

$$x_i \equiv \frac{X_i}{n_i^{\theta}},$$

where $X_i$ is the total household consumption expenditure for household i, $n_i$ is the household size and $\theta$ is the 'size elasticity' measuring the degree of economies of scale in household

consumption, varying between 0 and 1 (where the smaller the □ becomes within the range the higher is the degree of economies of scale, with the □ value of 1 representing no economies of scale –thus $x_i$ reduces to per capita expenditure – and value 0 representing a situation where all household consumption has public good property –$x_i$ equals total household expenditure – [xxix]; in our analysis we used values between 1.0 and 0.2).[xxx] We find that the point estimates of headcount poverty ratios are somewhat sensitive to the economies of scale assumptions. Generally as the value of □ decreases we tend to observe an increasing number of 'rank reversal' where the headcount poverty ratios of FHHs become higher than those of non-FHHs. However, many of such changes tend *not* to be statistically significant. This makes it difficult to draw unambiguous conclusions about poverty comparisons in many instances.

(c) Sensitivity to alternative poverty measures and alternative poverty lines

So far we have focused on the headcount poverty ratios, and thus have not taken into account the degree or depth of poverty. In order to examine the sensitivity of above findings when distribution among the poor is taken into account, we apply a few alternative poverty measures to poverty comparisons between FHHs and the rest of the households; alternative measures used here are the poverty gap ($P_1$), Foster-Greer-Thorbecke measure (FGT) with its '□' parameter equal to two ($P_2$), and Amartya Sen's measure ($P_{Sen}$).[xxxi] Our results show, as summarized in the 9th to 11th rows in Tables 4 through 7, that the patterns of poverty comparisons between female headed versus non-female headed households do not change except for a relatively small number of cases. In none of such cases is the initial difference in the headcount poverty measures statistically significant and thus our overall observations from headcount

measures do not seem to be affected significantly by the use of alternative poverty measures that take into account distribution among the poor.

Another aspect of sensitivity analysis in poverty comparisons concerns the level of the poverty line. In order to examine the sensitivity of our findings above, we conducted first order stochastic dominance test with B$2,000, which is roughly twice the poverty line used above, as the upper bound. Using this analysis, if the poverty incidence curve of non-FHHs (FHHs) is found to be first order stochastic dominant over that of FHHs (non-FHHs) within the range, then the headcount poverty ratio of FHHs (non-FHHs) is always higher no matter what the level of the poverty line is as far as it is below the upper bound. Our analysis shows (see the $12^{th}$ rows in Tables 4 through 7) that many of the poverty comparison results emerged in the previous sections are somewhat sensitive to the specific level of the poverty line used, which is in line with Quisumbing *et al* (1996)'s findings; in a majority of the cases the poverty incidence curve of neither FHHs nor non-FHHs dominates that of the other. Nevertheless, at the national aggregate level, roughly half of the cases where FHHs are found to be better-off earlier turn out to be robust regardless of the poverty line while in urban areas a few cases (including that of *unida*-FHHs) with higher poverty among FHHs are also found to be robust.

(d) Multivariate analysis of the consumption poverty of FHHs

There appears to be some systematic correlation between female headship and some dimensions of household characteristics. Thus, the bivariate poverty comparisons we have conducted so far may potentially reflect the results of not so much the poverty (or non-poverty) of FHHs per se as that of the households with particular household characteristics such as small

household size. In order to examine whether female headship is associated with higher or lower poverty after controlling for other household characteristics, we regressed per-capita household expenditures on a set of household characteristics, including a dummy variable for female headed households[xxxii]. The estimated coefficients on the female headship dummies, using alternative definitions of female headship, are summarized in Table 8, and coefficient estimates of the other control variables are presented in Appendix Table 1.[xxxiii] As we saw earlier, one key variable that appears strongly associated with both female headship and poverty is the household size. So we compared the association between female headship and household expenditure with and without the household size variable included. We can see from Table 8 that results are affected by whether or not the household size is controlled. When household size is not controlled for, except in urban areas, female headship has either no statistical association or positive association with per capita household expenditures, especially using purely demographic and 'working-head' definitions. However, once household size is controlled, such positive association completely disappears. Instead, we can find a strong negative association between female headship and household expenditures especially in urban areas, and, to some extent, in rural areas as well as at the national aggregate. That female headship is negatively correlated with household consumption expenditures after controlling for household characteristics is generally in line with an earlier study by Sahota (1990) based on the 1983 data. We can conclude that the greater economic disadvantages of FHHs, to the extent they exist, is mainly an urban phenomenon, where, among many categories of FHHs, female headship is associated with possibility of higher likelihood of poverty, *after* controlling for the household size, household composition and age

and education of the household head.

(TABLE 8 AROUND HERE)

## 6. INTERGENERATOINAL TRANSMISSION OF DISADVANTAGES?: SCHOOL ENROLLMENT RATES OF CHILDREN

### (a) Bivariate analysis

Welfare indicators of children could be particularly important information that is complimentary to current household consumption level, because they suggest the possibility of intergenerational transmission of poverty. When we examine the average proportion of children enrolled in school within the household at the time of the survey with two separate age groups (age 6 to 12 and age 13 to 18) of children by gender, the correlation between the gender of household head and school enrollment of children is not overwhelming as a whole. To the extent there is such correlation, however, at the primary schooling level (age 6 to 12) female headship is generally correlated with higher rather than lower school enrollment of children. Thus indications for the possibility of intergenerational transmission of poverty in FHHs, measured by school enrollment of children at least, appear to be weak.

At the secondary schooling level (age 13 and 18), bivariate correlation between female headship and school enrollment is even less clear than at the elementary level. At this level, higher school enrollment of children, to the extent there is significant correlation, is mainly correlated with 'working head' definitions of FHHs and purely demographic definitions of FHHs, but not so much with the self-reported headship categories (with a few exceptions where there are very small number of observations). In addition, unlike in the case of primary

schooling level, there are a few cases where school enrollment ratios are *lower* in FHH than in non-FHHs. Thus, at the level of secondary schooling when children can be counted as labor force, it appears that in some subcategories of self-reported FHHs, the time burden upon children's labor time is possibly so large as to reduce their school enrollment.

(b) Multivariate analysis

Like the case of consumption expenditure, we also conducted regression analysis in an attempt to assess correlation between children's schooling and female headship after controlling for other household characteristics, such as age and education of the head, per capita household expenditure, household size, household composition and regional dummies. Estimated coefficients on alternative female headship dummies[xxxiv] are summarized in Tables 9 and 10, and more detailed regression results are reproduced in Appendix Tables 2 and 3.[xxxv] Among the children of age 6 to 12, except in urban areas, there tends to be positive association between female headship and higher primary school enrollment, especially in rural areas, after controlling for other household characteristics. An exception to this tendency, however, appears to be the case of urban boys where there is some negative association. Furthermore, as we saw in the bivariate analysis above, the positive impact of the female headship on children's school enrollment, to the extent it exists, becomes much weaker at the secondary school level. Not only are there fewer cases of positive association, but in the case of teenage girls in urban areas the correlation between female headship and school enrollment is mostly negative with about half of the female headship categories having statistically significant effects. Again, to the extent there is substitution between mothers' and children's labor within FHHs, it occurs mostly at teenage

level, and, furthermore, female heads' time use appears more highly substitutable with their teenage girls' time than with boys' within the household resource allocation.

(TABLE 9 AND 10 AROUND HERE)

## 7. TRIPLE BURDEN?

There is a view that FHHs are at a greater economic disadvantage due to the "triple burden;"[xxxvi] (1) the main income earner being female with various disadvantages in the labor market and in other productive activities, (2) the 'head' being both the main earner and responsible for maintaining the household, including household chores and child care, and thus being 'time poor,' and (3) the 'head' often being the single earner (rather than joint) thus facing higher dependency burden. Regarding the first aspect of such 'triple burden,' the earning capacity of a household head partially depends on her or his human capital endowment. We can see in Tables 4 through 7, that when headship is defined in terms of 'working head,' female heads tend to have higher rather than lower education endowment, except in indigenous areas. Among self-reported female heads, however, female heads do seem to have lower level of education in indigenous areas in terms of literacy, and in mainly urban areas in terms of years of schooling. In rural areas, it appears that it is only the female heads without any male partners that have lower education.

Regarding the time burden on the female head of both economic support and household maintenance activities, the second aspect of the 'triple burden,' except for the 'working head' FHHs and FHHs with male partners (with spouse or with common-law partner), female heads indeed tend to work fewer hours than their male counterparts in urban and rural areas.[xxxvii] This

indicates the possibility that the household maintenance activities are the binding constraint on their labor supply. In addition, from school enrollment of children we did not find much strong evidence that children are mainly performing the household maintenance activities in place of their mothers (at least to the extent that such activities become binding constraint on school enrollment) with a possible exception of teenage girls in urban areas; sometimes female headship appears correlated with higher school enrollment, particularly at the primary school level. This again appears to suggest that female household heads are often bearing the 'double day' time burden themselves.

Among the 'triple burden' as described above, the third aspect (i. e., the possibly higher dependency burden) appears least compelling among FHHs in Panama. As summarized in Tables 4 through 7, FHHs (with most of their alternative definitions) have both fewer children and smaller total household size, and it is only a minority of cases where dependency ratios of FHHs are significantly higher than those of non-FHHs. In a number of cases, dependency ratios of FHHs are lower than those of non-FHHs. Furthermore, we find that all the cases of *positive* bivariate correlation observed between female headship and *lower* poverty disappear once household size is controlled for in the context of multiple regression. This suggests that many subcategories of self-reported FHHs are indeed *better off* than non-FHHs *despite* the female heads' possibly lower earning capacities and the 'double day' time burden on female heads, because, in contrast with the common assertion of the 'triple burden,' their dependency burden is often *lower* than that of non-FHHs.

## 8. CONCLUSIONS

We find that self-reported FHHs as a whole are *not* over-represented among the poor in Panama, but that FHHs are rather *better-off* on average than self-reported male headed households. Therefore the broad category of 'female headship' is *not* a useful tool for targeting interventions toward the poor. Furthermore, the familiar assertion of the "triple burden" of FHHs is only partially true, at best, depending on the definitional and geographical disaggregation of household headship.

Nevertheless, our study also indicates that detailed female headship analysis of consumption and non-consumption dimensions of poverty, as well as of other household characteristics, could still be used as a potentially useful starting point for identifying some specific segments of disadvantaged or vulnerable population within the heterogeneous group of FHHs. Our multivariate analysis shows that FHHs often tend to be poorer once household size and other characteristics are controlled for. Furthermore, even within the context of bivariate analyses, we find that some segments of FHHs are indeed disadvantaged, and that such disadvantages of FHHs, to the extent they exist, appear to be largely (though not exclusively) urban phenomena. In particular, urban FHHs with unmarried partners, *unlike many other sub-categories of FHHs*, are particularly disadvantaged, although the number of such households is quite small. In our analysis these households are found to be disadvantaged on both income and non-income dimensions such as higher consumption poverty, household heads being relatively less educated, and higher dependency burden with many children. Beyond that, however, our analysis reveals relatively little about how they come to fall into this type of household headship

in the first place and why they tend to be poor. The main value of the kind of disaggregated analysis as conducted in this paper would be not so much a tool for targeted interventions as a starting point for a focused in-depth study, perhaps of a qualitative approach, which in turn could inform policy makers in terms of policy measures for addressing the poverty of such groups.

Also potentially disadvantaged are FHHs headed by widows in indigenous areas. However, as far as indigenous areas are concerned, more important is the overwhelming prevalence of poverty in the area as a whole, so much so that gender of headship is not an issue – almost everyone is poor. Our study reveals that disaggregated FHH analysis could be a potentially useful first cut at the effort of identifying the poor in some circumstances, but that it is also only one of many possible 'cuts,' some of which can be more important than the gender of headship, in other circumstances.

## NOTES

[i] For example, see Quisumbing, *et al*. (1995) and Louat, *et al*, (1992).

[ii] See Rosenhouse (1989).

[iii] See, for example, Buvinic and Gupta (1997) and Bruce and Lloyd (1997).

[iv] Buvinic and Gupta (1997) and Haddad, *et al*. (1996).

[v] As has been frequently pointed out, in a great majority of studies, the "female household heads" are self-identified by survey respondents without clear *a priori* definition of household headship given in the survey. This ambiguity in the meaning of FHHs found in surveys has been one of the major difficulties for the analysis of FHHs. One approach to address this ambiguity has been to disaggregate self-reported household headship into subsets, such as *de facto* and *de jure* FHHs. An alternative approach has been to completely depart from the self-reported headship and use alternative definitions such as the 'economic definition' of headship. These alternative definitions of headship will be given in the empirical section of the paper later.

[vi] They used self-reported headship definition.

[vii] Quisumbing, *et al*. (1995: 24).

[viii] For example, while the number of *countries* (rather than the number of *studies*) covered in Buvinic and Gupta (1997)'s review is not clear, among the 12 countries specifically mentioned in their main texts of the paper, only two were included in Quisumbing, *et al.* (1995)'s analysis. So one possible source of differing conclusions might be the difference in the country coverage.

[ix] See, Dréze and Srinivasan (1997) on Kenya, DeGraff and Bilsborrow (1992) on Ecuador, Barros, *et al.* (1994). on Brazil, Appleton (1996) on Uganda, and Bruce and Lloyd (1997) for a review.

[x] For example, Bhushan and Chao (n.d.), Louat, *et. al* (1992), and Rosenhouse (1989). But also see, for a counter-example, Handa (1997).

[xi] For example, see Thomas (1990) and Lundberg, Polak and Wales (1997).

[xii] The Gini coefficient based on consumption expenditures was 0.45.

[xiii] See the World Bank (1999) for more details of the calculation of the poverty line.

[xiv] This paragraph draws upon The World Bank (1999).

[xv] Gammage (1998). The six countries are Brazil, Costa Rica, Ecuador, El Salvador and Paraguay, while the rest of countries are Argentina, Bolivia, Chile, Colombia, Dominican Republic, Mexico, Nicaragua and Peru.

[xvi] Because of the very small population share (1.5% of total population), however, in the following analysis the category of "rural remote access" was merged with the "rural non-indigenous" category.

[xvii] This description of the survey design is based on The World Bank (1999).

[xviii] World Bank (1999).

[xix] This paragraph draws heavily on Pena and Lindo-Fuentes (1998).

[xx] *De facto* FHHs are typically defined as those households where self-declared male heads are absent for a large proportion of the time while their spouses are present (e.g., Quisumbing, et al. 1995). The departure of our *de facto* FHH definition from the more conventional one has to do with the way the LSMS survey asked the respondent to identify the 'household head;' when someone who could have been designated as the 'head' (even though LSMS does not specify who should be named as the 'head') was absent for more than 9 months, then it asked the respondent to designate someone else (not necessarily his/her spouse, however) as the household head. On the other hand, if any of the household members included in the survey was away from home for less than 9 months, we cannot identify her/him. Thus, in our case, the only identifiable *de facto* FHHs (any households where 'a male (head) is absent for a particular time period and an adult female is present for a specific period') are those self-reported FHHs where male spouses/partners are recorded as absent.

[xxi] See, for example, Rosenhouse (1989: 9) and Rogers (1995: 2034).

[xxii] I would like to thank two anonymous referees for prompting me to emphasize this point.

[xxiii] One general difficulty that emerges in this type of analysis in further disaggregating FHH categories by area is the diminishing sample size. By further disaggregating FHHs in the data, in some cases the sample size in each cell becomes extremely small; for example, *de facto* FHHs represent less than 2 % of total households except in indigenous areas (where its share is 4%) and observations in indigenous areas become extremely small. In such comparisons, it could be argued that finding statistically significant differences in a few cases may well be random.

[xxiv] This interpretation was suggested by the members of the Ministry of Planning and Economic Policy (MIPPE) of Panama.

[xxv] For example, Dréze and Srinivasan (1997).

[xxvi] Detailed results are not reproduced here, but are available from the author upon request.

[xxvii] That incorporation of adult equivalent scales has small quantitative effects on the poverty estimates of FHHs is in line with the findings by both Bhushan and Chao (n.d.) from Ghana and Dréze and Srinivasan (1997) from India.

[xxviii] Bhushan and Chao (n.d.) and Dréze and Srinivasan (1997).

[xxix] While empirically estimating the value of θ is quite difficult for various reasons, Lanjouw and Ravallion (1995) obtained an empirical θ value of 0.6 based on data from Pakistan. Thus, while the θ value of between 0.5 to 0.6 might be considered a plausible range, the lower bound θ value of 0.2 in our sensitivity analysis perhaps represents an extremely high, if not totally implausible, degree of economies of scale. See Lanjouw and Ravallion (1995) for a discussion of various issues involved in such estimation.

[xxx] In defining the threshold poverty line (z(θ)), the following normalization was adopted:

$$z(\theta) \equiv z(1)m^{1-\theta},$$

where z(1) is the par capita poverty line used in the analysis without economies scale and m is the average household size. See for example, Dréze and Srinivasan (1997), Deaton (1997) and Lanjouw and Ravallion (1995).

[xxxi] Poverty gap ($P_1$), $P_2$, and $P_{Sen}$ are defined, respectively, as: $P1 = \frac{1}{N}\sum_{i=1}^{N}\left(1-\frac{x_i}{z}\right)1(x_i \le z)$,

$P2 = \frac{1}{N}\sum_{i=1}^{N}\left(1-\frac{x_i}{z}\right)^2 1(x_i \le z)$, and $Psen = P0\gamma^P + P1\left(1-\gamma^P\right)$, where $x_i$ is the per capita household expenditures for household i, z is the amount of per capita household expenditure at the poverty line, '$1(x_I \le z)$' takes the value 1 if $x_I \le z$ holds and 0 otherwise, $P_0$ is the headcount poverty ratio, and $\gamma^P$ is the Gini coefficient of

inequality among the poor. The poverty gap measure ($P_1$) places a weight on each poor according to the gap between her/his consumption level and the poverty line; while, unlike the headcount ratio, it is sensitive to income transfers from poor to nonpoor, or form poor to less poor who thereby become nonpoor, it is insensitive to transfers among the poor. Sen's poverty measure ($P_{Sen}$), on the other hand, incorporates inequality among the poor as well as the poverty gap and can be interpreted as an weighted average between the headcount and poverty gap measures with Gini coefficient of inequality among the poor as weights. FGT poverty measures ($P(\alpha)$) are generalization of the headcount ratio and the poverty gap, and a greater value of $\alpha$ in its definition indicates higher sensitivity to inequality among the poor. In particular, the FGT measure with an $\alpha$ value equal 2 ($P_2$) is commonly used because of its sensitivity to distribution among the poor (like $P_{Sen}$) and of its decomposability among subgroups, such as urban versus rural, or FHHs versus non-FHHs (unlike $P_{Sen}$). See, for example, Deaton (1997) and Ravallion (1993) for more details.

[xxxii] As is often pointed out, the use of simple FHH dummy could lead to biased estimates of headship effects if the female headship is endogenous with respect to household total consumption (e.g., if some unobserved factors cause both female headship and higher or lower consumption). Thus our results need to be interpreted with caution with this caveat in mind. In analyzing cross-section data, finding valid instruments for controlling for such potential endogeneity is difficult. Although some crude attempts have been made to instrument the headship variable, following Handa (1996)' s approach, by using combinations of the amount of transfer income, a dummy indicating the household member with highest education attainment being male, and a dummy indicating the oldest household member being male, as potential identifying instruments, tests of over-identification strongly rejects any combination of such variables, indicating that these are not valid instruments. Apart from such statistical testing, as Appleton (1996) found in Uganda, it may be difficult to argue that transfer income is exogenous with respect to household consumption or income, and some might argue that household composition in general, including the sex of oldest member or the member with highest education, is no more exogenous than the female headship itself. A potentially promising approach for avoiding the endogeneity issue could be a use of panel data.

[xxxiii] The control variables other than the female headship dummy are: age of the household head (and its square), years of the schooling of the household head, owned agricultural land, household size (logarithm), household composition (measured by shares of male and female members of five age groups), and regional dummies.

[xxxiv] As was discussed in footnote 32 above, the potential endogeneity of female headship variables is an issue here. Attempts have been made to use, as identifying instruments for the female headship dummy, the amount

of transfer income, a dummy indicating the oldest household member being male, and a dummy indicating the household member with highest education being male; while the tests of over-identification were not rejected at least for subsets of the instruments, in most cases Hausman-Wu tests indicated that the exogeneity of FHH dummies were not rejected. In a few cases where such exogeneity was rejected 2SLS estimates are reported, and OLS estimates are reported in all the other cases in the table.

[xxxv] We have to point out here, however, that school enrollment ratios are mostly quite high, above 90%, with relatively little variation at the primary schooling level; perhaps for this reason, our regressors explain extremely little variation in school enrollment ratios (i. e., extremely low adjusted R squares of well below 0.1).

[xxxvi] See, for example, Rosenhouse (1989).

[xxxvii] See 'hours of work of household head' rows in Tables 4 through 7.

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## Table 1. Number and Share of Female Headed Households in the LSMS Sample

| | Nationwide | urban | rural | indigenous |
|---|---|---|---|---|
| Total household | 4938 (100.00%) | 2442 (100.00%) | 2094 (100.00%) | 402 (100.00%) |
| A) Self-Reported Female Headed | 1097 (22.22%) | 686 (28.09%) | 351 (16.76%) | 60 (14.93%) |
| A)-1. Reported *de jure* FHH | 910 (18.43%) | 578 (23.67%) | 298 (14.23%) | 34 (8.46%) |
| A)-1.a. Reported *de jure* FHH: divorce/sepa | 333 (6.74%) | 220 (9.01%) | 96 (4.58%) | 17 (4.23%) |
| A)-1.b. Reported *de jure* FHH: widow only | 284 (5.75%) | 150 (6.14%) | 125 (5.97%) | 9 (2.24%) |
| A)-1.c. Reported *de jure* FHH: single only | 293 (5.93%) | 208 (8.52%) | 77 (3.68%) | 8 (1.99%) |
| A)-2. Reported *de facto* FHH | 89 (1.80%) | 48 (1.97%) | 26 (1.24%) | 15 (3.73%) |
| A)-3. Reported FHH: *unida* only | 119 (2.41%) | 69 (2.83%) | 32 (1.53%) | 18 (4.48%) |
| A)-4. Reported FHH: *casada* only | 68 (1.38%) | 39 (1.60%) | 21 (1.00%) | 8 (1.99%) |
| B) Potential FHH | 954 (19.32%) | 520 (21.29%) | 401 (19.15%) | 33 (8.21%) |
| C) Female working head | 758 (15.35%) | 508 (20.80%) | 215 (10.27%) | 35 (8.71%) |
| D) Core FHH [B&C] | 354 (7.17%) | 246 (10.07%) | 96 (4.58%) | 12 (2.99%) |

(source: Panama LSMS 1997)

## Table 2: Percentage of households defined as female-headed by the definition at the top which are also female-headed by the definitions at left

| | Reported female head | | | Potential FHH | Working female[b] head |
|---|---|---|---|---|---|
| | all | *de facto* only | *de jure* only | | |
| Reported female head: all | **100%** | NA(100%) [a] | NA(100%) | **57.57%** | **57.17%** |
| Reported: *de facto* only | (8.1%) | **100%** | NA(0%) | **5.07%** | **4.28%** |
| Reported: *de jure* only | (83.0%) | NA(0%) | **100%** | **51.24%** | **50.70%** |
| Potential FHH | **49.42%** | **57.88%** | **52.37%** | **100%** | **48.44%** |
| Working female head | **39.68%** | **39.49%** | **41.90%** | **39.17%** | **100%** |

[a.] Figures in parentheses indicate percentage shares as the subsets of self-reported female heads.
[b] "working" female headed' households are defined as those where more than 50% of total household labor hours worked (during the past week) was contributed by a single female member
(source: Panama LSMS 1997)

## Table 3. Head-count Poverty Ratios of Female Headed Households by Alternative Headship Definitions [a]

| | **Nation wide** | | | **Urban** | | | **Rural** | | | **Indigenous** | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | FHH | Non-FHH | t stat. | FHH | Non-FHH | t stat. | FHH | Non-FHH | t stat. | FHH | Non-FHH | t stat. |
| 1 Reported female headed | 0.290 | **0.395**[b] | -4.532 | **0.169** | 0.147 | 0.947 | 0.491 | **0.603** | -3.003 | 0.951 | **0.976** | -1.305 |
| 2 Reported dejure | 0.254 | **0.396** | -6.498 | 0.142 | **0.156** | -0.615 | 0.467 | **0.602** | -3.648 | **0.988*** | 0.952 | 2.546 |
| 3 Reported defacto | 0.396 | **0.373** | 0.343 | **0.244** | 0.151 | 1.127 | 0.524 | **0.588** | -0.661 | 0.920 | **0.955** | -0.589 |
| 4 Reported fhh: unida | **0.535***[c] | 0.369 | 2.781 | **0.382*** | 0.146 | 3.137 | **0.684** | 0.585 | 1.021 | **0.992*** | 0.952 | 2.774 |
| 5 Reported fhh: casada | 0.232 | **0.375** | -2.427 | 0.127 | **0.153** | -0.442 | 0.341 | **0.589** | -2.090 | 0.875 | **0.955** | -0.915 |
| 6 Reported fhh: div/sepa | 0.261 | **0.381** | -3.853 | 0.146 | **0.153** | -0.261 | 0.476 | **0.592** | -1.745 | **1.000*** | 0.952 | 3.575 |
| 7 Reported fhh: widow | 0.380 | **0.243** | -3.873 | 0.113 | **0.155** | -1.054 | 0.401 | **0.595** | -3.517 | **1.000*** | 0.953 | 3.574 |
| 8 Reported fhh: single | 0.253 | **0.380** | -3.363 | **0.158** | 0.152 | 0.136 | 0.547 | **0.588** | -0.631 | 0.909 | **0.954** | -0.609 |
| 9 Potential fhh | 0.225 | **0.394** | -7.119 | 0.103 | **0.161** | -2.098 | 0.412 | **0.608** | -5.359 | 0.922 | **0.956** | -0.881 |
| 10 Female working head | 0.207 | **0.401** | -8.491 | 0.100 | **0.165** | -2.657 | 0.405 | **0.606** | -5.252 | 0.901 | **0.958** | -1.070 |
| 11 Core fhh | 0.171 | **0.386** | -6.608 | 0.101 | **0.157** | -1.602 | 0.345 | **0.596** | -3.957 | 0.888 | **0.955** | -1.241 |

[a.] Head-count poverty ratios are calculated on the basis of estimated number of individuals.
[b.] Figues in bold type indicate the higher headcount poverty ratio between FHHs and non-FHHs in each category.
[c] Asterisks signify the cases where FHHs are significantly poorer than non-FHHs at 5% level or lower.
(source: Panama LSMS 1997)

## Table 4. Summary Table of the Poverty of FHHs in Panama: Nationwide

| | reported fhh | reported dejure | reported defacto | reported fhh: unida | reported fhh: casada | reported fhh: div/sepa | reported fhh: widow | reported fhh: single | potential fhh | female working head | core fhh |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Consumption poverty** [a] | | | | | | | | | | | |
| *Head count ratio* | | | | | | | | | | | |
| Percapita consumption | **L*** | **L*** | H | **H+** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** |
| Economies of scale 0.8 | **L*** | **L*** | H | H | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** |
| Economies of scale 0.6 | **L*** | **L*** | H | **H+** | L | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** |
| Economies of scale 0.4 | **L*** | L | L | H | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** |
| Economies of scale 0.2 | **L*** | **L*** | H | H | L | **L*** | L | **L*** | L | **L*** | **L*** |
| Adult equivalent scales (1;1;0.6)[b] | **L*** | **L*** | H | **H+** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** |
| Adult equivalent scales (1;0.8;0.6) | **L*** | **L*** | H | **H+** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** |
| Adult equivalent scales (1;0.7;0.4) | **L*** | **L*** | H | **H+** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** | **L*** |
| *Other poverty measures* | | | | | | | | | | | |
| P1 | L | L | H | H | L | L | L | L | L | L | L |
| P2 | L | L | H | H | L | L | L | L | L | L | L |
| P Sen | L | L | H | H | L | L | L | L | L | L | L |
| *Stochastic dominance*[c] | **L**** | x | x | **H+** | **L**** | x | x | **L**** | **L**** | **L**** | x |
| *Multivariate analysis of poverty* | **L+** | **L+** | L | L | H | **L+** | L | **L+** | **L+** | H | **L+** |
| **2. other characteristics** | | | | | | | | | | | |
| Age of house-hold head | H | H | L | L | H | H | H | L | H | L | L |
| Hours of work of household head | L | L | L | L | L | L | L | L | L | H | L |
| Literacy of household head | L | L | L | L | H | L | L+ | **H*** | **L+** | **H*** | **H*** |
| Years of schooling of household head | H | **H*** | L | **L+** | H | H | L+ | **H*** | **L+** | **H*** | **H*** |
| Number of children | L | L | H | H | L | L | L | L | L | L | L |
| Household size | L | L | L | H | H | L | L | L | L | L | L |
| Dependency ratio | **L*** | **L*** | H | **H+** | L | H | **L*** | **L*** | **L*** | H | **H+** |

## Table 4. Summary Table of the Poverty of FHHs in Panama: Nationwide (Continued)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **3. children's schooling** | | | | | | | | | | | |
| *Bivariate analysis* | | | | | | | | | | | |
| Male 6-12 | **H*** | **H*** | H | H | **H*** | H | **H*** | **H*** | **H*** | **H*** | **H*** |
| Male 13-18 | H | H | H | L | **H*** | H | H | H | **H*** | **H*** | **H*** |
| Female 6-12 | H | H | L | L | **H*** | **H*** | L | **H*** | H | **H*** | H |
| Female 13-18 | H | H | **L+** | L | L | L | L | **H*** | **H*** | **H*** | **H*** |
| *Multivariate analysis* | | | | | | | | | | | |
| Male 6-12 | **H*** | **H*** | H | **H*** | **H*** | H | H | **H*** | **H*** | H | H |
| Male 13-18 | H | L | H | H | **H*** | L | H | L | L | H | L |
| Female 6-12 | H | H | L | L | **H*** | **H*** | L | H | H | H | H |
| Female 13-18 | L | L | L | L | L | L | L | L | H | L | L |

a. H (or L) means that the average value is higher (or lower) in bivariate comparison, or estimated coefficient positive (or negative) in multiple regression. Bold types with '*' signify cases where female headed households can be judged (statistically) significantly (at 10% or less) better off than non-FHHs, in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Bold types with '+' signify cases where female headed households can be judged (statistically) significantly worse off than non-FHHs in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Letters (H or L) in non-bold types signify that the difference between FHHs and non-FHHs are not statistically significant.

b. The numbers in the parentheses represent relative weights among (adult male; adult female; child).

c. 'x' signifies the cases where the poverty incidence curve of neither FHHs nor non-FHHs dominates that of the others.' Bold types with '**L****' signify the cases where female headed households can be judged better off regardless of specific poverty lines. Bold types with '**H+**' signify the cases where female headed households can be judged worse off regardless of specific poverty lines. Stochastic dominance analysis is based on 'sample dominance' rather than 'statistical dominance.' (See Quisumging *et al*. 1995)

(source: Panama LSMS 1997)

## Table 5. Summary Table of the Poverty of FHHs in Panama: Urban only

| | reported fhh | reported dejure | reported defacto | reported fhh: unida | reported fhh: casada | reported fhh: div/sepa | reported fhh: widow | reported fhh: single | potential fhh | female working head | core fhh |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Consumption poverty**[a] | | | | | | | | | | | |
| *Head count ratio* | | | | | | | | | | | |
| Percapita consumption | H | L | H | **H+** | L | L | L | H | **L*** | **L*** | L |
| Economies of scale 0.8 | H | L | H | **H+** | H | L | L | H | L | **L*** | L |
| Economies of scale 0.6 | **H+** | H | H | **H+** | H | H | L | H | L | L | H |
| Economies of scale 0.4 | **H+** | H | L | **H+** | H | H | L | H | H | L | H |
| Economies of scale 0.2 | **H+** | H | H | **H+** | H | H | L | **H+** | **H+** | L | H |
| Adult equivalent scales (1;1;0.6)[b] | H | L | H | **H+** | L | H | L | L | **L*** | **L*** | **L*** |
| Adult equivalent scales (1;0.8;0.6) | H | L | H | **H+** | L | L | L | L | **L*** | **L*** | **L*** |
| Adult equivalent scales (1;0.7;0.4) | H | L | H | **H+** | L | L | L | L | **L*** | **L*** | **L*** |
| *Other poverty measures* | | | | | | | | | | | |
| P1 | H | L | H | H | H | H | L | H | L | L | L |
| P2 | H | H | H | H | L | H | L | H | L | L | L |
| P Sen | H | H | H | H | L | H | L | H | L | L | L |
| *Stochastic dominance*[c] | **H+** | x | **H+** | **H+** | x | x | x | x | x | **L**** | **L**** |
| *Multivariate analysis of poverty* | **L+** | **L+** | H | **L+** | H | **L+** | L | **L+** | **L+** | L | **L+** |
| **2. other characteristics** | | | | | | | | | | | |
| Age of house-hold head | H | H | L | L | H | H | H | L | H | L | L |
| Hours of work of household head | L | L | L | L | L | L | L | L | L | H | L |
| Literacy of household head | L | L | L | L | H | L | L | H | L | H | H |
| Years of schooling of household head | **L+** | L | **L+** | **L+** | **L+** | L | **L+** | **H*** | L+ | **H*** | **H*** |
| Number of children | L | L | H | H | L | L | L | L | L | L | L |
| Household size | L | L | L | H | H | L | L | L | L | L | L |
| Dependency ratio | H | L | **H+** | **H+** | L | **H+** | **L*** | H | H | H | **H+** |

## Table 5. Summary Table of the Poverty of FHHs in Panama: Urban only (Continued)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **3. children's schooling** | | | | | | | | | | | |
| *Bivariate analysis* | | | | | | | | | | | |
| Male 6-12 | H | H | L | L | **H*** | L | **H*** | **H*** | H | H | H |
| Male 13-18 | H | H | H | L | **H*** | L | H | L | H | H | **H*** |
| Female 6-12 | H | H | L | L | **H*** | L | **H*** | **H*** | H | H | H |
| Female 13-18 | L | L | **L+** | **L+** | L | L | L | **H*** | **H*** | **H*** | **H*** |
| *Multivariate analysis* | | | | | | | | | | | |
| Male 6-12 | **L+** | L | L | L | H | L | **L+** | L | H | L | L |
| Male 13-18 | L | L | L | L | **H*** | L | H | L | L | L | L |
| Female 6-12 | L | H | L | L | H | H | L | L | L | L | L |
| Female 13-18 | **L+** | **L+** | **L+** | L | L | **L+** | L | L | H | **L+** | **L+** |

a. H (or L) means that the average value is higher (or lower) in bivariate comparison, or estimated coefficient positive (or negative) in multiple regression. Bold types with '*' signify cases where female headed households can be judged (statistically) significantly (at 10% or less) better off than non-FHHs, in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Bold types with '+' signify cases where female headed households can be judged (statistically) significantly worse off than non-FHHs in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Letters (H or L) in non-bold types signify that the difference between FHHs and non-FHHs are not statistically significant.

b. The numbers in the parentheses represent relative weights among (adult male; adult female; child).

c. 'x' signifies the cases where the poverty incidence curve of neither FHHs nor non-FHHs dominates that of the others.' Bold types with '**L****' signify the cases where female headed households can be judged better off regardless of specific poverty lines. Bold types with '**H+**' signify the cases where female headed households can be judged worse off regardless of specific poverty lines. Stochastic dominance analysis is based on 'sample dominance' rather than 'statistical dominance.' (See Quisumging *et al*. 1995)

(source: Panama LSMS 1997)

**Table 6. Summary Table of the Poverty of FHHs in Panama: Rural (non indigenous) only**

| | Reported fhh | reported dejure | reported defacto | reported fhh: unida | reported fhh: casada | reported fhh: div/sepa | reported fhh: widow | reported fhh: single | potentia l fhh | female working head | core fhh |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Consumption poverty**[a] | | | | | | | | | | | |
| *Head count ratio* | | | | | | | | | | | |
| Percapita consumption | **L*** | **L*** | L | H | **L*** | **L*** | **L*** | L | **L*** | **L*** | **L*** |
| Economies of scale 0.8 | **L*** | **L*** | L | L | **L*** | **L*** | **L*** | L | **L*** | **L*** | **L*** |
| Economies of scale 0.6 | **L*** | L | L | L | **L*** | L | L | L | **L*** | **L*** | **L*** |
| Economies of scale 0.4 | L | L | H | L | L | L | L | H | H | **L*** | **L*** |
| Economies of scale 0.2 | H | H | H | H | L | L | H | H | **H+** | **L*** | L |
| Adult equivalent scales (1;1;0.6)[b] | **L*** | **L*** | L | H | **L*** | L | **L*** | L | **L*** | **L*** | **L*** |
| Adult equivalent scales (1;0.8;0.6) | **L*** | **L*** | L | H | **L*** | L | **L*** | L | **L*** | **L*** | **L*** |
| Adult equivalent scales (1;0.7;0.4) | **L*** | **L*** | L | H | **L*** | **L*** | **L*** | L | **L*** | **L*** | **L*** |
| *Other poverty measures* | | | | | | | | | | | |
| P1 | L | L | L | L | L | L | L | L | L | L | L |
| P2 | L | L | H | L | L | L | L | L | L | L | L |
| P Sen | L | L | L | H | L | L | L | L | L | L | L |
| *Stochastic dominance*[c] | **L**** | x | x | x | x | x | x | x | x | **L*** | **L*** |
| *Multivariate analysis of poverty* | L | L | **L+** | H | L | H | L | **L+** | **L+** | H | L |
| **2. other characteristics** | | | | | | | | | | | |
| Age of house-hold head | H | H | L | L | L | H | H | H | H | L | L |
| Hours of work of household head | L | L | L | L | L | L | L | L | L | H | L |
| Literacy of household head | **L+** | **L+** | H | H | H | L | **L+** | L | **L+** | **H*** | H |
| Years of schooling of household head | **L+** | **L+** | **H*** | **H*** | **H*** | **L+** | **L+** | H | **L+** | **H*** | **H*** |
| Number of children | L | L | L | H | L | L | L | L | L | L | L |
| Household size | L | L | L | H | L | L | L | L | L | L | L |
| Dependency ratio | **L+** | **L+** | H | **H*** | H | L | **L+** | **L+** | **L+** | H | H |

## Table 6. Summary Table of the Poverty of FHHs in Panama: Rural (non indigenous) only (Continued)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **3. children's schooling** | | | | | | | | | | | |
| *Bivariate analysis* | | | | | | | | | | | |
| Male 6-12 | **H*** | **H*** | **H*** | **H*** | **H*** | **H*** | **H*** | **H*** | **H*** | **H*** | **H*** |
| Male 13-18 | L | L | H | H | H | L | **L+** | L | H | **H*** | H |
| Female 6-12 | H | H | L | H | **H*** | **H*** | L | **H*** | H | **H*** | **H*** |
| Female 13-18 | H | L | L | H | L | H | H | L | H | L | H |
| *Multivariate analysis* | | | | | | | | | | | |
| Male 6-12 | **H*** | **H*** | **H*** | **H*** | **H*** | H | **H*** | **H*** | H | H | H |
| Male 13-18 | L | **L+** | L | H | L | H | **L+** | L | L | H | H |
| Female 6-12 | H | H | L | L | **H*** | **H*** | L | **H*** | **H*** | **H*** | **H*** |
| Female 13-18 | **L+** | L | L | L | L | L | L | L | L | L | L |

a. H (or L) means that the average value is higher (or lower) in bivariate comparison, or estimated coefficient positive (or negative) in multiple regression. Bold types with '*' signify cases where female headed households can be judged (statistically) significantly (at 10% or less) better off than non-FHHs, in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Bold types with '+' signify cases where female headed households can be judged (statistically) significantly worse off than non-FHHs in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Letters (H or L) in non-bold types signify that the difference between FHHs and non-FHHs are not statistically significant.

b. The numbers in the parentheses represent relative weights among (adult male; adult female; child).

c. 'x' signifies the cases where the poverty incidence curve of neither FHHs nor non-FHHs dominates that of the others.' Bold types with '**L****' signify the cases where female headed households can be judged better off regardless of specific poverty lines. Bold types with '**H+**' signify the cases where female headed households can be judged worse off regardless of specific poverty lines. Stochastic dominance analysis is based on 'sample dominance' rather than 'statistical dominance.' (See Quisumging *et al*. 1995)

(source: Panama LSMS 1997)

## Table 7. Summary Table of the Poverty of FHHs in Panama: Indigenous only

| | reported fhh | reported dejure | reported defacto | reported fhh: unida | reported fhh: casada | reported fhh: div/sepa | reported fhh: widow | reported fhh: single | potentia l fhh | female working head | core fhh |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **1. Consumption poverty**[a] | | | | | | | | | | | |
| *Head count ratio* | | | | | | | | | | | |
| Percapita consumption | H | **H+** | L | **H+** | L | **H+** | **H+** | L | L | L | L |
| Economies of scale 0.8 | **H+** | **H+** | L | **H+** | L | **H+** | **H+** | L | L | L | L |
| Economies of scale 0.6 | **H+** | **H+** | L | **H+** | L | **H+** | **H+** | **H+** | L | L | H |
| Economies of scale 0.4 | **H+** | **H+** | H | **H+** | L | **H+** | **H+** | **H+** | L | L | H |
| Economies of scale 0.2 | **H+** | **H+** | H | **H+** | H | **H+** | **H+** | **H+** | H | L | H |
| Adult equivalent scales (1;1;0.6)[b] | **H+** | **H+** | L | **H+** | L | **H+** | **H+** | L | L | L | L |
| Adult equivalent scales (1;0.8;0.6) | **H+** | **H+** | L | **H+** | L | **H+** | **H+** | L | L | L | L |
| Adult equivalent scales (1;0.7;0.4) | H | H | L | **H+** | L | H | **H+** | L | L | L | L |
| *Other poverty measures* | | | | | | | | | | | |
| P1 | H | H | L | H | L | H | H | L | L | L | L |
| P2 | H | H | L | H | L | H | H | L | L | L | L |
| P Sen | L | H | L | H | L | H | H | L | L | L | L |
| *Stochastic dominance*[c] | **H+** | x | x | x | x | **H+** | **H+** | x | x | x | x |
| *Multivariate analysis of poverty* | L | L | L | L | L | L | L | H | H | H | L |
| **2. other characteristics** | | | | | | | | | | | |
| Age of house-hold head | H | H | L | L | L | H | H | L | H | H | H |
| Hours of work of household head | L | L | L | L | H | L | L | L | L | H | L |
| Literacy of household head | **L+** | **L+** | **L+** | **L+** | L | **L+** | **L+** | **L+** | **L+** | L | L |
| Years of schooling of household head | L | **L+** | H | L | H | **L+** | **L+** | L | H | H | H |
| Number of children | L | L | L | L | L | L | H | L | L | L | L |
| Household size | L | L | L | L | L | L | H | L | L | L | L |
| Dependency ratio | **L*** | L | **L*** | L | **L*** | L | L | L | **L*** | **L*** | L |

## Table 7. Summary Table of the Poverty of FHHs in Panama: Indigenous only (Continued)

| | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **3. children's schooling** | | | | | | | | | | | |
| *Bivariate analysis* | | | | | | | | | | | |
| Male 6-12 | H | L | H | H | **H*** | H | L | **H*** | L | H | H |
| Male 13-18 | L | L | L | H | H | L | H | **L+** | **H*** | H | **H*** |
| Female 6-12 | H | L | **H*** | **H*** | **H*** | L | L | H* | H | H | **H*** |
| Female 13-18 | H | L | H | H | H | **L+** | L | H | H | L | H |
| *Multivariate analysis* | | | | | | | | | | | |
| Male 6-12 | **H*** | H | H | H | **H*** | H | L | **H*** | H | H | L |
| Male 13-18 | H | L | **L+** | L | H | L | **H*** | **L+** | H | H | H |
| Female 6-12 | H | L | **H*** | **H*** | **H*** | L | L | H | H | H | **H*** |
| Female 13-18 | H | L | H | H | **H*** | L | L | L | L | L | L |

a. H (or L) means that the average value is higher (or lower) in bivariate comparison, or estimated coefficient positive (or negative) in multiple regression. Bold types with '*' signify cases where female headed households can be judged (statistically) significantly (at 10% or less) better off than non-FHHs, in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Bold types with '+' signify cases where female headed households can be judged (statistically) significantly worse off than non-FHHs in terms of consumption expenditures, literacy of the household head, schooling of the household head, dependency ratio, or schooling of children. Letters (H or L) in non-bold types signify that the difference between FHHs and non-FHHs are not statistically significant.

b. The numbers in the parentheses represent relative weights among (adult male; adult female; child).

c. 'x' signifies the cases where the poverty incidence curve of neither FHHs nor non-FHHs dominates that of the others.' Bold types with '**L****' signify the cases where female headed households can be judged better off regardless of specific poverty lines. Bold types with '**H+**' signify the cases where female headed households can be judged worse off regardless of specific poverty lines. Stochastic dominance analysis is based on 'sample dominance' rather than 'statistical dominance.' (See Quisumging *et al*. 1995)

(source: Panama LSMS 1997)

**Table 8. Estimated coefficients on female headship dummy in the per capita household expenditure determination regression**[a.]

| Headship category | *Nationwide* | | *Urban only* | | *Rural only* | | *Indigenous only* | |
|---|---|---|---|---|---|---|---|---|
| | Without household size | With household size | Without household size | With household size | Without household size | With household size | Without household size | With household size |
| reported FHH | 0.0112 (0.40) [b.] | -0.0989 (-3.65) | -0.0896 (-2.49) | -0.1941 (-5.74) | 0.0448 (1.04) | -0.0335(-0.80) | 0.0219 (0.21) | -0.0095 (-1.13) |
| reported dejure | 0.0407 (1.36) | -0.1126 (-3.93) | -0.0520 (-1.37) | -0.1911 (-5.29) | 0.0579 (1.17) | -0.0709(-1.61) | 0.0260 (0.20) | -0.1648 (-1.37) |
| reported defacto | 0.469 (0.78) | -0.0172 (-0.32) | 0.0509 (0.64) | 0.0216 (0.34) | -0.0107 (-0.13) | -0.1189(-1.73) | 0.1038 (0.68) | -0.0249 (-0.19) |
| reported fhh: unida | -0.1007 (-1.58) | -0.0379 (-0.59) | -0.2175 (-2.70) | -0.1719 (-2.32) | -0.0097 (-0.11) | 0.1102 (1.08) | -0.0089 (-0.07) | -0.0023 (-0.02) |
| reported fhh: casada | -0.0118 (-0.17) | 0.0050 (0.08) | -0.0178 (-0.21) | 0.0170 (0.22) | 0.0078 (0.09) | -0.0134(-0.16) | 0.0622 (0.41) | -0.0514 (-0.31) |
| reported fhh: div/sepa | 0.0136 (0.33) | -0.0927 (-2.46) | -0.0870 (-1.68) | -0.1767 (-3.67) | 0.1010 (1.33) | 0.0022 (0.03) | -0.0432 (-0.29) | -0.2005 (-1.43) |
| reported fhh: widow | 0.1213 (2.56) | -0.0238 (-0.52) | 0.0748 (1.24) | -0.0494 (-0.85) | 0.1363 (2.16) | -0.0111(-0.19) | -0.0017 (-0.47) | -0.1715 (-0.80) |
| reported fhh: single | -0.0203 (-0.49) | -0.1162 (-2.96) | -0.0528 (-1.10) | -0.1356 (-3.05) | -0.1373 (-1.69) | -0.1829(-2.60) | -0.5809 (5.05) | 0.1795 (1.23) |
| potential fhh | 0.1870 (5.13) | -0.1559 (-4.18) | 0.1474 (3.28) | -0.1565 (-3.48) | 0.1543 (2.51) | -0.1774(-2.96) | 0.4469 (2.74) | 0.1158 (0.65) |
| female working head | 0.1097 (3.30) | 0.0027 (0.09) | 0.0616 (1.61) | -0.0476 (-1.30) | 0.0977 (1.89) | 0.0283 (0.58) | 0.2080 (1.18) | 0.1751 (1.18) |
| core fhh | 0.1340 (2.84) | -0.1234 (-2.80) | 0.0670 (1.25) | -0.1586 (-3.12) | 0.1196 (1.47) | -0.0937(-1.32) | 0.1806 (0.56) | -0.2499 (-0.96) |

[a.] Dependent variable is: logarithm of per capita household expenditure; control variables, in addition to female headship dummy, included are: age of household head and its squared, years of schooling of household head, agricultural land owned, logarithm of household size, share of household members by sex and age groups (female 0-4, male 0-4, female 5-9, male 5-9, female 10-14, male 10-14, female 15-54, male 15-54 and female 54-), and regional dummies. More detailed regression results are found in Appendix Table 1. Coefficients were estimated by OLS. See footnote 32 for a discussion of potential endogeneity of the headship variables.

[b.] t-statistics in parentheses.

(source: Panama LSMS 1997)

**Table 9. Estimated coefficients on female headship dummy in the school enrollment ratio regression (Female Children)** [a.]

| Headship category | Nationwide | | Urban only | | Rural only | | Indigenous only | |
|---|---|---|---|---|---|---|---|---|
| | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 |
| reported FHH | -0.0035(-0.60) [b.] | -0.0461 (-1.57) | -0.0163 (–1.49) | **-0.2261 (-2.76)** [c] | 0.0219 (0.96) | **-0.1120(-1.78)** | 0.0236 (0.33) | 0.0058 (0.05) |
| reported dejure | 0.0098 (0.85) | -0.0460 (-1.23) | 0.0002 (0.02) | **-0.2483 (-2.80)** [c] | 0.0274 (1.01) | -0.1167(-1.63) | -0.0973 (–0.88) | -0.1802 (-1.42) |
| reported defacto | -0.0216 (-0.47) | -0.1315 (-1.41) | -0.0627 (–0.99) | **-0.3094 (-2.66)** | -0.0226 (-0.28) | -0.1177(-0.63) | **0.2038 (2.94)** | 0.1866 (0.95) |
| reported fhh: unida | -0.0144 (-0.44) | -0.0062 (-0.11) | -0.0691 (–1.36) | -0.0599 (-0.70) | -0.0134 (-0.33) | -0.0092(-0.10) | **0.1281 (2.36)** | 0.0056 (0.04) |
| reported fhh: casada | **0.0231 (1.93)** [d] | -0.0622 (-0.46) | 0.0043 (0.57) | -0.2331 (-1.03) | **0.0552 (1.80)** | -0.1456(-0.60) | **0.1971 (2.00)** | **0.4629 (1.99)** |
| reported fhh: div/sepa | **0.0215 (1.90)** | -0.0375 (-0.78) | 0.0131 (1.47) | **-0.4679 (-2.78)** [c] | **0.0474 (3.13)** | -0.0840(-0.85) | -0.1525 (–1.09) | -0.1207 (-0.72) |
| reported fhh: widow | -0.0268 (-0.83) | -0.0613 (-0.91) | -0.0006 (–0.09) | -0.0543 (-0.56) | -0.0405 (-0.58) | -0.0904(-0.83) | -0.0382 (–0.19) | -0.1653 (-1.17) |
| reported fhh: single | 0.0087 (0.44) | -0.0018 (-0.04) | -0.0143 (–0.95) | -0.0073 (-0.15) | **0.0524 (2.00)** | -0.0702(-0.60) | 0.0560 (0.77) | -0.2276 (-0.77) |
| potential fhh | 0.0075 (0.40) | 0.0365 (0.80) | -0.0344 (–1.42) | 0.0518 (0.99) | **0.0505 (1.66)** | -0.0722(-0.80) | 0.1102 (1.49) | -0.0358 (-0.20) |
| female working head | 0.0102 (1.01) | -0.0277 (-0.87) | -0.0108 (–0.96) | **-0.2731 (-1.77)** [c] | **0.0373 (1.82)** | -0.1035(-1.56) | 0.0631 (0.94) | -0.1496 (-1.10) |
| core fhh | 0.0063 (0.30) | -0.0286 (-0.61) | -0.0290 (–1.11) | **-0.5897 (-1.86)** [c] | **0.0598 (1.97)** | -0.1345(-1.32) | **0.3631 (3.61)** | -0.2215 (-0.90) |

[a.] Dependent variable is: the proportion of female children of age 6-12 or 13-18 who are enrolled in school to the total number of female children of the given age range; control variables, in addition to female headship dummy, included are: age of household head and its squared, years of schooling of household head, logarithm of per capita household expenditure agricultural land owned, logarithm of household size, share of household members by sex and age groups (female 0-4, male 0-4, female 5-9, male 5-9, female 10-14, male 10-14, female 15-54, male 15-54 and female 54-), and regional dummies. More detailed regression results are found in Appendix Table 2.

[b.] t-statistics in parentheses.

[c] Coefficient was estimated by 2SLS when Hausman-Wu test rejects exogeneity of the headship variables. Identifying instruments for headship dummies were chosen among: a dummy indicating the household member with highest education being male, a dummy indicating oldest household member being male and the amount of transfer income. All the other coefficients were estimated by OLS. See footnote 34 for a discussion of potential endogeneity of the headship variables.

[d] Bold letters signify that coefficient estimates are statistically significant at 10% level.

(source: Panama LSMS 1997)

**Table 10. Estimated coefficients on female headship dummy in the school enrollment ratio regression (Male Children)**[a.]

| Headship category | *Nationwide* | | *Urban only* | | *Rural only* | | *Indigenous only* | |
|---|---|---|---|---|---|---|---|---|
| | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 |
| reported FHH | **0.0361 (2.98)** [bd] | 0.1118 (0.38) | **-0.0596 (-1.80)** [c] | -0.0032 (-0.10) | **0.0577 (3.85)** | -0.0795(-1.34) | **0.1536 (2.13)** | 0.0299 (0.26) |
| reported dejure | **0.0287 (2.14)** | -0.0133 (-0.41) | -0.0573 (-1.62) [c] | -0.0137 (-0.38) | **0.0516 (2.95)** | **-0.1230(-1.83)** | 0.0911 (0.89) | -0.0202 (-0.16) |
| reported defacto | 0.0124 (0.42) | 0.0278 (0.35) | -0.0271 (–0.59) | -0.0034 (-0.04) | **0.0413 (2.28)** | -0.0039(-0.01) | 0.1443 (1.27) | **-0.2396 (-2.22)** |
| reported fhh: unida | **0.0393 (1.74)** | 0.0254 (0.40) | -0.0060 (–0.18) | -0.0636 (-0.82) | **0.0599 (3.86)** | 0.0907 (0.67) | 0.1081 (1.37) | -0.0266 (-0.13) |
| reported fhh: casada | **0.0349 (3.07)** | **0.1272 (1.75)** | 0.0004 (0.02) | **0.1473 (3.83)** | **0.0368 (1.94)** | -0.0648(-0.29) | **0.2485 (2.64)** | 0.3741 (0.82) |
| reported fhh: div/sepa | 0.0081 (0.40) | -0.0095 (-0.22) | -0.0264 (–0.99) | -0.0396 (-0.84) | 0.0356 (1.62) | 0.0009(0.01) | 0.1484 (1.34) | -0.0609 (-0.43) |
| reported fhh: widow | 0.1988 (1.03) | 0.0177 (0.29) | **-0.6336 (-2.34)** [c] | 0.0457 (0.84) | **0.0545 (2.24)** | **-0.2878(-2.84)** | -0.2042(-0.72) | **0.3157 (2.24)** |
| reported fhh: single | **0.0352 (4.02)** | -0.0328 (-0.62) | -0.0955 (-1.14) [c] | -0.0106 (-0.18) | **0.0306 (1.71)** | -0.1267(-1.33) | **0.1665 (2.34)** | **-0.3826 (-2.14)** |
| potential fhh | **0.0314 (1.66)** | -0.0358 (-0.61) | 0.0039 (0.18) | -0.0513 (-0.81) | 0.0486 (1.50) | -0.0599(-0.46) | 0.0545 (0.45) | 0.0870 (0.50) |
| female working head | 0.0115 (0.88) | 0.0312 (0.97) | -0.0048 (–0.33) | -0.0199 (-0.55) | 0.0192 (0.85) | 0.1016 (1.37) | 0.0487 (0.76) | 0.0702 (0.43) |
| core fhh | 0.0161 (0.83) | -0.0220 (-0.38) | -0.0115 (-0.45) | -0.0028 (-0.05) | 0.0557 (2.52) | 0.0383 (0.26) | -0.1500(-0.89) | 0.0502 (0.29) |

[a.] Dependent variable is: the proportion of male children of age 6-12 or 13-18 who are enrolled in school to the total number of male children of the given age range; control variables, in addition to female headship dummy, included are: age of household head and its squared, years of schooling of household head, logarithm of per capita household expenditure agricultural land owned, logarithm of household size, share of household members by sex and age groups (female 0-4, male 0-4, female 5-9, male 5-9, female 10-14, male 10-14, female 15-54, male 15-54 and female 54-), and regional dummies. More detailed regression results are found in Appendix Table 3.

[b.] t-statistics in parentheses.

[c] Coefficient was estimated by 2SLS when Hausman-Wu test rejects exogeneity of the headship variables. Identifying instruments for headship dummies were chosen among: a dummy indicating the household member with highest education being male, a dummy indicating oldest household member being male and the amount of transfer income. All the other coefficients were estimated by OLS. See footnote 34 for a discussion of potential endogeneity of the headship variables.

[d] Bold letters signify that coefficient estimates are statistically significant at 10% level.

(source: Panama LSMS 1997)

**Appendix Table 1. Per-capita household expenditure determination regression (dep. var.: log of per capita household expenditure)** [a.]

| Independent variables | *Nationwide* | | *Urban only* | | *Rural only* | | *Indigenous only* | |
|---|---|---|---|---|---|---|---|---|
| | Without household size | With household size | Without household size | With household size | Without household size | With household size | Without household size | With household size |
| age | -0.0071(-1.61) [b] | 0.0216 (5.19) | 0.0105 (1.95) | 0.03826 (7.64) | -0.0150 (-2.25) | 0.0103 (1.63) | -0.0322 (-1.43) | -0.0075 (-0.39) |
| age squared | 0.0079 (1.84) | -0.0099 (-2.43) | -0.0095 (-1.75) | -0.0270 (-5.38) | 0.0136 (2.17) | -0.0014 (-0.23) | 0.0291 (1.28) | 0.0129 (0.66) |
| female headed household head | 0.0112 (0.40) | -0.0989 (-3.65) | -0.0896 (-2.49) | -0.1941 (-5.74) | 0.0448 (1.04) | -0.0335 (-0.80) | 0.0219 (0.21) | -0.1095 (-1.13) |
| years of schooling | 0.0988 (36.13) | 0.0922 (36.75) | 0.0753 (20.78) | 0.0693 (20.26) | 0.0934 (21.17) | 0.0887 (21.64) | 0.0508 (4.41) | 0.0417 (3.84) |
| owned land | 0.0001 (4.50) | 0.0001 (5.87) | 0.0009 (3.12) | 0.0007 (2.07) | 0.0017 (1.14) | 0.0019 (1.36) | 0.0001 (8.92) | 0.0001 (10.27) |
| household size | --- | -0.6047(-22.10) | --- | -0.5778 (-16.46) | --- | -0.5703(-15.56) | --- | -0.5592 (-6.42) |
| share female 0-4 | -1.8921(-14.37) | -0.3840 (-2.80) | -1.5272 (-8.69) | -0.2207 (-1.20) | -1.8470(-9.59) | -0.3824 (-1.98) | -1.8612( -3.08) | -0.1759 (-0.29) |
| share female5-9 | -1.5071(-12.68) | -0.1680 (-1.37) | -1.2691 (-7.57) | -0.1205 (-0.72) | -1.4274 (-8.55) | -0.1137 (-0.65) | -0.6703 (-1.06) | 0.7918 (1.30) |
| share female 10-14 | -1.2615(-10.91) | -0.0127 (-0.10) | -1.2059 (-7.50) | -0.1822 (-1.10) | -0.9726 (-5.87) | 0.3222 (1.85) | -0.4662 (-0.79) | 0.8988 (1.48) |
| share female 15-54 | -0.0366 (-.040) | 0.7537 (8.04) | -0.0837 (-0.64) | 0.5528 (4.31) | 0.2241 (1.83) | 1.0136 (7.98) | -0.6816 (-0.94) | 0.4119 (0.64) |
| share female 55- | 0.0903 (0.91) | 0.3889 (4.10) | 0.3071 (2.16) | 0.5054 (3.74) | 0.1355 (1.04) | 0.3822 (3.07) | -0.8610 (-1.09) | -0.1038 (-0.15) |
| share male 0-4 | -2.0893(-15.76) | -0.5081 (-3.59) | -1.4741 (-8.19) | -0.1392 (-0.72) | -2.1613(-12.11) | -0.5801 (-3.08) | -1.8860 (-2.93) | -0.1064 (-0.17) |
| share male 5-9 | -1.4990(-12.85) | -0.1547 (-1.21) | -1.2444 (-7.85) | -0.0608 (-0.36) | -1.4867 (-9.23) | -0.2083 (-1.22) | -1.0308 (-1.68) | 0.4004 (0.66) |
| share male 10-14 | -1.2566(-11.02) | -0.0151 (-0.12) | -0.9567 (-6.14) | 0.0697 (0.45) | -1.2591 (-8.19) | 0.0219 (0.13) | -0.5251 (-0.80) | 0.8809 (1.32) |
| share male 15-54 | -0.4302 (-5.49) | 0.2923 (3.53) | -0.4337 (-3.81) | 0.1681 (1.43) | -0.3213 (-3.10) | 0.4006 (3.80) | -0.2280 (-0.43) | 0.6496 (1.31) |
| region 1 | -0.5041(-16.56) | -0.5086(-18.03) | -0.3133 (-7.75) | -0.3047 (-8.64) | -0.0669 (-0.86) | -0.0874 (-1.29) | -0.1189 (-1.48) | -0.1763 (-2.41) |
| region 2 | -0.3330(-11.97) | -0.3671(-14.15) | -0.2076 (-6.39) | -0.2160 (-7.46) | -0.0621 (-0.80) | -0.0917 (-1.35) | ---[c] | ---[c] |
| region 3 | -0.4177(-11.60) | -0.4190(-12.74) | -0.2046 (-4.58) | -0.2244 (-5.51) | -0.0153 (-0.19) | -0.0282 (-0.40) | ---[c] | ---[c] |
| Constant | 7.3727 (52.20) | 6.6075 (51.72) | 7.1552 (40.69) | 6.5254 (40.63) | 7.1413 (33.10) | 6.3809 (32.60) | 5.0590 (9.00) | 6.3074 (9.24) |
| adjust.R-squared | 0.5833 | 0.6422 | 0.4450 | 0.5352 | 0.3955 | 0.4738 | 0.1581 | 0.2500 |
| Sample size | 4910 | 4910 | 2423 | 2423 | 2089 | 2089 | 398 | 398 |

[a.] Coefficient estimates on other control variables when female headship dummies with alternative definitions are used are very similar so are not displayed here but available upon request. Coefficients were estimated by OLS. See footnote 32 for a discussion of potential endogeneity of the headship variables.

[b.] t-statistics in parentheses.

[c.] "indigenous areas," as defined in the survey, do not exist in these areas.

(source: Panama LSMS 1997)

**Appendix Table 2. Determinants of school enrollment ratio of children (Female Children)**
**dependent variable: school enrollment ratio of girls age 6-12 or 13-18** [a]

| Independent | *Nationwide* | | *Urban only* | | *Rural only* | | *Indigenous only* | |
|---|---|---|---|---|---|---|---|---|
| variables | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 |
| age | 0.0039 (1.51)[b] | 0.0096 (1.45) | 0.0019 (0.87) | 0.0086 (0.95) | 0.0055 (1.51) | 0.0187 (1.78) | 0.0252 (1.39) | 0.0204 (1.18) |
| age squared | -0.0035(-1.42) | -0.0106 (-1.57) | -0.0018 (-0.99) | -0.0071 (-0.82) | -0.0047 (-1.31) | -0.0211 (-2.01) | -0.0243(-1.35) | -0.0184 (-1.02) |
| female headed household head | 0.0070 (0.60) | -0.0461 (-1.39) | -0.0163 (-1.48) | -0.0631 (-1.39) | 0.0219 (0.96) | -0.1120 (-1.78) | 0.0236 (0.33) | 0.0058 (0.05) |
| years of schooling | 0.0013 (0.95) | 0.0069 (6.41) | -0.0009(-0.78) | 0.0060 (1.48) | 0.0050 (1.57) | 0.0058 (0.81) | 0.0100 (1.43) | 0.0244 (1.90) |
| owned land | -0.0001(-43.5) | -0.0001 (-7.76) | ---[c] | 0.0092 (2.57) | 0.0004 (0.80) | 0.0006 (2.46) | -0.0001(-9.15) | -0.0001 (-3.89) |
| Log per-capita household expenditure | 0.0407 (4.01) | 0.1558 (6.41) | 0.0103 (1.24) | 0.0512 (1.25) | 0.0353 (2.36) | 0.2252 (6.11) | 0.0824 (1.86) | 0.1309 (2.47) |
| log(household size) | -0.0060(-0.37) | 0.0780 (1.56) | -0.0325(-1.74) | 0.0076 (0.10) | 0.0325 (1.39) | 0.1145 (2.09) | -0.0360(-0.51) | 0.0654 (0.60) |
| share female 0-4 | 0.0133 (0.13) | -0.5642 (-1.68) | 0.1133 (1.34) | -0.4649 (-0.93) | -0.0454(-0.26) | -0.4286 (-0.90) | -0.5354 (-0.85) | 0.6159 (0.52) |
| share female5-9 | -0.0389(-0.44) | -0.1016 (-0.36) | -.0432(-1.00) | 0.1777 (0.50) | 0.0768(0.47) | -0.3347 (-0.77) | -0.7548 (-1.35) | 1.1764 (1.00) |
| share female 10-14 | -0.0318(-0.37) | 0.7418 (2.75) | -0.0549(-1.05) | 0.7747 (2.33) | 0.0831 (0.51) | 0.6437 (1.51) | -.04846(-0.87) | 2.1464 (1.76) |
| share female 15-54 | -0.0297(-0.32) | 0.1366 (0.53) | 0.0729 (1.00) | 0.2946 (0.92) | -0.0992(-0.60) | -0.0693 (-0.17) | -0.5546(-0.90) | 1.7468 (1.42) |
| share female 55- | -0.0856(-0.75) | 0.3307 (1.13) | 0.1208 (1.47) | 0.3731 (1.06) | -0.2344(-1.00) | 0.3931 (0.78) | -0.9158(-1.11) | 1.7707 (1.70) |
| share male 0-4 | -0.0967(-0.92) | -0.4941 (-1.55) | 0.0080 (0.10) | -0.5736 (-1.25) | -0.1602(-1.02) | -0.4815(-1.07) | -0.7095(-1.10) | 1.6056 (1.41) |
| share male 5-9 | 0.0305 (0.29) | 0.2941 (1.01) | 0.0316 (0.31) | 0.5167 (1.36) | 0.0296 (0.17) | 0.0848 (0.20) | -0.3730(-0.67) | 1.4133 (1.22) |
| share male 10-14 | -0.0258(-0.24) | 0.0079 (0.03) | 0.0265 (0.27) | 0.1986 (0.58) | -0.0597(-0.34) | -0.2025(-0.48) | -0.7430(-1.18) | 0.9591 (0.84) |
| share male 15-54 | -0.0238(-0.32) | -0.1604 (-0.65) | 0.0353 (0.73) | 0.0772 (0.24) | -0.0378(-0.30) | -0.5154 (-1.43) | -0.7209(-1.31) | 0.6461 (0.57) |
| region 1 | 0.0029 (0.24) | 0.0612 (1.90) | 0.0056 (0.44) | 0.1365 (3.82) | 0.0272 (0.52) | -0.1943 (-2.33) | -0.0496 (-1.19) | -0.0152 (-0.19) |
| region 2 | 0.0002 (0.02) | 0.0816 (2.58) | 0.0040 (0.30) | 0.0636 (1.72) | -0.0041 (-0.08) | -0.1534 (-1.98) | ---[d] | ---[d] |
| region 3 | 0.0204 (1.96) | 0.0449 (1.17) | 0.01787 (2.45) | 0.0960 (1.71) | 0.0257 (0.49) | -0.1802 (-2.07) | ---[d] | ---[d] |
| constant | 0.6047 (4.61) | -0.8701 (-3.00) | 0.9049 (8.59) | -0.1305 (-0.32) | 0.5038 (2.26) | -1.1854 (-2.39) | 0.4314 (0.66) | -2.3972 (-2.01) |
| adjust.R-squared | 0.078 | 0.2562 | 0.0492 | 0.1893 | 0.0517 | 0.2321 | 0.1574 | 0.2274 |
| Sample size | 1285 | 1082 | 543 | 510 | 538 | 423 | 204 | 149 |

[a] Coefficient estimates on other control variables when female headship dummies with alternative definitions are used are very similar so are not displayed here but available upon request. Coefficients were estimated by OLS. See footnote 34 for a discussion of potential endogeneity of the headship variables.
[b] t-statistics in parentheses.
[c] Land variable dropped due to the small variation in the sample.
[d] "indigenous areas," as defined in the survey, do not exist in these areas.
(source: Panama LSMS 1997)

**Appendix Table 3. Determinants of school enrollment ratio of children (Male children)**
**dependent variable: school enrollment ratio of boys age 6-12 or 13-18[a]**

| Independent | *Nationwide* | | *Urban only* | | *Rural only* | | *Indigenous only* | |
|---|---|---|---|---|---|---|---|---|
| variables | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 | Age 6-12 | Age 13-18 |
| Age | 0.0005 (0.16) [b] | 0.0115 (1.82) | 0.0020 (0.62) | 0.0277 (2.91) | 0.0013 (0.27) | 0.0072 (0.71) | 0.0077 (0.51) | -0.0018 (-0.10) |
| age squared | -0.00004(-0.02) | -0.0073 (-1.17) | 0.0001(0.15) | -0.0215(-2.17) | -0.0006 (-0.14) | -0.0038 (-0.41) | -0.0145 (-0.91) | 0.0015 (0.08) |
| female headed | 0.0361 (2.98) | 0.0112 (0.38) | -0.0097(-0.49) | -0.0033(-0.10) | 0.0577 (3.85) | 0.2395 (1.34) | 0.1536 (2.13) | 0.0299 (0.26) |
| Household head | | | | | | | | |
| years of schooling | 0.0029 (2.09) | 0.0175 (5.95) | 0.0027 (1.72) | 0.0072 (2.09) | 0.0021 (0.68) | 0.0277 (4.49) | 0.0117 (1.90) | 0.0307 (2.57) |
| owned land | 0.00001 (3.53) | -0.0001 (-11.07) | 0.00003(0.20) | -0.0032 (-0.43) | 0.00004 (0.07) | -0.0030 (-2.26) | 0.00001 (1.14) | -0.0001 (-4.01) |
| Log per-capita | | | | | | | | |
| household | 0.0355 (2.38) | 0.2082 (10.68) | -0.0221(-0.68) | 0.1333 (4.65) | 0.0321 (1.95) | 0.2395 (6.92) | 0.1178 (3.08) | 0.1480 (2.52) |
| expenditure | | | | | | | | |
| log(household size) | -0.0330 (-0.97) | 0.0643 (1.69) | -0.0957(-1.61) | 0.0139 (0.30) | -0.0229 (-0.67) | -0.0551(0.77) | 0.0870 (1.13) | 0.0902 (0.79) |
| share female 0-4 | 0.0659 (0.31) | -0.1329 (-0.49) | 0.3254 (0.89) | 0.0529 (0.14) | 0.0894 (0.53) | -0.2152 (-0.48) | -1.3179 (-1.78) | -0.9883 (-1.02) |
| share female5-9 | 0.0870 (0.52) | 0.2696 (1.20) | 0.3102 (1.15) | 0.4352 (1.51) | 0.0696 (0.42) | 0.3283 (0.90) | -1.3577 (-1.88) | -0.7031 (-0.74) |
| share female 10-14 | 0.0700 (0.35) | 0.2943 (1.41) | 0.2794 (0.84) | 0.5902 (2.29) | 0.0247 (0.14) | 0.2182 (0.64) | -1.0996 (-1.88) | -1.3088 (-1.43) |
| share female 15-54 | -0.0240 (-0.14) | 0.2338 (1.22) | 0.1870(0.64) | 0.3857 (1.61) | 0.0997 (0.63) | 0.0759 (0.23) | -1.4118 (-2.08) | -0.9210 (-1.06) |
| share female 55- | -0.0324 (-0.23) | 0.0959 (0.41) | 0.1726 (0.80) | 0.3427 (1.27) | -0.0708 (-0.44) | -0.0069 (-0.02) | -1.5004 (-1.46) | -0.6317 (-0.61) |
| share male 0-4 | 0.1520 (0.75) | 0.6022 (2.51) | 0.3215 (0.89) | 0.6228 (1.97) | 0.1774 (1.08) | 0.7548 (1.85) | -1.0015 (-1.52) | -0.6143(-0.70) |
| share male 5-9 | -0.0161 (-0.08) | 0.2928 (1.25) | 0.2360(0.69) | 0.4205 (1.32) | -0.0415 (-0.27) | 0.2098 (0.56) | -1.4175 (-2.16) | -1.1348 (-1.22) |
| share male 10-14 | 0.0184 (0.10) | 0.6401 (3.46) | 0.2245(0.71) | 0.8079 (3.44) | 0.0312 (0.17) | 0.5723 (1.94) | -1.2236 (-1.71) | -0.4830 (-0.50) |
| share male 15-54 | 0.0737 (0.40) | 0.0181 (0.10) | 0.2687 (0.85) | 0.2639 (1.14) | 0.0661 (0.54) | -0.1612 (-0.58) | -1.2172 (-1.85) | -1.5003 (-1.84) |
| region 1 | 0.0158 (1.23) | 0.0889 (2.78) | 0.0295 (2.12) | 0.1276 (3.45) | -0.0365 (-2.40) | 0.1967 (1.68) | -0.0449 (1.01) | 0.1431 (1.63) |
| region 2 | 0.0214 (1.54) | 0.0299 (0.93) | 0.0166 (1.00) | 0.1087 (2.85) | -0.0529 (-3.09) | 0.1390 (119) | ---[c] | ---[c] |
| region 3 | 0.0215 (1.41) | 0.0198 (0.53) | 0.0376 (2.80) | 0.1320 (3.40) | -0.0558 (-2.67) | 0.0975 (0.80) | ---[c] | ---[c] |
| constant | 0.6764 (4.73) | -1.6049 (-6.20) | 0.9309 (6.10) | -1.4659 (-4.12) | 0.7114 (2.84) | -1.7672 (-3.90) | 1.2180 (1.52) | 0.4498 (0.48) |
| adjust.R-squared | 0.0511 | 0.2895 | 0.0519 | 0.2182 | 0.0038 | 0.2331 | 0.1388 | 0.2312 |
| Sample size | 1351 | 1168 | 559 | 510 | 572 | 492 | 220 | 166 |

[a]Coefficient estimates on other control variables when female headship dummies with alternative definitions are used are very similar so are not displayed here but available upon request. Coefficients were estimated by OLS. See footnote 34 for a discussion of potential endogeneity of the headship variables.
[b] t-statistics in parentheses.
[c] "indigenous areas," as defined in the survey, do not exist in these areas.
(source: Panama LSMS 1997)