THE IMPACT OF CHANGING POPULATION COMPOSITION ON THE DISTRIBUTION OF INCOME IN A DEVELOPING COUNTRY

by

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The nature of the income distribution is a major component in the evaluation of the economic success of a society. In recent years there has been considerable concern about the inequality of income distribution in many developing countries. There is a wide spread perception that earlier growth-dominated development strategies often worsened the relative position and sometimes worsened the absolute position of the poorest members of society.[1]

In this paper we investigate the role of demographic characteristics in the determination of the distribution of household income in the small and large urban areas of a Latin American developing country. Household income equals the sum of the primary female's earnings, the primary male's earnings, other income (including the earnings of other household members) and transfers. Earnings, in turn, depend on labor force participation currently and in the past, with the latter summarized by work experience. All of the components of income, as well as current and past labor force participation, a priori would seem to depend upon a number of demographic characteristics: age, marital status, education, health, nutrition, urbanization, family type, age of first cohabitation, number of children, migration status, and similar characteristics of the adult's childhood families Changes in the distributions of these demographic characteristics, therefore, might alter significantly the distribution of household income. Our basic objective is to explore the importance of such demographic characteristics in the distribution of income in urban areas of a Latin American country.

We divide our investigation into two parts. In Section 1 we explore the role of demographic characteristics in the determination of experience, labor force participation and earnings for primary men and women, as well as in the determination of other household income and transfers. In these

estimates we control for possible selectivity bias due to the fact that not every primary adult participates in the labor force and not every household receives transfers and other income.

In Section 2 we use these estimates to investigate how changes in the population composition would affect the distributions of household income and of each of the components of household income. We calculate Gini coefficients for each in the total and component income distributions and simulate the impact in each case of changes in family size, the primary women's age of first cohabitation, having extended families, marital status and the presence of a father during the primary women's childhood. In all of these cases we focus on the expected distributions by incorporating the probabilities of primary male and female labor force participations and of receiving other income and transfers into the analysis. This leads to a much more satisfactory analysis of the impact of demographic changes on household income distribution than usually has been undertaken for developing countries because we incorporate not only the effects of demographic variables on earnings and on other components of household income, but also on the probabilities of receiving each component of household income.

For our empirical estimates we use a random sample which we collected in Nicaragua in 1977-78. Our universe for the sample included households with at least one woman of age 15-45 who was not a full-time student. Our respondents were the randomly selected (from each sample household) women in this age range whom we characterize as the primary woman in this study. Because of the prevalence of extended families and the frequent presence of women domestics, this universe is almost the same as the universe of Nicaraguan urban households. More over it is almost identical to the universe of urban Nicaraguan households in which the next generation is being raised

(there are very few Nicaraguan households with children but without a woman in the 15-45 year age range). Therefore we are confident that our results are of relevance for the overall distribution of urban household income and particularly for those households in which the next generation is being raised in the conditions that prevailed in this Latin American country at the time of our survey.

Because in many developing countries there exists a central metropolitan area which may be different in structure from other cities and towns, we divide our analysis between that for the central urban area of Managua and that for other urban areas. We also test to see whether the relations differ for those two samples. In Table 1 we present means and standard deviations for all of the variables which we use in our analysis for the Managuan and the other urban samples. For more extensive descriptions of the sample see Behrman, Belli, Gustafson, and Wolfe (1979) and Behrman, Gustafson and Wolfe (1980). For other studies in the larger project of which this paper is a part see Behrman and Wolfe (1979a,b,; 1980a,b,c,d,e, f,g,h,i,j), Behrman, Wolfe and Tunali (1979), Blau (1977, 1980), Wolfe and Behrman (1980), and Wolfe, Behrman and Flesher (1979).

Section 1. Structural Estimates of Primary Male and Female Labor Force Participation, Experience, and Earnings and Household Transfers and Other Income

We are interested in the role of demographic characteristics in the determination of the components of income. However in regard to earnings we must first consider the impact of the demographic characteristics on current and past labor force participation for two reasons: First, some of the population characteristics may affect household income indirectly through labor force participation decisions. Second, if we estimate earnings functions without worrying about the labor force participation

decision, our estimates may be subject to selectivity bias (see Subsection 1.2 below). Therefore we begin with estimates of the determinates of labor force participation and experience. We then present estimates of earnings functions. Finally we consider the determination of transfers and other household income.

Subsection 1.1 Labor Force Participation and Experience

We use the standard framework to estimate labor force participation. We assume that comparisons are made between an individual's market wage and the same individual's shadow wage or opportunity cost. If the former is higher, the individual elects to participate in the labor force. If the latter is higher, the individual elects to stay out of the labor force. Therefore the dependent variable can have two values: one for labor force participation and zero for no labor force participation. The right-hand side variables include those that relate to the determination of the market wage (e.g., human capital stocks, geographical location, see Subsection 1.2 below) and those additional ones that relate to the opportunity costs of labor force participation (e.g., other income, marital status, child care needs and options). Among our human capital variables we include health status, nutritional inputs, and migration status in addition to the usual schooling and quadratic experience factors

Table 2 gives our probit estimates of labor force participation for women and for men for Managua, other urban areas and for both geographic samples combined.

The estimates for men are easily summarized because most of the variables do not have significant effects. This is so because almost 98 percent of the men in our sample participate in the labor force. Nevertheless there are a few significant determinants. For all urban areas, but particularly for Managua, the quadratic experience terms have an impact, with the maximum effect after 23 years of work experience -- or more or

less in the prime of life. For all urban areas better nutrition also significantly increases the probability of male labor force participation. The coefficient estimates otherwise tend not to be significantly different from zero, nor to differ significantly between Managua and other urban areas. There is some suggestion, however, that within the other urban areas male labor force participation is less likely in Nueva Segovia than elsewhere.

For women the results are much more interesting, in part because women are less likely to participate in the paid labor force than are men. At the time of our survey, 47 percent of the women in Managua and 39 percent of the women in other urban areas were participating in the labor force.

The traditional human capital variables have a significant role in the determination of women's labor force participation. Education has a significant coefficient estimate in Managua - although not for other urban areas. This difference may reflect the existence of more formal sector employment opportunities in Managua than elsewhere, and that education actually selects women into formal sector employment as opposed to informal or domestic sector employment or non labor force activities (se Behrman, Wolfe and Tunali, 1979). The quadratic experience terms have significant coefficient estimates for all urban areas, and imply a maximum probability of labor force participation after 19 years of actual labor force experience. However the linear (but not the squared) part of the experience coefficient estimates indicates a significantly greater impact for experience in other urban areas than in Managua.

We include several additional human capital variables beyond the standard schooling and experience ones. One of these also is a significant determinant of women's labor force participation. The nutritional input significantly increases the probability of labor force participation, more so in the other urban areas in which nutrition tends to be less satisfactory

than in Managua (the lower mean and greater standard deviation for this variable in Table 1 reflect that relatively more households are below international standards in other urban areas than in Managua). However the various measures of health status that we have (in Table 2 we include one related to parasitic diseases) do not indicate a significant role for this factor.[2]

The variables related to the nature of the household and the opportunity cost of labor force participation in terms of household activities have a number of significant effects for women. Women who never have been accompanied by a male ("single") or who no longer are accompanied ("previously accompanied") are significantly more likely to participate in the labor force in all urban areas. Presumably this is so because such women are less likely to be in a household with satisfactory income due to the absence of a working male companion. The effect for single women (but not for previously accompanied ones) is significantly greater in other urban areas than in Managua. In Managua, however, this tendency is reinforced by an inverse association between other household income and women's labor force participation.

Also only in Managua, women who have small children and who do not have home child care from older children or from extended families are less likely to participate in the labor force. These effects are the standard ones that are reported in the literature for other samples from other countries. What is interesting in this case is that there is not similar evidence of a impact of these child-care considerations for other smaller urban areas. We speculate that this pattern of estimates may reflect the dominance of informal sector employment in which on-the-job childcare is possible in other urban areas, in contrast to the much greater formal and domestic sector employment in Managua.

We have noted several significant differences between the determinants of women's labor force participation in Managua and in other urban areas. The estimates also suggest that there may be some differences among the areas within the latter category, with higher probability of participation in Madriz and lower probabilities in the North and in Nueva Segovia than elsewhere. Such a pattern is similar to that for men except in Madriz women are more, and men less, likely to participate in the labor force than elsewhere. Thus in general local labor market conditions may affect both male and female participation decisions similarly, except that in Madriz the current employment structure may be biased towards women in comparison with the rest of the urban areas.

We now turn to the determinants of total work force experience. We do not present estimates for men because almost all prime age males participate in the labor force so that actual work experience almost equals age minus years of schooling minus number of pre-schooling years.

For women, the considerations that underlie our specification are basically the longer-run integral of those that determine labor force participation at a point of time. But because the considerations here are longer run, we exclude some short-run variables (e.g., nutrition status for last week) and add earlier background variables that may pertain to tastes for work, ability and/or motivation (e.g., women's parental characteristics). Table 3 gives ordinary least squares multivariate regression estimates for women's experience in Managua, other urban areas, and all urban areas.

Among the human capital variables, emphasis generally is greatest on education. Our estimates suggest that in other urban areas, education has been obtained at the margin of almost a year-for-year opportunity cost in terms of work experience since the coefficient estimate of -0.94 is not significantly different from minus one. Therefore those women in our

sample who were not in school when they were of school age apparently were largely in the work force. However once we control for this direct substitution between schooling and early work force experience, added schooling increases work experience, as is indicated by the significantly positive coefficient estimates for the interaction between schooling and age. In fact the magnitude of this estimate suggests that by the time a woman is 29 years old, the added work experience gained by working more in her post-schooling years offsets the experience directly lost by attending school. Women older than 29 with more schooling tend to have significantly more work experience than those with less schooling, despite the earlier one-for-one substitution of time in school for time in work force.

For Managua the signs of the estimates also are consistent with this pattern, but the magnitudes are smaller and are not significantly nonzero. The difference between Managua and other urban areas probably reflects the greater availability of early education in Mangua and the greater social and legal pressures for almost universal attendance. Therefore there was not the same degree of trade-off between going to school and labor force participation at a young age. The higher mean and lower standard deviation for the primary woman's education in Table 1 are consistent with this possibility.

The other human capital variables which we include relate to health status and medical history. Generally having had diseases in various categories does not significantly affect women's labor force experience. The one exception is the significantly positive coefficient estimate for having had generally preventable (i.e., by sanitation or other public health measures) diseases for women in M agua (which also carries over to the regression for all urban areas). The sign of this estimate is somewhat perplexing since it implies that less healthy women have more

work experience, ceteris paribus. We expect that it is representing the greater necessity of poorer women (who have poorer sanitation, water supplies etc. and therefore greater probability of such diseases) to work because of a lack of sufficient other household income and/or that working women are more susceptible to such diseases (e.g., because of greater tiredness, more exposure) -- not that bad health causes a women to acquire more work experience.

The variables that relate to the family situation and the opportunity cost of working in terms of childcare generally reflect a pattern that is similar to that for the estimates for women's labor force participation at the time of the survey. In Managua, but not in other urban areas, having children reduces work force experience, particularly while the children are young. This difference between Managua and other urban areas, once again, probably is due to the greater dominance of on-the-job child care possibilities in the latter (since formal and domestic sector options are less common). In Managua and in other urban areas, currently being unaccompanied increases accumulated work experience because of the smaller probability of an unaccompanied woman having adequate resources on which to live in comparison to those who have male companions with earnings. An interesting related implication of the estimates is that women in Managua have -0.2 years significantly less work experience for every year since they first cohabitated with a male.

The family background variables which have significant coefficient estimates suggest that for women in Managua, a better socioeconomic background in their childhood (e.g., mothers present, fathers with higher occupational prestige) leads to more work experience in their adult lives. Apparently such a background is associated with greater sanction for female education and labor force participation in the present generation of adult

women, which more than offsets greater pressures to work when young in poorer childhood households.[3] However these same factors do not have a significant impact outside of Managua, perhaps because of the prevalence of more traditional attitudes regarding the appropriate place of women at home (if economically possible).

The other background variables are migration status and age. In Managua, women who emigrated from other areas are likely to have about a year more work experience than do other women, ceteris paribus. Such emigrants often are women who have come to Managua for the specific purpose of working (generally as domestics, see Behrman, Wolfe and Tunali, 1979), so such a result is not surprising. Work experience increases with age, given that we have controlled for schooling.[4] This is logical since older women have had more years in which they might have worked. What is of interest is that the estimate for Managua is significantly larger at 0.53 than is the 0.36 value for other urban areas. Female long-run paid labor force participation apparently is greater in the central metropolitan area -- whether this is due to different attitudes about work or to more options in the more rapidly growing economy there.

We note, finally, that there are significant differences in the relations between Managua and other areas.[5] If we combine all of the observations into one regression (but not otherwise), moreover, women in the North and in Madriz seem to have 1-3 years significantly less work experience. For the North this result is consistent with the labor force participation estimates in Table 2. For Madriz, however, such an estimate indicates less favorable long-run conditions relative to other areas for women's labor force participation even though the estimates in Table 3 suggest more favorable short-run conditions.

Subsection 1.2 Earnings

For most households in our sample earnings are the major source of income. The standard economic model posits that ln earnings are dependent on human capital investment in schooling and in work experience (with a quadratic form for the latter). Particularly for women, the standard approach also includes a correction for selectivity bias (i.e., individuals deciding not to participate in the labor force because the returns of doing so would be relatively low for their stock of human capital, a selection decision which may bias downward the estimated returns to the human capital stocks).[6] We basically follow this standard model, with an extended definition of human capital to include nutrition, health and migration statuses. Table 4 gives our ordinary least squares regression estimates of the ln earnings functions for women and for men, for Managua, other urban areas, and all urban areas.

The standard human capital variables of schooling and experience generally have significant coefficient estimates of the anticipated signs, although the quadratic experience terms in some cases are below the margin of significance. For both women and men, the estimates are somewhat higher for Managua than for other urban areas, although the differences are not statistically significant. However the estimated returns to the standard human capital variables are significantly higher for women than for men. For women the estimated returns to education are 12.9 percent as compared to 9.3 percent for men, and those to 10 years of experience are 35 percent for women and 19 percent for men. If anything, thus these values suggest that labor market imperfections result in higher returns to the standard human capital investments for women than for men. We wish to emphasize, however, that despite such higher marginal returns, women receive the same earnings as men only if their human capital stocks are substantially larger because the base level of ln earnings (as represented by the constant estimates) is significantly higher for men (due to discrimination or

or selection into more demanding jobs?).[7]

We also include human capital variables related to health, nutrition, and migratory status. As for labor force participation and generally for experience, we find no evidence of a significant impact of health status on earnings.

For nutrition status (as represented by protein intake) we obtain significant positive coefficients for women for other urban areas and larger ones for men both for Managua and for other urban areas. For women we understand the difference between Managua and other urban areas to reflect that nutritional levels tend to be higher and less varied in Managua (and thus less likely in a critical range than in the other urban areas, as we suggest above in Subsection 1.1). That the estimates are higher for men than for women reflects a combination of two factors: (1) Men tend to be engaged more frequently in more demanding physical labor in which the payoffs to a better nutrition state may be higher than in the occupations in which women are concentrated. (2) Men may receive very large shares of household protein, so the variable in the regression may represent individual protein input much better for men than for women.

Our third additional human capital variable relates to migratory status (which is available only for women in our sample). In this study, however, we do not investigate the human capital returns from migration decisions by comparing expected returns from staying where one is to those for alternative locations (e.g., Behrman and Wolfe, 1980i). Instead we simply ask if there is any advantage to remaining in one's home town in terms of contacts which lead to better jobs. The coefficient estimates suggest that there is such a return for women born in Managua, but not for those born in other urban areas. This difference may reflect that Managua is much bigger and more complex in regard to occupational structure than are the other urban areas, so there is a higher payoff to having good personal contacts and they take longer to acquire than elsewhere.[8]

We have noted several possible differences between Managua and other urban areas in regard to the determination of ln earnings, although on an overall level the hypothesis of homogeneity in the two samples is not rejected at the 5 percent level. With the combined sample for all urban areas (although not in those for other urban areas alone) there is some evidence of significant differences in earnings levels in the various regions which we include in other urban areas. These estimates suggest lower earnings for women and men in the North and the Pacific, and for women in Madriz and Nueva Segovia. That such differences only show up in the combined samples suggests that they are stronger relative to the Managuan metropolitan area earnings, than to earnings in other parts of the other urban areas.

The coefficient estimates for the labor force participation variables, finally, suggest that labor force participation selectivity may be a problem for women (particularly in Managua)[9] but not for men. Of course this is the standard result and hardly is surprising, especially after our discussion of the labor force participation decisions in Subsection 1.1 above.

Subsection 1.3 Transfers

For most households in our sample, transfers are small relative to earnings. In fact for two thirds of the sample transfers are zero. However for the minority of households that receive them, transfers may be significant (see Table 1). Major sources of transfers include parents and other relatives, friends, and companions (particularly for child support). Transfers from public welfare and other related programs, are not very important, in contrast to the situation in most more developed mixed and socialist economies and in a number of other developing countries.

Observed transfers are the reduced form outcomes of supply (i.e., available resources under the control of parents and other relatives,

former companions, and friends) and demand or perceived needs. In our modeling of these flows, we attempt to represent these supply and demand factors (given our data constraints) with reference to four groups of variables: household characteristics and family status, woman's family background, woman's personal characteristics, and regional variables. Our variable list focuses on the woman because, as we discuss in the introduction, our sample includes only households with adult women present, but not always with adult men present (and therefore characteristics of previous male companions are not always known to us).

Because of the large number of households for which such transfers are zero, we break the estimation into two steps. First we estimate probit relations for whether or not a household receives transfers. Second we estimate the amount of these transfers for those households which receive some, with a Heckman (1976) term included to control for selection into the group that receives transfers.

Table 5 gives the probit estimates for whether or not a household receives transfers, for Managua, other urban areas, and all urban areas. Table 6 includes multivariate estimates for the amount of these transfers, conditional on them being positive. We discuss the results in these two tables together, with reference to the four variable groups that we mention above.

1) Among the household characteristics and family status variables, several have significant coefficient estimates. The most important in the determination of the probability of receiving transfers is the positive effect of the woman having a previous companion, which reflects transfers from such previous companions for child support (and perhaps some alimony). The second most important is the presence of household members over 14, who can contribute transfers to total household income. Third is the

number of live children, which probably relates to the inducement for former companions and for grandparents and other relatives and friends to provide transfers. Nearer to the margin of significance is being single, for which women transfers from parents are not uncommon. It is interesting to note that the coefficient estimates for all of these variables are larger (often significantly so) for the Managuan sample than for the other urban areas.

In the determination of the amount of transfers (given that they are positive), household characteristics and family status variables are much less important than in determining the probability of receiving transfers. Only the previous accompanied marital status variable for Managua has a significantly nonzero coefficient estimate of the same sign as in the probability probit in Table 5. In this case the very strong impact regarding receiving transfers is reinforced by a weaker effect on the amount that is received. In all other cases of variables in this group, with the single exception of the number of live children in the combined sample (which seems to be reflecting some aggregation problem, given the insignificant estimates for the two separate samples), the coefficient estimates are insignificant at standard levels. What this suggests is that some factors (e.g., the presence of household members over 14) affects significantly whether or not transfers are received, but the amounts that are obtained are so small that they do not have a significant impact on the total (conditional on it being positive).

2) For the <u>woman's childhood family background variables</u>, the coefficient estimates suggest less important roles in the determination of the probability of receiving transfers and, in some cases, puzzling ones. The marginally positive significant effect of the woman's father's presence during her childhood probably relates to the stability of the household in which she was raised. But it does not seem

to relate to the income of that household, particularly in so far as the father's occupational prestige (with its negative estimated coefficient) represents permanent income. The negative coefficient estimate for the woman's mother being present also is perplexing, even though the number of women without their mother (or a female surrogate) present during their childhood is quite small. The significantly negative impact of upbringing in an urban household for current Managuan households may reflect the greater cohesion and support from more traditional rural families. But all in all these estimates do not provide much support for our general prior hypothesis that transfers are more probable the better off are the parents of the woman, the fewer her siblings (who might compete for such transfers) and the closer their residence to their parents (see the "never migrated" variable).

The variables pertaining to the woman's childhood family, in contrast, are more important in regard to the determination of the amount of transfers than they are in regard to the selection rule regarding whether or not such transfers are received at all. Both father's and mother's socioeconomic status have significantly positive coefficient estimates (although the one for mother's socioeconomic status is just below the margin of significance for Managua). These estimates suggest that the woman's family socioecnomic background does condition the amount of transfers to her household, even if they have very limited impact on the probability of receiving transfers. However there is one puzzling estimate in this group -- the significantly negative one for the woman's father being present in the household of her childhood in the sample for other urban areas (and therefore in the overall sample).

3) Among the <u>woman's characteristics</u>, the most significant in the

determination of the probability of receiving transfers is the negative effect of the women's work experience. Presumably these estimates reflect less support from parents, relatives, and perhaps previous companions for women who are perceived to be able to take care of themselves from their own earnings. For the Managuan sample alone, the negative impact of the woman's work experience on the probability of receiving transfers is reinforced by a significantly negative effect on the magnitude of transfers (for those who receive them).

The only other clearly significant coefficient estimate in this group for both the probability of receiving transfers and for the amount of these transfers is the positive one for the woman's education for the Managuan sample. At least two possible interpretations of these coefficients are possible: (i) Parents who invest more in their daughter's education are more likely to provide more <u>in vivos</u> gifts.[10] (ii) Previously accompanied women with higher education are more likely to have former companions with higher current earnings from which to make current transfers for child support.

Age has a significantly positive coefficient estimate for the amount of transfers that are received (given that they are positive), but not for the probability of receiving transfers. This may reflect that for older women in our sample, friends, siblings, and previous companions are able to be more helpful (given that they have decided to be helpful with transfers at all) because they more likely in their prime earnings years. If this is the case, then we would not expect that the effect would perservere for extrapolation to older ages outside of the sample.

The human capital variables relating to health status of the women are insignficant in all of the relations (although the coefficient estimate

for having had a generally preventable disease is just below the margin of significance in other urban areas in the probability probit). Therefore there is not support for the plausible hypothesis that women with poor health are more likely to receive transfers or are likely to receive larger trasnfers than do others, either transitorily (as represented by recent days ill) or in the longer run.

c) The regional variables, finally, suggest higher probability of receiving transfers in the Pacific area and perhaps in Nueva Segovia. The former probably represents the greater wealth of family and friends and former companions because of the relatively rich agricultural land along the Pacific coast. In regard to the amount of transfers, however, only the positive estimate for the North in the overall regression even approaches the margin of significance.

Subsection 1.4 Other Income

For most households in our sample, other income is even less important than are transfers (although the difference is greater in Managua than in other urban areas, see Table 1). Less than 15 percent of the households in our overall sample receive other income. Since other income refers primarily to returns from assets, the limited relevance of this variable is not very surprising since very few households in urban Nicaragua own income-earnings assets.

In our data set we do not have good direct measures of such asset ownerships. Therefore we model the determinants of other income as reflecting two groups of indirect measures of current household income producing assets. First, the respondent's family background characteristics may relate to direct intergenerational assets transfers and human capital investments in her. Second, the household adult composition and stock of human capital relate to potential earnings capacity, part of

which may have been utilized in the past to acquire current other income generating assets. We also include a third group of regional variables. Because of the small portion of the sample that receive other income, we again break the estimation into two steps. Table 7 gives probit estimates for the probability of receiving other income. Table 8 gives multivariate ordinary least squares regression estimates for the amount of other income, conditional on it being positive.

1) The primary woman's family background variables apparently have but limited impact on other income. For Managua, the father's occupational prestige has a significantly positive impact on the probability of receiving other income and the mother's occupational prestige has a significantly positive impact on the amount that is received. Such results are plausible in that the socioeconomic status measures probably are associated with income and wealth and the magnitude of intergenerational asset transfers and human capital investments. We do not find evidence, however of other significantly nonzero family background effects.

2) The household composition and adult human capital variables have several effects. The primary woman's education increases significantly the probability of receiving other income in the Managuan sample, and the amount of other income in Managua and in other urban areas (although significantly more so in the former). Her experience increases significantly the probability of receiving other income in Managua and in other urban areas (although more so in the latter), and the amount of other income in other urban areas. The presence and education of a male companion, perhaps somewhat surprisingly, does not have a significant impact. But the presence of other household members over 14 years of age who might contribute to earnings and to wealth significantly increases the probability of receiving other income in Managua and the magnitude of such income in

all urban areas (with no significant difference between Managua and other urban areas in this case, even though the point estimate for the former is almost twice that of the latter).

3) The regional variables imply a significantly lower probability of receiving other income in the North and in Madriz and significantly lower amounts of other income in the North and in the Pacific. The last of these probably is most surprising, since the regional variables presumably reflect regional wealth differences and the Pacific region is relatively wealthy.

Section 2. The Distribution of Urban Household Income and the Impact of Demographic Changes

In this section we turn to the question of primary interest in this study: What impact would demographic changes have on the distribution of household income and on its components? However first we consider the nature of the actual distributions of income and of our predicted distributions.

Throughout our analysis we use Gini coefficients to summarize the nature of income distributions. This coefficient can range from zero (complete equality across households) to one (all income received by one household). Thus higher values imply greater inequality.

Subsection 2.1 Actual Distributions of Income

The first row of Table 9 gives Gini coefficients for the actual distributions of household income and of the major components for Managua, other urban areas and all urban areas combined. In parentheses beneath the Gini coefficients are the mean values for the distributions. We begin by summarizing several important characteristics of these actual distributions.

First, among the components of household income, the distribution is

most equal for primary male earnings and least equal for transfers and other income, with primary female earnings in between. This pattern is not surprising, given the probabilities of receiving different types of income that we note in Subsections 1.1, 1.3 and 1.4 above. That is, almost all adult males receive earnings, 43 percent of adult females receive earnings, 33 percent of households receive transfers, and 15 percent of households receive other income. A big factor in the determination of the degree of inequality in any of these distributions simply is the proportion of individuals or households with zero values. In the comparisons between the distributions of transfers verus other income for other urban areas, however, it is clear that the relative inequality among those who receive transfers or other income differs sufficiently so that the Gini coefficients are about the same even though many more households do not receive other income than the number that does not receive transfers.

Second, the total household income is distributed more equally than all of the components with the single exception of male earnings. Therefore the relatively unequal distributions of woman's earnings, transfers, and other income tend to offset each other partly. Households which do not receive income from one of these sources apparently are more likely to receive it from one of the others.

Third, the effect of women's labor force participation is to equalize somewhat the actual distribution of income. This is clear from the comparison of the Gini coefficients for total income with the higher ones for total income minus her earnings.

Fourth, inequalities are greater in other urban areas taken as a group than in Managua for total income and for all but one component of total income. The exception is other income, in which case the Gini coefficients are virtually identical (and very high) for Managua and for other urban areas.

Fifth, urban household income inequalities were considerable in pre-revolutionary Nicaragua. Comparisons with other studies is not easy because most such estimates are for different segments of the total population. But a Gini coefficient of .54 for total household income is quite high, particularly in light of the fact that rural households are not included in this study. Were the rural sector added, with its predominance of very poor households and a few very rich ones, almost for sure the overall Nicaraguan Gini coefficient for household income distribution would be even higher.

Subsection 2.2 Simulated Expected Distribution of Income

The second row of Table 9 gives Gini coefficients for predicted expected distributions of income and of the major components, which we have calculated on the basis of our estimates in Section 1. These estimates are "expected" in that they incorporate both the estimated probability of receiving a particular component of income and the estimated amount that would be received (conditional on it being positive). Therefore in an important sense these estimates are more long run in nature than are the actual distributions. They incorporate the underlying probability of receiving a particular type of income, rather than the actual extreme all or nothing fact of whether or not that type of income was received in the response period for our survey.

For example, less than half of the women actually participated in the paid labor force during the period immediately preceding the survey, but many more had participated earlier or might do so in the future, and some of those who happened to participate during the survey period might not do so for much of their adult life. By using our probability estimates of women labor force participation based on the individual and household characteristics, we are able to capture much better the longer

run participation pattern of a woman than do the data on her actual participation for two weeks prior to our survey. Of course, the same considerations apply to male earnings, transfers and other income. Both of these may be received erratically or at long intervals, which implies that the fact of whether or not they were received in the sample period may not be a very good guide to the longer run pattern.

Because of this feature of the expected income distributions, they are a more interesting basis for simulating the impact of hypothetical population changes than would be the actual distributions. Therefore we use them for this purpose in Subsection 2.3 below. But before we turn to those simulations, it is useful and interesting to discuss several dimensions of the expected distributions themselves.

Perhaps the most striking aspect of the expected distributions is that they imply much less inequality than do the actual distribution. The Gini coefficients are lower in every case, and generally quite substantially so (with transfers in Manggua being the only case in which the decline is small). This suggests that longer run household income distribution inequality in urban Nicaragua is much less than is indicated by the short-run actual distributions which we discuss in Subsection 2.1.[11] It also implies that one has to be careful in comparing summary statistics for various income distributions to be sure that the distributions are defined in comparable ways.

In addition to comparing our predicted Gini coefficient with the actual ones, it is interesting to ask to what extent differential probabilities of receiving the different types of income affect inequality. In the third row of Table 3 we present Gini coefficients based on the estimated amount of each type of income (as in the second row), but without adjusting for the differential probabilities of receiving the different

income components. The comparison between the second and third rows indicates that differential probabilities of receiving income always increases our estimated Gini coefficients, although not always by very much. That is, those households who are more likely to receive a particular type of income are also likely to receive a large amount if they receive any. This effect is large for woman's earnings, transfers (although not in Managua), and other income. For men's earnings, not surprisingly, it is very small since almost all men participate in the labor force. For total income, this effect is of some relevance for the Managuan and other urban distributions. However for the combined distribution of total income for all urban areas, interestingly, it becomes very small.

Subsection 2.3 Simulated Impact of Population Changes on Income Distribution

In rows 4 through 9 of Table 9 we present the simulated impact on the expected distributions of income and its components of specific hypothetical demographic changes:

(1) Fewer children: All households with one or more children have one less child. and reduced prob. of having children 5

(2) Higher Age of Cohabitation: All women first cohabitate when they are two years older.

(3) Lesser probability of extended family: For each household which includes an extended family the probability of having an extended family is halved.

(4) Changed marital status: Increased probability of being single by using 0.1 instead of 0.0 for dummy variable for women being single and reduced probability of having an absent companion by changing dummy variable for absent companion from 1.0 to 0.5 for women with no companion present.

(5) Higher probability of woman's father being present during her childhood: If father was not present, replace dummy variable value of 0 by 0.2.

(6) Combination of all above changes.

In each case we give the impact of these changes on the Gini coefficients for expected income and its components for the included households[12] for Managua, other urban areas, and all urban areas. We summarize these simulations by examining the implications for each of the components of income, and then for total income.

Woman's earnings: The hypothesized changed marital status has the biggest impact on the distributions of expected women's earnings in all urban areas and in each of the separate samples. The combination of increasing the probability of being single and reducing the probability of there being an absent companion results in greater equality of women's earnings. An increase in the age of women's first cohabitation also works to a lesser extent in the same direction. All of the other effects are very small.

Man's earnings: Not surprisingly, none of the hypothesized changes have much impact on the distribution of earnings for men. Once again this reflects the almost complete labor force participation of prime age males.

Transfers: For Managua the distribution of transfers is affected most by the changed marital status (in an equalizing direction), with significant reinforcement when all changes occur at once. For other urban areas the equalizing effect of changing the marital status is largely offset by the inequalizing impact of increasing the probability of the woman's father being present in her household, so the result of all changes occuring at once is equalizing -- but less than for Managua. However for all urban areas the combined impact is slightly unequalizing.

Other income: For Managua and for all urban areas, both the reduced probability of having an extended family and the increased probability of the women having a father present during her childhood increase inequality. The latter effect also works in the same direction for other urban areas.

Total income: For Managua higher age of first cohabitation, changed marital status, and reduced probability of extended families all contribute relatively strongly to unequalizing changes. For other urban areas, higher age of first cohabitation and higher probability of having had her father present during her childhood both have relatively strong roles in somewhat smaller inequalizing changes. For all urban areas combined, higher age of first cohabitation, changed marital status, and more probable childhood presence of woman's father all work in the same direction.

Section 3. Conclusion

The determinants of income distribution in developing countries is a subject of considerable importance given the increasing concern about inequality in such societies. We explore the roles of various population characteristics in the determinants of the major components of urban income in a Latin American country. We find that there are many significant channels through which these population characteristics alter the determinants of the probabilities that a household receives a particular type of income and of the amount of such income conditional on it being positive. We find both differences and similarities for these channels between the central metropolitan area and other towns and cities.

We then use these estimates to obtain expected or longer-run distributions of income and of its components for the central metropolitan and for other urban areas, and then to simulate the impact of a number of hypothetical population changes. We focus on five changes that tend to occur in the development process. We find that one of these changes,

having fewer children, has almost no impact on income distribution. However the other changes combine to have significant unequalizing effects on income distribution. In the case studied, thus, the population changes associated with development tend to exacerbate the regressive nature of urban household income distribution.

NOTES

1. Cline (1975) reviews much of the recent evidence on income distributions in developing countries and provides references to other relevant studies.

2. For Managua in Behrman, Wolfe and Tunali (1979) we find some evidence of the health status affecting the selection of women into the formal sector labor force participation.

3. The insignificance of the coefficient estimate for women whose mothers worked might seem to be inconsistent with the interpretation of these family background variables as representing taste formation regarding work. But in the women's mother's generation in Managua, as in other areas more recently, a woman working was a reflection of low economic status -- not "modern" attitudes. Therefore such women did not provide the same role models as might be the case in more "modern" societies.

4. The constants in all three regressions are about -5 years, a value which probably is reflecting the pre-school infant years of zero work experience.

5. The F statistic rejects the hypothesis that the relations are homogeneous at the 1 percent level (with a value of 1.81).

6. See Heckman (1974, 1976), Maddala (1978) and Wales and Woodland (1980). In Behrman, Wolfe and Tunali (1979) we present a double selectivity model in which selection rules for labor force participation and for reporting earnings both are incorporated. However the results in that paper and in Behrman and Wolfe (1979a) suggest that selectivity with regard to reporting is not significant. Therefore we use the Heckman (1976) single-selectivity model here.

7. In fact in Behrman, Wolfe and Tunali (1979) we find that for a subset of the Managuan data the apparent higher returns to the standard human capital variables for women disappears in combined regressions for men and women, but the base level of ln earnings for men remains significantly higher than that for women.

8. Alternatively, such contacts may be more important in the formal sector in which product is less easily measured. For evidence consistent with this possibility, see Behrman, Wolfe, and Tunali (1979).

9. The greater importance in Managua than elsewhere also is consistent with the greater importance in Managua than elsewhere of childcare related opportunity costs (see Subsection 1.1 above).

10. This might be the case on an interfamilial basis even if on an intra-familial basis parents use gifts to compensate for differential human capital investments in their children. See Behrman, Pollak and Taubman (1979).

11. The estimates in row two are based upon the systematic parts of our estimated relations in Section 1 above. Therefore they are conditional upon the disturbance terms being distributed randomly with respect to the distributions of income and income components. If this assumption is not valid, part of the difference between rows one and two may be due to such heteroskedasticity in the disturbances, and not to the short-run versus long-run distinction in the text. We intend to explore this possibility further in our ongoing work.

12. We are simulating what would happen if these characteristics were different. We do not assume that more households would be created or some households would be destroyed if there were changes in marital status or in the prevalence of extended families.

Table 1: Variable Definitions and Descriptive Statistics

Definition	Managua Mean	Managua Standard deviation	Other Urban Areas Mean	Other Urban Areas Standard deviation	Sample[a]
A. Respondent's (i.e., Primary Woman's) Characteristics					
Education (years of formal schooling)	4.8	3.2	4.0	3.7	G
Age (years)	28.5	7.6	29.0	7.8	G
Work experience (years of)	6.1	6.6	6.3	7.5	G
Single (Dummy =1 if respondent is single)	.08	.28	.06	.23	E
Previously accompanied (dummy = 1 if respondent is separated, widowed, or divorced)	.19	.39	.18	.38	E
Never migrated (dummy = 1 if respondent never migrated)	.43	.50	.47	.50	E
Had medically preventable disease (dummy =1 if respondent reported having pneumonia, bronchitis, asthma, typhoid, tumor, skin disease, high blood pressure, or hernia)	.43	.49	.38	.49	E
Had therapeutically treatable disease (dummy =1 if respondent reported having anemia, tetanus, or V.D.)	.30	.46	.37	.48	E
Had generally preventable disease (dummy =1 if respondent reported having TB, croup, diptheria, or parasites)	.39	.49	.56	.50	E
Had parasites (dummy =1 if respondent reported having parasites)	.39	.49	.56	.50	A
Days reported ill last year	5.4	19.2	6.3	17.5	E

Definition					
Religious marriage (dummy = 1 if respondent was married in a religious ceremony)	.21	.41	.28	.45	E
Monthly church attendance (days/month respondent attends church)	2.1	2.7	2.3	2.4	E
Years of cohabitation	10.0	7.7	11.7	8.0	A
Bi-weekly earnings in Cordobas, natural log (includes non-zero values only).	5.51	.89	5.31	.91	B
Bi-weekly income other than respondents and companions earnings, and transfers	450	674	254	253	A
Family income other than respondents earnings, bi-weekly, non-zero values only	636	781	559	1016	H
Transfer payments from relatives and other sources, bi-weekly, non-zero values only	211	250	463	1651	F
B. Companion's (i.e., Primary Male's) Characteristics					
Education (years of formal schooling)	5.8	3.7	4.8	4.8	C
Age (in years)	32.1	8.9	34.2	9.9	C
Work experience (years)	17.3	10.0	19.1	11.6	C
Days reported ill last year	6.0	15.4	7.6	18.3	C
Bi-weekly earnings (Cordobos, non-zero values only), natural log	6.37	.76	6.15	.94	

Table 1: Continued (p. 4)

Definition	Managua Mean	Managua Standard deviation	Other Urban Areas Mean	Other Urban Areas Standard deviation	Sample
Both raisers (dummy =1 if both parents were present during respondent's childhood)	.54	.50	.56	.50	A
Regions					
North (dummy =1 if respondent lives in a northern department)	0	0	.25	.44	G
Madriz (dummy =1 if respondent lives in Madriz)	0	0	.02	.13	G
Nueva Segovia (dummy =1 if respondent lives in Nueva Segovia)	0	0	.04	.19	G
Pacific (dummy =1 if respondent lives i a Pacific dept. other than Managua)	0	0	.62	.48	G
Atlantic coast (dummy =1 if respondent lives in an Atlantic coast dept.)	0	0	.02	.14	G

Notes to Table 1

[1]Sample discriptions and sizes

		Sample Size	
		Managua	Other Urban
A	No missing data on variables in the women's labor force probits	1,208	1,006
B	Same as A plus positive earnings	500	353
C	No missing data on variables in the men's labor force probits	496	679
D	Same as C plus positive earnings	461	563
E	No missing data on variables in the probit on receive transfers	1,321	1,296
F	Same as E plus positive transfers	254	245
G	No missing data on variables in the probit on receive other income	1,268	1,365
H	Same as G plus positive other income	164	146

Table 2: Probit Estimates for Labor Force Participation for Women and for Men, Managua, Other Urban and All Urban, 1977-1978.[a]

Right-Hand-Side Variables	Women			Men		
	Managua	Other Urban	All Urban	Managua	Other Urban	All Urban
Human Capital Variables						
Educat:	.049 (3.4)	.025 (1.4)	.040 (3.7)	.015 (0.3)	-.033 (1.2)	-.020 (0.8)
Experi	.20 (10.7)	.25 (13.2)	.21 (16.8)	.13 (2.9)	.02 (0.8)	.05 (2.6)
Experi	-.0054 (6.3)	-.0063 (8.1)	-.0055 (9.9)	-.0028 (2.8)	-.0007 (1.6)	-.0011 (3.1)
Protei	.32 (2.9)	.52 (3.8)	.38 (4.5)	.69 (1.2)	.50 (1.7)	.51 (2.1)
Parasitic Diseases	.01 (0.1)	-.08 (0.8)	-.03 (0.5)			
Family Situation & Child Care						
Other Income	-.23 (3.6)	.05 (1.0)	-.07 (1.7)	-.49 (1.5)	.02 (0.1)	-.08 (0.7)
Children Under Five	-.42 (2.7)	-.01 (0.1)	-.14 (1.4)	-.03 (0.1)	-.03 (0.1)	-.01 (0.0)
Home Child Care* Children Under Five	.50 (3.4)	.04 (0.3)	.23 (2.5)	-.15 (0.3)	.40 (1.5)	.19 (0.9)
Single	2.12 (8.0)	3.08 (8.6)	2.53 (12.0)			

Table 2: Continued

Right-Hand-Side Variables	Women			Men		
	Managua	Other Urban	All Urban	Managua	Other Urban	All Urban
Previously Accompanied	.53 (4.5)	.63 (4.9)	.60 (7.1)			
Regional Variables						
North		-.38 (1.6)	-.27 (2.5)		-2.98 (0.2)	-.35 (1.4)
Madriz		.67 (1.7)	.62 (2.0)		-3.28 (0.2)	-.76 (1.5)
Nueva Segovia		-.66 (1.7)	-.54 (1.8)		-3.43 (0.2)	-.89 (2.1)
Pacific		-.17 (0.7)	-.06 (0.8)		-2.72 (0.2)	-.18 (0.8)
Atlantic Coast		-.56 (1.2)	-.40 (1.0)		-0.10 (0.0)	1.90 (0.2)
Constant	-1.59 (8.0)	-2.21 (7.2)	-1.91 (12.8)	3.17 (0.1)	4.08 (0.2)	1.18 (2.7)
-2* Ln Likelihood Ratio	465	561	1007	14.1	21.3	27.3
Sample Size	1208	1006	2214	496	679	1175
Number of Participants	571	391	962	489	659	1148

Table 3: Multivariate Regression Estimates for Women's Labor Force Experience in Managua, Other Urban Areas, and All Urban Area, 1977-1978.[a]

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Human Capital Variables			
Education	-.30 (1.5)	-.94 (3.9)	-.62 (4.1)
Education * Age	.005 (0.7)	.033 (4.2)	.019 (3.8)
Had Generally Preventable Disease	.71 (2.3)	.08 (0.2)	.46 (1.8)
Had Medically Preventable Disease	-.10 (0.3)	.11 (0.3)	.01 (0.0)
Had Therapeutically Treatable Disease	.37 (1.2)	.26 (0.6)	.31 (1.2)
Family Situation and Child Care			
Children Under Five	-1.57 (4.2)	.02 (0.0)	-.87 (2.7)
Number Live Children	-.24 (2.2)	-.12 (0.9)	-.17 (2.0)
Household Members Over 14 (Other than Primary Woman and Man)	-.37 (1.2)	.37 (0.9)	-.07 (0.3)
Single (Never Accompanied)	.78 (1.2)	2.71 (2.8)	1.72 (3.1)
Previously Accompanied	1.69 (4.2)	2.12 (3.9)	1.88 (5.7)

Table 3: Continued

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Years of Cohabitation	-.21 (4.0)	-.09 (1.3)	-.15 (3.7)
Background Variables			
Both Raisers	-.61 (0.7)	-1.11 (0.7)	-1.14 (1.6)
Father Present	-.33 (0.4)	-.94 (0.6)	-.58 (0.9)
Mother Present	.88 (1.8)	.43 (0.3)	.89 (1.9)
Mother Work	-.00 (0.2)	.02 (0.9)	.01 (1.0)
Father's Occupational Prestige	.94 (3.0)	.74 (1.4)	.83 (3.0)
Never Migrated	-.84 (2.7)	.60 (1.5)	-.16 (0.7)
Age	.53 (9.8)	.36 (5.9)	.44 (11.0)
Regional Variables			
North		-.32 (0.3)	-1.03 (2.5)
Madriz		-1.90 (1.2)	-2.56 (2.2)

Table 3: Continued

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Nueva Segovia		-.38	-1.39
		(0.3)	(1.3)
Pacific		.73	.11
		(0.8)	(0.4)
Atlantic Coast		-.35	-.70
		(0.2)	(0.5)
Constant	-5.41	-5.23	-4.94
	(4.0)	(2.2)	(4.7)
$\bar{R}^2$	.28	.24	.25
Standard Error	5.09	6.22	5.67
Sample Size	1208	1006	2214

[a] See note a to Table 2.

Table 4: Multivariate Regression Estimates for Women's and Men's Ln Earnings: Managua, Other Urban, and All Urban, 1977-1978.[a]

Right-Hand-Side Variables	Women			Men		
	Managua	Other Urban	All Urban	Managua	Other Urban	All Urban
Human Capital Variables						
Education	.133 (12.5)	.121 (10.2)	.129 (16.5)	.100 (11.2)	(12.0)	.093 (16.6
Experience	.062 (3.4)	.057 (3.3)	.055 (4.6)	.033 (2.1)	.020 (2.4)	.022 (2.6)
Experience^2	-.0011 (1.5)	-.001 (1.9)	-.0010 (2.2)	-.0005 (1.6)	-.0003 (1.4)	-.000 (1.7)
Protein	.11 (1.3)	.24 (2.2)	.14 (2.1)	.51 (5.6)	.48 (5.4)	.50 (7.3)
Days Ill	-.002 (0.9)	-.000 (0.1)	-.001 (0.6)	-.000 (0.1)	-.000 (0.1)	-.000 (0.3)
Never Migrated	.21 (3.0)	-.04 (0.4)	.12 (2.2)			
Regional Variables						
North		-.13 (0.6)	-.28 (3.0)		-.12 (0.9)	-.17 (2.3)
Madriz		-.33 (1.1)	-.45 (2.0)		-.14 (0.5)	-.26 (1.2)
Nueva Segovia		-.47 (1.2)	-.68 (2.0)		-.04 (0.1)	-.16 (0.8)

Table 4: Continued

Right-Hand-Side Variables	Women			Men		
	Managua	Other Urban	All Urban	Managua	Other Urban	All Urb
Pacific		.02 (0.1)	-.11 (1.9)		-.05 (0.4)	-.08 (1.7
Atlantic Coas		-.07 (0.2)	-.27 (0.8)		-.19 (0.9)	-.19 (1.1
Labor Force Participation	.43 (4.4)	.18 (1.8	.28 (3.9)	1.44 (1.3)	-.75 (0.9)	.06 (0.1
Constant	3.94 (18.0)	3.96 (13.3)	4.08 (25.1)	4.64 (18.7)	4.92 (28.8)	4.87 (31.
$\bar{R}^2$	.27	.32	.29	.33	.46	.42
Standard Error	.76	.75	.76	.62	.62	.65
Sample Size	500	353	853	461	563	1024

[a] See note a in Table 2.

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Household Characteristics and Family Status			
Number of Live Children	.06 (2.4)	.04 (1.7)	.05 (3.0)
Household Members Over 14 (Other than Primary Woman and Man)	.58 (6.7)	.33 (4.0)	.44 (7.5)
Single (Never Accompanied)	.83 (1.5)	.33 (0.7)	.70 (1.9)
Previously Accompanied	1.24 (11.8)	1.12 (10.3)	1.13 (15.6)
Religious Marriage	-.08 (0.7)	-.13 (1.3)	-.11 (1.4)
Single * Age of Woman	-.01 (0.2)	-.00 (0.1)	-.01 (0.4)
Woman's Childhood Family Background			
Father Present	.23 (2.7)	.15 (1.1)	.15 (1.8)
Mother Present	-.14 (1.3)	-.25 (1.9)	-.17 (2.0)
Father's Occupational Prestige	-.01 (1.9)	-.00 (0.4)	-.01 (2.0)

Table 5: Continued

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Mother's Occupational Prestige	.00 (0.0)	-.00 (0.4)	-.01 (0.3)
Number of Siblings	-.01 (0.4)	-.00 (0.1)	-.00 (0.3)
Urban Residence	-.29 (2.4)	-.03 (0.3)	-.09 (1.1)
Woman's Characteristics			
Educatio:	.03 (2.2)	.01 (0.5)	.02 (2.1)
Experience	-.02 (2.2)	-.01 (2.0)	-.01 (2.9)
Had Generally Preventible Disease	.08 (1.0)	.12 (1.6)	.08 (1.5)
Had Medically Preventible Disease	.05 (0.7)	-.08 (1.0)	-.02 (0.3)
Had Therapeutically Treatable Diseas:	-.03 (0.3)	.11 (1.4)	.04 (0.7)
Days Ill	.00 (0.7)	.00 (0.5)	.01 (0.6)
Age	-.00 (0.6)	.01 (0.1)	-.00 (0.3)

Table 5: Continued

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Never Migrated	.02 (0.2)	.06 (0.7)	.04 (0.8)
Monthly Church Attendance	-.01 (0.0)	.02 (1.4)	-.01 (0.9)
Regional Variables			
North		.34 (1.6)	-.00 (0.0)
Madriz		.44 (1.3)	.12 (0.4)
Nueva Segovia		.59 (2.1)	.27 (1.3)
Pacific		.57 (2.9)	.25 (3.7)
Atlantic Coast		.35 (1.0)	.06 (0.2)
Constant	-.89 (3.4)	-1.33 (3.9)	-.96 (5.4)
-2 * Ln Likelihood Ratio	247	207	434
Sample Size	1321	1296	2616
Number Receiving Other Income	421	452	873

Table 6: Multivariate Regression Estimates of Household Transfers: Managua, Other Urban and All Urban, 1977-1978.[a]

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Household Characteristics and Family Status			
Number of Live Children	8.7 (0.8)	-94 (1.5)	-66 (1.7)
Household Members over 14 (Other than Primary Woman and Man)	93.6 (1.2)	-1.4 (0.0)	181 (0.6)
Single (Never Accompanied)	273 (1.1)	1036 (0.6)	496 (0.5)
Previously Accompanied	254 (1.7)	-602 (0.6)	-657 (0.9)
Religious Marriage	5.1 (0.1)	-374 (1.1)	-182 (1.1)
Single * Age of Woman	-10.0 (1.0)	-57.1 (0.8)	-35.5 (1.0)
Woman's Childhood Family Background			
Father Present	-85 (1.4)	-1204 (3.3)	-702 (3.8)
Mother Present	-8.4 (0.2)	-302 (0.7)	-59 (0.3)
Father's Occupational Prestige	3.7 (2.1)	26 (1.7)	26 (3.0)

Table 6: Continued

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Mother's Occupational Prestige	2.4 (1.5)	44 (3.9)	19 (3.5)
Number of Siblings	6.9 (1.3)	35 (0.9)	24 (1.3)
Woman's Characteristics			
Education	25.9 (4.2)	-36.5 (0.9)	-20.7 (0.9)
Experience	-8.1 (2.8)	-20.8 (1.2)	-10.9 (1.0)
Age	7.0 (2.3)	24 (1.2)	17 (1.7)
Never Migrated	1.4 (0.0)	113 (0.5)	28 (0.2)
Regional Variables			
North		-148 (0.2)	313 (1.7)
Madriz		-604 (0.6)	-162 (0.4)
Nueva Segovia		-586 (0.6)	-181 (0.4)
Pacific		-172 (0.2)	256 (1.2)

Table 6: Continued

Right-Hand-Side Variables	Managua	Other Urban	All Urban
Atlantic Coast			113 (0.3)
Selection for Postive Transfers[a]			-876 (0.9)
Constant			596 (0.4)
R^2			.06
Standard Error			1143
Sample Size			498

[a] The variable for selection for positive transfers is the inverse of Mill's ratios calculated from the probit estimates in Tables 5 in the procedure suggested by Heckman (1976). Also see note a in Table 2.

Table 7: Probit Estimates for Households Receiving Other Income, Managua and Other Urban, 1977-1978[a]

Right-Hand-Side Variables	Managua	Other Urban
Woman's Family Background Variables		
Father Present	-.11 (0.8)	.02 (0.1)
Mother Present	.13 (1.0)	-.14 (0.9)
Father's Occupational Prestige	.01 (1.7)	.00 (0.4)
Mother's Occupational Prestige	-.00 (0.1)	-.00 (0.5)
Household Composition and Adult Human Capital Variables		
Woman's Educatic	.05 (3.2)	.02 (1.3)
Woman's Experier	.01 (1.7)	.02 (2.8)
Woman's Age	.01 (1.1)	.01 (0.9)
Companion Preser	-.13 (1.1)	-.15 (1.5)
Companion's Education	.01 (0.5)	-.00 (0.3)
Household Members Over 14 (other than Primary Woman and Companion)	.22 (2.2)	.14 (1.5)
Regional Variables		
North		-.51 (2.6)
Madriz		-.84 (2.1)
Nueva Segovia		-.30 (1.0)
Pacific		-.28 (1.6)

Table 7: Continued

Right-Hand-Side Variables	Managua	Other Urban
Atlantic Coast		-.02 (0.1)
Constant	-1.95 (7.3)	-.94 (2.8)
-2* ln Likelihood Ratio	38	41
Sample Size	1268	1365
Number of Recipients	169	209

[a]See note a in Table 2.

Table 8: Multivariate Regression Estimates for Household Other Income: Managua and Other Urban, 1977-1978[a]

Right-Hand-Side Variables	Managua	Other Urban
Woman's Family Background Variables		
Father Present	-35.5 (1.5)	-9.84 (0.9)
Mother Present	16.0 (0.7)	-1.63 (0.1)
Father's Occupational Prestige	.28 (0.3)	.50 (1.3)
Mother's Occupational Prestige	2.12 (3.1)	-.35 (0.8)
Household Composition and Adult Human Capital Variables		
Woman's Education	12.6 (4.2)	4.80 (4.3)
Woman's Experience	1.28 (0.9)	1.34 (2.8)
Woman's Age	-.65 (0.5)	.54 (1.2)
Companion Present	-7.07 (0.3)	-3.53 (0.5)
Companion's Education	-.57 (0.2)	.42 (0.5)
Household Members over 14 (other than Primary worman and Companion)	32.2 (1.9)	16.6 (2.4)
Regional Variables		
North		-32.7 (2.1)
Madriz		-49.2 (1.9)
Nueva Segovia		-28.5 (1.3)
Pacific		-31.8 (2.1)

Table 8: Continued

Right-Hand-Side Variables	Managua	Other Urban
Atlantic Coast		-41.6 (1.5)
Constant	-48.1 (1.1)	15.3 (0.6)
$\bar{R}^2$	.04	.05
Sample Size	1263	1302

[a]See note a in Table 2.

Table 9: Gini Coefficients for Household Income and Major Components in Urban Nica
and Simulated Impact of Demogr

	Woman's Earnings			Man's Earnin	
	Managua	Other Urban	All Urban	Managua	Other
1) Actual Distribution (mean)	.772 (167)	.810 (105)	.793 (137)	.438 (780)	.5 (6
2) Expected Distribution (Predicted amount * probability)	.388	.544	.468	.241	.3
3) Predicted amounts	.284	.311	.302	.240	.2
Simulations					
1) Fewer children	.385	.536	.462	.246	.2
2) Higher age of cohabilitation	.379	.538	.461	.241	.2
3) Lesser probability of extended family	.386	.546	.468	.241	.2
4) Changed marital status	.364	.501	.434	.241	.2
5) Higher probability of woman's father's presence	.388	.546	.469	.241	.2
6) All 5 at once	.352	.491	.423	.246	.2
Sample Size	1100	1054	2154	439	6

[a]The predicted value for each type of income is multiplied by the probability of receiving su
prediction (row 2) and the simulations. The sample includes observations for which the actua
is not missing, and which are in the sample for prediction.

ents in Urban Nicaragua, 1977-1978: Actual, Expected, Predicted
d Impact of Demographic Changes

Man's Earnings			Transfers			Other In	
Managua	Other Urban	All Urban	Managua	All Urban	All Urban	Managua	O
.438 (780)	.531 (626)	.449 (687)	.888 (48)	.950 (98)	.932 (74)	.945 (59)	
.241	.383	.334	.844	.418	.662	.523	
.240	.382	.332	.817	.322	.625	.385	
.246	.385	.336	.848	.413	.661	.521	
.241	.383	.334	.845	.419	.663	.522	
.241	.383	.334	.848	.421	.666	.537	
.241	.383	.334	.822	.401	.662	.523	
.241	.383	.334	.846	.433	.670	.540	
.246	.385	.336	.807	.409	.672	.553	
439	666	1105	1078	1171	2249	1169	

ty of receiving such income, for both the base line
or which the actual value of the income variable

ban	Other Income			Total Income			
	Managua	Other Urban	All Urban	Managua	Other Urban	All Urban	Mana
2	.945	.943	.946	.500	.575	.540	.58
)	(59)	(30)	(43)	(756)	(701)	(777)	(58
52	.523	.368	.474	.364	.311	.354	.44
75	.385	.301	.368	.302	.261	.345	.33
51	.521	.368	.473	.364	.306	.354	.45
53	.522	.368	.473	.385	.327	.372	.47
56	.537	.365	.481	.374	.314	.356	.46
52	.523	.368	.473	.382	.314	.361	.46
70	.540	.380	.489	.369	.320	.360	.45
72	.553	.378	.497	.410	.339	.382	.51
49	1169	1394	2563	653	721	1374	653

an	Total Income			Total Income minus Woman's Earnings		
	Managua	Other Urban	All Urban	Managua	Other Urban	All Urban
	.500 (756)	.575 (701)	.540 (777)	.584 (583)	.639 (577)	.616 (580)
	.364	.311	.354	.449	.323	.397
	.302	.261	.345	.335	.274	.376
	.364	.306	.354	.451	.318	.397
	.385	.327	.372	.476	.339	.418
	.374	.314	.356	.467	.329	.404
	.382	.314	.361	.467	.328	.404
	.369	.320	.360	.451	.334	.402
	.410	.339	.382	.519	.359	.441
	653	721	1374	653	721	1374

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