Inter-American Development Bank
Banco Interamericano de Desarrollo
Latin American Research Network
Red de Centros de Investigación
Research Network Working Paper #R-547

Female-Headed Households and Homeownership in Latin America

by

Néstor Gandelman

Universidad ORT Uruguay

January 2008

Cataloging-in-Publication data provided by the
Inter-American Development Bank
Felipe Herrera Library

Gandelman, Néstor.

Female-headed households and homeownership in Latin America / by Néstor Gandelman.

p. cm.
(Research Network Working papers ; R-547)
Includes bibliographical references.

1. Home ownership—Latin America. 2. Homeowners—Latin America. 3. Women—Latin America. 4. Women heads of households—Latin America. I. Inter-American Development Bank. Research Dept. II. Latin American Research Network. III. Title. IV. Series.

HD7287.8 .G378 2008
643.12 G378----dc22

Inter-American Development Bank
1300 New York Avenue, N.W.
Washington, DC 20577

The Research Department (RES) produces a quarterly newsletter, *IDEA (Ideas for Development in the Americas)*, as well as working papers and books on diverse economic issues. To obtain a complete list of RES publications, and read or download them please visit our web site at: http://www.iadb.org/res.

Abstract[*]

The gender of the household head has often been treated as an exogenous determinant of homeownership. This paper argues that several determinants of homeownership also affect household headship and that failing to explicitly account for this endogeneity leads to inconsistent results. Using individual level data for Chile, Honduras and Nicaragua, the paper shows that although on average women have lower probability of being homeowners, women who head households (single, separated or divorced) have a greater probability of attaining homeownership. Thus household level analysis should control for the endogeneity of household headship in order to properly address the gender effect on housing tenure. Estimating a bivariate probit model, the paper finds evidence that female-headed families have a lower probability of owning their home in Latin American countries. Without the endogeneity control this result was not present in eight countries.

[*] This paper was undertaken as part of the Latin American and Caribbean Research Network Project "Discrimination and Economic Outcomes."

1. Introduction

As stated in IDB (2004) "Poverty is both cause and effect of poor housing conditions. Lack of effective demand resulting from the low income of households is the underlying cause that prevents the private provision of houses…. Conversely, improving housing conditions can have a major influence on poverty alleviation through improvements in the living standards of low income families, and on poverty reduction via increased employment opportunities." Therefore, understanding the determinants of housing tenure and potential gender discrimination is important for poverty reduction policies.

The determinants of housing tenure and concerns with possible discrimination have been on the research agenda even before appropriate econometric techniques became commonly used. Li (1977) is the first paper that goes beyond linear models and estimates a logit model of the determinants of homeownership, but this study does not consider the gender of the household head.

Several types of variables have received most of the attention of the researchers: income and wealth, life cycle status, location and neighborhood attributes and a variety of socioeconomic indicators. In particular, much attention has been given to the racial or ethnic origin of the father. There is substantial evidence of racial discrimination in access to mortgage credit and homeownership.

The gender economic discrimination literature has also devoted considerable attention to studying the existence of discrimination in dimensions such as salaries and promotions. One common strategy is to include an explanatory variable indicating the presence of women and to conclude that if the estimated coefficient is significantly different from zero, females or female-headed households receive discriminatory (positive or negative) treatment. It is therefore striking find a dearth of comments on gender differentials in studies of the determinants of homeownership. The reason is that most studies find more favorable outcomes for female=headed families or do not find significant results at all.[1] Given the outcomes, in other contexts, of the gender discrimination literature these results are surprising. We argue that the

[1] Van Leuvensteijn and Koning (2004) and Gandelman and Gandelman (2004) find that female headed households have higher probabilities of owning their household in the Netherlands and Uruguay respectively. Chiuri and Jappelli (2003) and Arimah (1997) do not find gender differences in fourteen OECD countries and Nigeria respectively. Manrique and Ojah (2003) find that in Spain male-headed households are more likely to own their household but female headed households tend to have higher household expenditures.

determinants of women's household headship and those of homeownership are correlated and therefore the specification used in most studies has an endogeneity problem that leads to inconsistent and often counterintuitive results.

If female household headship is not exogenous to the tenure choice, then, even in the presence of lower probabilities of homeownership, a naive view of the data may reflect that women-headed households have higher probabilities of owning their home. For instance, women who have lower income, more children, etc., will probably not divorce their husbands even if they want to. There is a selection bias in which women-headed families tend to have better socioeconomic indicators than what they would have if female headship were a completely random process. Thus, the gender of the household head cannot be treated in the same way as other truly exogenous characteristics like race and ethnic origin.

To the best of our knowledge this is the first paper that focuses on the factors affecting homeownership and household headship jointly by explicitly providing an econometric solution to the endogeneity issues that arise from the joint determination of both variables. Our results for 17 Latin American countries show that the biases are important and that female-headed families have a substantially lower probability of attaining homeownership.

2. Data

Thanks to the collaboration of the MECOVI[2] program and the corresponding national institutes of statistics we were able to have access to the household surveys of 17 Latin American countries. The countries included in this study are: Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Peru, Paraguay, Uruguay and Venezuela from South America; Costa Rica, El Salvador, Guatemala, Honduras, Nicaragua and Panama from Central America; and Mexico. Table A1 in the Appendix presents detailed information on the data sources.

Table 1 presents the housing tenure structure for the countries covered in this study. Argentina is the only country that does not distinguish those that own their house and are still paying for it from those who have already finished paying. On average, 72 percent of all

[2] MECOVI is short for "Programa para el Mejoramiento de las Encuestas y la Medición de Condiciones de Vida," the Spanish translation for the Program for Improvement of the Surveys of Living Conditions. MECOVI is a regional program of technical assistance for capacity building to improve the household surveys to measure living conditions and poverty in Latin America and the Caribbean that was jointly launched in 1996 by IDB, World Bank and UN-ECLAC.

households own their home, 14 percent rent and 13 percent use a house with or without owners' approval. Venezuela, Panama, Paraguay and Nicaragua have the highest shares of homeowners and the lowest shares of renters. Colombia is the opposite case, with the lowest ownership ratio. This may in part be due to the internal forced migration that many Colombians have faced in recent decades. The mortgage market seems to be more developed in Chile, Costa Rica, Panama and Uruguay, the only countries where more than 10 percent of households own their home but are still paying for it.[3]

Table 1. Housing Tenure

	Own, already paid	Own, still paying	Rent	User with or without owner approval	Cases
Argentina	72.6%		14.8%	12.6%	26,285
Bolivia	61.2%	2.2%	16.2%	20.4%	4,832
Brazil	69.7%	4.5%	14.8%	11.1%	107,840
Chile	61.8%	10.4%	11.2%	16.6%	68,153
Colombia	45.7%	6.8%	34.3%	13.2%	22,949
Costa Rica	65.1%	10.3%	13.4%	11.2%	11,032
Ecuador	63.2%	4.7%	17.8%	14.3%	18,959
El Salvador	64.2%	5.6%	11.2%	19.1%	16,808
Guatemala	59.9%	1.8%	18.6%	19.7%	2,784
Honduras	69.2%	3.7%	13.4%	13.7%	7,983
Mexico	67.3%	5.9%	14.0%	12.8%	22,130
Nicaragua	77.0%	0.6%	3.2%	19.2%	4,171
Panama	67.3%	11.0%	10.0%	11.7%	6,344
Paraguay	76.6%	1.3%	8.4%	13.7%	9,591
Peru	68.9%	0.4%	10.2%	20.5%	2,163
Uruguay	57.3%	10.6%	16.8%	15.3%	18,338
Venezuela	74.8%	6.2%	9.7%	9.3%	46,287

Source: Authors' compilation based on countries' household surveys.

[3] In Uruguay, the state-owned Banco Hipotecario del Uruguay has a market share of more than 80 percent of all mortgage housing credit (Gandelman and Gandelman, 2004). As a result of a severe financial crisis in 2002, this source of home finance is no longer available.

3. Data Measurement Problems

3.1 Household Headship

There are potential difficulties in measuring the two main variables of our analysis. First, the status of household head is self-declared, and the definition of household headship is not homogeneous across countries. Female household headship does not necessary imply that the marital status of the woman of the house is divorced. In principle, a woman household head could be single, married, divorced or a widow. But given the household self-declaration of headship, it is not surprising that in practice in Latin America there are very few cases of married female household heads. To deal with this issue we explored the use of alternative "objective" definitions of household headship (e.g., assigning the household headship to the main income provider). We found no significant differences in the main results of the paper.

The endogeneity stressed in this paper has to do with the explicit decision of women to head their family. Naturally, single mothers and divorced or separated women are examples of such women. The decision to head the family may be the result of a woman divorcing her husband, but not all divorced or separated women wanted to end their marriage. Even in those cases where the husband ends the marriage, the woman has the possibility of remarrying or moving in with other family members. Less clear is the case of widows. First, although widows are female household heads, they became so only after the passing of their partner. Therefore, with the exception of criminal cases, women do not choose to become widows. But it could also be argued, as in the case of divorced women, that widows decide to continue living on their own, i.e. not to remarry or to live with some other family member. Even if remarrying is not a possibility for many widows (nor for many divorcees or separated women) and there are no family members or friends willing to live with or take care of them, those widows who end up heading their own household are those who managed to make a living on their own, caring for children on their own, etc., and these characteristics are likely to be correlated with homeownership.[4]

[4] In previous versions of this paper we dropped widows from our sample and the results were qualitatively similar to those presented here.

3.2 Homeownership in Household Data

A second measurement problem is that for most countries homeownership is not observed at the individual level but only at the household level, i.e., we do not know which member of the family is the legal owner of the house. Therefore our analysis, like most of the homeownership literature, has to be carried out at the household level rather than the individual level, as is more traditional in discrimination analysis.

When the estimation is carried out at the household level, the gender dummy will equal one in the presence of a female household head. The problem is that household headship is not exogenous. For instance, there is evidence that divorces are affected by several income and welfare variables. Shroder (2002) reviews the evidence on indirect effects of housing assistance on the self-sufficiency of assisted families. He concludes that there is a strong association of housing assistance with single-adult household formations. Other papers that report similar evidence include Danzinger et al. (1982) and Hannan and Tuma (1990). It is therefore natural to assume that some of the variables that increase the probability of owning a house also increase the probability of observing women-headed families. If this endogeneity is neglected the estimation is inconsistent.

3.3 Three Examples Using Individual and Household-Level Data

The traditional approach to estimating the determinants of homeownership is to postulate a structural equation

$$Own_i^* = x'\beta_i + \varepsilon_i$$

where $Own = 1 \text{if } Own^* > 0$ and ε is an error term assumed to distribute normal or logistic. All explanatory variables in x are assumed to be exogenous.

We are in the presence of gender differential effects, if all other things equal, females or female-headed households have a lower probability of owning their home. In order to test this gender differential treatment, one of the regressors would be a gender dummy. When the estimation is carried out at the individual level there are no problems with the gender variable since sex, like race or ethnic origin, is not a choice variable and could be taken as exogenous.

The only three countries where we could obtain data on the actual owner of the house were Chile, Honduras and Nicaragua. Column A and B use individual data and column C uses

household-level data.[5] As expected, richer, older, married and more educated people are more likely to own their home. After controlling for these variables, the Woman coefficients reported in columns A and C seem to contradict each other. The explanation for such a contradiction, though, appears in column B.

Column A and C report the "average" gender marginal effect on the probability of homeownership. Column A implies that the probability of women's owning a home is lower than the probability for men for the three countries. But this result is not homogenous for all types of women. In column B, we desegregate the gender effect by "types" of women. In particular, we distinguish single women heading a family, single women not heading a family (e.g., daughters living with their parents), women living with her couple (married or not), divorced or separated women and finally widows. After disaggregating the analysis, we observe that separated women or single female household heads have a higher probability of owning their home. For Nicaragua this is also true for widows. Thus, although we have already established in these three countries that women have a lower probability of owning their home, when estimating a column A type of regression using data aggregated at the household level, we will only capture the effect of those females that became household heads. The results in column C are not the true gender effect; it instead reflects the fact that those women who felt they could head their family have a greater probability of achieving ownership.

[5] Table A2 in the Appendix reports the estimated coefficients and standard errors.

Table 2. Probability of Homeownership, Marginal Effects									
	Chile			Honduras			Nicaragua		
	A	B	C	A	B	C	A	B	C
	Individual data	Individual data	Household data	Individual data	Individual data	Household data	Individual data	Individual data	Household data
Woman	-0.0067***		0.0545***	-0.0234***		-0.0113	-0.0487***		0.0732***
Woman-Single-Not household head		-0.0148***			-0.0410***			-0.1338***	
Woman-Single-household head		0.0028			0.0533***			0.2113*	
Woman Separated		0.0123***			0.0275**			0.0838***	
Woman Couple		-0.0072***			-0.0227***			-0.0663***	
Woman Widow		-0.0057**			0.0053			0.0530**	
Income	0.0182***	0.0179***	0.0379***	0.0010***	0.0007***	0.0018*	0.0166***	0.0143***	0.0017
Age	0.0014***	0.0013***	0.0081***	0.0035***	0.0027***	0.0104***	0.0091***	0.0076***	0.0064***
Married	0.0067***	0.0079***	0.1182***	0.0270***	0.0371***	0.1232***	0.0705***	0.1093***	0.0864***
Schooling	0.0045***	0.0044***	-0.0120***	0.0014***	0.0012***	-0.0082***	0.0020**	0.0019**	-0.0027
Observations	147,056	147,056	67,954	29,212	29,212	6,275	15,703	15,703	4,169

Note: In columns A and B Own=1 if individual owns the house, Wom=1 for females, Married=1 if the individual is married, Schooling is years of formal education. In column C Own=1 if someone in the household owns the house, Wom=1 if the household head is female, Age, Married and Schooling refers to the household head. Standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

4. Methodology

Since for most countries the information about homeownership is at the household level rather than the individual level (i.e., we know if a member of the household owns the house but not whom), we need to provide a remedy for the endogeneity that arises in household-level analysis. Therefore, to estimate the differential effect of gender household headship we postulate a bivariate probit model in which it is possible to test whether female headship and housing tenure are exogenous. The model is based on two structural equations.

$$Own_i^{*} = \beta_1' x_i + \gamma_1' z_{1i} + \delta_1 Woman_i + \varepsilon_{1i}$$

$$Woman_i^{*} = \beta_2' x_i + \gamma_2' z_{2i_i} + \delta_2 Own + \varepsilon_{2i}$$

where Own^{*} and $Woman^{*}$ are latent variables, *Own* and *Woman* are dichotomous variables that take the following values:

$$Own = \begin{cases} 1 \text{ if } Own^{*} > 0 \\ 0 \text{ otherwhise} \end{cases} \qquad Woman = \begin{cases} 1 \text{ if } Woman^{*} > 0 \\ 0 \text{ otherwhise} \end{cases}$$

x, z_1 and z_2 are vectors of exogenous variables, $\beta_1, \beta_2, \gamma_1$ and γ_2 are vector of parameters, δ_1 and δ_2 area scalar parameters and the error terms are assumed to be distributed bivariate normal

with mean 0, variance 1 and correlation $Cov(\varepsilon_1, \varepsilon_2) = \rho$. While the bivariate probit model can be identified based on the functional form assumptions of the joint normal distribution, this is a weak form of identification and it is desirable to have a more explicit identification strategy. Fortunately, some of the determinants of homeownership should not affect the gender headship regression and vice versa. The validity of the instruments depends on two conditions: whether the variables in z_1 and z_2 are sufficiently correlated with *Own* and *Woman* and whether the exclusions of variables are legitimate.

The exclusion restrictions in this paper come from the fact that homeownership is likely to be a family decision, while female headship is a personal decision. For example, the purchasing power of a household is determined by the total income of all its members, therefore household income should be related to homeownership. Female income, although correlated with total household income, is on average a minor percentage of it, and so it could be excluded from the homeownership regression. On the other hand, females with more income are more likely to feel secure and confident on their ability to head their family so it should be included in the headship regression. In our regressions we also include age and education variables, but in the homeownership regression they are instrumented with the age and schooling of the household head (male or female), and in the female headship regression we use data for the woman of the house (household head or household head's companion).

As shown in Greene (1998) and Greene (2003), despite the endogeneity of female headship, a multiple equation specification for two dichotomous variables like the previous one can be consistently estimated by Full-Information Maximum Likelihood (FIML) methods. The intuition behind this result is that the four probability terms that enter the likelihood function can be decomposed into the conditional and the marginal distribution for women. For instance,

$P(Own = 1, Woman = 1) = P(Own = 1 | Woman = 1) P(Woman = 1)$.

The loglikelihood function to be maximized is given by:

$$\ell(\beta) = \sum_{i}^{N} \left[d_{11} P_i^{11} + d_{10} P_i^{10} + d_{01} P_i^{01} + d_{00} P_i^{00} \right]$$

where:

$$d_{11} = Own_i Woman_i \qquad P_i^{11} = P(Own = 1, Woman = 1) = \Phi_i(\beta_1' x_{1i} + \gamma, \beta_2' x_{2i}, \rho)$$
$$d_{10} = Own_i(1 - Woman_i) \qquad P_i^{10} = P(Own = 1, Woman = 0) = \Phi_i(\beta_1' x_{1i} + \gamma, -\beta_2' x_{2i}, \rho)$$
$$d_{01} = (1 - Own_i) Woman_i \qquad P_i^{01} = P(Own = 0, Woman = 1) = \Phi_i(-\beta_1' x_{1i}, \beta_2' x_{2i}, \rho)$$
$$d_{00} = (1 - Own_i)(1 - Woman_i) \qquad P_i^{00} = P(Own = 0, Woman = 0) = \Phi_i(-\beta_1' x_{1i}, -\beta_2' x_{2i}, \rho)$$

and $\Phi_i(.,.,\rho)$ is the bivariate normal distribution assumed for the perturbations.

This nice result of the bivariate probit model has already been used in empirical work in various areas. Greene (1998) studies the probability of gender economic courses at Liberal Arts Colleges, White and Wolaver (2003) focus on occupation choice and migration and Greene, Rhine and Toussaint-Comeau (2006) study the decision to patronize check-cashing businesses and the decision to be unbanked.

5. Basic Statistics at the Household Level

There may be important differences in housing tenure and in female headship decisions between urban and rural areas. In this paper, whenever possible we wanted to restrict attention to urban areas. The household surveys of Bolivia, Brazil, Chile, Ecuador, Paraguay, Peru, Costa Rica, Guatemala, Honduras and Panama have a specific variable that allows differentiating between urban and rural areas. In Argentina, Colombia, Nicaragua and Uruguay, due to lack of more detailed information we restricted our analysis to households living in the capital city.[6] In Mexico we used data for all cities of more than 2,500 habitants. Finally, for Venezuela and El Salvador we were unable to differentiate households according to their location and ended up using the whole sample for each country.

Tables 3 and 4 present descriptive statistics of variables likely to affect the probability of becoming a homeowner and the probability of a woman to head her own household. Some of the variables are for the household as a whole, some are characteristics of the household head and some are characteristics of the woman of the household.

The first two variables are the dependent variables of our model at the household level. *Own* and *Woman* are dummy variables. *Own* takes a value of one when the household owns the house where they live and 0 otherwise, while *Woman* takes a value of one when the household

[6] For Argentina we used Gran Buenos Aires, including suburbs of the capital city.

head is a woman and 0 otherwise. Simply looking at the means, there are no sizeable differences in homeownership between male and female-headed households.

The variables of interest can be classified in the following four categories: income, life-cycle status, location and neighborhood attributes and other socioeconomic characteristics. We define two income-related variables: total household income (*IncomeHouse*) and total income of the woman of the house (*IncomeWoman*). In most countries, the household income of owners is higher than renters, the exceptions being Chile, Costa Rica, Nicaragua, Paraguay, Peru and Venezuela. The mean values of *IncomeWoman* and *IncomeHouse* imply that on average the income of the woman of the house accounts for approximately 30 percent of total income. Venezuela and Honduras are exceptional cases where the mean value of *IncomeWoman* is 55 percent and 50 percent, respectively, of the mean value of total household income. When these averages are broken down according to head of household, it is found that when a man heads the household the share of women's income in total household income is much lower (about 20 percent) than when the household is headed by a woman. Women who potentially earn more money by themselves are likely to feel more independent and therefore this may affect the decision to remain married. This pattern is clear from the comparison in absolute terms of *IncomeWoman* for those women who are household heads and those who are not. For most countries the average income of women heading their household is about two times the income of women not heading their household. The exceptions are Panama, Mexico, and Nicaragua, where for the first two the average income of women heading their households is more than 30 percent greater than the average income of spouses of male household heads. For Nicaragua this income difference is 12 percent.

We considered three life-cycle status variables: age of the household head and age of the woman (*AgeHead* and *AgeWoman*), a dummy that takes a value of 1 if the household head is married and 0 otherwise (*Married*),[7] and the number of children under 18 years old in the house (*Children*). In female headed families *AgeHead* takes the same value of *AgeWoman*. In most Latin American countries owning a house is a family achievement that can be attained only after many years of effort, and our tables show that owners who are household heads and the women of the house are about 10 years older than renters and users. In couples, men are usually older

[7] This variable could not be defined for Ecuador and Brazil.

than women and on average our data implies a difference between 2 and 4 years older (Uruguay being the minimum and Costa Rica the maximum).

If a person does not believe his actual mate to be stable, he may not be interested in entering into a long-term contract as a housing mortgage credit or buying a household that could be considered a marital property in case of divorce or separation. He will prefer a more flexible housing solution like renting. The household head being married is a proxy for family stability. The majority of owners are married (figures going up to 65 percent and 63 percent for Mexico and Bolivia, respectively). In all countries considered, most of renters' household heads are not married, and in only a few cases are most users married (the share of married household heads for users is above 50 percent only for Bolivia, Chile, Guatemala and Mexico). In regard to the household head gender dimension, only a very small proportion (in most countries below 15 percent) of woman households heads are married; Paraguay is the exception, with the highest share of married female household heads (24 percent). Also households headed by females tend to have fewer children than households where there is a couple present and the household head is a man.[8]

With respect to education we defined *SchoolingHead* and *SchoolingWoman* as the years of formal education of the household head or the woman of the house.[9] On average, owners are less educated than renters. Given the improvements in education levels over the last decades it is not surprising that the younger group is more educated than the older one.

[8] It may be surprising that the average number of children is between 1 and 2, but it should be noted that this is the average number of children per household and not per family.

[9] Argentina only reports schooling levels and not actual years. We assume that those with primary incomplete attend three years, those that did not complete secondary school attended eight years, and those that did not complete university studies had 13 formal years of education. Finally, those with university degrees were assigned 16 years of schooling.

Table 3. Summary Statistics by Housing Tenure

	Argentina				Bolivia				Brazil				Chile				Colombia				Costa Rica			
	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot
Own	100%	0%	0%	74%	100%	0%	0%	56%	100%	0%	0%	74%	100%	0%	0%	70%	100%	0%	0%	50%	100%	0%	0%	76%
Woman	30%	29%	29%	30%	23%	26%	21%	23%	29%	30%	28%	29%	28%	23%	25%	27%	35%	33%	36%	34%	20%	21%	17%	20%
IncomeHouse	975	894	590	919	2254	1667	1818	2029	1406	1347	748	1337	503	527	302	479	3553	2143	1497	2803	179	204	112	171
IncomeWoman	372	390	193	353	676	555	509	613	440	467	253	428	109	131	70	107	1327	828	668	1072	36	43	20	34
AgeHead	55.8	43.2	46.9	53.0	48.7	36.6	38.5	43.8	48.2	39.5	41.2	46.1	53.2	40.7	43.2	49.8	54.1	40.1	44.3	47.5	47.6	36.4	41.6	45.7
Agewoman	53.6	41.4	43.8	50.8	45.7	34.6	35.8	41.2	45.3	36.9	38.6	43.4	50.5	38.2	40.6	47.3	51.2	37.6	41.6	44.9	43.3	32.9	36.5	41.4
Married	53%	35%	40%	49%	63%	41%	52%	56%					60%	49%	52%	57%	46%	27%	27%	37%	57%	35%	38%	52%
Children	0.8	0.8	1.2	0.8	2.0	1.8	1.9	1.9	1.2	1.1	1.3	1.2	1.2	1.3	1.3	1.2	0.9	1.2	1.2	1.1	1.6	1.6	1.8	1.6
SchoolingHead	9.2	10.3	8.3	9.2	8.0	9.1	9.2	8.5	6.3	7.3	5.7	6.5	7.8	10.2	8.5	8.3	9.7	9.6	8.6	9.6	5.8	7.4	5.0	5.8
SchoolingWoman	9.3	10.2	8.7	9.3	7.4	8.9	9.1	8.1	6.4	7.3	5.9	6.5	7.8	9.9	8.5	8.2	9.4	9.4	8.6	9.3	6.1	7.0	5.2	6.1
	Ecuador				El Salvador				Guatemala				Honduras				Mexico				Nicaragua			
	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot
Own	100%	0%	0%	61%	100%	0%	0%	70%	100%	0%	0%	57%	100%	0%	0%	66%	100%	0%	0%	70%	100%	0%	0%	80%
Woman	24%	23%	24%	24%	32%	35%	30%	32%	25%	27%	21%	25%	32%	30%	29%	31%	24%	26%	25%	25%	39%	45%	28%	38%
IncomeHouse	524	515	310	495	7707	7553	3654	6917	5211	3862	3096	4480	9374	8196	5689	8718	11338	10147	7017	10573	4820	10269	2647	4682
IncomeWoman	136	116	99	126	2576	2639	1468	2382	1188	1172	747	1100	4653	4216	2736	4352	4803	4597	3076	4548	952	5078	640	1062
AgeHead	51.6	40.7	41.5	47.4	48.8	39.1	42.0	46.4	50.8	38.6	40.9	45.9	50.3	37.1	40.9	46.3	50.0	38.2	41.2	46.8	49.2	38.8	36.5	46.7
Agewoman	48.2	37.5	38.3	44.2	45.1	36.2	38.0	42.8	47.3	36.0	38.4	42.8	46.6	34.0	37.2	42.8	47.0	35.6	39.0	44.1	45.9	35.2	33.1	43.5
Married					39%	26%	25%	35%	55%	38%	52%	51%	44%	28%	29%	39%	65%	48%	54%	61%	35%	32%	22%	33%
Children	1.8	1.8	1.9	1.8	4.5	3.8	3.8	4.3	1.1	0.9	1.1	1.1	2.1	1.9	2.0	2.1	1.4	1.4	1.5	1.4	5.1	4.0	4.0	4.9
SchoolingHead	8.2	9.4	8.5	8.6	4.9	7.4	4.7	5.2	6.7	7.1	6.6	6.8	7.6	7.9	7.2	7.6	8.3	9.7	8.6	8.6	6.3	9.0	6.5	6.4
SchoolingWoman	8.1	9.2	8.6	8.5	4.6	6.9	4.5	4.8	5.6	6.2	5.5	5.7	7.5	7.8	7.2	7.6	8.0	9.3	8.4	8.3	5.9	9.6	6.5	6.1
	Panama				Paraguay				Peru				Uruguay				Venezuela							
	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot	Own	Rent	Use	Tot				
Own	100%	0%	0%	71%	99%	0%	0%	74%	100%	0%	22%	69%	100%	0%	0%	67%	100%	0%	0%	81%				
Woman	31%	30%	27%	30%	32%	36%	30%	32%	22%	26%	20%	22%	36%	36%	34%	36%	33%	28%	22%	31%				
IncomeHouse	893	693	494	807	162	266	55	165	2347	3376	1317	2235	18454	15289	9099	16587	232	322	196	237				
IncomeWoman	273	238	113	247	56	64	43	56	572	1278	437	629	7355	6462	3424	6665	130	169	91	131				
AgeHead	50.2	41.4	40.5	47.5	49.4	36.5	39.5	46.4	52.0	41.4	40.1	47.8	58.4	47.3	49.7	55.0	48.0	39.0	38.5	46.3				
Agewoman	47.2	38.9	37.1	44.6	46.2	33.8	35.8	43.5	48.8	38.4	37.5	44.8	56.4	45.5	47.3	53.1	45.0	35.9	34.1	43.2				
Married	38%	23%	23%	34%	57%	35%	37%	52%	54%	37%	37%	48%	52%	40%	44%	49%	36%	36%	24%	35%				
Children	1.3	1.2	1.8	1.4	1.8	1.5	1.7	1.8	1.9	2.0	1.8	1.9	0.6	0.7	1.2	0.7	4.6	3.7	3.6	4.4				
SchoolingHead	9.4	10.3	8.4	9.4	7.3	9.6	7.4	7.7	8.8	11.8	9.8	9.4	10.1	10.6	8.1	9.9	7.1	10.0	6.8	7.4				
SchoolingWoman	9.7	10.3	8.5	9.6	7.3	9.0	7.4	7.5	7.5	11.3	8.6	8.2	10.8	11.4	9.1	10.7	7.3	10.1	7.5	7.6				

Note: Own=1 if household owns the house. Wom=1 if household the head is female. IncomeHouse= total household income. IncomeWom= total income of the woman of the house. Age and Schooling are evaluated for the household head and the woman of the house. Schooling is years of education. Married=1 if household head is married. Children=amount of children under 18 in the house. Data for Argentina. Colombia. Nicaragua and Uruguay refer to the capital city. Venezuela and El Salvador include both urban and rural areas. For the rest of the countries we consider only households living in urban areas.

Table 4. Summary Statistics by Household Head

	Argentina			Bolivia			Brazil			Chile			Colombia			Costa Rica		
	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot
Own	74%	75%	74%	56%	55%	56%	74%	74%	74%	69%	73%	70%	50%	52%	50%	76%	78%	76%
Wom	0%	100%	30%	0%	100%	23%	0%	100%	29%	0%	100%	27%	0%	100%	34%	0%	100%	20%
IncomeHouse	1029	652	915	2153	1616	2029	1447	1070	1337	526	351	479	2882	2650	2803	178	139	170
IncomeWom	260	560	355	463	1048	613	327	645	428	82	176	107	715	1634	1072	25	68	34
AgeHead	50.8	57.5	52.9	42.6	47.8	43.8	44.4	50.2	46.1	48.0	54.8	49.8	46.4	49.4	47.5	44.9	48.1	45.5
AgeWom	47.3	57.5	50.8	38.9	47.8	41.2	40.2	50.2	43.4	44.1	54.8	47.3	42.0	49.4	44.9	39.3	48.1	41.2
Married	68%	6%	49%	68%	16%	56%				73%	12%	57%	51%	9%	37%	63%	7%	52%
Children	0.9	0.6	0.8	2.1	1.4	1.9	1.2	1.0	1.2	1.3	1.0	1.2	1.1	0.9	1.1	1.6	1.5	1.6
SchoolingHead	9.3	8.9	9.2	9.0	7.0	8.5	6.6	6.0	6.5	8.6	7.4	8.3	9.8	9.1	9.6	5.9	5.5	5.8
SchoolingWom	9.5	8.9	9.3	8.5	7.0	8.1	6.7	6.0	6.5	8.5	7.4	8.2	9.5	9.1	9.3	6.3	5.5	6.1
	Ecuador			El Salvador			Guatemala			Honduras			Mexico			Nicaragua		
	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Tot
Own	61%	61%	61%	70%	70%	70%	56%	57%	57%	65%	67%	66%	69%	68%	68%	77%	83%	80%
Wom	0%	100%	24%	0%	100%	32%	0%	100%	25%	0%	100%	31%	0%	100%	24%	0%	100%	38%
IncomeHouse	546	330	495	7326	6034	6917	4756	3651	4480	9144	7627	8674	11110	8472	10465	5493	3342	4682
IncomeWom	103	193	126	1813	3423	2382	887	1667	1100	3361	6489	4329	4001	5320	4522	1015	1132	1062
AgeHead	46.4	50.7	47.4	44.8	49.8	46.4	44.5	50.1	45.9	44.7	49.4	46.1	45.1	50.8	46.5	44.3	50.7	46.7
AgeWom	41.8	50.7	44.2	39.1	49.8	42.8	40.1	50.1	42.8	39.2	49.4	42.7	41.3	50.8	43.8	38.6	50.7	43.5
Married				49%	6%	35%	64%	11%	51%	51%	10%	39%	76%	13%	61%	50%	6%	33%
Children	1.8	1.8	1.8	4.4	3.9	4.3	1.1	1.0	1.1	2.1	1.9	2.0	1.5	1.2	1.4	4.9	4.9	4.9
SchoolingHead	8.9	7.5	8.6	5.6	4.1	5.2	7.3	5.2	6.8	7.7	7.4	7.6	8.9	7.6	8.6	7.0	5.4	6.4
SchoolingWom	8.8	7.5	8.5	5.2	4.1	4.8	5.9	5.2	5.7	7.6	7.4	7.6	8.6	7.6	8.3	6.6	5.4	6.1
	Panama			Paraguay			Peru			Uruguay			Venezuela					
	Man	Wom	Tot	Man	Wom	Tot	Man	Wom	Total	Man	Wom	Tot	Man	Wom	Tot			
Own	70%	73%	71%	74%	73%	74%	69%	67%	69%	66%	67%	67%	79%	85%	81%			
Wom	0%	100%	30%	0%	100%	32%	0%	100%	22%	0%	100%	36%	0%	100%	31%			
IncomeHouse	884	631	807	161	174	165	2317	1950	2235	18533	13116	16587	264	178	237			
IncomeWom	213	313	247	45	75	56	518	962	629	4916	9281	6665	105	179	131			
AgeHead	46.1	50.8	47.5	45.4	48.6	46.4	46.9	51.1	47.8	52.8	58.9	55.0	45.0	49.0	46.3			
AgeWom	41.5	50.8	44.6	40.6	48.6	43.5	42.8	51.1	44.8	49.2	58.9	53.1	40.0	49.0	43.2			
Married	46%	6%	34%	65%	24%	52%	60%	5%	48%	72%	8%	49%	47%	10%	35%			
Children	1.4	1.2	1.4	1.8	1.6	1.8	1.8	2.0	1.9	0.8	0.5	0.7	4.5	4.3	4.4			
SchoolingHead	9.5	9.3	9.4	8.0	6.9	7.7	10.0	7.4	9.4	10.0	9.9	9.9	7.5	7.0	7.4			
SchoolingWom	9.8	9.3	9.6	7.9	6.9	7.5	8.5	7.4	8.2	11.1	9.9	10.7	7.9	7.0	7.6			

Note: Own=1 if household owns the house. Wom=1 if household the head is a Wom. IncomeHouse= total household income. IncomeWom= total income of the Wom of the house. Age. Schooling and Illiteracy are evaluated for the household head and the Wom of the house. Schooling is years of education. Married=1 if household head is married. Children=amount of children under 18 in the house. Data for Argentina. Colombia. Nicaragua and Uruguay refer to the capital city. Venezuela and El Salvador include both urban and rural areas. For the rest of the countries we consider only households living in urban areas.

6. Results

Table 5 presents the results of the traditional probit estimation for homeownership and female household headship. Table 6 presents the estimation of the bivariate probit model where we control for the endogeneity of woman headship.[10] With respect of the identification of the model we performed a test of joint significance of our instruments (excluded variables) in the bivariate probit model and rejected the null hypothesis of no effect in both equations.

There are two differences in the ownership regression presented in Table 5 and in Table 6: the simultaneous estimations in the case of the bivariate probit model and the number of observations included. Since the bivariate probit model can be run only when there is information for all variables in both equations, the number of observations in Table 6 is lower than in the ownership regression in Table 5 for all countries. In order to be sure that our results are not due to composition effects we run the simple probit models, restricting the set of observations to those considered in Table 6. The results are robust to this change in the set of observations. Thus, the differences in the estimations from the simple probits to the bivariate probits must be due to the endogeneity control.

The main methodological result of this section can be seen by the reverse of the sign of *Women* in the homeownership regressions for the cases of Argentina, Bolivia, Chile, Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Uruguay and Venezuela.

According to the simple probit models there is a statistically significant better outcome in terms of ownership for women-headed households in Argentina, Chile, Colombia, Costa Rica, El Salvador, Mexico, Panama, Uruguay and Venezuela. The only countries where there is discrimination against female headed households at the traditional statistical significance levels are Brazil and Ecuador. On the contrary, the bivariate probit models show evidence of lower probability of homeownership for female household heads in all cases.

The simple probit estimation results suggest in nine countries a more favorable outcome in terms of homeownership for female-headed families and a less favorable result for two countries; the results were inconclusive for six countries. When the bivariate probit model is used, there is significant evidence a lower probability of homeownership for female-headed in

[10] Tables A3, A4, and A5 report the coefficient and standard error behind the marginal effects of Tables 5 and 6.

households not only the two countries that had previously shown worse conditions for women, but also for the five countries that were previously inconclusive and the nine countries where the results seemed to indicate a greater probability of homeownership by female-headed households. Therefore, in the bivariate probit model we recover the intuitive result that female-headed families are not in a better situation than husband-wife households in respect to homeownership.

The rest of the variables present plausible results for most cases. In the simple probit model, for five countries the relation between income and ownership was not significant, and in Venezuela it was negative. The bivariate probit model presents more reasonable results. In all cases, the higher the income of the household the greater the members' likelihood of becoming a homeowner. In both the simple probit model and the bivariate probit model we found in all countries the higher the income of the woman of the house, the greater the likelihood that she will head her own household.

The life cycle variables also have the expected signs for most cases. The older the household head, the more likely he or she is to own his/her house (both in the probit and biprobit model the marginal effects are of similar magnitude). Family stability is also associated with less flexible housing tenure options as ownership. Being married significantly increases the probability of becoming a homeowner in the probit model, with a marginal effect around 0.13 larger than the 0.05 marginal effect implied by the bivariate probit model. The difference in the marginal effects is probably due to the controls for female headed households in the bivariate probit model. Older women are more likely to become household heads; this result is robust to the exclusion of widows from the estimation sample. Therefore, it suggests that, even for those female household heads whose first option was a more traditional two-parent family, they choose to head their own family if they do not obtain that first choice. The number of children also is negatively related with the probability of female household head.

With respect to education we found more counterintuitive results. In at least one of the estimation methods the schooling variable reflects that more education is associated with a higher probability of being a homeowner in Colombia, Uruguay, Argentina and Costa Rica. In contrast, in Bolivia, Brazil, Chile, Ecuador, Mexico, Peru and Venezuela more education is associated with a lower probability of homeownership. In part this result may be produced by an increase in the level of education of young cohorts that have a lower probability of owning their home, as reflected in the age variable. We conjectured that more educated women have more

labor opportunities and therefore may feel less attached to an unsatisfactory marriage. This seems to be verified for Colombia and Uruguay but not for most of the other countries.

Table 5. Marginal Effects of the Probability of Homeownership and Woman Household Headship, Simple Probit Model																	
	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Ecuador	El Salvador	Guatemala	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
Home ownership																	
Woman	0.0383*	0.0096	-0.0389***	0.0641***	0.0563***	0.0888***	-0.0306*	0.0263**	0.0237	0.0242	0.0333***	0.0522	0.0613***	0.0195	-0.0499	0.0409***	0.0484***
IncomeHouse	0.0000	0.0336***	0.0126***	0.0696***	0.0240***	0.0075**	0.0416***	-0.0024	0.0504***	0.0130	0.0473***	0.0177*	0.0385***	-0.0015	0.0060	0.0490***	-0.0024***
AgeHead	0.0075***	0.0125***	0.0068***	0.0092***	0.0173***	0.0068***	0.0118***	0.0058***	0.0124***	0.0141***	0.0117***	0.0090***	0.0083***	0.0083***	0.0091***	0.0092***	0.0061***
Married	0.1401***	0.1533***		0.1260***	0.1676***	0.1697***		0.1387***	0.1323***	0.1502***	0.1631***	0.1036**	0.1258***	0.1612***	0.0883**	0.1305***	0.0556***
SchoolingHead	0.0074***	-0.0054**	-0.0012***	-0.0175***	0.0100***	0.0042*	-0.0015	-0.0010	0.0010	0.0016	-0.0030***	0.0027	0.0028	-0.0065***	-0.0153***	0.0109***	-0.0058***
Constant																	
Observations	5222	3309	92195	42306	12236	5752	10452	16808	1983	3628	17318	548	3363	5035	1592	18338	45976
Female headship																	
Own	-0.0949***	-0.1175***	-0.0973***	-0.0729***	-0.1319***	-0.0418**	-0.0871***	-0.0747***	-0.0827***	-0.1296***	-0.1681***	-0.1108	-0.1051***	-0.1612***	-0.1316**	-0.1135***	-0.0186**
IncomeWoman	0.0733***	0.0583***	0.0633***	0.0360***	0.0364***	0.0326***	0.0653***	0.0512***	0.0623***	0.0515***	0.0777***	0.0415***	0.0489***	0.0324***	0.0507***	0.0800***	0.0236***
AgeWoman	0.0072***	0.0061***	0.0075***	0.0071***	0.0106***	0.0050***	0.0076***	0.0085***	0.0077***	0.0092***	0.0104***	0.0172***	0.0096***	0.0067***	0.0052***	0.0075***	0.0093***
Children	-0.0025	-0.0421***	-0.0055***	-0.0040	-0.0207***	0.0081*	0.0001	-0.0351***	-0.0143	-0.0085	-0.0237***	-0.0123	-0.0042	-0.0087	0.0079	-0.0370***	-0.0228***
SchoolingWoman	-0.0121***	-0.0061***	-0.0093***	-0.0106***	-0.0072***	-0.0132***	-0.0107***	-0.0128***	-0.0104***	-0.0082***	-0.0139***	-0.0040	-0.0099***	-0.0178***	-0.0153***	-0.0044**	-0.0090***
Constant																	
Observations	4087	2967	84816	38820	10795	5617	9346	15038	1807	3330	9317	515	3020	4550	765	9162	41182

Note: Dependent variables: Own=1 if household owns the house and Woman=1 if the household head is female. Other variables: IncomeHouse= total household income, AgeHead and SchoolingHead are age and years of formal education of the household head IncomeWoman, AgeWoman and SchoolingWoman are total income, age and years of formal education of the woman of the house, Married=1 if the household head is married, Children=amount of children under 18 in the house. Data for Argentina, Colombia, Nicaragua and Uruguay refer to the capital city. Venezuela and El Salvador include both urban and rural areas. For the rest of the countries we consider only households living in urban areas. Standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%.

Table 6. Marginal Effects of the Probability of Homeownership and Woman Household Headship, Bivariate Probit Model																	
	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Ecuador	El Salvador	Guatemala	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
Home ownership																	
Woman	-0.4900***	-0.4818***	-0.5382***	-0.4883***	-0.4273***	-0.4231***	-0.5247***	-0.4877***	-0.4554***	-0.4741***	-0.5251***	-0.4542***	-0.5038***	-0.5063***	-0.5869***	-0.4728***	-0.4918***
IncomeHouse	0.0178***	0.0407***	0.0329***	0.0374***	0.0194***	0.0171***	0.0385***	0.0118***	0.0413***	0.0259***	0.0375***	0.0156***	0.0255***	0.0084***	0.0207***	0.0498***	0.0026***
AgeHead	0.0096***	0.0143***	0.0088***	0.0114***	0.0166***	0.0083***	0.0118***	0.0091***	0.0136***	0.0146***	0.0126***	0.0135***	0.0108***	0.0094***	0.0112***	0.0113***	0.0093***
Married	0.0570***	0.0625***		0.0401***	0.0874***	0.1136***		0.0576***	0.0642*	0.0801***	0.0339**	0.0633	0.0530***	0.0436***	0.0398	0.0230	0.0191***
SchoolingHead	0.0024	-0.0019	-0.0035***	-0.0109***	0.0057***	0.0002	-0.0046***	-0.0027***	-0.0012	-0.0006	-0.0031*	0.0018	0.0011	-0.0082***	-0.0102**	0.0105***	-0.0058***
Constant																	
Female headship																	
Own	-0.5762***	-0.5277***	-0.5875***	-0.5501***	-0.5483***	-0.5462***	-0.5446***	-0.5681***	-0.5681***	-0.5690***	-0.5943***	-0.5475***	-0.5699***	-0.5991***	-0.6170***	-0.5571***	-0.5613***
IncomeWoman	0.0506***	0.0382***	0.0417***	0.0262***	0.0185***	0.0255***	0.0366***	0.0265***	0.0265***	0.0305***	0.0414***	0.0222***	0.0282***	0.0197***	0.0305***	0.0507***	0.0163***
AgeWoman	0.0096***	0.0111***	0.0092***	0.0107***	0.0157***	0.0073***	0.0102***	0.0096***	0.0096***	0.0138***	0.0133***	0.0173***	0.0114***	0.0101***	0.0098***	0.0113***	0.0109***
Children	0.0032	-0.0112***	0.0005*	0.0013	-0.0023***	0.0020*	-0.0007***	-0.0085***	-0.0085	0.0001	-0.0004	0.0001	0.0028	0.0006**	0.0017***	-0.0045	-0.0076***
SchoolingWoman	-0.0038	-0.0021	-0.0045***	-0.0094***	0.0040***	-0.0051***	-0.0048***	-0.0052***	-0.0053*	-0.0026**	-0.0039***	0.0014	-0.0002	-0.0109***	-0.0111***	0.0093***	-0.0084***
Constant																	
Observations	4085	2967	84132	38804	10666	5194	9346	15038	1807	3177	9317	515	2990	4550	765	9162	41016

Note: Dependent variables: Own=1 if household owns the house and Woman=1 if the household head is female. Other variables: IncomeHouse= total household income, AgeHead and SchoolingHead are age and years of formal education of the household head IncomeWoman, AgeWoman and SchoolingWoman are total income, age and years of formal education of the woman of the house, Married=1 if the household head is married, Children=amount of children under 18 in the house. Data for Argentina, Colombia, Nicaragua and Uruguay refer to the capital city. Venezuela and El Salvador include both urban and rural areas. For the rest of the countries we consider only households living in urban areas. Standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%

7. Conclusions

Although there is a large literature on the determinants of housing tenure, as well as a large literature on discrimination against women, no previous study showed that female-headed households—all else being equal—have a lower probability of owning their home. We argue that the housing tenure decision and the housing headship decision should not be treated as exogenous. Among the variables that enter into the decision of a woman to divorce her husband are income-related issues and family life cycle dimensions that also affect the probability of owning their house. Similarly, those single women who decide to head their own households are likely different than those who choose to continue keep living with their parents. Taking to the extreme this argument, those widows who do not remarry and do not move in with other family members are likely richer, more self confident, etc. than the "average" widow. If this type of endogeneity is not properly accounted, it leads to inconsistent and often counterintuitive results.

In this paper, we use individual-level data on homeownership from Chile, Honduras and Nicaragua to verify the potential problems with household level estimations that do not control for headship endogeneity. In these three countries we found evidence that women as a whole have a lower probability of owning their home but that certain types of women, single family heads, separated or divorced women and in one case also widows, have a higher probability of being homeowners.

Then we proceed to estimate the gender effect in 17 Latin American countries using household-level data but also controlling for household head endogeneity with a bivariate probit estimation. We found that a naive simple probit model seems to imply that women-headed families have a higher probability of owning their home in nine out of the 17countries studied and that there are no significant results in six other countries. Once we estimate the bivariate probit model we find that female headed families have a lower probability of owning their home in all the countries studied.

With respect to the other variables, as expected, we found that the higher the income of the family the higher the probability of owning their home. The higher the income of the woman of the house, the higher the probability of having a woman-headed family. The older the household head, the higher the probability of being a homeowner and the higher the probability of female household headship. Family status variables such as being married have a positive

direct effect on the probability of being a homeowner. The only not-so-intuitive results we obtain are related to the effect of education of women, but this could be due to the increase in the education level of younger cohorts that have a lower probability of owning their home and a lower probability of becoming household heads.

Finally, poverty is both cause and effect of poor housing conditions. The results of this paper are therefore important for poverty reduction policies. Although it does not provide immediate policy recommendations to eliminate or reduce homeownership gender biases, it completely changes the diagnostic and opens the window for exploring at the country level the institutional determinants of this situation and the eventual remedies.

References

Arimah, B. 1997. “The Determinants of Housing Tenure Choice in Ibadan, Nigeria.” *Urban Studies* 34(1): 105-124.

Blank, R., M. Dabady and C. Citro, editors. 2004. *Measuring Racial Discrimination: Panel on Methods for Assessing Discrimination*. Washington, DC, United States: National Academies Press.

Chiuri, M., and T. Jappelli. 2003. “Financial Market Imperfections and Home Ownership: A Comparative Study.” *European Economic Review* 47(5): 857-875.

Danzinger, S. et al. 1982. “Work and Welfare as Determinants of Female Poverty and Household Headship.” *Quarterly Journal of Economics* 97(3): 519-534.

Gandelman, E., and N. Gandelman. 2004. “Los efectos del sector público en el financiamiento de la vivienda: El mercado hipotecario en Uruguay.” Documento de Trabajo 503. Washington, DC, United States: Inter-American Development Bank, Research Department.

Greene, W. 1996. “Marginal Effects in the Bivariate Probit Model. Working Paper 96-11. New York, United States: New York University, Department of Economics, Stern School of Business.

Greene, W. 1998. “Gender Economic Courses in Liberal Arts Colleges: Further Results.” *Journal of Economic Education* 29(4): 291-300.

Greene, W. 2003. *Econometric Anal*ysis. Fifth Edition. Upper Saddle River, United States: Prentice-Hall.

Greene, W., S. Rhine and M. Toussaint-Comeau. 2006. “The Importance of Check-Cashing Businesses to the Unbanked: Racial/Ethnic Differences, *Review of Economics and Statistics* 88(1): 146-57.

Hannan, M., and N. Tuma. 1990. “A Reassessment of the Effect of Income Maintenance on Marital Dissolution in the Seattle-Denver Experiment.” *American Journal of Sociology*, 95(5): 1270-1298.

Inter-American Development Bank. 2004. *Reforming Latin American Housing Markets*. Washington, DC, United States: Inter-American Development Bank.

Li, M. 1977. “A Logit Model of Homeownership.” *Econometrica* 45(5): 1081-1097.

Manrique, J., and K. Ojah. 2003. “The Demand for Housing in Spain: An Endogenous Switching Regression Analysis.” *Applied Economics* 35: 323-336.

Shroder, M. 2002. “Does Housing Assistance Perversely Affect Self-sufficiency? A Review Essay.” *Journal of Housing Economics* 11(4): 381-417.

Van Leuvensteijn, M., and P. Koning. 2004. “The Effect of Home-ownership on Labor Mobility in The Netherlands.” *Journal of Urban Economics* 55(3): 580-596.

White, N., and A. Wolaver. 2003. “Occupation Choice, Information and Migration.” *Review of Regional Studies* 33(2): 142-163.

Appendix

Table A1. Data Sources			
Country	**Survey**	**Year**	**Source**
Argentina	Encuesta Permanente de Hogares	2003	Instituto Nacional de Estadística y Censos
Bolivia	Encuesta Integrada de Hogares	2002	Instituto Nacional de Estadística
Brazil	Pesquisa Nacional por Amostra de Domicilios	2003	Instituto Brasileiro de Geografia e Estatística
Chile	CASEN	2003	Ministerio de Planificación
Colombia	Encuesta Continua de Hogares	2003	Departamento Administrativo Nacional de Estadística
Costa Rica	Encuesta de Hogares de Propósitos Múltiples	2003	Instituto Nacional de Estadística y Censos
Ecuador	Encuesta de Calidad de Vida	2003	Instituto Nacional de Estadística y Censos
El Salvador	Encuesta de Hogares de Propósitos Múltiples	2003	Dirección General de Estadística y Censos
Guatemala	Encuesta Nacional de Empleo e Ingresos	2003	Instituto Nacional de Estadística
Honduras	Encuesta Permanente de Hogares de Propósitos Múltiples	2003	Instituto Nacional de Estadística
Mexico	Encuesta Nacional de Ingresos y Gastos de los Hogares	2004	Instituto Nacional de Estadística, Geografía e Informática
Nicaragua	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida	2001	Instituto Nacional de Estadística y Censos
Panama	Encuesta de Hogares	2003	Dirección de Estadística y Censo
Paraguay	Encuesta Permanente de Hogares	2003	Dirección General de Estadística, Encuestas y Censos
Peru	Encuesta Nacional de Hogares sobre Medición de Niveles de Vida	2000	Instituto Nacional de Estadística e Informática
Uruguay	Encuesta Continua de Hogares	2004	Instituto Nacional de Estadística
Venezuela	Encuesta de Hogares por Muestreo	2003	Instituto Nacional de Estadística

Table A2. Determinants of the Probability of Homeownership									
	Chile			Honduras			Nicaragua		
	A	B	C	A	B	C	A	B	C
	Individual data	Individual data	Household data	Individual data	Individual data	Household data	Individual data	Individual data	Household data
Woman	-0.075		0.174	-0.270		-0.034	-0.227		0.271
	[0.012]***		[0.015]***	[0.025]***		[0.043]	[0.028]***		[0.057]***
Woman-Single-Not household head		-0.186			-0.701			-1.051	
		[0.025]***			[0.060]***			[0.092]***	
Woman-Single- household head		0.031			0.479			0.735	
		[0.034]			[0.059]***			[0.257]***	
Woman Separated		0.125			0.289			0.351	
		[0.030]***			[0.075]***			[0.047]***	
Woman Couple		-0.085			-0.379			-0.380	
		[0.015]***			[0.031]***			[0.035]***	
Woman Widow		-0.067			0.068			0.232	
		[0.026]**			[0.072]			[0.070]***	
Income	0.201	0.200	0.000	0.012	0.010	0.005	0.076	0.071	0.006
	[0.008]***	[0.008]***	[0.000]***	[0.001]***	[0.001]***	[0.002]**	[0.007]***	[0.007]***	[0.005]
Age	0.015	0.015	0.025	0.041	0.037	0.031	0.042	0.037	0.022
	[0.000]***	[0.000]***	[0.000]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.002]***
Married	0.073	0.087	0.361	0.272	0.397	0.382	0.292	0.462	0.313
	[0.012]***	[0.014]***	[0.013]***	[0.027]***	[0.030]***	[0.039]***	[0.030]***	[0.035]***	[0.051]***
Schooling	0.050	0.049	-0.037	0.017	0.016	-0.025	0.009	0.009	-0.009
	[0.001]***	[0.001]***	[0.002]***	[0.003]***	[0.003]***	[0.005]***	[0.003]***	[0.003]***	[0.005]*
Constant	-2.726	-2.698	-0.650	-2.855	-2.730	-0.786	-2.306	-2.207	-0.400
	[0.023]***	[0.024]***	[0.027]***	[0.040]***	[0.042]***	[0.068]***	[0.036]***	[0.037]***	[0.082]***
Observations	147056	147056	67954	29212	29212	6275	15703	15703	4169

Note: In columns A and B Own=1 if individual owns the house, Wom=1 for females, Married==1 if the individual is married, Schooling is years of formal education. In column C Own=1 if someone in the household owns the house, Wom=1 if the household head is female, Age, Married and Schooling refers to the household head. Standard errors in brackets * significant at 10%; ** significant at 5%; *** significant at 1%

Table A3. Determinants of the Probability of Homeownership, Probit Model																	
	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Ecuador	El Salvador	Guatemala	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
Woman	0.126	0.024	-0.122	0.199	0.141	0.318	-0.080	0.077	0.061	0.068	0.099	0.212	0.188	0.064	-0.143	0.118	0.199
	[0.052]**	[0.062]	[0.010]***	[0.019]***	[0.029]***	[0.051]***	[0.031]**	[0.025]***	[0.078]	[0.054]	[0.029]***	[0.151]	[0.057]***	[0.046]	[0.096]	[0.027]***	[0.017]***
IncomeHouse	0.000	0.085	0.040	0.209	0.060	0.025	0.109	-0.007	0.129	0.036	0.138	0.070	0.116	-0.005	0.018	0.140	-0.009
	[0.007]	[0.021]***	[0.004]***	[0.008]***	[0.006]***	[0.009]***	[0.011]***	[0.005]	[0.029]***	[0.020]*	[0.011]***	[0.033]**	[0.017]***	[0.010]	[0.015]	[0.014]***	[0.001]***
AgeHead	0.024	0.032	0.022	0.028	0.043	0.023	0.031	0.017	0.032	0.039	0.034	0.036	0.025	0.027	0.027	0.026	0.024
	[0.001]***	[0.002]***	[0.000]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.002]***	[0.002]***	[0.001]***	[0.005]***	[0.002]***	[0.001]***	[0.003]***	[0.001]***	[0.001]***
Married	0.455	0.390		0.375	0.425	0.563		0.422	0.339	0.426	0.467	0.442	0.394	0.526	0.260	0.375	0.228
	[0.047]***	[0.053]***		[0.016]***	[0.029]***	[0.041]***		[0.025]***	[0.068]***	[0.052]***	[0.026]***	[0.159]***	[0.057]***	[0.044]***	[0.082]***	[0.025]***	[0.016]***
SchoolingHead	0.024	-0.014	-0.004	-0.053	0.025	0.014	-0.004	-0.003	0.002	0.004	-0.009	0.011	0.008	-0.021	-0.045	0.031	-0.023
	[0.006]***	[0.005]***	[0.001]***	[0.002]***	[0.003]***	[0.005]**	[0.003]	[0.002]	[0.007]	[0.006]	[0.003]***	[0.016]	[0.006]	[0.005]***	[0.008]***	[0.003]***	[0.002]***
Constant	-1.058	-1.949	-0.511	-3.230	-3.329	-0.998	-1.715	-0.347	-2.477	-1.818	-2.480	-1.527	-1.566	-0.601	-0.495	-2.722	-0.043
	[0.109]***	[0.160]***	[0.025]***	[0.095]***	[0.097]***	[0.125]***	[0.078]***	[0.050]***	[0.234]***	[0.176]***	[0.097]***	[0.368]***	[0.143]***	[0.148]***	[0.160]***	[0.122]***	[0.034]
Observations	5222	3309	92195	42306	12236	5752	10452	16808	1983	3628	17318	548	3363	5035	1592	18338	45976

Note: Dependent variable: Own=1 if household owns the house. Independent variables: Woman=1 if the household head is female, IncomeHouse= total household income, AgeHead is the age of the household head and SchoolingHead is years of education of the household head, Married=1 if the household head is married, Children=amount of children under 18 in the house. Data for Argentina, Colombia, Nicaragua and Uruguay refer to the capital city. Venezuela and El Salvador include both urban and rural areas. For the rest of the countries we consider only households living in urban areas. Standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%

Table A4. Determinants of the Probability of Female Headship, Probit Model																	
	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Ecuador	El Salvador	Guatemala	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
Own	-0.285	-0.430	-0.280	-0.231	-0.355	-0.167	-0.287	-0.206	-0.298	-0.385	-0.436	-0.285	-0.287	-0.432	-0.415	-0.303	-0.051
	[0.056]***	[0.063]***	[0.012]***	[0.018]***	[0.030]***	[0.053]***	[0.033]***	[0.027]***	[0.078]***	[0.058]***	[0.032]***	[0.168]*	[0.059]***	[0.051]***	[0.125]***	[0.034]***	[0.019]***
IncomeWoman	0.229	0.219	0.189	0.118	0.098	0.137	0.220	0.144	0.228	0.158	0.205	0.109	0.137	0.090	0.169	0.217	0.065
	[0.009]***	[0.012]***	[0.002]***	[0.002]***	[0.003]***	[0.004]***	[0.007]***	[0.003]***	[0.015]***	[0.008]***	[0.010]***	[0.018]***	[0.010]***	[0.004]***	[0.021]***	[0.007]***	[0.001]***
AgeWoman	0.022	0.023	0.023	0.023	0.029	0.021	0.026	0.024	0.028	0.028	0.028	0.045	0.027	0.019	0.017	0.020	0.026
	[0.002]***	[0.002]***	[0.000]***	[0.001]***	[0.001]***	[0.002]***	[0.001]***	[0.001]***	[0.003]***	[0.002]***	[0.001]***	[0.005]***	[0.002]***	[0.002]***	[0.004]***	[0.001]***	[0.001]***
Children	-0.008	-0.158	-0.016	-0.013	-0.056	0.034	0.000	-0.099	-0.053	-0.026	-0.063	-0.032	-0.012	-0.024	0.026	-0.100	-0.063
	[0.021]	[0.019]***	[0.004]***	[0.007]*	[0.012]***	[0.015]**	[0.009]	[0.006]***	[0.030]*	[0.016]*	[0.011]***	[0.026]	[0.018]	[0.013]*	[0.030]	[0.015]***	[0.003]***
SchoolingWoman	-0.038	-0.023	-0.028	-0.034	-0.019	-0.055	-0.036	-0.036	-0.038	-0.025	-0.037	-0.011	-0.028	-0.049	-0.051	-0.012	-0.025
	[0.007]***	[0.006]***	[0.001]***	[0.002]***	[0.003]***	[0.006]***	[0.004]***	[0.003]***	[0.008]***	[0.006]***	[0.003]***	[0.015]	[0.007]***	[0.005]***	[0.012]***	[0.004]***	[0.002]***
Constant	-2.021	-1.974	-1.906	-2.165	-2.144	-2.054	-2.063	-1.387	-2.617	-2.155	-2.360	-2.207	-1.645	-1.275	-1.449	-2.596	-1.455
	[0.140]***	[0.143]***	[0.023]***	[0.044]***	[0.077]***	[0.112]***	[0.073]***	[0.055]***	[0.171]***	[0.124]***	[0.100]***	[0.322]***	[0.137]***	[0.102]***	[0.244]***	[0.096]***	[0.037]***
Observations	4087	2967	84816	38820	10795	5617	9346	15038	1807	3330	9317	515	3020	4550	765	9162	41182

Note: Dependent variable: Woman=1 if household the head is female. Independent variables: Own=1 if household owns the house. IncomeWoman, AgeWoman and SchoolingWoman are total income, age and years of formal education of the woman of the house, Married=1 if the household head is married, Children=amount of children under 18 in the house. Data for Argentina, Colombia, Nicaragua and Uruguay refer to the capital city. Venezuela and El Salvador include both urban and rural areas. For the rest of the countries we consider only households living in urban areas. Standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%

Table A5. Determinants of the Probability of Homeownership and Woman Household Headship, Bivariate Probit Model																	
	Argentina	Bolivia	Brazil	Chile	Colombia	Costa Rica	Ecuador	El Salvador	Guatemala	Honduras	Mexico	Nicaragua	Panama	Paraguay	Peru	Uruguay	Venezuela
Home ownership																	
Woman	-1.379	-1.311	-1.527	-1.340	-1.132	-1.175	-1.436	-1.350	-1.223	-1.277	-1.471	-1.413	-1.399	-1.465	-1.640	-1.303	-1.493
	[0.033]***	[0.044]***	[0.007]***	[0.012]***	[0.018]***	[0.035]***	[0.021]***	[0.024]***	[0.075]***	[0.048]***	[0.029]***	[0.136]***	[0.040]***	[0.042]***	[0.118]***	[0.042]***	[0.015]***
IncomeHouse	0.052	0.103	0.096	0.105	0.049	0.053	0.099	0.033	0.104	0.069	0.102	0.050	0.071	0.025	0.058	0.134	0.008
	[0.010]***	[0.009]***	[0.002]***	[0.007]***	[0.002]***	[0.009]***	[0.006]***	[0.004]***	[0.012]***	[0.021]***	[0.013]***	[0.015]***	[0.012]***	[0.002]***	[0.013]***	[0.010]***	[0.001]***
AgeHead	0.028	0.036	0.026	0.032	0.042	0.026	0.030	0.025	0.034	0.039	0.034	0.043	0.030	0.028	0.031	0.030	0.030
	[0.001]***	[0.002]***	[0.000]***	[0.000]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.002]***	[0.002]***	[0.001]***	[0.004]***	[0.002]***	[0.001]***	[0.003]***	[0.001]***	[0.000]***
Married	0.167	0.158		0.112	0.220	0.347		0.161	0.163	0.213	0.092	0.208	0.148	0.129	0.111	0.062	0.062
	[0.020]***	[0.046]***		[0.011]***	[0.010]***	[0.040]***		[0.022]***	[0.076]**	[0.053]***	[0.031]***	[0.163]	[0.008]***	[0.030]***	[0.120]	[0.044]	[0.016]***
SchoolingHead	0.007	-0.005	-0.010	-0.031	0.014	0.001	-0.012	-0.007	-0.003	-0.002	-0.008	0.006	0.003	-0.024	-0.028	0.028	-0.019
	[0.006]	[0.004]	[0.001]***	[0.002]***	[0.002]***	[0.004]	[0.002]***	[0.002]***	[0.006]	[0.006]	[0.004]**	[0.012]	[0.004]	[0.004]***	[0.010]***	[0.003]***	[0.001]***
Constant	-0.948	-1.891	-0.710	-1.847	-2.421	-1.044	-1.267	-0.498	-1.982	-1.611	-1.486	-1.223	-1.005	-0.430	-0.753	-2.353	-0.108
	[0.115]***	[0.108]***	[0.019]***	[0.084]***	[0.064]***	[0.122]***	[0.041]***	[0.041]***	[0.143]***	[0.158]***	[0.106]***	[0.267]***	[0.095]***	[0.082]***	[0.210]***	[0.105]***	[0.030]***
Female headship																	
Own	-1.613	-1.661	-1.640	-1.562	-1.561	-1.608	-1.604	-1.572	-1.543	-1.608	-1.668	-1.542	-1.578	-1.683	-1.787	-1.537	-1.569
	[0.037]***	[0.045]***	[0.009]***	[0.011]***	[0.019]***	[0.040]***	[0.029]***	[0.016]***	[0.049]***	[0.040]***	[0.022]***	[0.179]***	[0.035]***	[0.032]***	[0.086]***	[0.021]***	[0.014]***
IncomeWoman	0.145	0.119	0.116	0.078	0.049	0.088	0.108	0.071	0.125	0.084	0.107	0.057	0.075	0.053	0.090	0.134	0.043
	[0.008]***	[0.010]***	[0.002]***	[0.001]***	[0.002]***	[0.004]***	[0.006]***	[0.003]***	[0.012]***	[0.006]***	[0.009]***	[0.017]***	[0.009]***	[0.003]***	[0.019]***	[0.005]***	[0.001]***
AgeWoman	0.028	0.035	0.026	0.032	0.041	0.025	0.030	0.026	0.035	0.038	0.034	0.045	0.030	0.027	0.029	0.030	0.029
	[0.002]***	[0.002]***	[0.000]***	[0.000]***	[0.001]***	[0.001]***	[0.001]***	[0.001]***	[0.002]***	[0.002]***	[0.001]***	[0.004]***	[0.002]***	[0.001]***	[0.003]***	[0.001]***	[0.000]***
Children	0.009	-0.035	0.002	0.004	-0.006	0.007	-0.002	-0.023	-0.001	0.000	-0.001	0.000	0.007	0.002	0.005	-0.012	-0.020
	[0.016]	[0.006]***	[0.001]*	[0.003]	[0.001]***	[0.004]*	[0.000]***	[0.002]***	[0.003]	[0.003]	[0.007]	[0.001]	[0.006]	[0.001]**	[0.002]***	[0.012]	[0.002]***
SchoolingWoman	-0.011	-0.006	-0.013	-0.028	0.010	-0.018	-0.014	-0.014	-0.010	-0.007	-0.010	0.004	-0.001	-0.029	-0.033	0.024	-0.022
	[0.007]	[0.005]	[0.001]***	[0.001]***	[0.002]***	[0.004]***	[0.002]***	[0.002]***	[0.006]*	[0.003]**	[0.003]***	[0.012]	[0.007]	[0.004]***	[0.010]***	[0.003]***	[0.001]***
Constant	-1.126	-1.498	-0.699	-1.291	-1.902	-0.900	-1.095	-0.478	-1.739	-1.370	-1.307	-1.168	-0.826	-0.507	-0.691	-2.023	-0.328
	[0.131]***	[0.097]***	[0.018]***	[0.029]***	[0.052]***	[0.061]***	[0.030]***	[0.045]***	[0.128]***	[0.102]***	[0.081]***	[0.283]***	[0.130]***	[0.068]***	[0.199]***	[0.080]***	[0.032]***
Observations	4085	2967	84132	38804	10666	5194	9346	15038	1807	3177	9317	515	2990	4550	765	9162	41016

Note: Dependent variables: Own=1 if household owns the house and Woman=1 if household the head is female. IncomeHouse= total household income, AgeHead and SchoolingHead are age and years of formal education of the household head IncomeWoman, AgeWoman and SchoolingWoman are total income, age and years of formal education of the woman of the house, Married=1 if the household head is married, Children=amount of children under 18 in the house. Data for Argentina, Colombia, Nicaragua and Uruguay refer to the capital city. Venezuela and El Salvador include both urban and rural areas. For the rest of the countries we consider only households living in urban areas. Standard errors in brackets, * significant at 10%; ** significant at 5%; *** significant at 1%