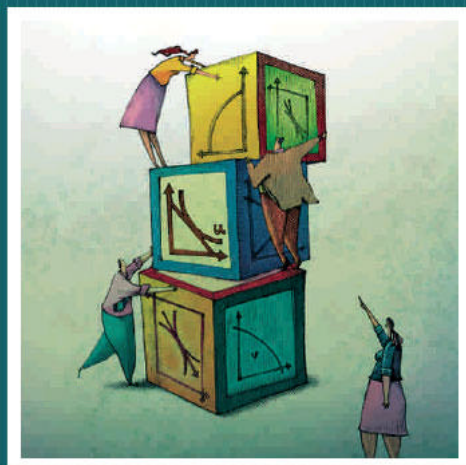


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N° 58 FEMALE LABOR SUPPLY IN CHILE

ALEJANDRA MIZALA - PILAR ROMAGUERA - PAULO HENRÍQUEZ

Female Labor Supply in Chile

Alejandra Mizala
amizala@dii.uchile.cl

Pilar Romaguera

Paulo Henríquez

Centro de Economía Aplicada
Departamento de Ingeniería Industrial
Universidad de Chile
Phone: (56-2) 678-4524
Fax : (56-2) 689-7895
Casilla 2777
Santiago-Chile

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Abstract

The aim of this study is to analyze female labor supply in Chile and explain its peculiarities: the difference between female and male participation, and the pattern of female participation rates according to household income levels.

To analyze the factors that affect the behavior of the female labor participation rate, we first estimate a labor supply function for men and women, and then a female labor supply equation with additional variables that might explain the differences in behavior between women from different socioeconomic levels.

Female Labor Supply In Chile*

I. Introduction

In developed countries (DCs), the difference in participation rates between men and women is lower than in Latin America. In DCs the female participation rate is only 20% lower than that of men, whereas in Latin America it is on average 37% lower. In Chile the female participation rate is 42% below the male rate.

The aim of this study is to analyze the female labor participation rate in Chile and explain its peculiarities: the difference between male and female participation, and the pattern of female participation rates according to household income levels. We use data from the 1996 CASEN National Household Survey.

An outstanding feature of the Chilean economy in recent decades has been its sustained growth rate. In 1998 it completed an uninterrupted cycle of 15 years of economic growth at an annual average rate of 7%. Inflation measured over the past three years is the lowest since the great depression of the 1930s. Despite the success of these figures, Chile still has an important unsolved problem to deal with: inequality.

Inequality is closely related to differences in labor income. The concentration of income as a whole, as measured in household surveys, is highly correlated with the concentration of labor income.¹ Differences in labor income, in turn, are explained largely by differences in education, but also by differences relating to labor supply, where labor force participation by income levels is one of the contributing factors. Differences in

participation rates according to income level, are closely related to women's labor-market participation patterns.

Understanding the behavior of women's participation rates makes it possible to design better policies to increase opportunities for lower-income women in the labor market, thereby helping to reduce the existing levels of inequality.

The paper is organized as follows. The next section examines the patterns of labor force participation of males and females in Chile, organizing households by schooling of heads of households. The third section analyzes factors influencing the behavior of female participation. First estimating labor supply for both men and women, and second a female labor supply, considering other variables that might explain the differences in behavior between women of different socioeconomic levels. The final section draws together the main conclusion of the study.

II. Women's Labor-Market Participation

Participation rates in Chile partially correspond to trends occurring internationally. In most countries, male participation rate is higher than those of women, although the latter have increased their labor-market participation over time. Both of these phenomena are present in Chile; however, there is a significant difference between male and female participation rate. Although women's participation rate has increased from about 29% in 1996 to about 35% in 1998, levels of female participation are much lower than those in developed countries. In fact they are similar to rates in countries such as Great Britain, Canada and United States in the 1970s.²

This sharp gender difference in participation rates is present even when comparing the men's participation with that of women's who are head of households. According to the 1996 Chilean household survey, the male participation rate is 75%, in contrast to women in general (33%), and women who are head of households (41%).

Female labor participation in Chile is low comparing it with other countries with similar or lower per-capita income and/or schooling levels. Table 1 shows female participation rates for the 25-44 age group by income level for some Latin American countries. Only Mexico and Costa Rica have lower female labor participation than Chile. Moreover, Chile has the biggest difference in participation rates between the upper and lower decile. The wealthiest 10% of the female population in Chile has a participation rate that is 3.8 times higher than that of the poorest 10%. Only El Salvador, a country with lower development level than Chile has a similar ratio between the participation rate of the wealthiest and the poorest 10%.

The labor literature has offered a good starting model to explain female labor participation. Basically it depends on the market value of time versus the opportunity cost of time in the household. Schooling is an important variable that helps to predict the market value of time, and there are several variables that help to predict the opportunity cost of time in the household; i.e., number of children, household wealth, husband's schooling.

Table 2 shows women's education level by income decile, together with the female participation rate by education level. The figures show that the percentage of women with university and non-university higher education (Technical and Professional Institutes) rises sharply with the household income level. In contrast to this, most women in the lowest income levels only have elementary education. The female participation rate rises

significantly with the level of education; the participation rate for women with higher education (university and non-university) is practically double than the one of women with elementary education only. Women with no education have a participation rate of just 15%.

Finally, table 3 presents patterns of labor force participation of males and females in Chile, organizing households according to the schooling of the head of households³. There is an important increase in women participation rate in the highest deciles, where the head of household has more years of schooling. This pattern is not found in the case of male participation rate.

III. Empirical Estimates

In what follows we attempt to understand the behavior of the female participation rate in Chile, as described in the previous section.

As is well known, an individual supplying labor to the market has to make two decisions: first, whether or not to participate at all, and second how many hours to work. Accordingly, the individual's supply of labor can be expressed as follows:

$$H = h(W, V, Z, \varepsilon) \quad \text{if } W > W_r \tag{1}$$

$$H = 0 \quad \text{if } W \leq W_r$$

where H is hours worked per period, W is the wage rate, V represents non-wage income, Z other variables determining labor supply, W_r is the reservation wage and ε a random disturbance term.

OLS estimation procedures are unsuitable in this case, since selection bias is caused by only including individuals for whom there is an observable wage value: i.e. people in work. This problem is most obvious in the case of female labor supply in developing countries, as in general women's participation rates there are relatively low.⁴ But even if the wage were theoretically observable for the whole population, the problem would remain of identifying the different propensities of unemployed people to participate in the labor force –information that is unknown.

Accordingly, two problems have to be solved: distinguish between non-working individuals according to their probability of participating in the labor market, and estimate a potential wage for those who are not working.

One alternative for dealing with the first problem is to use the technique proposed by Tobin, known as Tobit.⁵ This method sets up a *probit* which includes data on the probability of participation among individuals not working, as well as hours worked by those who are. This second component is identical to the maximum likelihood function implicit in an OLS regression if all individuals were working.

A solution to the second problem consists of setting up a wage equation whose explanatory variables can be observed for the whole working age population. For this we use extensions of the Mincer human capital model, corrected for selection bias, introducing a fictitious variable in accordance with the technique proposed by Heckman.⁶ This fictitious variable, which corrects the selection bias, is obtained from the coefficients estimated for the labor supply model using the Tobit method, in which the wage has been replaced by

human capital variables that are available for the whole sample. This method enables us to obtain consistent estimators of the wage variable coefficient in the labor supply equation.

3.1 Results of the labor supply model

The labor supply model was estimated separately for men and women. The functional form of the estimated equations is given by:

$$\ln W = \hat{\alpha}X \quad (2)$$

$$\hat{H} = \hat{g}[\hat{\alpha}X] + \beta Z \quad (3)$$

where, X represents variables explaining the wage rate, Z the other variables explaining labor supply, g represents the coefficient of the natural logarithm of wages (W) in the labor supply equation H , and α and β are vectors of coefficients to be estimated.

The data used comes from the 1996 CASEN National Household Survey. From this survey, all individuals aged 15 or older were taken – 43,537 women and 43,676 men. Nevertheless, both samples have an expansion factor that needs to be taken into account when obtaining descriptive statistics and econometric models.⁷

Table 4 gives the results of the wage model, and Table 5 those of the labor supply equation for men and women using a Tobit-type maximum likelihood method.⁸

The estimation of the labor supply model yields coefficients with the expected signs. Non-wage income has a negative and significant effect on the number of hours supplied per

week (dependent variable H), which confirms the income effect predicted by theory. Being a head of household causes the number of hours supplied to go up, owing to the responsibility of supporting a family. The biggest differences between men and women relate to having pre-school-age children (under seven years old) and being married. Both variables are positive for men, causing them to increase their hours of work, but they are negative for women: being married and having young children restricts the number of hours supplied to the labor market.

The variables determining the wage have the same sign both in the labor supply model and in the wage model. Therefore, and as expected, labor supply depends positively on the wage.

Finally, in the wage equation all the coefficients have the expected signs. More education and potential experience raise wages. The return to formal education among men is 9%, and for women it is 10.5%. The return to experience is 2.8% for men and 3.0% for women. Current job experience also has a positive effect on wages (table 5).

3.2 Interpretation of the coefficients

The coefficients estimated in the labor supply model have to be weighted by the probability of participation, in order to reflect the response of labor supply to a change in one of the explanatory variables:

$$\frac{\partial H}{\partial X_i} = F(z)a_i \quad (4)$$

Given equations (2) and (3), we have the following definition:

$$\hat{q} = g\mathbf{a}$$

When labor supply is estimated, the variables determining the wage have the coefficient θ . What we need is to obtain γ , which is the coefficient of $\ln W$ in labor supply.

Expanding the above equation gives:

$$(b_{11}, b_{12}, \dots, b_{1n}) = (ga_{11}, ga_{12}, \dots, ga_{1n})$$

therefore:

$$g = \frac{q_1}{a_1} = \frac{q_2}{a_2} = \dots = \frac{q_n}{a_n}$$

Where, g is obtained as the average of the estimated quotients. The results are as follows:

$$g_{\text{men}} = 69.45 ; \quad g_{\text{women}} = 92.53$$

These coefficients, weighted by the probability of participation, give us the rate of change of labor supply in response to a unit change in the natural logarithm of the wage. Table 6 shows the change in labor supply H given a change in one of the explanatory variables.

The main conclusion from these results is that men vary their number of hours worked in response to monetary variables more than women do.⁹ In effect, the increase in men's labor supply in response to an hourly wage rise, and its reduction in response to an increase in non-wage income, are greater than the corresponding figures for women. It can also be inferred that the impact of being a head of household is slightly stronger in men than in women.¹⁰

The McDonald - Moffit decomposition enables us to calculate the degree to which the labor supply response to a change in the explanatory variables relates to a change in the participation rate or a change in the number of hours supplied by individuals already working (see Table 7)¹¹.

The main factor responsible for increases and decreases in female labor supply is labor market entry and exit; i.e. changes in the participation rate (74.79%). By contrast, in the case of male labor supply, the response is greater in terms of changes in hours worked (66.25%) than changes in the participation rate (33.75%). This is an aspect that should be taken into account when designing labor market policies.

Table 8 gives labor supply elasticities with respect to the compensated and uncompensated wage, as well as total income. The signs of the substitution and income effects

(compensated wage elasticity and total income elasticity respectively) are as predicted by theory, with the substitution effect dominating.¹²

Although, in absolute terms, hours worked by men shows greater sensitivity to changes in the wage, this is not so in percentage terms, as the results for uncompensated wage elasticity show. This is because men on average have a higher participation rate than women, so in absolute terms the change is greater. This result agrees with most international empirical studies.¹³ In fact, even though different studies to estimate labor supply functions vary considerably in their elasticities, those in which the sample consists of women show greater sensitivity in the response of labor supply to changes in the wage. More recent studies on female labor supply in developed countries have found elasticities closer to those for men but as Heckman argues, just how far men's and women's elasticities will converge, as female participation rates go up, is an open question at the present time¹⁴.

Given that in developing countries women have different labor market behavior than men, and given the hypothesis that in large cities women tend to assume functions more similar to those of men, the female labor supply model was re-estimated for the Metropolitan Region alone. Table 9 shows the McDonald - Moffit decomposition and Table 10 the elasticities obtained in this case.

The results for the Metropolitan region show a smaller change in female labor supply due to entry and exit from the labor market, and a bigger change due to changes in hours worked. This is probably explained by women's more active labor market participation in big cities. The elasticity of female labor supply is also smaller, similar to that estimated for men¹⁵.

3.3 Another look at female labor supply

In this section we re-estimate female labor supply, including additional explanatory variables related to family structure, apart from those considered before. This is because in Chile women have the major responsibility for looking after children, while men tend to specialize in work outside the home.¹⁶ Variables considered are: children under 7 years old, children between 7 and 14 years old, daughters between 15 and 18 years old living at home, sons between 15 and 18 living at home, daughters between 19 and 24 living at home, and sons between 19 and 24 years of age living at home. By differentiating between children over 15 living in the same house by gender, the idea is to investigate the possibility that daughters may substitute for the mother in looking after smaller brothers and sisters, thereby enabling the mother to work outside the home. We also include a dummy variable to identify households that employ a live-in maid.

Other variables are included to reflect the facilities women have for carrying out domestic chores, such as whether the house is connected to the public water supply, or has tap connecting to the public water supply inside the home, or has a toilet connected to the public sewerage system and whether it has electricity.

Table 11 gives the results of the wage model and Table 12 those obtained by estimating this new model by the Tobit method. The wage model variables have the expected signs and are all statistically significant. The estimation of labor supply confirms the positive effect of the wage and the negative effect of non-wage income on women's hours worked. Being a head of household also has a positive effect on labor supply; on the other hand, married women work fewer hours than single women. The fact that the home

has certain minimum facilities has a positive and significant effect on female labor supply; if a woman has greater facilities for carrying out domestic chores she may have more time available for paid work.¹⁷

On the other hand, the estimated model shows that in general it is not only pre-school age children, but all children under 15 years old that inhibit female labor supply. The same is true with daughters between 15 and 18 years of age. Sons between 15 and 18 or between 19 and 24 living in the home do not have any affect on women's supply of hours to the labor market. However, the presence of daughters between 19 and 24 years old has a positive and significant effect on female labor supply. This is related to the fact that it is women and not men who are most likely to substitute for the housewife in domestic chores and in care for small children. This result may mean that a woman's decision to participate in the labor market involves trade-off between different family members. Similar results have been reported by other studies for Latin American.¹⁸ Having a live-in maid also has a positive effect on female labor supply, but it is only statistically significant at 10%.

Next we show the McDonald – Moffit decomposition and female labor supply elasticities estimated from the extended model (see tables 13 and 14). The values obtained are similar to those in the labor supply model estimated by comparing the behavior of men and women.

Lastly, it is interesting to analyze in greater depth the role of education in the female participation rate. For this purpose simulations were carried out, using the probability of participating in the labor market obtained by estimating the extended female labor supply model. The first simulation seeks to determine the impact of an additional year of schooling and of having any post-secondary qualification (professional title) on a woman's

probability of participating in the labor market. The simulation starts from the sample average number of years of schooling (9.2 years) and the percentage of women with professional title, and takes the average values of all other explanatory variables. Table 15 presents the results of this simulation, showing that the probability of participation has a significant increase when years of schooling are increased.

A second simulation was made of the effect of family structure on a woman's probability of participation. From the sample-average values in all explanatory variables we calculate the likelihood of participation if the woman had the average family composition of the sample (average number of children by age group), then we estimate the likelihood of participation if she had the family composition of the richest 20% and the poorest 20% of the sample.

The results, presented on table 16, show that family composition affects female labor market participation. *Ceteris paribus*, a woman whose family structure is the same as the average structure in the highest income quintile is a percentage of 10 points more likely to be in the labor market than the one whose family composition corresponds to the average of the lowest income quintile (38.8% versus 28.7%).

IV. Conclusions

Data on labor market participation rates in Chile show a big difference between men and women. Women's participation rates vary according to the schooling of the heads of households. They tend to increase with the schooling of the head of household and are significantly higher in the top 10%.

Moreover, there is a big difference in female participation rates according to their education level. While women with no education have a participation rate of 15%, women with higher education have a 59%. Such information is vital when designing policies aimed at achieving greater equality in the income distribution. As we know inequality is associated with differences in labor incomes, and these are associated with education and women's labor market participation.

This paper has estimated labor supply in Chile, distinguishing between men and women. It then estimated female labor supply including other variables that explain women's labor-market behavior in a more specific way.

When comparing changes in labor supply against changes in the explanatory variables, the conclusion is that men alter the number of hours they work, in response to monetary variables, more than women do. However, education level proves to be more important for women than for men when deciding the number of hours to work; this is consistent with data presented in the introduction of this paper.

The results show that the response of labor supply to changes in the explanatory variables in the case of women is mainly due to changes in their participation rate (74.8%) and to a lesser extent (25.2%) to adjustments in working hours. In the case of men, on the other hand, the response occurs more in terms of changes in hours worked, than in the participation rate (66.2% as against 33.8%).

In addition to this, the elasticity of female labor supply is higher than the elasticity of male labor supply (1.92 compared to 1.70). This greater elasticity is largely explained by the compensated wage elasticity, although income elasticity is higher for men (-0.04) than

for women (-0.006). These results also agree with international studies showing that in general women have a high response to changes in the price of their time.

Nonetheless, the behavior of women in the Metropolitan Region tends to approach that of men, and this is explained by their more active participation in the labor market. These results are consistent with studies carried out in developed countries.

The estimation of female labor supply in the extended model makes it possible to analyze the effects of household composition and the facilities existing in the home on hours of labor supplied. The fact that the house has electricity, water and a toilet connected to public networks has a positive and significant effects on women's labor supply, possible because having these services makes house work easier, and allows her to undertake paid work outside the home. In addition, household composition plays an important role; the existence of children (not only those of pre-school age) inhibits female labor supply. The presence of male children over 14 years old has no effect on the quantity of hours supplied by women, as culturally men do not substitute for women in looking after children and in doing domestic chores. On the other hand, the presence of daughters between 19 and 24 years of age does have a positive impact on female labor supply, as they can substitute for the women in household chores and take care of younger brothers and sisters. This raises the possibility of trade-off between female members of the family group, which would mainly affect young (non-adolescent) daughters.

The estimations carried out in this study suggest that increasing female participation rates in Chile involves designing policies which facilitate domestic chores and caring for small children, as well as policies that allow women access to better wages.

Women in the lower income deciles do not have the human capital needed to earn

reasonable wages in the market, and so their opportunity cost of not working is low.

Education plays a very important role in the female participation rate, therefore, if the aim is to incorporate these women into the labor force, they must be given the opportunity to become educated and trained. At the same time, the cost of going out of the house is high, because they do not have anybody to look after their children and do the heavy domestic chores. Moreover, in cases where they do have someone to do this, it is likely to be a daughter who carries out these duties instead of working herself or furthering her education. Accordingly, it is necessary to increase the provision of full-time day care centers. It is also important to make hours of work more flexible and allow women to work part-time, this is a very common practice which has helped to increase female participation rates in developed countries.

Notes:

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¹ See IDB (1998).

² See Killingsworth and Heckman, (1986) and Pencavel (1986).

³ This variable was chosen because it does not depend on female labor force participation.

⁴ Table A1 in the Annex shows the distribution of hours worked per week and the percentage of people not working.

⁵ See Tobin (1958).

⁶ See Mincer (1974) and Heckman (1979).

⁷ The expansion factor represents the relative weight of each person surveyed in the composition of the real population. For example, if the number of people interviewed from a given socioeconomic level does not correspond to their real weight in the population, the expansion factor for these people would be small.

⁸ Annex 2 presents the definition of the variables used in the regressions.

⁹ Note that this measurement does not correspond to the elasticity of labor supply with respect to monetary variables, as this is measured in percentage rather than absolute terms.

¹⁰ However, variables such as years of schooling (which is included in the wage effect) are more important for women than for men when deciding the number of hours supplied:

(0.73 as against 0.12).

¹¹ See McDonald and Moffitt (1980).

¹² There are differences in total income elasticity depending on the time period used to measure labor supply. In this paper, labor supply was measured weekly.

¹³ See Killingsworth (1983); Killingsworth and Heckman (1986) and Pencavel (1998).

¹⁴ See Mroz (1987) and Heckman (1993).

¹⁵ There is only one previous study of female labor supply in Chile, and this is based on data for Santiago, the capital city. In this study the estimated uncompensated wage elasticity varies between 0.90 and 0.98 (Muchnick, Vial, Strüver and Harbart, 1991). The difference between their elasticities and the results we obtained for the Metropolitan Region in our study is explained by the estimation procedure they used: namely, procedure III in Killingsworth (1983), which is subject to selection bias.

¹⁶ In this approach we assume the composition of the household to be exogenous.

¹⁷ The only variable that is not significant relates to having a tap inside the house connecting to the water supply.

¹⁸ See Connelly, DeGraff and Levinson (1996) and Wong and Levin (1992).

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Table 1: Female labor market participation rates (25-44 years of age) by income decile. Selected countries

Decile	1	2	3	4	5	6	7	8	9	10	Total	<u>wealthiest 10% / poorest 10%</u>
Country												
Argentina**	41	47	45	48	46	62	64	69	74	88	60	2.1
Bolivia*	56	53	55	62	65	65	69	65	75	78	65	1.4
Brazil	48	50	53	54	58	61	63	67	70	78	61	1.6
Chile	20	25	28	37	43	49	53	63	70	76	47	3.8
Costa Rica	28	23	32	33	29	44	54	58	64	71	45	2.5
El Salvador	22	35	37	50	53	60	65	69	74	82	57	3.7
Honduras	27	39	31	39	42	48	54	58	69	77	50	2.9
Mexico	36	28	27	38	34	42	40	53	57	64	44	1.8
Nicaragua	27	36	46	52	57	51	55	66	65	72	55	2.7
Uruguay*	49	57	65	64	70	77	79	82	87	90	72	1.8
Venezuela	32	31	34	36	48	48	59	65	73	77	52	2.4

Source: Inter-American Development Bank, see note 1.

(*) The Bolivian and Uruguayan Surveys only include urban data

(**) The Argentinian Survey only includes Great Buenos Aires

Table 2: Female education levels by income decile, and participation rates by education level
(percentages)

Education level	Income deciles										Participation rate
	1	2	3	4	5	6	7	8	9	10	
None	9.8	8.6	8.6	7.2	6.3	5.9	4.1	2.5	1.2	0.7	15.0
Elementary	57.5	51.0	46.8	43.4	39.5	36.5	30.4	25.3	19.3	10.8	25.2
Secondary	30.9	38.0	41.3	43.7	46.6	47.5	50.5	51.8	48.1	43.1	36.3
Higher (non-university)	1.1	1.4	2.1	3.3	4.1	5.5	7.6	9.3	10.9	11.9	59.5
University	0.7	1.0	1.1	2.4	3.5	4.6	7.4	11.1	20.5	33.5	58.5
Total	100	100	100	100	100	100	100	100	100	100	33.2

Source: Calculated on the basis of CASEN household survey 1996.

Table 3: Participation rates according to schooling of the head of household. 1996

Schooling head of household (years)	Male Participation Rate (%)	Female Participation Rate (%)
3.9	0.69	0.25
5.4	0.69	0.27
6.4	0.73	0.29
7.5	0.71	0.26
7.8	0.78	0.28
8.8	0.80	0.27
10.2	0.75	0.29
11.2	0.78	0.30
12.0	0.73	0.32
14.1	0.73	0.43

Source: Calculated on the basis of CASEN household survey 1996.

Table 4: Results of the wage model*(dependent variable ln W)*

Variables	Coefficients (men)	t-test	Coefficients (women)	t-test
Constant	5.369	156.46**	4.818	58.88**
Education	0.090	66.46**	0.105	34.64**
Experience	0.028	14.13**	0.030	14.08**
Experience Square	-0.0003	- 6.86**	-0.0003	- 7.72**
Current job experience	0.008	13.00**	0.017	9.57**
Professional tittle	0.676	42.50**	0.396	17.34**
I Region	-0.162	- 5.75**	-0.285	- 5.98**
II Region	0.059	2.27*	-0.255	- 4.49**
III Region	-0.127	- 3.71**	-0.390	- 5.95**
IV Region	-0.358	- 15.14**	-0.492	- 11.02**
V Region	-0.275	- 17.24**	-0.322	- 11.39**
VI Region	-0.294	- 14.10**	-0.476	- 10.94**
VII Region	-0.425	- 22.20**	-0.460	- 12.25**
VIII Region	-0.382	- 26.06**	-0.391	- 12.90**
IX Region	-0.524	- 24.59**	-0.601	- 12.92**
X Region	-0.317	- 17.71**	-0.343	- 9.83**
XI Region	-0.118	- 2.13*	-0.152	- 1.46
XII Region	0.046	1.11	-0.228	- 3.24**
λ	-0.077	- 1.55	0.305	6.08**
F	957.89**		235.14**	
Adjusted R ²	0.36		0.27	

Notes: ** statistically significant at 1%. * statistically significant at 5%.
Reference dummy variable Metropolitan Region.

Table 5: Estimation of the labor supply model using the Tobit method*(dependent variable hours of work per week)*

Variables	Coefficients (men)	t-test	Coefficients (women)	t-test
Constant	16.797	21.21**	- 31.951	- 13.67**
Education	0.141	3.35**	2.658	26.74**
Experience	2.199	69.30**	2.156	31.46**
Experience Square	- 0.042	-84.93**	- 0.048	- 39.27**
Current job experience	0.775	45.65**	2.883	58.52**
Professional title	4.390	8.35**	19.765	19.98**
I Region	- 6.881	- 7.87**	- 20.421	- 10.63**
II Region	- 5.870	- 7.33**	- 35.121	- 17.37**
III Region	- 9.215	- 8.66**	- 31.455	- 12.32**
IV Region	- 5.304	- 7.31**	- 23.990	- 13.74**
V Region	- 7.661	-16.23**	- 21.403	- 20.27**
VI Region	- 10.079	-15.98**	- 32.397	- 20.57**
VII Region	- 4.064	- 6.85**	- 22.631	- 15.87**
VIII Region	- 8.120	-18.34**	- 28.005	- 27.09**
IX Region	- 7.871	-12.33**	- 36.841	- 22.18**
X Region	- 3.267	- 5.86**	- 16.986	- 12.86**
XI Region	- 15.505	- 8.61**	16.860	4.29**
XII Region	- 8.382	- 6.27**	- 24.946	- 8.13**
Head of household	5.968	13.70**	13.417	12.59**
Ln per capita non - wage income	- 0.958	- 18.08**	- 1.414	- 7.85**
N° children under 7	2.877	14.14**	- 3.587	- 7.99**
Married	5.196	13.91**	- 10.291	- 14.07**
σ (standard deviation)	26.901	235.34**	48.377	130.94**

Notes: ** statistically significant at 1%.

Reference dummy variable Metropolitan Region.

Table 6: Change in labor supply in response to changes in the explanatory variables

Explanatory variables	Rate of change of H (men)	Rate of change of H (women)
Wage	60.20	25.24
Ln of per capita non-wage income	- 0.83	- 0.39
Head of household	5.17	3.66
N° pre-school children	2.49	- 0.98
Married	4.50	- 2.81

Table 7: McDonald - Moffit decomposition

Gender	Change in H due to entry and exit from the labor market	Change in H due to changes in hours worked
Men	33.75 %	66.25 %
Women	74.79 %	25.21 %

Table 8: Elasticities of labor supply

Gender	Compensated wage elasticity (E*)	Uncompensated wage elasticity (E)	Total income elasticity (mpe)
Men	1.746	1.704	-0.042
Women	1.927	1.921	-0.006

Table 9: McDonald - Moffit Decomposition. Female labor supply for the Metropolitan Region

Change in H due to entry and exit from the labor market	Change in H due to changes in hours worked
72.70%	27.30%

Table 10: Female labor supply elasticities. Metropolitan Region

Compensated wage elasticity (E*)	Uncompensated wage elasticity (E)	Total income elasticity (mpe)
1.710	1.704	-0.006

Table 11: Results of the wage model for women*(dependent variable ln W)*

Variables	Coefficients	t-test
Constant	4.868	115.79**
Education	0.109	38.50**
Experience	0.045	23.38**
Experience Squared	- 0.0005	-14.31**
Current job experience	0.011	8.58**
Professional tittle	0.340	13.49**
I Region	- 2.653	- 63.56**
II Region	- 0.113	- 1.93*
III Region	- 0.248	- 3.45**
IV Region	- 0.383	- 8.01**
V Region	- 0.258	- 8.94**
VI Region	- 0.329	- 7.69**
VII Region	- 0.407	- 10.30**
VIII Region	- 0.297	- 10.35**
IX Region	- 0.440	- 10.10**
X Region	- 0.299	- 7.89**
XI Region	- 0.191	- 1.63
XII Region	0.002	0.02
λ	0.0004	14.58**
F	599.10**	
Adjusted R ²	0.44	

Notes: ** statistically significant at 1%, * statistically significant at 5%.
Reference dummy variable: Metropolitan Region.

Table 12: Estimation of female labor supply by the Tobit method
(dependent variable: hours worked per week)

Variables	Coefficients	t-test
Constant	- 61.646	- 16.82**
Education	1.851	16.95**
Experience	1.975	27.28**
Experience Square	- 0.492	- 37.96**
Current job experience	3.425	63.44**
Professional tittle	17.230	17.02**
I Region	- 17.184	- 8.84**
II Region	- 33.234	- 16.66**
III Region	- 28.668	- 11.35**
IV Region	- 19.563	- 11.19**
V Region	- 17.897	- 17.03**
VI Region	- 26.117	- 16.40**
VII Region	- 18.549	- 12.87**
VIII Region	- 24.209	- 23.23**
IX Region	- 36.014	- 20.95**
X Region	- 9.067	- 6.58**
XI Region	-119.30	- 20.00**
XII Region	- 21.784	- 7.19**
Head of household	11.174	10.52**
Ln per-capita non-wage income	- 1.850	- 10.21**
Married	- 10.571	- 14.23**
N° children under 7	- 3.448	- 7.54**
N° children between 7 and 14	- 2.317	- 5.97**
N° sons between 15 and 18	0.0008	0.93
N° sons between 19 and 24	0.0002	0.25
N° daughters between 15 and 18	- 0.013	- 16.19**
N° daughters between 19 and 24	0.005	6.16**
Live-in maid	3.545	1.66
Connected to public water supply	8.449	4.88**
Water tap inside house	2.249	1.37
House has toilet	15.867	13.22**
House has electricity	15.701	5.43**
σ (standard deviation)	48.872	129.41**

Notes: ** statistically significant at 1%.

Reference dummy variable: Metropolitan Region

Table 13: McDonald - Moffit Decomposition: female labor supply

Change in H due to entry and exit from the labor market	Change in H due to changes in hours worked
74.33%	25.67%

Table 14: Female labor supply elasticities

Compensated wage elasticity (E*)	Uncompensated wage elasticity (E)	Total income elasticity (mpe)
1.931	1.924	-0.007

Table 15: Effect of education on a woman's probability of participating in the labor market

Schooling (years)	Percentage of women with professional title (%)	Probability of participation
9.2 (sample mean)	9.2	33.2
10	0.0	33.1
11	0.0	34.6
12	0.0	36.2
13	0.0	37.8
14	32.4	44.4
15	36.3	46.7
16	73.6	54.5
17	86.5	58.4

**Table 16: Simulation of the effect of family structure on the probability of participation,
by income level**

Income quintile	N° of children under 7 (decile average)	N° of children between 7 and 14 (decile average)	N° of sons between 15 and 18 (decile average)	N° of sons between 19 and 24 (decile average)	N° of daughters between 15 and 18 (decile average)	N° of daughters between 19 and 24 (decile average)	Probability of participation
Poorest 20%	0.75	0.97	0.20	0.19	0.35	0.21	28.7
Richest 20%	0.25	0.35	0.12	0.20	0.16	0.26	38.8

Annex 1.

Table A1 shows the percentage of people who are not working in the sample used in this study and the proportion of people working for different amounts of hours per week.

Table A1. Breakdown of hours worked per week, by gender

Hours per week	Women (%)	Men (%)
0	70.31	30.78
1-10	1.27	1.22
11-20	1.71	2.17
21-34	3.17	4.22
35-48	14.34	33.85
49 or more	9.18	27.74
	100.00	100.00

Source: Authors' calculations based on 1996 CASEN survey.

Annex 2. Definition of variables

The variables used in the regressions were constructed using data from the 1996 CASEN National Household Survey.

W = labor income from main occupation

EDUCATION = years of formal schooling

EXPERIENCE = potential experience (age- schooling- 6)

CURRENT JOB EXPERIENCE = number of years in current job

PROFESSIONAL TITTLE = graduate of post-secondary education (dummy variable)

REGION = dummy variable (there are 13 regions in the country)

λ = Heckman fictitious variable

LN PER CAPITA NON-WAGE INCOME = corresponds to the logarithm of total family income, less the individual's labor income, divided by the number of members of the family group

HEAD OF HOUSEHOLD = dummy variable that takes the value 1 if the person is a head of household

MARRIED = dummy variable that takes the value 1 if the person is married