Labour Supply and Inequality for Wage-Earning Farm Households in Spain

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Abstract

We provide empirical evidence on labour supply and inequality for wage-earning farm households in Spain, using two cross-sections from 1991 and 1994. The fundamental results can be divided into two groups. With respect to the labour supply: i) household size has a positive effect on male supply and a negative effect on female supply; ii) if there are children younger than 4, the female supply reduces, whereas that corresponding to males increases; iii) if the housing area is Andalusia or Extremadura, this reduces the number of worked hours by both spouses and iv) the income elasticities are negative, and both the male and female labour supplies are increasing. As regards the welfare analysis: i) monetary income is a good welfare indicator; ii) welfare inequality is lower than income inequality and, finally, iii) inequality among the wage-earning farm households in Spain has increased between 1991 and 1994.

Keywords: *labour supply, inequality, wage-earning farm households, Spain.*

Introduction

The success of any agricultural economic policy directed at wage-earning farm households depends, essentially, on a detailed knowledge of the economic behaviour of these households and, particularly, on the effects that wages and income variations have on the labour supply of both spouses, the male and the female, that is to say, on a knowledge of individual wage and income elasticities (see, for example, Sawit and O'Bried, 1995; Abraham, 1996; Kimhi, 1996; Azam, 1997; Caiumi and Perali, 1997; Aaberge et al., 1998; Benjamin et al., 1999; Butault and Lerouvillois, 1999; Agel and Persson, 2000). A point which usually arises in this type of household analysis is where one spouse does not work, implying a real restriction over the behaviour of the other.

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In this case, the initial model must be reformulated using the rationing theory, in order to incorporate this specific situation and to obtain the rationed formulation of the labour supply model.

One direct implication of the formulation and subsequent estimation of a labour supply model is an analysis of inequality in the welfare and monetary income levels. In this sense, it is well known and generally accepted that the reduction of inequality among the welfare levels of households is a fundamental objective in the economic policy of every country. However, given that individual welfare is not directly observable, the policy makers must specify variables that can be used in order to measure this inequality. Thus, we have noted the appearance of other monetary measures of welfare which employ the estimated parameters of individual preferences functions that take household labour supply into account, as well as some sociodemographic characteristics.

The objective of this paper is twofold. First, we provide empirical evidence on labour supply for wage-earning farm households in Spain and, secondly, we calculate the inequality in welfare and income levels that exist between these farm households. We use family data from the two most recent Spanish surveys which include statistical information on the labour behaviour of Spanish people, that is to say, ECBC and PHOGUE, which date from 1991 and 1994, respectively. From these two cross-sections, we have selected the observations corresponding to wage-earning employees, which allows us to estimate a flexible functional form derived from the indirect utility function proposed by Hausman and Ruud (1984). Further, we specify three different labour regimes, namely where both spouses work, where the male alone works and where the female alone works, and we then derive the restricted and unrestricted labour supply functions, from which we in turn derive the income and Marshallian wage elasticities (see Kooreman and Kapteyn, 1986; Kapteyn *et al.*, 1990). With respect to the second objective, we employ the estimated parameters in order to derive the equivalent income of each farm household as an indicator of individual welfare, allowing us to determine the inequality in their respective welfare levels. This inequality is then compared with that resulting from the observed monetary income (see Apps and Savage, 1989; Apps, 1994). In summary, the empirical results of this paper can be a potential guide for economic policy makers in the development of agricultural policies directed towards wage-earning farm households, which can include the implementation of subsidies and/or taxes leading to better market performance, as well as a reduction in the income and welfare inequality among this kind of farm households.

The paper is organized as follows. In Section 2, we first explain the flexible functional form of individual preferences and, secondly, the equivalent income and the inequality measures. The data and the estimation procedure are described in Section 3. Section 4 is devoted to the empirical results and, finally, in Section 5 we summarise the most important conclusions of the paper.

Theoretical Framework

The Labour Supply Model

The labour supply model which allows us to analyse the behaviour of wage-earning farm households considers that these are formed by two agents who can work, the male and the female, with the objective of the family being to maximize one utility function, whose endogenous variables are the leisure of both spouses and the total monetary income, $u = u(l_m, l_f, X)$, where l_m is the male leisure time, l_f is the female leisure time and X is the total monetary income. The budget restriction is $Y = \omega_m T + \omega_f T + y = \omega_m l_m + \omega_f l_f + X$, where Y is the full income obtained as the sum of the non wage monetary income and the valuation of both male and female total times, and where ω_m and ω_f are the male and female exogenous wages, respectively, T is the time endowment allocated between work and leisure and, finally, y is the non-wage income.

On the basis of this theoretical framework, the functional form chosen in order to carry out our analysis is the indirect utility function proposed by Hausman and Ruud (1984), which has some appropriate properties, namely consistency with the economic theory, simplicity of the theory calculus and of the empirical estimation and, finally, flexibility. This functional form is given by:

$$V = [y + \theta + \delta_m\omega_m + \delta_f\omega_f + \frac{1}{2}(\gamma_m\omega_m^2 + \gamma_f\omega_f^2 + 2\alpha\omega_m\omega_f)]\ \exp(\beta_m\omega_m + \beta_f\omega_f) \tag{1}$$

with β_m, β_f, δ_m, δ_f, γ_m, γ_f, α and θ being parameters which reflect the household preferences. Specifically, and as we will see in the following empirical section, δ_m and δ_f allow us to incorporate the sociodemographic characteristics of the household.

Applying Roy's lemma to (1), we can obtain the Marshallian labour supply functions for both the male and the female:

$$h_i = \beta_i[y + \theta + \delta_j\omega_j + \delta_i\omega_i + \frac{1}{2}(\gamma_j\omega_j^2 + \gamma_i\omega_i^2 + 2\alpha\omega_j\omega_i)] + \delta_i + \gamma_i\omega_i + \alpha\omega_j \quad i,j = m,f,\ i \neq j \tag{2}$$

The labour supply system (2) corresponds to a situation where restrictions on the labour hours that agents wish to supply do not exist. However, if such agents are in fact restricted in this way, then it is evident that the original theoretical specification must include this new characteristic in its formulation. In particular, we can consider that one spouse does not work and, hence, its labour supply is null, which implies a restriction that affects the labour supply of the other (see, for example, Tobin and Houthakker, 1950-51; Pollak, 1969; Neary and Roberts, 1980; and Deaton and Muellbauer, 1981).

Rationing theory is an approach that has been widely adopted in the empirical literature on labour markets to solve these situations describe above, that is to say, where one spouse does not work. This approach introduces the virtual wages in the indirect utility function, with these being the wages that should induce non-participant spouses to work. Thus, if the individual works, the current wage will be the virtual wage. However, if the spouse does not work, then his/her current and virtual wage do not coincide, with the second being higher than the first. Furthermore, this theory allows us to obtain the Marshallian functions of the rationed agent from the function of the unrationed one, substituting the female current wage, ω_f, by the virtual wage, $\bar{\omega}_f$, and adding the difference between both wages, multiplied by the rationed quantity, in our case T, to the full income Y. Thus, if we assume that it is the female who does not work, then the rationed Marshallian labour supply of the male will be:

$$h_m^R = \beta_m[y+\theta+\delta_f\bar{\omega}_f+\delta_m\omega_m+\frac{1}{2}(\gamma_f\bar{\omega}_f^2+\gamma_m\omega_m^2+2\alpha\bar{\omega}_f\omega_m)] + \delta_m+\gamma_m\omega_m+\alpha\bar{\omega}_f \tag{3}$$

with the female virtual wage being:

$$\bar{\omega}_f=\frac{-\gamma_f-\beta_f(\delta_f+\alpha\omega_m)+\left[[\gamma_f+\beta_f(\delta_f+\alpha\omega_m)]^2-2\beta_f\gamma_f[\delta_f+\alpha\omega_m+\beta_f(y+\theta+\delta_m\omega_m+\frac{1}{2}\gamma_m\omega_m^2)]\right]^{1/2}}{\beta_f\gamma_f} \tag{4}$$

From the Marshallian labour supply functions, we derive the theoretical expressions of rationed and non-rationed income and price elasticities.

Equivalent Income and Inequality Measures

In the analysis of inequality, the observed income of households has been used as an indicator of welfare, in that this is not directly observable. However, we have noted the appearance of other monetary measures of welfare based on the opportunity set and on household characteristics, such as size and composition. These different sociodemographic characteristics imply that household decisions will be different even though the wage and non-wage income may be the same. One of these monetary measures is equivalent income, which is calculated from the estimated parameters of a particular functional form of preferences.

Household preferences can be represented by an indirect utility function that includes wages (ω_m, ω_f), full income (Y) and some sociodemographic characteristics (z), $V = V(\omega_m, \omega_f, Y, z)$. Thus, equivalent income is the income that, for the vector of reference wages and characteristics $(\omega_m^r, \omega_f^r, z^r)$, that is to say, the sample mean variables, allows us to obtain the utility level, u, corresponding to the current wages, income and characteristics $(\omega_m, \omega_f, Y, z)$. In this way, from the equality $V(\omega_m, \omega_f, Y, z) = V(\omega_m^r, \omega_f^r, Y^E, z^r)$, we can derive the equivalent income $Y^E = f(\omega_m^r, \omega_f^r, z^r, \omega_m, \omega_f, z, Y)$, (see King, 1983).

As our model includes households in which both spouses work, and others in which only one works, we express the indirect utility function as $V(\omega_m^*, \omega_f^*, Y^*, z)$, where ω_m^* is the current wage of the male, if he works, and his virtual wage if he does not, and where $Y^* = \omega_m^* T + \omega_f^* T + y$. The female wage is obviously obtained in the same way. With this more general notation, we have $V(\omega_m^*, \omega_f^*, Y^*, z) = V(\omega_m^{r*}, \omega_f^{r*}, Y^E, z^r)$, from which we can derive the equivalent income corresponding to the Hausman-Ruud functional form:

$$Y^E = \frac{\exp[\beta_h \omega_h^* + \beta_m \omega_m^*]}{\exp[\beta_h \omega_h^{r*} + \beta_m \omega_m^{r*}]} \left[Y^* + \theta + \omega_m^* \delta_m - \omega_m^* T + \omega_h^* \delta_h - \omega_h^* T + \frac{1}{2}(\gamma_h \omega_h^{*2} + \gamma_m \omega_m^{*2} + 2\alpha \omega_h^* \omega_m^*) \right] -$$

$$- \theta - \omega_m^{r*} \delta_m + \omega_m^{r*} T - \omega_h^{r*} \delta_h + \omega_h^{r*} T - \frac{1}{2}(\gamma_h \omega_h^{r*2} + \gamma_m \omega_m^{r*2} + 2\alpha \omega_h^{r*} \omega_m^{r*}) \quad (5)$$

If we take the same reference wage and characteristics for all households, we can compare the individual welfare and measure the inequality among them. Considering n wage-earning households, we will obtain n comparable equivalent incomes, which we can denote as $Y^{EQ} = (Y_1^E, Y_2^E, ..., Y_n^E)$, whereas the monetary income vector is

$$X = (X_1, X_2, ..., X_n) \text{ where } \quad X_i = \omega_{mi} h_{mi} + \omega_{fi} h_{fi} + y_i, \ i = 1, ..., n.$$

The literature on welfare economics (e.g. Sen, 1973 and 1978; and Cowell, 1977) recommends the use of several inequality indicators, instead of considering just one, in order to guarantee that the welfare results will be robust. Each of the indicators includes different properties and, hence, we can group them into three different groups for a generic distribution W, which we particularise for equivalent income, Y^{EQ}, and for monetary income, X:

1º The classical objective measures. These indicators, which have been traditionally used, estimate the dispersion of each distribution from a descriptive point of view.

- Average relative deviation: $ARD(W) = \left(\sum_{i=1}^{n} \frac{|W_i - \bar{W}|}{n \bar{W}} \right)$, where $\bar{W}$ is the average of W

- Coefficient of variation: $CV(W) = \frac{\sigma}{\bar{W}}$, where σ is the standard deviation of W

- Logarithmic variance: $LV(W) = var\,[\log (W_i)]$

- Gini index: $G(W) = 1 + \frac{1}{n} - \frac{2}{n^2 \bar{W}} \sum_{i=1}^{n} (i\,W_i)$, $W_1 \geq W_2 \geq ... \geq W_n$

2º The Theil indexes family. This family was proposed by Theil (1967), with the original index being when the parameter c is equal to one.

$$
\bullet\ T_c(W) = \begin{cases} \dfrac{1}{n}\dfrac{1}{c(c-1)}\sum\limits_{i=1}^{n}\left[\left(\dfrac{Wi}{\bar{W}}\right)^{c}-1\right] & c \neq 0,1 \\ \dfrac{1}{n}\sum\limits_{i=1}^{n}\left(\dfrac{Wi}{\bar{W}}\right)\ln\left(\dfrac{Wi}{\bar{W}}\right) & c = 1 \\ \dfrac{1}{n}\sum\limits_{i=1}^{n}\ln\left(\dfrac{\bar{W}}{Wi}\right), & c = 0 \end{cases}
$$

3° The Atkinson indexes family. These normative indexes, developed by Atkinson (1970), are specified in terms of a parameter α, which indicates the inequality aversion, that is to say, as α increases, so the index gives more consideration to the poorest agents.

$$
\bullet\ A_\alpha(W) = \begin{cases} 1-\left[\sum\limits_{i=1}^{n}\dfrac{1}{n}\left(\dfrac{Wi}{\bar{W}}\right)^{1-\alpha}\right]^{1/1-\alpha} & \alpha > 0\ ; \alpha \neq 1 \\ 1-\prod\limits_{i=1}^{n}\left(\dfrac{Wi}{\bar{W}}\right)^{1/n} & \alpha = 1 \end{cases}
$$

Each of these indicators satisfies the different theoretical ordinal properties that are desired, namely the s-convexity, which is necessary in order to guarantee that the inequality index is consistent with the Lorenz criterion; the relative decrease in the impact of regressive transfers; the distributive homotheticity which implies that, as inequality increases, so the index gives more importance to the poorest individuals; and, finally, the limited variation of the magnitude between zero and one, in order to facilitate the economic interpretation of the index. These properties define the advantages of each index with respect to the others. In particular, the Atkinson indexes family satisfies the four desired properties; the Theil index *($c = 0$)* incorporates the first three conditions; the original Theil index *($c = 1$)* satisfies the first and the third; the Gini index and the coefficient of variation only satisfy the first; and, finally, the average relative deviation and the logarithmic variance do not incorporate any property. Accordingly, the best indicator is the Atkinson indexes family.

Data and Estimation

Data

In order to estimate the labour suppy model, we employ the two most recent Spanish cross-sections corresponding to 1991 and 1994, which provided statistical information on the labour behaviour of Spanish people, that is to say, the "Encuesta de Estructura, Conciencia y Biografía de Clase" (ECBC) prepared by the Regional Government of Madrid and the Spanish Minister of Labour and Social Affairs, and the "Panel de Hogares de la Unión Europea" (PHOGUE) published by the Statistical National Institute. From these surveys, we have selected those farm households made-up of wage-earning employees. Thus, we have obtained two representative samples composed by 156 (ECBC) and 167 observations (PHOGUE). We have decided to carry out all the empirical analysis using both statistical sources for the purpose of guaranteeing that our final conclusions are robust. In the Appendix, we define the variables and show the average, as well as the standard deviation and the minimum and maximum values.

Estimation

With respect to the estimation method, we first follow the Heckman (1979) procedure in order to derive the estimated wage of those males and females who do not work. Given that the decision of whether or not to work can be taken either individually or jointly by both spouses, the first step in this method consists of estimating a bivariant probit model which allows us to analyze the labour decision-making process. As explanatory variables we incorporate age, age raised to square and divided by 100, education levels, net non-wage income, family size and one dummy variable which indicates the Spanish region of either Andalusia or Extremadura as the housing area. The results are set out in Table 1. Thus, from the resolution of simple equations using the estimated coefficients of AGE and $AGE^2/100$, we find that the probability of working increases with age for males younger than 34, whilst it decreases for males older than 34. Moreover, this probability increases with education level, with the values of the parameters indicating that this effect is higher for males than for females. Furthermore, the significant coefficients of non-wage income and household size imply the positive effect of these variables on the female probability of participating in the labour market, whilst the Andalusia or Extremadura housing area variable reduces the male probability of working. Finally, we can observe that the value of ρ is not significant, which implies that we can consider that the participation decisions of both spouses will not be taken jointly.

The second stage of the Heckman (1979) method implies the estimation of the wage equations, whose results appear in Table 2. According to our initial criterion of considering as robust only the empirical results obtained from both data sets, we find that age and education level have significant and positive effects on both male and female wages, with the Andalusia or Extremadura housing area variable reducing the wages of both. Moreover, we have corrected the sample selection bias for both males and females including Heckman's λ, although in the case of males, both estimations of this coefficient indicate sample bias in the opposite direction. Furthermore, we have accepted the joint significance of all the variables and the existence of heteroscedasticity in the wage equations, as shown by the F and the Breusch-Pagan statistics, respectively. Thus, we have corrected the initial estimations of the standard deviations by way of the White (1980) method.

Table 1. Estimation of Participation Equations

	Male (j = m)		Female (j = f)	
	Coefficient	*t-ratio*	*Coefficient*	*t-ratio*
ECBC				
Intercept	0.49*	1.99	0.72**	1.66
AGEj	0.35	1.52	-0.06	-1.53
$AGEj^2/100$	-0.52	1.15	-1.21	-1.49
ED2j	0.32*	2.16	0.21*	2.06
ED3j	0.38*	2.33	0.22*	2.15
Y	0.25	0.89	0.36*	2.03
HSIZE	0.04*	2.09	0.15*	2.31
SOUTH-WEST	-0.22*	-1.97	0.32*	2.00
ρ	-0.34	1.14		
Observations	156		156	
Maddala's R^2	0.09		0.11	
F	14.74		18.42	
PHOGUE				
Intercept	0.58*	2.53	0.63*	2.31
AGEj	0.31*	2.02	-0.05*	-2.25
$AGEj^2/100$	-0.45*	-1.98	0.02**	1.71
ED2j	0.25*	2.63	0.15*	2.15
ED3j	0.50*	2.12	0.21*	2.36
Y	0.21	1.15	0.01**	1.69
HSIZE	0.12	1.32	0.41*	2.20
SOUTH-WEST	-0.21*	-2.63	-0.32*	-2.55
ρ	0.15	1.62		
Observations	167		167	
Maddala's R^2	0.12		0.15	
F	21.82		28.24	

* Significant at the 5% level. ** Significant at the 10% level

Table 2. Estimation of Wage Equations

	Male (j = m)		*Female (j = f)*	
	Coefficient	*t-ratio*	*Coefficient*	*t-ratio*
ECBC				
Intercept	5.41*	3.06	5.23*	2.56
AGEj	1.15*	3.14	1.26*	2.60
$AGEj^2/100$	-0.98	-1.35	0.02	1.63
ED2j	3.52*	2.06	2.53*	2.03
ED3j	3.98*	2.05	2.80*	2.06
SOUTH-WEST	-1.93*	-1.97	-1.56*	-2.31
Heckman's λ	0.52*	2.31	-0.36**	-1.92
Observations	137		61	
R^2	0.30		0.39	
R^2 Adjusted	0.29		0.26	
F	53.51		19.32	
Breusch-Pagan	34.13		46.22	
PHOGUE				
Intercept	5.83*	2.15	5.51*	3.02
AGEj	2.12*	2.62	2.05*	2.13
$AGEj^2/100$	1.34	1.25	-1.26*	-2.21
ED2j	4.35*	2.51	3.26*	2.53
ED3j	4.96*	1.99	3.78*	2.36
SOUTH-WEST	-2.15*	-2.44	-1.14*	-2.41
Heckman's λ	-2.33*	-2.26	-1.09*	-2.15
Observations	150		65	
R^2	0.39		0.35	
R^2 Adjusted	0.37		0.33	
F	92.07		29.06	
Breusch-Pagan	21.14		16.26	

* Significant at the 5% level. ** Significant at the 10% level

In order to analyze the predictive accuracy of our estimations, in Table 3 we present the percentages of success of the bivariant probit model, as well as the average predictions of the wage equations. We can first note that the prediction success is higher for males, 66.57% (ECBC) and 90.75% (PHOGHE), than for females, 54.50% (ECBC) and 47.48% (PHOGUE). These four percentages are obtained as the sum of the values corresponding to participation and non-participation; for example, 66.57% is the sum of 62.20% and 4.31%. Secondly, we can observe that the wage predictions for males, 648.21 (ECBC) and 624.32

(PHOGUE), slightly overestimate the observed wages, that is to say, 504.06 (ECBC) and 534.05 (PHOGUE); whereas for females, the wage predictions are 340.17 (ECBC) and 442.64 (PHOGUE), with 486.21 (ECBC) and 495.22 (PHOGUE) being the observed values. Thus, for both males and females, the PHOGUE predicts better than the ECBC.

Table 3. Predictive Accuracy of the Heckman Model

	Observed participation (%)					**Mean wages**	
	Male		**Female**			**Male**	**Female**
ECBC	Yes	No	Yes	No			
Predicted participation (%)					Observed	504.06	486.21
Yes	62.26	7.77	32.14	38.54	Predicted	648.21	340.17
No	25.66	4.31	6.96	22.36			
Total	87.92	12.08	39.10	60.90			
PHOGUE							
Predicted participation (%)					Observed	534.05	495.22
Yes	85.43	4.86	25.12	38.72	Predicted	624.32	442.64
No	4.49	5.32	13.80	22.36			
Total	89.82	10.18	38.92	61.08			

In the neoclassical labour supply model, with rationing specified as above, we can distinguish three differents regimes. In the first, I_1, both spouses work in the agricultural sector as wage-earners. In the second, I_2, only the male works, and in the third, I_3, only the female works. The functional form of the labour supply is different in each regime, resulting in the following switching endogenous model, in its stochastic form (see Kooreman and Kapteyn, 1986):

$$h_m^* = h_m(\omega_m, \omega_f, y) + \varepsilon_m$$

$$h_f^* = h_f(\omega_m, \omega_f, y) + \varepsilon_f$$

$$\left.\begin{array}{l} h_m = h_m^* \\ h_f = h_f^* \end{array}\right\} \text{ if } h_m^* > 0 \text{ and } h_f^* > 0. \text{ Reg. } I_1 \tag{6}$$

$$\left.\begin{array}{l} h_m^R = h_m(\omega_m, \bar{\omega}_f, y) + \varepsilon_m^R \\ h_f = 0 \end{array}\right\} \text{ if } h_f^* \le 0. \text{ Reg. } I_2$$

$$\left.\begin{array}{l} h_m = 0 \\ h_f^R = h_f(\bar{\omega}_m, \omega_f, y) + \varepsilon_f^R \end{array}\right\} \text{ if } h_m^* \le 0. \text{ Reg. } I_3$$

We have introduced the error terms assuming that there are no differences among the preferences of households with the same characteristics. Moreover, these error terms $(\varepsilon_m, \varepsilon_f, \varepsilon_m^R, \varepsilon_f^R)$ follow a multivariant normal distribution, with a covariance matrix:

$$\Sigma = \begin{pmatrix} \sigma_m^2 & . & . & . \\ \sigma_{fm} & \sigma_f^2 & . & . \\ * & \sigma_{mfR} & \sigma_{mR}^2 & . \\ \sigma_{fmR} & * & * & \sigma_{fR}^2 \end{pmatrix} \quad (7)$$

where * indicates that these terms do not appear in the likelihood function.

Model (6) is estimated in its budget share form, with the likelihood function being:

$$L = \prod_{i \in I_1} f_1(s_f^{*i}, s_m^{*i}) \prod_{i \in I_2} \int_{-\infty}^{0} f_2(s_f^i, s_m^{Ri})\, ds_f^i \prod_{i \in I_3} \int_{-\infty}^{0} f_3(s_m^i, s_f^{Ri})\, ds_m^i \quad (8)$$

where s_f^*, s_m^*, s_m^R and s_f^R are the income shares of h_f^*, h_m^*, h_m^R and h_f^R, respectively, f_1 is the joint density function of s_f^{*i} and s_m^{*i}, f_2 is the joint density function of s_f^i and s_m^{Ri}, and f_3 is the joint density function of s_m^i and s_f^{Ri}.

Let us now introduce the family socioeconomic characteristics in the parameters $\delta_m(z)$ and $\delta_f(z)$ of the model by choosing the usual linear especification:

$$\delta_j(z) = \delta_{jj} + \delta_{jH} \ln(\text{HSIZE}) + \delta_{jE1}\text{ED1j} + \delta_{jE2}\text{ED2j} + \delta_{jC}\text{CHILD<4} + \delta_{jS}\text{SOUTH-WEST} \quad j=m,f \quad (9)$$

Empirical Results

The Labour Supply Model

The estimated parameters appear in Table 4. As can be seen, the majority of components of the parameter δ_j are significant at the 5% level. According to (9), the signs of these significant components determine the positive or negative variation of the number of hours worked by spouse *j*. We can observe that household size has a positive effect on male labour supply and a negative one on

Table 4. Estimated Parameters of the Labour Supply System

		Male (j = m)				*Female (j = f)*	
		Coefficient	*t-ratio*	*Coefficient*	*t-ratio*	*Coefficient*	*t-ratio*
ECBC							
Components of δ_j							
Intercept	δ_{jj}	18.56*	4.25			26.32*	6.02
HSIZE	δ_{jH}	4.09*	4.12			-3.06*	-3.00
ED1j	δ_{jE1}	2.58*	5.21			1.52*	2.04
ED2j	δ_{jE2}	3.09*	2.98			1.88*	2.41
CHILD<4	δ_{jC}	0.138*	2.26			-0.096*	2.34
SOUTH-WEST	δ_{jS}	-0.06**	-1.78			-1.22*	-2.99
Utility function constants	γ_j	2.86	1.05			1.55	0.59
	β_j	-0.36	-1.24			-0.22	-0.98
	α			-0.52*	-2.78		
	θ			45.21	-		
Variances/covariances	σ_j	0.26	1.32			0.33*	2.15
	σ_{fm}			0.26	1.15		
	σ_{jR}	0.26**	1.66			0.03	0.65
	σ_{mfR}			0.21	1.52		
	σ_{fmR}			0.13	1.55		
Log likelihood		569.32					
PHOGUE							
Components of δ_j							
Intercept	δ_{jj}	20.20*	5.16			31.15*	5.09
HSIZE	δ_{jH}	3.06*	2.65			-5.16*	-2.06
ED1j	δ_{jE1}	1.16*	2.26			2.85*	2.16
ED2j	δ_{jE2}	1.65*	2.93			3.22*	1.98
CHILD<4	δ_{jC}	0.043*	2.08			-0.154*	-1.97
SOUTH-WEST	δ_{jS}	-1.56*	-2.06			-1.59*	-3.58
Utility function constants	γ_j	3.06*	2.56			2.06*	2.12
	β_j	-1.56*	-3.09			-0.89*	2.03
	α			-0.16*	-1.98		
	θ			12.25	-		
Variances/covariances	σ_j	0.05*	3.91			0.09	1.25
	σ_{fm}			0.16*	2.24		
	σ_{jR}	0.05	1.45			0.12*	1.98
	σ_{mfR}			0.06*	2.15		
	σ_{fmR}			0.31*	2.36		
Log likelihood		538.21					

* Significant at the 5% level. ** Significant at the 10% level.

female supply. This effect on females is related to which appears in the participation equation. Thus, we find that when females have more children, the probability of participating in the labour market will be higher; however, the labour suppy results indicate that if they do indeed participate, then they offer less hours for work and, therefore, devote more time to caring for their children. The variables which indicate the education level are significant and positive, with the highest values appearing in the secondary education level. Moreover, if there are children younger than 4, the female labour supply decreases, whereas that corresponding to males increases. Furthermore, if the housing area is Andalusia or Extremadura, this reduces the number of worked hours by both spouses. Finally, one part of the utility function constants and of the variances and the covariances, are also significant at the conventional 5% level.

The estimation of the model can exhibit endogeneity problems, given that it is possible for the worked hours to depend on the wage per hour, and that this, in turn, depends on the hours that both spouses dedicate to work. Thus, in order to test if we have correctly used wages as exogenous variables, we apply the procedure proposed by Hausman (1978). Here, we use different instrument variables for both data sets, given that the statistical information of each set is not exactly the same. In the case of the ECBC, the five instruments are the age of the worker, the risk associated with the job, whether the individual has responsability in job decisions, the level of difficulty of the job and, lastly, the control over the work exercised by the worker. For the PHOGUE, the four selected variables are the age, years of service in the job, if the job includes a supervisory task and, finally, satisfaction with respect to the wage earned. Before applying both sets of instruments, Table 5 first shows that we cannot reject the validity of the instruments at the 5% level of significance and, secondly, that the endogeneity of wages is rejected at the same level.[i]

Table 5. Specification Tests

	Male	Critical Values	Female	Critical Values
ECBC				
Validity of instruments	9.42	$\chi^2_{0.05} = 11.07$	8.13	$\chi^2_{0.05} = 11.07$
Endogeneity of wages	1.42	$t_{0.05} = 1.96$	0.87	$t_{0.05} = 1.96$
PHOGUE				
Validity of instruments	9.62	$\chi^2_{0.05} = 9.49$	7.66	$\chi^2_{0.05} = 9.49$
Endogeneity of wages	-1.29	$t_{0.05} = 1.96$	-1.36	$t_{0.05} = 1.96$

Table 6 compares the observed and predicted labour supply. We can note that the household labour supply system predicts the participation of males using the ECBC, and of females using both data sets, in a way that is superior to the bivariant probit model. In particular, the probability of prediction success is higher for males, 92.47% (ECBC) and 86.86% (PHOGUE), than for females, 71.06% (ECBC) and 53.13% (PHOGUE). Moreover, with respect to the worked hours per week, the observed male hours are 47.43 (ECBC) and 48.54 (PHOGUE), with the predicted values being 54.26 (ECBC) and 51.43 (PHOGUE). By contrast, the labour supply system slightly underestimates the observed values of the females, 43.44 (ECBC) and 41.84 (PHOGUE), where it predicts 32.26 (ECBC) and 31.19 (PHOGUE). Thus, we can note that the male predictions are better than those corresponding to the females and that predictions using the PHOGUE are also better than those using the ECBC.

Table 6. Predictive Accuracy of the Labour Supply System

	Observed participation (%)					*Mean worked hours*	
	Male		*Female*			*Male*	*Female*
ECBC	Yes	No	Yes	No			
Predicted participation (%)					Observed	47.43	43.44
Yes	84.26	3.87	32.14	21.98	Predicted	54.26	33.26
No	3.66	8.21	6.96	38.92			
Total	87.92	12.08	39.10	60.90			
PHOGUE							
Predicted participation (%)					Observed	48.54	41.84
Yes	86.21	9.53	26.31	34.26	Predicted	51.43	31.19
No	3.61	0.65	12.61	26.82			
Total	89.82	10.18	38.92	61.08			

In Table 7 we indicate the mean and the standard deviation of the income and

Table 7. Estimated Elasticities

	Both spouses work		*Only the male works*		*Only the female works*	
	Mean	*St.dev.*	*Mean*	*St.dev.*	*Mean*	*St.dev.*
ECBC						
Male non-labour income elasticity: E_m	-0.03	0.06	-0.16	0.18		
Female non-labour income elasticity: E_f	-0.05	0.10			-0.09	0.11
Male Marshallian own-wage elasticity: E_{mm}	0.21	0.26	0.26	0.21		
Female Marshallian own-wage elasticity: E_{ff}	0.35	0.45			0.34	0.37
Male Marshallian cross-wage elasticity: E_{mf}	-0.34	0.25				
Female Marshallian cross-wage elasticity: E_{fm}	-0.52	0.50				
PHOGUE						
Male non-labour income elasticity: E_m	-0.09	0.12	-0.12	0.15		
Female non-labour income elasticity: E_f	-0.12	0.29			-0.16	0.36
Male Marshallian own-wage elasticity: E_{mm}	0.32	0.42	0.34	0.44		
Female Marshallian own-wage elasticity: E_{ff}	0.52	0.63			0.66	0.44
Male Marshallian cross-wage elasticity: E_{mf}	-0.33	0.45				
Female Marshallian cross-wage elasticity: E_{fm}	-0.66	0.69				

wage elasticities in the three possible situations. The results of both samples are very similar, with the absolute values of the average elasticities being higher when using the PHOGUE than when using the ECBC. However, the standard deviations values indicate that the variability of these elasticities is very high, which is due to the high number of different family situations (i.e. household composition, housing area, ...) that appear in the sample. In particular, all the non-wage income elasticities are, as expected, negative for both males and females, with the highest value, in absolute terms, corresponding to the latter when both spouses work. Both the male and the female Marshallian own-wage elasticities are positive, with the former being lower when both spouses work, as well as when only one of them works. Moreover, the negative signs of the cross-price elasticities show that both labour supplies are substitutes.

Equivalent Income and Inequality Measures

Table 8 contains the rankings based on our monetary measure of family welfare, that is to say, the equivalent income, using both data sets. The average of the equivalent income and of the monetary income appear in the second and third columns, respectively. In the subsequent columns we show the percentage of males and females who work in each quintile and the percentage who are the family head, considering that, of both spouses, the family head is the agent who obtains the highest wage income. When the wage income of both spouses is equal, we do not consider either of the spouses as head family and, thus, the sum of percentages of both columns is not necessarily 100%. Finally, we have calculated the average family size in each quintile.

The results obtained from both data sources reveal, obviously, that equivalent income is higher than monetary income, which is due to the first incorporating the leisure valuation, as well as the influence of sociodemographic characteristics of households, in addition to the income, We can further note that monetary income follows the increasing order of equivalent income. This is the case because the income level of wage-earning farm households is not sufficiently high for them to consider leisure time to be as important as income in their welfare, which is in accordance with the increasing labour supply of both spouses, as we have shown above. The percentages of both working males and females increase, with the highest percentages appearing in the fifth quintile, that is to say, in the highest welfare level. With respect to family heads, the model reveals that, at every welfare level, the highest percentage of family heads corresponds to males and that the highest percentage of females appear in the first quintile, after which it falls. Finally, family size follows an oscillating but increasing order up to the fifth quintile, where it reaches its maximum.

Table 9 presents similar results, but this time using monetary income as the variable used to rank the households. We can observe that equivalent income increases according to monetary income. We can also note that the percentage of working females increases, although not continuously, with welfare. Thus, and as we expected, family welfare and family income increase with the participation of both males and females in the labour market. Moreover, welfare increases imply a high number of male family heads and also a low number of female family heads. Finally, family size exhibits an increasing trend, with the highest value appearing in the fifth quintile.

Table 8. Equivalent Income Rankings

Quintile	*Mean equivalent income*	*Mean monetary income*	*Employed males (%)*	*Employed females (%)*	*Male head (%)*	*Female head (%)*	*Mean household size*
ECBC							
1	*4.59*	*1.12*	*70.96*	*41.15*	*48.95*	*38.56*	*3.26*
2	*5.09*	*1.26*	*78.15*	*52.56*	*52.31*	*32.16*	*3.26*
3	*5.65*	*1.41*	*79.34*	*58.26*	*65.46*	*18.12*	*3.52*
4	*6.63*	*1.52*	*100.00*	*69.02*	*70.26*	*6.52*	*3.42*
5	*7.14*	*1.59*	*100.00*	*85.31*	*73.77*	*5.39*	*4.24*
Mean	*5.82*	*1.38*	*85.69*	*61.26*	*62.15*	*20.15*	*3.54*
PHOGUE							
1	*4.05*	*1.15*	*87.87*	*51.36*	*61.02*	*32.21*	*3.05*
2	*4.59*	*1.41*	*92.56*	*55.34*	*63.25*	*28.56*	*3.49*
3	*5.21*	*1.48*	*96.65*	*62.98*	*64.32*	*21.32*	*3.88*
4	*5.99*	*1.53*	*98.32*	*64.23*	*66.36*	*8.26*	*3.94*
5	*6.72*	*1.73*	*100.00*	*64.84*	*70.15*	*7.55*	*4.26*
Mean	*5.31*	*1.46*	*95.08*	*59.75*	*65.02*	*18.96*	*3.72*

Table 9. Monetary Income Rankings

Quintile	*Mean monetary income*	*Mean equivalent income*	*Employed males (%)*	*Employed females (%)*	*Male head (%)*	*Female head (%)*	*Mean household size*
ECBC							
1	*1.05*	*4.63*	*72.36*	*51.26*	*45.36*	*35.65*	*3.02*
2	*1.11*	*4.99*	*78.56*	*59.64*	*59.65*	*21.32*	*3.56*
3	*1.18*	*5.69*	*77.53*	*62.52*	*65.44*	*17.25*	*3.96*
4	*1.56*	*6.89*	*100.00*	*69.22*	*72.15*	*12.48*	*3.12*
5	*2.00*	*6.90*	*100.00*	*63.66*	*68.16*	*14.05*	*4.04*
Mean	*1.38*	*5.82*	*85.69*	*61.26*	*62.15*	*20.15*	*3.54*
PHOGUE							
1	*1.12*	*4.54*	*88.84*	*50.43*	*62.05*	*33.25*	*3.22*
2	*1.39*	*4.66*	*92.25*	*52.36*	*65.96*	*29.46*	*3.38*
3	*1.31*	*5.62*	*94.31*	*59.94*	*70.25*	*16.53*	*3.56*
4	*1.42*	*5.71*	*100.00*	*64.12*	*60.12*	*10.05*	*3.89*
5	*2.06*	*6.02*	*100.00*	*71.9*	*66.72*	*5.51*	*4.55*
Mean	*1.46*	*5.31*	*95.08*	*59.75*	*65.02*	*18.96*	*3.72*

In Table 10 we present the inequality measures defined above, using both equivalent income and monetary income. In the case of all calculated indicators, we can observe that the inequality measure using monetary income is higher than that using equivalent income. This result indicates that the inclusion of both leisure time and the sociodemographic characteristics into the equivalent income contributes towards reducing the inequality in welfare levels. The comparison of both data sets reveals that the inequality observed from the PHOGHE is higher than that corresponding to the ECBC, which, given the detected similarities between both data sets, can indicate an increase in the inequality of wage-earning households from 1991 to 1994. In any event, the magnitude of the indicators close to zero reveals the low inequality observed among the wage-earning farm households in Spain.

Table 10. Inequality Measures

Measure	*Equivalent income* $W = Y^{EQ}$	*Monetary income* $W = X$
ECBC		
Average Relative Deviation: ARD (W)	0.215	0.452
Coefficient of Variation: CV (W)	0.292	0.625
Logaritmic Variance: LV (W)	0.184	0.389
Gini Index: G (W)	0.259	0.320
Theil Index: T_0 (W)	0.153	0.269
Theil Index: T_1 (W)	0.112	0.243
Atkinson Index: $A_{0.5}$ (W)	0.100	0.215
Atkinson Index: A_1 (W)	0.162	0.200
Atkinson Index: A_2 (W)	0.191	0.458
PHOGUE		
Average Relative Deviation: ARD (W)	0.214	0.432
Coefficient of Variation: CV (W)	0.284	0.645
Logaritmic Variance: LV (W)	0.182	0.451
Gini Index: G (W)	0.242	0.326
Theil Index: T_0 (W)	0.146	0.294
Theil Index: T_1 (W)	0.102	0.250
Atkinson Index: $A_{0.5}$ (W)	0.098	0.238
Atkinson Index: A_1 (W)	0.152	0.275
Atkinson Index: A_2 (W)	0.184	0.532

From the point of view of economic policy making, the conclusion we can draw from these results is essentially that policy measures devoted to improving the welfare of wage-earning farm households must increase income, given that this welfare component is the most valuable for them. Here, we can consider two kinds of measures. First, agricultural subsidies, which would imply direct increases in family income and, hence, family welfare. Moreover, this increase in income will, according to the income elasticity values, further imply a very small reduction in the labour supply of both spouses. The second kind of policy measure would involve a reduction in the tax that agricultural households must pay on earned income. This supposes a clear increase in the real wage that agricultural individuals receive in the labour market. In this case, the wage elasticities reveal increases in the labour supply of both spouses and, therefore, increases appear in both household income and household welfare.

Finally, given that sectorial analyses on household labour supply and inequality have not been carried out with respect to the Spanish economy, we have compared our results with those corresponding to the total of Spanish wage-earning households (García, 1996). This has allowed us to detect the different effects of each economic policy on both the total Spanish wage-earning households and on the wage-earning farm sector. Thus, the hours worked by males in the wage-earning agricultural sector are higher than those in the total economy, whereas the female hours worked and the male and female wages are lower. Moreover, the own-wage elasticities reveal that the male labour supply is decreasing slightly for the total economy, whereas it is increasing for the wage-earning farm employees. By contrast, both studies exhibit an increasing female labour supply, with the magnitud for the total economy being lower than for the wage-earning farm sector. Additionally, household income and household welfare are lower in the wage-earning agricultural sector than in the total economy, whereas inequality levels are higher. Therefore, economic policy measures which give more help to the Spanish wage-earning households, for example, a change in the personal tax system that implies an increase in the net wage, will have a higher effect on the labour supply of wage-earning farm employees than on the rest of wage-earning employees. Thus, the income of the former will increase more than that of the latter, increasing their welfare and, therefore, reducing the inequality between all wage-earning households.

In addition to the above comparison of our results with the previous Spanish findings, we can also compare them with those obtained in other international studies. Thus, Benjamin et al. (1996) present a joint model of labour decisions for French farm couples, in which these authors pay attention to the spouse participation decisions in the off-farm labour market, as well as the decision to use hired farm labour. Their results confirm our theoretical framework, according to which all labour decisions should be modelled in a joint framework. Furthemore, Butault and Lerouvillois (1999) analyse the agricultural income inequality within the European Union before and after the 1993 Common Agricultural Policy (CAP) reform and, using a Cobb-Douglas function, show that this reform does not necessary lead to a reduction in monetary income inequality. Specifically, they obtain a Theil index of 0.2 for France, Spain and Greece, which is slightly lower than our value, of around 0.25.

Summary and Conclusions

In this paper we have provided empirical evidence on labour supply and inequality for wage-earning farm households in Spain, using data from the two most recent Spanish surveys in order to carry out this applied analysis. In particular, we have considered the Hausman-Ruud indirect utility function, from which we have derived the restricted and unrestricted labour supply functions and the expressions of the income and Marshallian wage elasticities. We have then used the estimated parameters in order to calculate the equivalent income as an indicator of individual welfare and, finally, we have compared the resulting inequality in equivalent income and monetary income.

The participation equations indicate that the probability of working increases with age for males younger than 34, whilst it reduces for males older than 34, and also for females. Moreover, this probability increases with education level. The significant coefficients of non-wage income and household size imply the positive effect of these variables on the female probability of participating in the labour market, whilst the Andalusia or Extremadura housing area variable reduce the male probability of working. Moreover, in the estimation of wage equations we can note that age and education level have significant and positive effects on both male and female wages, with the Andalusia or Extremadura housing area variable reducing the wages of both. Furthermore, we find that the prediction success of the bivariant probit model is higher for males than for females, and that the wage predictions for males overestimate observed wages, whereas the female wage predictions underestimate those corresponding to them.

The estimated parameters of the Hausman-Ruud model show that household size has a positive effect on male labour supply and a negative one on female supply. The variables which indicate the education level are significant and positive, with the highest values appearing in the secondary education level. Moreover, if there are children younger than 4, the female labour supply reduces, whereas that corresponding to males increases. Furthermore, if the housing area is Andalusia or Extremadura, this reduces the number of worked hours by both spouses. The household labour supply system predicts the participation of males using the ECBC, and of females with both data sets, in a way that is superior to the bivariant probit model. With respect to the worked hours per week, it overestimates the male hours, whilst it underestimates those corresponding to females. Furthermore, the non-wage income elasticities are negative and the wage elasticities show that both male and female labour supplies are increasing, and that both labour supplies are substitutes.

We can draw some conclusions from the welfare analysis. With respect to both data sets, we can first show that the ranking using equivalent income is similar to that corresponding to monetary income. This confirms that income is the fundamental element in the welfare of farm families, with leisure time and sociodemographic characteristics having a secondary importance. The highest income and welfare levels appear when individual incomes are very close. The welfare inequality of farm families is lower than income inequality, because leisure compensates for a percentage of the income differences. Lastly, inequality among the wage-earning farm households in Spain has increased from 1991 to 1994, although the magnitude of the indicators is low.

Therefore, policy measures devoted to improving the welfare of wage-earning farm households must increase income, with two types of measures being available. First, farm subsidies, which would imply direct increases in family income. Secondly, a reduction in the tax on earned income that wage-earning households must pay. This would suppose an increase in the net wage and, given that the labour supply of wage-earning farm households is increasing at a faster rate than that corresponding to all other wage-earning households, then the income and, therefore, the welfare of the former will increase more than that of the latter, thereby, reducing the inequality between all wage-earning households.

Notes

1. The obtention of the rationed Marshallian function of the male, as well as the expressions of income and Marshallian price elasticities are available from the authors upon request.
2. We have selected the samples considering that, in the case where farm households have dependents, these are younger than 24, with the objective of including students and of eliminating those dependents who participate in the labour market.
3. For example, using the PHOGUE, the probability of working corresponding to males can be expressed as $x = 0.31\ AGE - 0.45\ AGE^2/100$. If we now maximisize this equation with respect to age, we obtain a value of this variable equal to 34.44.
4. The instrumental variables estimations used in order to calculate these specification tests are available from the authors upon request.

Appendix

Table A1 shows the definition, mean, standard deviation and the minimum and maximum values of all the explanatory variables for both samples of wage-earning farm households, with these variables being those habitually employed in the literature on labour supply models (see Hausman and Ruud, 1984, and Ransom, 1987a, 1987b). Thus, we first have the age of both spouses, AGEM and AGEF for males and females, respectively, and the ages raised to square and divided by one hundred, $AGEM^2/100$ and $AGEF^2/100$. The following three dummy variables indicate the education level of both spouses, distinguishing between primary education level, ED1M and ED1F, secondary education level, ED2M and ED2F, and university education level, ED3M and ED3F. We then present the net wages per hour (in pesetas) of the working males and females, ω_m and ω_f, the worked hours per week of both spouses, h_m and h_f, the annual net non-wage income (in thousands of pesetas) of the family, y, and the household size, HSIZE. Finally, we include two dummy variables which are especially relevant in this analysis. The first, CHILD<4, indicates the existence of children from 0 to 4 in the family, who demand much more care time from their parents than older children, and thus drastically reduce the available work time in the labour market. The second, SOUTH-WEST, indicates that the housing area of the household is Andalusia or Extremadura, given that substantial monetary subsidies to wage-earning farm employees are provided by the national government only for these two Spanish regions.

Table A1. Mean, Standard Deviation, Minimum and Maximum of Variables

	Definition	Mean	Std.Dev.	Mini-mum	Maxi-mum
ECBC					
AGEM	Age of males	44.58	13.26	18	64
AGEF	Age of females	44.26	12.36	19	64
AGEM2/100	Age raised to square and divided by 100 of males	21.62	11.76	3.24	40.96
AGEF2/100	Age raised to square and divided by 100 of females	21.11	10.79	3.61	40.96
ED1M	Primary education level of males	0.71	0.45	0	1
ED2M	Secondary education level of males	0.22	0.42	0	1
ED3M	University education level of males	0.07	0.25	0	1
ED1F	Primary education level of females	0.75	0.43	0	1
ED2F	Secondary education level of females	0.16	0.37	0	1
ED3F	University education level of females	0.09	0.28	0	1
ω_m	Net wage per hour of males (in pesetas)	504.06	427.48	204.16	2,043.21
ω_f	Net wage per hour of females (in pesetas)	486.21	315.96	243.14	1,710.68
h_m	Weekly working hours of males	47.43	15.60	15	94
h_f	Weekly working hours of females	43.44	15.42	3	84
y	Net non-wage income of the household per year	64,227	325,436	0	2,943,000
HSIZE	Household size	3.56	1.31	2	7
CHILD<4	Some dependent 0-4 years	0.31	0.46	0	1
SOUTH-WEST	Housing area: Andalusia or Extremadura	0.27	0.44	0	1
PHOGUE					
AGEM	Age of males	45.80	11.16	25	64
AGEF	Age of females	42.43	11.15	22	64
AGEM2/100	Age raised to square and divided by 100 of males	22.21	10.27	6.25	40.96
AGEF2/100	Age raised to square and divided by 100 of females	19.24	9.70	4.84	40.96
ED1M	Primary education level of males	0.77	0.42	0	1

	Definition	Mean	Std.Dev.	Mini-mum	Maxi-mum
ED2M	Secondary education level of males	0.18	0.38	0	1
ED3M	University education level of males	0.05	0.22	0	1
ED1F	Primary education level of females	0.72	0.45	0	1
ED2F	Secondary education level of females	0.17	0.37	0	1
ED3F	University education level of females	0.11	0.31	0	1
ω_m	Net wage per hour of males (in pesetas)	534.05	513.50	117.68	2,125.00
ω_f	Net wage per hour of females (in pesetas)	495.22	304.01	125.25	1,662.50
h_m	Weekly working hours of males	48.54	15.23	15	96
h_f	Weekly working hours of females	41.84	15.78	10	90
y	Net non-wage income of the household per year	131,279	512,417	0	4,300,00
HSIZE	Household size	3.72	1.33	2	8
CHILD<4	Some dependent 0-4 years	0.36	0.48	0	1
SOUTH-WEST	Housing area: Andalusia or Extremadura	0.23	0.42	0	1

* Only for those working

We can observe that the mean values of both samples are very similar. Thus, we can note that the average age of the wage-earning farm individuals is around 45 for males and between 42 and 44 for females, in particular, 44.58 (ECBC) and 45.80 (PHOGUE) for the former, and 44.26 (ECBC) and 42.43 (PHOGUE) for the latter. In accordance with these high ages, the education level of the majority of employees is primary, 71% (ECBC) and 77% (PHOGUE) for males, and 75% (ECBC) and 72% (PHOGUE) for females. Moreover, the net wage per hour is low, with that corresponding to females, 486.21 (ECBC) and 495.22 (PHOGUE), being lower than corresponding to males, 504.06 (ECBC) and 534.05 (PHOGUE). The household size is 3.56 (ECBC) and 3.72 (PHOGUE). Finally, with respect to the dummy variables, we can note that around one third of households have children from 0 to 4, in particular, 31% (ECBC) and 36% (PHOGHE), and that the percentages of wage-earning farm employees resident in Andalusia or Extremadura, 27% (ECBC) and 23% (PHOGUE), are higher than the average for the country as a whole, 17% ("Encuesta de Población Activa" elaborated by the Statistical National Institute).

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