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Is income a good welfare indicator for Spanish households? A comparison between both distributions

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Abstract

This paper compares the income and welfare distributions of Spanish households, with the objective of determining whether the first is a good indicator of the second. We consider different inequality measures of both adjusted income and welfare. The results show that the income ranking does not represent the welfare ranking of households and, secondly, that monetary inequality is higher than welfare inequality, which gives support to the idea that leisure time has a compensating effect on household welfare.

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1. Introduction

From the point of view of economic policy, the distributional aspects of aggregate magnitudes, in particular, the reduction of inequality in the welfare levels of households, is

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a fundamental objective for every country. To satisfy this objective, observed income has been traditionally used as an indicator of welfare, given that this is not directly observable. However, the recent economic literature has used the estimated parameters of a particular functional form of preferences that take into account both household labour supply, as well as a number of demographic characteristics, such as the size and composition of the family, in order to obtain some monetary measures of welfare, with equivalent income being one of the most popular (e.g., Apps, 1994; Apps & Savage, 1989; Blundell, Meghir, Symons, & Walker, 1986, 1988; Jorgenson & Slesnick, 1984; Kaiser, Van Essen, & Spahn, 1992; King, 1983).

The objective of this paper is to compare the income and welfare distributions of Spanish households, in order to determine whether the first is a good indicator of the second. To that end, we consider different inequality measures of both adjusted income and welfare, with the former being obtained using the Oxford Equivalence Scale and the latter being measured using equivalent income as an indicator which includes monetary income and, moreover, leisure time. The equivalent income of households is derived from the estimated parameters of a labour supply model, in particular, from the coefficients of a generalization of the Linear Expenditure System (Blundell & Ray, 1982; Stone, 1954), which permits nonseparable preferences (NLES). The Spanish labour situation, characterized by persistent unemployment, indicates that we should introduce into this model the hypothesis that one of the spouses does not take part in the labour market (Deaton & Muellbauer, 1981; Neary & Roberts, 1980). This allows us to specify the three possible labour regimes, namely, where both spouses work, where the husband alone works, or where the wife alone works.

The paper is organized as follows. In Section 2, we explain the labour supply model and the use of equivalent income as a measure of welfare. The data and estimation procedure are described in Section 3. Section 4 is dedicated to presenting the empirical results and, finally, Section 5 closes the paper with a summary of the most important conclusions.

2. Theoretical framework

The labour supply model is formulated assuming that the objective of the household is to maximize one joint utility function, whose endogenous variables are the leisure of both spouses and total monetary income, $u=u(l_m, l_f, X)$, where l_m is the male leisure time, l_f the female leisure time, and X the total monetary income. The corresponding 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, ω_m and ω_f the male and female wage, respectively, T the time endowment and y the nonwage income.

In this context of joint labour supply, the particular functional form we use is a generalization of the Linear Expenditure System (Blundell & Ray, 1982; Stone, 1954), which permits nonseparable preferences (NLES). Considering the total monetary income as a single composite commodity, q, which involves strong aggregation assumptions with

respect to the price of the goods (Slesnick, 1998), the NLES with linear Engel curves is obtained from the cost function:

$$C(\omega_m, \omega_f, u) = \gamma^*_{ff}\omega_f + \gamma^*_{fm}\omega_f^{1/2}\omega_m^{1/2} + \gamma^*_{fq}\omega_f^{1/2} + \gamma^*_{mf}\omega_m^{1/2}\omega_f^{1/2} + \gamma^*_{mm}\omega_m + \gamma^*_{mq}\omega_m^{1/2} + \gamma^*_{qq} + \gamma^*_{qf}\omega_f^{1/2} + \gamma^*_{qm}\omega_m^{1/2} + \omega_f^{\beta f}\omega_m^{\beta m}u \quad (1)$$

where u is the utility and where β_i and γ_{ij}* are the parameters. From the cost function (1), we derive the corresponding indirect utility function. Thereafter, by applying Roy's lemma, we derive the Marshallian demand functions of leisure, from which we directly obtain the labour supply functions relative to the husband and the wife:

$$h_i(\omega_m, \omega_f, y) = \bar{\gamma}_{ii} - \gamma_{ij}\left(\frac{\omega_j}{\omega_i}\right)^{1/2} - \gamma_{iq}\left(\frac{1}{\omega_i}\right)^{1/2} - \frac{\beta_i}{\omega_i}(y + \bar{\gamma}_{ff}\omega_f - 2\gamma_{fm}\omega_m^{1/2}\omega_f^{1/2} - 2\gamma_{fq}\omega_f^{1/2} + \bar{\gamma}_{mm}\omega_m - 2\gamma_{mq}\omega_m^{1/2} - \gamma_{qq}) \qquad i,j = m, f, \quad i \neq j \quad (2)$$

where $\bar{\gamma}_{ff} = T - \gamma_{ff}$, $\bar{\gamma}_{mm} = T - \gamma_{mm}$. The theoretical hypotheses are formulated in terms of the parameters of the model, that is to say, adding-up: $\sum\beta_i = 1$, i = m, f, q; and symmetry: $\gamma_{ij} = \gamma_{ji}$, i,j = m, f, q.

Labour supply system [Eq. (2)] corresponds to a situation in which there are no restrictions on the working hours that the agents wish to supply. However, if one spouse does not work and, hence, his/her labour supply is null, this implies a restriction, which affects the labour supply of the other. In this case, rationing theory allows us to include this new situation in the original model, thus obtaining the restricted specification (see Deaton & Muellbauer, 1981; Neary & Roberts, 1980). Thus, if we assume that the wife does not take part in the labour market, the restricted Marshallian labour supply of the husband will be [Eq. (3)]:

$$h_m^R(\omega_m, \bar{\omega}_f, y) = \bar{\gamma}_{mm} - \gamma_{fm}\left(\frac{\bar{\omega}_f}{\omega_m}\right)^{1/2} - \gamma_{mq}\left(\frac{1}{\omega_m}\right)^{1/2} - \frac{\beta_m}{\omega_m} \times (y + \gamma_{ff}\bar{\omega}_f - 2\gamma_{fm}\omega_m^{1/2}\bar{\omega}_f 1/2 - 2\gamma_{fq}\bar{\omega}_f 1/2 + \bar{\gamma}_{mm}\omega_m - 2\gamma_{mq}\omega_m^{1/2} - \gamma_{qq}) \quad (3)$$

where the female virtual wage $\bar{\omega}_f$ is obtained by solving ω_f from expression (2) equal to zero.

Once we have specified the labour supply functions, we can easily calculate the indirect utility function of the NLES model:

$$V(\omega_m, \omega_f, Y, z) = \frac{Y - a(\omega_m, \omega_f, z)}{b(\omega_m, \omega_f, z)} \quad (4)$$

where z is the vector of sociodemographic variables. From Eq. (4), we can derive the equivalent income (King, 1983) [Eq. (5)]:

$$Y^{E} = \frac{b(\omega_m^r, \omega_f^r, z^r)}{b(\omega_m, \omega_f, z)}[Y - a(\omega_m, \omega_f, z)] + a(\omega_m^r, \omega_f^r, z^r) \quad (5)$$

where r indicates reference values and with the wages ω_m and ω_f being current values if the other spouse works, and virtual if he/she does not.

In order to compare the monetary income with welfare, measured using equivalent income, we apply an equivalence scale to the former, which allows us to homogenize the monetary income of every family, and in this way, obtain our adjusted monetary income. In particular, we use the Oxford Scale, which assigns 1 to the first adult, 0.7 to the second, and 0.5 to each of the dependents.

Finally, the comparison between both adjusted monetary income (X^{A}) and welfare (Y^{E}) distributions is carried out using several inequality measures, rather than considering just one, with the objective of guaranteeing that the final results are robust. Thus, we divide the inequality measures into three different groups: (i) the classical objective measures: the average relative deviation (ARD), the coefficient of variation (CV), the logarithmic variance (LV), and the Gini index (G); (ii) the Theil indexes family (T); and, finally, (iii) the Atkinson indexes family (A).

3. Data and estimation method

3.1. Data

In this paper, we employ one Spanish cross-section corresponding to 1991 in order to estimate the model. The statistical information is obtained from the survey "Encuesta de Estructura, Conciencia y Biografía de Clase" (ECBC). This survey includes 6632 initial observations, from which we have selected those households composed of a couple with dependent children who are studying, thereby obtaining 1454 feasible observations. We have used weights to solve the equiprobability problem of the ECBC, which results from two overrepresentations, namely the agents with secondary and university education levels and, secondly, the agents from the Madrid housing area. The definition, mean and standard deviation of all variables are included in Appendix A.

3.2. Estimation method

In the estimation of the labour supply model, we must first consider the sample distribution of workers and nonworkers. In particular, 953 out of the 1454 wives work. With respect to husbands, 1388 work and the rest, 66, do not. In order to derive the estimated wage of the husbands and wives who do not work, we follow the Heckman (1979) method.

In the neoclassical labour supply model we can, with the rationing specified above, distinguish three different regimes. In the first, I_1, both spouses work; in the second, I_2, only the husband works; and in the third, I_3, only the wife 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 & Kapteyn, 1986):

$$
\begin{aligned}
&h_{\mathrm{m}}^{*} = h_{\mathrm{m}}(\omega_{\mathrm{m}}, \omega_{\mathrm{f}}, y) + \varepsilon_{\mathrm{m}} \\
&h_{\mathrm{f}}^{*} = h_{\mathrm{f}}(\omega_{\mathrm{m}}, \omega_{\mathrm{f}}, y) + \varepsilon_{\mathrm{f}} \\
&\left.\begin{aligned} h_{\mathrm{m}} &= h_{\mathrm{m}}^{*} \\ h_{\mathrm{f}} &= h_{\mathrm{f}}^{*} \end{aligned}\right\} \text{ if } h_{\mathrm{m}}^{*} > 0 \text{ and } h_{\mathrm{f}}^{*} > 0.\ \text{Reg. } I_1 \\
&\left.\begin{aligned} h_{\mathrm{m}}^{\mathrm{R}} &= h_{\mathrm{m}}(\omega_{\mathrm{m}}, \omega_{\mathrm{f}}, y) + \varepsilon_{\mathrm{m}}^{\mathrm{R}} \\ h_{\mathrm{f}} &= 0 \end{aligned}\right\} \text{ if } h_{\mathrm{f}}^{*} \le 0.\ \text{Reg. } I_2 \\
&\left.\begin{aligned} h_{\mathrm{m}} &= 0 \\ h_{\mathrm{f}}^{\mathrm{R}} &= h_{\mathrm{f}}(\omega_{\mathrm{m}}, \omega_{\mathrm{f}}, y) + \varepsilon_{\mathrm{f}}^{\mathrm{R}} \end{aligned}\right\} \text{ if } h_{\mathrm{m}}^{*} \le 0.\ \text{Reg. } I_3
\end{aligned}
\tag{6}
$$

We have introduced the error terms assuming that there are no differences between the preferences of households with the same characteristics. Moreover, these error terms, ε_{m}, ε_{f}, ${\varepsilon_{\mathrm{m}}}^{\mathrm{R}}$, and ${\varepsilon_{\mathrm{f}}}^{\mathrm{R}}$, follow a multivariate normal distribution, with a covariance matrix [Eq. (7)]:

$$
\sum = \begin{pmatrix}
\sigma_{\mathrm{m}}^2 & \cdot & \cdot & \cdot \\
\sigma_{\mathrm{fm}} & \sigma_{\mathrm{f}}^2 & \cdot & \cdot \\
* & \sigma_{\mathrm{mfR}} & \sigma_{\mathrm{mR}}^2 & \cdot \\
\sigma_{\mathrm{fmR}} & * & * & \sigma_{\mathrm{fR}}^2
\end{pmatrix}
\tag{7}
$$

where * indicates that such terms do not appear in the likelihood function. Furthermore, due to the low number of nonworking husbands, we impose ${\sigma_{\mathrm{mR}}}^2 = {\sigma_{\mathrm{fR}}}^2 = {\sigma_{\mathrm{R}}}^2$ and $\sigma_{\mathrm{fmR}} = \sigma_{\mathrm{mfR}}$ in the estimation.

Model (6) is estimated in its budget share form, with the likelihood function being [Eq. (8)]:

$$
L = \prod_{i \in I_1} f_1(s_{\mathrm{f}}^{*i}, s_{\mathrm{m}}^{*i}) \prod_{i \in I_2} \int_{-\infty}^{0} f_2(s_{\mathrm{f}}^{i}, s_{\mathrm{m}}^{\mathrm{R}i}) \mathrm{d}s_{\mathrm{f}}^{i} \prod_{i \in I_3} \int_{-\infty}^{0} f_3(s_{\mathrm{m}}^{i}, s_{\mathrm{f}}^{\mathrm{R}i}) \mathrm{d}s_{m}^{i}
\tag{8}
$$

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 into the parameters of the model. In particular, the parameters β_f and β_m are defined in terms of household size, that is to say, $\beta_f(z) = \beta_{ff} - \beta_{fm}\ln(\text{HSIZE})$ and $\beta_m(z) = \beta_{mm} + \beta_{fm}\ln(\text{HSIZE})$, with the adding-up condition $\beta_f + \beta_m + \beta_q = 1$, whereas the parameters γ_{ff} and γ_{mm} allow for the translation effect (see Pollak & Wales, 1978) and depend on different variables which indicate household composition and housing area [Eq. (9)]:

$$\begin{aligned}\bar{\gamma}_{ij}(z) = {} & \gamma_i + \gamma_{jh}\ln(\text{HSIZE}) + \gamma_{j1}N1 + \gamma_{j2}N2 + \gamma_{j3}N3 + \gamma_{j4}N4 \\ & + \gamma_{j5}N5 + \gamma_{jn}\text{NORTH} + \gamma_{je}\text{EAST} + \gamma_{jma}\text{MADRID} + \gamma_{ji}\text{ISLANDS} \\ & + \gamma_{js}\text{SOUTH} \\ j = {} & \text{m, f}\end{aligned} \tag{9}$$

Table 1
Estimated parameters

		Male (j = m)		Female (j = f)
Elements of $\bar{\gamma}_{jj}$				
Intercept	γ_j	4.146* (27.78)		57.321* (94.88)
HSIZE	γ_{jh}	− 0.421* (− 4.16)		− 5.145* (− 12.52)
*N*1	γ_{j1}	0.312* (4.25)		− 3.523* (− 12.25)
*N*2	γ_{j2}	0.182* (3.26)		− 4.292* (− 40.72)
*N*3	γ_{j3}	0.326* (2.21)		− 4.325* (− 20.45)
*N*4	γ_{j4}	0.458* (3.81)		− 3.693* (− 26.45)
*N*5	γ_{j5}	0.220 (1.31)		− 3.782* (− 14.27)
NORTH	γ_{jn}	1.090* (13.10)		1.742* (23.32)
EAST	γ_{je}	1.230* (15.44)		2.188* (9.10)
MADRID	γ_{jma}	1.329* (14.52)		2.665* (9.84)
ISLANDS	γ_{ji}	− 0.994* (− 7.38)		− 1.821* (− 10.31)
SOUTH	γ_{js}	− 0.451* (− 5.21)		− 2.252* (− 19.10)
Utility function constants	γ_{jq}	0.782* (10.10)		15.314* (164.60)
	γ_{fm}		− 14.592* (− 79.21)	
	γ_{qq}		2.145 (−)	
Elements of β_{jj}				
Intercept	β_{jj}	0.021* (5.02)		0.810* (233.41)
HSIZE	β_{fm}		− 0.032* (− 11.36)	
Variances/covariances	σ_j	0.025* (182.85)		0.032* (144.39)
	σ_{fm}		$0.24\ 10^{-3}$* (34.04)	
	σ_R		0.031* (82.52)	
	σ_{fmR}		$0.16\ 10^{-3}$* (9.42)	

t-statistics in parentheses. * Significant at the 5% level.

4. Empirical results

The estimated parameters of the model appear in Table 1. As we can note, all the coefficients are significant at the 5% level, save for γ_{m5}. With respect to the significant parameters corresponding to γ_{mm}, we can observe that household size has a negative effect on male labour supply, while the dependents dummies have a positive one. Moreover, the North, the East, and Madrid coefficients are significant and positive, while those of the Islands and the South are significant and negative. With respect to the parameters corresponding to γ_{ff}, we can see that household size, together with dependents of every age, have a negative effect on female labour supply. As regards the geographical variables, female labour supply in the North, the East, and in Madrid is higher than in the Centre, the reference area, while that corresponding to the Islands and the South is lower. Finally, the parameters γ_{mq}, γ_{fq}, γ_{fm}, β_{mm}, β_{ff}, β_{fm}, as well as the variances and the covariances, are also significant at the conventional 5% level.

The estimation results are used to obtain the equivalent income, which allows us to measure the inequality in welfare levels. These results are then compared with those calculated using monetary income as an indicator of inequality in income levels. We use the mean of the variables as reference values.

Table 2 reflects the equivalent income ranking by deciles. The adjusted monetary income corresponding to the equivalent income ranking appears in the third column. In the following columns, we show the percentage of husbands and wives who work in each decile 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 incomes of both spouses are the same, we do not consider either of them as the family head and, hence, the sum of columns six and seven is not necessarily the total 100%. Finally, we calculate the average household size in every decile.

The results indicate that equivalent income is clearly higher than adjusted monetary income, due to the first of these incorporating the leisure valuation, in addition to the income. Adjusted monetary income follows an increasing order, except from decile no. 4 to no. 5, and

Table 2
Equivalent income ranking

Decile	Mean equivalent income	Mean adjusted monetary income	Male employed (%)	Female employed (%)	Male head (%)	Female head (%)	Mean household size
1	51.5081	13.7736	54.80	54.80	40.08	31.63	3.19
2	78.2531	22.2760	100.00	60.66	62.69	18.63	3.29
3	85.5452	25.7977	100.00	63.82	65.08	23.91	3.45
4	89.0598	28.6094	100.00	85.09	57.11	27.11	3.45
5	94.6145	25.6867	100.00	80.23	60.64	19.51	3.56
6	99.1952	17.9496	100.00	72.37	50.83	8.77	3.83
7	102.2559	18.1473	100.00	63.53	51.21	11.64	3.79
8	104.8041	20.6725	100.00	56.98	70.89	12.39	3.82
9	107.3477	20.8309	100.00	57.02	78.33	20.45	3.85
10	111.2704	28.1273	100.00	61.10	75.44	20.65	3.86
Mean	92.3854	22.1371	95.48	65.56	61.23	19.43	3.61

from this to no. 6. As regards husbands, all nonworking agents appear in the first decile, that is to say, in the lowest level of welfare, which indicates that the husband's work is fundamental to household welfare. The highest percentages of working wives appear in deciles no. 4 to no. 6, that is to say, in the intermediate levels of welfare. With respect to family heads, the highest values for the husbands appear in the high deciles, whereas the highest percentage of wives appear in the first decile, thereafter falling to a minimum value in decile no. 6, from where it increases up to the last decile, no. 10. These results indicate that the wife is the family head when the husband does not work and, if both spouses work, that the husband will usually be the family head or that the earnings of both spouses are in the same segment, such that we cannot consider either of them to be the family head. Finally, average household size follows an increasing order up to the last decile. This means that welfare increases with the number of dependents, until such a number reaches 1.86.

Table 3 shows the adjusted monetary income ranking. The equivalent income ranking increases up to decile no. 7, at which the maximum welfare level is reached. Moreover, we can observe that the percentage of working husbands increases in the first five deciles and that the percentage of working wives increases in all deciles. This can be regarded as normal, in that the monetary income of a family where both spouses work will generally be higher than that of a family where only one works. With respect to which of the two spouses is the family head, we can observe that the number of family heads who are husbands is the highest in the medium deciles, after which this number decreases. Finally, family size does not display any clear trend, with the lowest value appearing in the first decile.

In Table 4, we present the inequality measures, using both equivalent income and adjusted monetary income distributions. In the case of all calculated indicators, we can note that there are differences between some estimated inequality values. In particular, the small differences between both distributions in the case of some estimated inequality values, specifically, the Gini, Theil, and Atkinson indicators (save for A2), are due to the similar theoretical and statistical

Table 3
Adjusted monetary income ranking

Decile	Mean adjusted monetary income	Mean equivalent income	Male employed (%)	Female employed (%)	Male head (%)	Female head (%)	Mean household size
1	6.7369	74.0022	75.30	34.20	49.88	8.17	3.44
2	10.8294	96.7604	89.39	40.47	61.80	1.87	3.82
3	13.1046	93.6574	96.05	42.92	68.00	8.07	3.54
4	15.1057	89.9430	96.36	43.13	65.79	15.53	3.48
5	17.4300	98.8688	98.79	45.51	74.82	6.89	3.66
6	21.9410	93.8313	97.14	73.61	64.86	13.26	3.56
7	26.5642	94.4635	100.00	89.29	65.85	19.15	3.61
8	30.3740	93.0444	99.77	97.61	72.22	20.65	3.69
9	32.9339	91.2354	100.00	95.32	39.93	49.98	3.67
10	46.5363	98.0476	100.00	93.54	49.15	50.73	3.64
Mean	22.1556	92.3854	95.48	65.56	61.23	19.43	3.61

Table 4
Inequality measures

Measure	Equivalent income ($W-Y^{E}$)	Adjusted monetary income ($W-X^{A}$)
$\mathrm{ARD}(W)=(\sum_{i=1}^{n}(\lvert W_i-\bar{W}\rvert/n\bar{W}))$, where $\bar{W}$ is the mean of W	0.1310	0.4347
$\mathrm{CV}(W)=\sigma/\bar{W}$, where σ is the standard deviation of W	0.2044	0.5446
$\mathrm{LV}(W)=\mathrm{var}[\log(W_i)]$	0.1333	0.4311
$G(W)=1+(1/n)-(2/n^2\bar{W})\sum_{i=1}^{n}(iW_i)$, where $W_1\geq W_2\geq \ldots \geq W_n$	0.1044	0.1720
$T_0(W)=(1/n)\sum_{i=1}^{n}\ln(\bar{W}/W_i)$	0.0438	0.1693
$T_1(W)=(1/n)\sum_{i=1}^{n}(W_i/\bar{W})\ln(W_i/\bar{W})$	0.0280	0.1416
$A_{0.5}(W)=1-[\sum_{i=1}^{n}(1/n)(W_i/\bar{W})^{0.5}]^2$	0.0171	0.0731
$A_1(W)=1-\prod_{i=1}^{n}(W_i/\bar{W})^{1/n}$	0.0417	0.0444
$A_2(W)=1-[\sum_{i=1}^{n}(1/n)(W_i/\bar{W})^{-1}]^{-1}$	0.1441	0.4041

properties which these exhibit. Thus, these inequality measures satisfy both the same desirable property that gives more weight to the values appearing in the lowest part of the distribution, as well as the Lorenz criteria, with this latter not being satisfied by some of the classical indicators, e.g., the average relative deviation and the logarithmic variance. We can also observe that the inequality measure using adjusted monetary income is higher than that obtained using equivalent income. In other words, welfare inequality is lower than monetary inequality and, therefore, adjusted monetary income is not a good indicator of household welfare.

5. Conclusions

In this paper, we have compared the income and welfare distributions of Spanish households, with the objective of determining whether the first is a good indicator of the second. To that end, we have obtained different inequality measures of both income and welfare, using equivalent income as a monetary indicator of welfare.

On the basis of our results, we can draw a number of conclusions. First, we can note that the ranking of both measures, that is to say, equivalent income and adjusted monetary income, obtained using the Oxford Equivalence Scale, is not exactly the same. In other words, the income ranking does not indicate the welfare ranking of households. With respect to the welfare ranking, we can see that in the lowest level, it is the working wife who is the family head; in the intermediate levels, their labour participation is higher; while in the highest levels, the number of wives who work decreases and, therefore, it is the husband who becomes the family head. Every family where the husband does not work appears in the lowest levels of welfare, and, moreover, we find that, in general, household size increases with welfare, except at the highest levels. As regards the monetary ranking, we can note that the percentage of working husbands and wives increases in all deciles, and we can also observe that the number of male family heads decreases in the highest deciles. Finally, with respect to the measure of inequality, we find that adjusted monetary income inequality is

higher than welfare inequality. This result provides supports for the idea that leisure time has a compensating effect on household welfare.

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Table 5
Definition, mean, and standard deviation of variables

	Definition	Mean	Standard deviation
AGEM	Male age	39.24	8.79
AGEF	Female age	36.73	8.88
EDM1	Male primary education level	0.58	0.49
EDM2	Male secondary education level	0.20	0.40
EDM3	Male university education level	0.22	0.41
EDF1	Female primary education level	0.66	0.47
EDF2	Female secondary education level	0.17	0.38
EDF3	Female university education level	0.17	0.37
$\omega_{\mathrm{m}}^{\mathrm{a}}$	Male net wage per hour (in pesetas)	782.50	510.71
$\omega_{\mathrm{f}}^{\mathrm{a}}$	Female net wage per hour (in pesetas)	708.77	855.12
$h_{\mathrm{m}}^{\mathrm{a}}$	Male weekly working hours	40.70	7.78
$h_{\mathrm{f}}^{\mathrm{a}}$	Female weekly working hours	39.45	10.47
y	Net nonwage income of the household per year (in pesetas)	56,247.36	240,315.37
HSIZE	Household size	3.61	1.01
$N1$	Dependents (aged 0–4 years)	0.15	0.36
$N2$	Dependents (aged 5–9 years)	0.36	0.48
$N3$	Dependents (aged 10–14 years)	0.17	0.38
$N4$	Dependents (aged 15–18 years)	0.16	0.37
$N5$	Dependents (aged 19–23 years)	0.25	0.43
NORTH	Housing area: Asturias, Cantabria, Navarra, Galicia, País Vasco, and La Rioja	0.21	0.40
EAST	Housing area: Aragón, Cataluña, and Valencia	0.32	0.47
CENTRE	Housing area: Castilla–La Mancha, Castilla León, and Extremadura	0.12	0.33
MADRID	Housing area: Madrid	0.10	0.30
ISLANDS	Housing area: Baleares and Canarias	0.06	0.23
SOUTH	Housing area: Andalucía and Murcia	0.20	0.40

[a] Only for those working.

Appendix A. Definition, mean, and standard deviation of the variables

Table 5 presents the definition, the average, and the standard deviation of all the variables. The calculation of these is straightforward, save for the net wage and the net nonwage income, where problems arise due to the different tax treatment given to each individual. We distinguish three education dummies (primary, secondary, and higher), five variables relative to the age of dependents (0–4, 5–9, 10–14, 15–18, 19–23) and six housing area variables (North, East, Centre, Madrid, Islands, and South).

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