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Preliminary version

Working Hours and Earnings: Are the Mates' Answers Coherent?

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Abstract

As surveys about time allocation among couples are extremely expensive, one way of reducing costs could be to query only one member of the couple with the same set of questions about him/her and about his/her partner. In this paper we show that after carrying out a survey in this way, the responses given by one partner do not always fit the same econometric model as those obtained from the other.

Keywords: Time allocation; Labour supply; Wages; Surveys

JEL *classification*: C24, J22

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1. Introduction

As surveys about time allocation among couples are extremely expensive, one way of reducing costs could be to query only one member of the couple with the same set of questions about him/her and about his/her partner. Theoretically, this should be as good as asking both partners, as our intuition leads us to assume full information inside the couple. In this paper we show that after carrying out a survey in this way, the responses given by one partner do not always fit the same econometric model as those obtained from the other. We develop an econometric model with the estimation of functions for a market wage rate and a supply of working hours. The study is carried out for both male and female partners in a couple. Each person was asked the same set of questions about himself/herself and his/her mate. The main point was to verify whether or not both sets of responses were coherent with the same model. Introducing a dummy variable to identify if it was the individual or his mate who answered the survey was the procedure used here. We did this for both hours and wages. We conclude that concerning wages, both man and woman responded with the "truth" about the mate. Concerning the female's working hours, the response given by the man is not significantly different from the response given by the woman. As to the male's working hours, the woman states that the mate works less than what is asserted by the man. The question raised for future research is: Is this an isolated case, or can we use it in the future? We pursue our research studying the allocation of time at home. The issues presented in the present study were first explored in Pereira et al. (1995).

The earnings data are grouped by categories and only the limits of these categories are available. We therefore used an algorithm in order to fill in the gaps. The grouped data regression which we applied is of the type proposed by Stewart (1983). We also estimated women's earnings with a selection bias corrected regression. The hourly wage rate is the dependent variable in this regression and among the independent variables we have the so-called inverse Mill's ratio. We estimate, using a Tobit function, the hours supplied by women to the labour market. For the man, we used

least squares. The estimated wage rates for both mates are instrumental variables in the working hours equations. The theoretical and econometric issues involved are well documented in Berndt (1991) and Killingsworth (1983), and the references therein.

2. The data

The data used in this study are comprised of a sample of 431 married Portuguese individuals, aged between 25 and 54 years, with at least one child under 18 years old living at home. The source is a 1994 survey from the Portuguese Ministry of Employment and Social Security (see Pereira et al. 1995). In the survey, the respondent was asked to give information about the mate. We can fully characterize both members of the couple, although only one responded to the survey. We have 206 female responses and 225 male responses. The respondent was asked to place monthly earnings by categories. So, we have both mates' earnings grouped by classes. These classes are (in 1000s of escudos): $[0;50[$; $[50;75[$; $[75;100[$; $[100;150[$; $[150;200[$; $[200;+\infty[$. The other variables used are as follows in Table 1.

3. Earnings

Firstly, we estimated a wage equation for each member of the couple. The variable D is included as an independent variable. This variable indicates whether it was the individual or his/her mate who answered the survey.

In our sample we have earnings data reported by categories. We divided the monthly income limits by 4 (weeks) and then by 40 (hours). We assume that the respondent is paid by a contract of 40 hours of work (full-time). In fact, the number of hours may vary. We introduce a dummy variable, DTIME, for those who worked less than 25 hours, to account for part-time contracts. So, the class limits of the hourly wage rate are, in escudos: $[0;312.5[$; $[312.5;468.75[$; $[468.75;625[$; $[625;937.5[$; $[937.5;1200[$; $[1200;+\infty[$. These limits are in logs for the computations. We applied an algorithm of the type proposed by Stewart (1983), using data on working individuals to solve this grouped data problem.

One central problem in the labour supply estimation is that we only observe wages for those who work. This leads to a bias and we have a selection problem. The inverse Mill's ratio is introduced in the right hand of the wage equation to correct the sample-selection bias in the estimation. The variable is defined as LAMBDA. This variable is computed from a probit equation for the women's participation in the labour market. The procedure is only necessary in the case of the women. All men in the sample participated in the labour market.

The log of the hourly wage rate is the dependent variable in the equations. The estimated results are in Table 2. The estimation is made separately for men and women. As we can see from the estimation results, in neither case is the coefficient associated with the variable D found to be significant. We can thus say that the respondent is telling the "truth" about his mate's earnings. We can rely on the earnings data supplied by only one of the members of the couple.

4. Working hours

In this section we introduce the variable D into a labour supply equation. As before, we have one equation for each member of the couple.

The number of hours supplied is a dependent variable that is censored. It can never be less than zero. This information can be used in a "censored" regression as in the Tobit analysis. As there are women that do not participate in the labour market, the Tobit equation is necessary. All male individuals participate in the labour market, allowing the use of the least squares estimation.

The weekly supply of working hours' equation has the wages (log wage) of the individual and his mate in the set of explanatory variables. We attribute an estimated wage rate to all individuals in the sample, male and female, using the estimation procedure employed in the previous section. The only difference is that we exclude the variable D in this wage estimation. The variable W is the estimated wage rate of the individual and the variable Y is the estimated wage rate of the respective mate, in logarithms.

Table 3 shows the figures for the hours estimation. As we can see, the male answers correctly to the question about his mate's working hours. In the hours estimation for women the coefficient associated with D is not significant. It makes no statistical difference who answers the survey concerning the female's working hours.

The same is not true for the male's hours in the labour market. The coefficient associated with D is significant at the 10% level. In this case, there is a significant difference between the response that a woman gives about her mate in the case of hours supplied to the labour market and the one a man gives about himself. In the case of the man, when he responds to the survey, the mean of the male's working hours is 47.293 hours per week. When his wife answers the survey, the mean is 45.593. The mean of female working hours is approximately 42 hours per week, regardless of who answers the survey.

5. Conclusion

This study demonstrates that information given by a mate must be used with caution. In the case of hours supplied, it seems that males and females have different ideas about the meaning of work, as pointed out by the coefficient of the dummy variable. Even in the case of the women, where the coefficient is not significantly different from zero at any reasonable level, its sign is coherent with that obtained in the male's regression.

More study is needed to explain this result and to assess the existence or not of a gender bias, especially when comparing results for men and women. A survey where both members of the couple are interviewed should help to settle this question.

Note:

In Table 4 we present more results for the men's working hours. We replaced the dummy variable D by two other dummies, D0 and D1. The variable D0 is 0 if it was the man who answered the survey; 1 if it was the woman and if she did not participate

in the labour market. The variable D1 is 0 if it was the man who answered the survey; 1 if it was the woman and if she participated in the labour market. The results indicate that the bias in the answers can come from the women that do not participate in the labour market and not from gender differences.

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Table 1. Variables definition

AGE	age in years divided by 10.
AGESQR	age squared divided by 100.
EXP	years of experience divided by 10.
EXPSQR	years of experience squared divided by 100.
EDi, i=4,6,9,12,15,17	vector of six dummy variables: 1 if the individual has i completed years of education; 0 otherwise. The range is from primary level to university level.
K<6	number of children under six years of age.
K6_12	number of children between six and twelve years of age.
K12_18	number of children between twelve and eighteen years of age.
EDFATHER	dummy variable: 0 if the individual's father has only the primary level (4 years) completed or less; 1 otherwise.
EDMOTHER	same as EDFATHER for the individual's mother.
CITY>10	dummy variable: 1 if the individual lives in a city with more than 10 000 inhabitants; 0 otherwise.
CITY>150	dummy variable: 1 if the individual lives in a city with more than 150 000 inhabitants; 0 otherwise.
DTIME	dummy variable: 1 for those who worked less than 25 hours; 0 otherwise.
D	dummy variable: 0 if it was the individual who answered the survey; 1 if it was the mate.
h	number of weekly working hours supplied by the individual.

Table 2. Wage equations: grouped data estimates

	Female		Male	
Variable	*Coefficient*	*t-ratio*	*Coefficient*	*t-ratio*
Constant	4.6614*	(6.084)	4.7436*	(11.404)
AGE	0.27702	(0.765)	0.45551**	(2.182)
AGESQR	-0.029802	(-0.595)	-0.043933***	(-1.700)
EXP	0.33797*	(3.765)	0.17032**	(2.209)
EXPSQR	-0.080418*	-(2.582)	-0.044334**	(-1.954)
ED4	0.25597***	(1.938)	0.18805	(1.333)
ED6	0.12718***	(1.756)	0.20487*	(3.920)
ED9	0.14985**	(2.072)	0.12224**	(2.072)
ED12	0.16403**	(2.261)	0.29599*	(4.593)
ED15	0.45910*	(5.035)	0.074258	(0.714)
ED17	0.12154	(1.104)	0.36442*	(3.235)
CITY>10	0.073811	(1.511)	-0.0010046	(-0.026)
CITY>150	0.059983	(0.849)	0.075077	(1.275)
DTIME	-0.32105*	(-3.166)	-0.087673	(-0.597)
D	0.012004	(0.289)	-0.036107	(-1.016)
LAMBDA	0.12505	(0.646)		
adj. R^2	0.51		0.44	

Note:* significant at 1% level; ** significant at 5% level; *** significant at 10% level.

Table 3. Hours supply equations: Tobit and least squares estimates, respectively

	Female		Male	
Variable	*Coefficient*	*t-ratio*	*Coefficient*	*t-ratio*
Constant	-490.18*	(-12.915)	22.219	(0.381)
AGE	-12.486	(-0.969)	-11.670	(-1.224)
AGESQR	-0.82541	(-0.488)	1.2684	(1.198)
ED4	-20.715*	(-4.636)	1.5191	(0.314)
ED6	-10.025*	(-3.754)	-5.0120***	(-1.705)
ED9	-9.4592*	(-3.020)	1.5193	(0.627)
ED12	-21.021*	(-6.113)	-4.6703	(-1.122)
ED15	-52.178*	(-9.861)	-3.8669	(-1.175)
ED17	-16.077*	(-2.988)	-0.10874	(-0.020)
K<6	-11.577*	(-6.338)	1.8361***	(1.683)
K6_12	-10.776*	(-6.389)	0.85043	(0.878)
K12_18	-6.8250*	(-3.759)	2.6944*	(2.432)
EDFATHER	-0.075481	(-0.021)	2.0431	(0.865)
EDMOTHER	4.5025	(1.031)	-2.9691	(-1.021)
W	109.96*	(18.995)	11.361	(0.927)
Y	-4.9683	(-1.293)	-3.7329**	(-2.077)
D	0.84697	(0.477)	-1.8275***	(-1.667)

Note:* significant at 1% level; ** significant at 5% level; *** significant at 10% level.

Table 4. Hours supply equation: Least squares estimates

	Male	
Variable	*Coefficient*	*t-ratio*
Constant	25.799	(0.442)
AGE	-10.753	(-1.123)
AGESQR	1.1723	(1.103)
ED4	1.4466	(0.299)
ED6	-4.9622***	(-1.688)
ED9	1.4341	(0.591)
ED12	-4.4519	(-1.068)
ED15	-3.9118	(-1.189)
ED17	0.37653	(0.067)
K<6	1.9605***	(1.787)
K6_12	0.86841	(0.897)
K12_18	2.7043*	(2.441)
EDFATHER	2.1704	(0.918)
EDMOTHER	-3.0245	(-1.040)
W	11.204	(0.914)
Y	-4.5221**	(-2.317)
D0	-3.3402***	(-1.830)
D1	-1.2747	(-1.046)

Note:* significant at 1% level;** significant at 5% level; *** significant at 10% level.