



Dipartimento di Economia Politica



## Materiali di discussione

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### Allocation of Time within Italian Couples: Exploring the Role of Institutional Factors and their Effects on Household's Wellbeing

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## **Abstract:**

Italy is characterized by a very uneven distribution of paid and unpaid work in gender terms. Italy has the lowest female employment rate apart from Malta in the European region, with a tangibly wide gender gap in employment and participation rates to the disadvantage of women. Furthermore, the female labour supply is very unevenly distributed across the Italian regions, and both institutional and labour market factors may be considered as lying at the basis of the high regional heterogeneity.

This paper aims at understanding more in depth the uneven allocation of time by gender in Italian households. For this purpose we propose a model on the partners' allocation of time, that takes into account the simultaneity of partners' allocation of time decisions, as well as the issue of censored observations in some partners' uses of time. In order to estimate this model, we use IT SILC 2007 data that provides us with information on income and hours of work as well as on other relevant socio-demographic variables, maintaining the significance at regional level. This also allows us to analyze the contribution of institutional factors (like the heterogeneous distribution of childcare services in Italy and labour market differences) and interaction with various dimensions of wellbeing. Our findings suggest that an increase in women's wages affects women's working time, both by directly increasing women's paid hours of work, and decreasing the time devoted to household activities and indirectly via a more equal distribution of unpaid work within the couple. The presence of children in the household tends to reduce women's paid work, while having a positive effect on the time spent by the husband in paid work and on both partners' supply of unpaid work. We also note that the availability of childcare services represents the most relevant factor affecting women's participatory decisions as well as their hours of paid work.

JEL Classification: J16, J22

## Introduction<sup>1</sup>

The allocation of domestic and care work time in Italy is very unevenly distributed in gender terms, with women bearing the most of unpaid work even in double-income families. Moreover, Italy is characterized by the lowest female employment rate apart from Malta in the European region and by a tangibly wide gender gap in employment and participation rates to the disadvantage of women. The female labour supply is very unevenly distributed across the Italian regions, and both institutional and labour market factors may be considered as lying at the basis of the high regional heterogeneity. The uneven allocation of time by gender in Italian households needs to be understood more in depth in order to address public policies efficiently. Therefore, in this paper we address the issue of the distribution of time by gender within Italian households, trying to account for the simultaneity of partners' decisions as well as the issue of censored observations. For these purposes we propose a simultaneous equation model on the partners' allocation of time. In order to estimate this model, we use IT SILC 2007 data that provides us with information on income and hours of work as well as on other relevant socio-demographic variables, maintaining the significance at regional level. This also allows us to analyze the contribution of institutional factors (like the heterogeneous distribution of childcare services in Italy and labour market differences) and interaction with various dimensions of wellbeing. Our findings suggest the presence of a substitutive relationship both between women's paid and unpaid hours of work and between the provision of couple members' unpaid work. Indeed, an increase in women's wages seems to affect women's working time, both by directly increasing women's paid hours of work, and decreasing the time devoted to household activities and indirectly via a more equal distribution of unpaid work within the couple. However, the extent of the latter effect is limited, in keeping with the view that the spouses' working time on household activities may be entirely substituted only in special cases (Pollak, 2007). The presence of children in the household tends to reduce women's paid work, while having a positive effect on the time spent by the husband in paid work and on both partners' supply of unpaid work. In addition, we note that the availability of childcare services represents the most relevant factor affecting women's participatory decisions as well as their hours of paid work: women living in regions where kindergartens are more widespread are more likely to belong to the labour force, and, if employed, to provide a higher number of paid working hours.

In Section 2 we analyze the relevant literature as regards time allocation, focusing in particular on papers that are closer to the structure of our model. The model that we will estimate is illustrated in Section 3, while in Section 4 we present the results of its estimation together with descriptive statistics on the allocation of time in Italian households. Concluding remarks with policies suggestions follow.

## 2. Allocation of time by gender: the literature

The dramatic increase in female employment, witnessed over recent decades in industrialized countries, and the subsequent rise of a serious work-life balance issue, has led to an increasing interest in the interactions of time allocation decisions taken by household members.

Pioneering work on intra-household time allocation extends the standard neoclassical labour supply

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theory to the household and reveals the existence of a possible interdependency of labour supply decisions between different members of the household (Mincer, 1962 and Becker, 1965), while denying the classical labour-leisure trade-off, as unpaid work is affected differently by changes in socio-economic variables from how leisure is (Gronau, 1977).

More recently, the empirical literature has focused on the simultaneous decisions of time allocation of the partners within the household. This allows us to investigate to what extent husbands' and wives' uses of time are interchangeable and are influenced by individual and family characteristics, such as the presence of children in the household.

This literature has been led by the work by Kooreman & Kapteyn (1987). The Authors estimated a structural model of time allocation of couples on a random sample of US households, considering seven categories of time use, including time spent on different leisure activities. Their results reveal that women's time use is more elastic than men's in terms of both their own and their partner's wage rates, and that the presence of young children negatively affects the time spent by the wife on leisure activities. Assuming a similar model of household behaviour, Jenkins & O'Leary (1995) use the UK 1987 time budget data and find that domestic work in general tends to increase with age, and if the individual is part of a couple with children.

Connelly & Kimmel (2009) study the effect of spouse's characteristics on leisure time, childcare time and home production time using a sample of US individuals living in couples. For this purpose they estimate three time-use equations simultaneously, i.e. allowing for a non-zero correlation across the error terms of the different equations, while accounting for the possibility of censored observations in some time uses. Since the data set does not provide information on the partner's time use, the Authors use an out-of-sample prediction and propensity score in order to obtain the relevant information on the spouse time use information. The logarithm of the predicted wife's wages divided by husband's wages results in a negative effect on the husband's home production only at a 90% level of confidence, and no significant effects on leisure time allocation or caregiving time. There is a small positive effect of the mother's employment time on the father's weekday caregiving time, but no effect on the father's weekend time. On the whole, their results are consistent with a reduction in one partner's time allocation on that of the other.

Kalenkoski, Ribar & Stratton (2009) use the UK 2000 Time Use Survey to show a greater response among women compared to men in terms of their allocation of time in relation to changes in wages. In particular, they find that women's working time increases with their own wage and decreases with husband's wage, while their childcare time tends to increase with their partner's increasing wage.

Bloemen & Stanca (2008) use the 1998-99 French Time Use Survey to estimate a simultaneous equation model for the wages, employment decisions and time allocation of both partners, allowing also for the possibility of censored observations in some time uses. The model is estimated by simulated maximum likelihood, using the Geweke, Hajivassiliou & Keane algorithm. The empirical results show that an increase in one's own wages increases paid hours of work, while decreasing time devoted to housework and childcare activities. Fathers' housework and childcare activities are positively affected by an increase in their wives' wages, while women's paid work is depressed by their husbands' increasing wages and by the presence of children in the household, especially if aged under 10.

There is currently an increased effort in implementing analyses of time allocation by allowing for the simultaneity of choice between partners also with reference to Italian households. In this Section we will refer to the literature closest to our research aims.

Bloemen, Pasqua & Stanca (2010) use data from the 2002-03 Italian Time Use Survey on the paid work, childcare and domestic activities of Italian couples. According to their analysis, women's higher level of education increases their paid working time and childcare while reducing housework time for women throughout the week. Their findings suggest a more balanced allocation of

time amongst more educated parents. The presence of young children is negatively associated with women's paid work and positively associated with their parents' caregiving time. Living in the North of Italy significantly increases fathers' unpaid work and decreases mothers' domestic work.

Mancini & Pasqua (2009) use the Italian Time Use Surveys for both 1988-89 and 2002-03 and estimate simultaneously the time spent by each partner in paid work, domestic work and childcare. Their model makes it possible to distinguish between basic childcare (related to children's essential needs like feeding, dressing, bathing...) and quality childcare (with reference to activities that affect children's educational, cultural and emotional development, like doing homework with the child, playing together, reading, etc.). Taking into account the causal links between the different time uses of the partners, Mancini & Pasqua find that a woman's working time reduces her time spent on domestic and childcare activities, while the time spent by each partner on basic care reduces the time spent on quality care. The estimates also confirm that the presence of children significantly discourages women's paid work, while increasing the husband's. Better educated women spend more time on the market and in childcare activities and less in domestic work, while also encouraging the time spent by male partners in childcare activities. Living in the South decreases both partners' paid work provision, as well as women's time spent with children. The effect of the presence of children on their fathers' caring time is higher in 2002 than in 1988.

Finally, Addabbo, Caiumi & Maccagnan (2010), using a propensity score matching procedure, combine the information provided by the ISTAT Multipurpose Survey for 2006 and by the Bank of Italy Household Survey for 2006 to build up an integrated archive containing both data on paid and unpaid working time and on individual and family income. These data are analyzed using the iterative version of Zellner's seemingly unrelated regression estimator and focusing on double-earner families. In line with the findings of Mancini & Pasqua (2009), the results confirm that the presence of children in the household decreases women's paid working hours, while increasing their unpaid work and men's paid working hours. Furthermore, the partner's hourly earnings significantly reduce individual paid hours of work. Finally, men married to women with a university degree tend to reduce their working time, while increasing their unpaid work provision.

The model that we introduce in the following Section may be placed in this most recent strand of literature aimed at modelling simultaneous decisions on the allocation of time by partners and at accounting for the relevant institutional, family and individual variables.

### **3. The empirical time allocation model**

In line with previous analyses (Bloemen, Pasqua & Stanca 2010; Addabbo, Caiumi & Maccagnan 2010; Mancini & Pasqua, 2009), we simultaneously estimate time allocation decisions within the household. We distinguish three broad categories of time uses – market work, non-market work (including domestic and care work) and leisure – based on a reduced-form model for each partner in a couple. In particular, we assume that the distribution between different activities varies according to one's earnings, one's spouse's earnings, as well as in relation to individual and household characteristics and institutional factors.

Unlike Addabbo, Caiumi & Maccagnan (2010), the model specification in this study is not restricted to individuals engaged in all time-use activities; rather, it allows for non-participation decisions either in the labour market or in households activities. This choice allows us to extend our focus to one-earner families, who represent a relevant group in Italy, given the structurally low rate of female participation in the labour market, and are likely to become even more widespread in

consideration of the current economic crisis. A more comprehensive analysis is also needed to better address the issue of this paper with regard to the impact of specific institutional factors on time allocation decisions in households with children. The empirical time allocation model is thus the following:

$$\begin{aligned}
 t_{ijk}^* &= X_{ik} \beta_{jk} + \varepsilon_{ijk} & j = 1,2,3; \quad k = m, f; \quad \text{and } i = 1, \dots, N \\
 t_{ijk} &= t_{ijk}^* \quad \text{if } t_{ijk}^* > 0 \\
 t_{ijk} &= 0 \quad \text{otherwise}
 \end{aligned} \tag{1}$$

where  $t_{ijk}$  is an observed continuous variable when the  $k^{\text{th}}$  member of the  $i^{\text{th}}$  household allocates positive hours to the  $j^{\text{th}}$  time use activity ( $t_{ijk}^* > 0$ ), and takes zero value for some observations in the sample of those who choose not to spend time on such activity ( $t_{ijk} = 0$ , corner solution). The resulting empirical model is a standard censored Tobit that allows for corner solution outcomes. Note that if everyone in the sample allocates positive hours of time to a given activity, then the Tobit estimator is reduced to a traditional OLS regression. Hence, our empirical model (1) represents a gender-specific system of generalized linear equations for different time uses, combining Tobit and OLS-based estimates.  $X_{ik}$  denotes the matrix of exogenous variables and  $\beta_{jk}$  the vector of coefficients to be estimated. Time budget constraints allow us to drop one equation for each sub-system of equations. In this study, the leisure equations are those omitted for both genders. The random disturbance terms  $\varepsilon_{ijk}$  added to each equation are meant to capture measurement errors as well as unobserved heterogeneity in preferences for different activities, and are assumed to be jointly and normally distributed across equations within each gender-specific sub-system of equations and across both gender sub-systems of equations. To account for potential correlation across the residual components of each equation in (1), the parameters of the entire equation system (1) are estimated by using a seemingly unrelated maximum likelihood regression estimator<sup>2</sup>, which guarantees that the results are invariant to the deleted equations. Wages for the unemployed and those not in search of work were imputed by using estimated two-step Heckman selection equations where explanatory variables include age, education and region.

Our empirical model specification (1) incorporates earnings, spouse's earnings, and several observable individual and household characteristics, such as age, the number of children living in the household by age group and the presence of household members requiring long-term care. In particular, the model framework (1) allows us to infer how couple members' time allocation to paid work, household activities and leisure respond to one's own and one's spouse's wage. As predicted by the theory, the effect of a wage increase on time use can be broken down into a substitution and an income component. Within model (1), where the set of alternative time uses is expanded to include non-market work, a wage increase will increase the opportunity cost of all commodities, but will also increase the relative cost of the most intensive ones. This is likely to result in a shift away from more time-intensive toward less-intensive non-market activities, and towards market labour supply. For example, an increase in earnings may result in purchases of timesaving devices for household chores or in domestic workers. We must also consider childrearing, which is clearly a time-intensive process, as parents' childcare activities may depend at least in part on the opportunity costs of the parents' time. Other things being equal, married women with higher earning potential are more likely to purchase childcare services from the market and participate to a greater extent in the labour force. However, if the time-intensive non-market activities are normal, the income effect deriving from the wage increase will lead to less time being devoted to market work and more being allocated to non-market activities. Yet, as model (1) allows the labour-supply response of a member of the couple to depend on his/her wage rate and the spouse's wage rate, it is an interesting empirical issue to ascertain whether an increase in the wife's income may result in a substitution relationships in terms of the couple members'

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<sup>2</sup> We apply the Stata module that implements a conditional (recursive) mixed-process estimator (Roodman, 2008).

non-market work provision. Hence, we might expect that an increase in a woman's earnings will result not only in a reduction in her unpaid activities but (possibly) in an increase in her partner's non-market work.

Other things being equal, differences in preferences amongst individuals may also arise from the lifecycle position. It is likely that women and men in different age groups will undertake different paid and unpaid workloads. Furthermore, in line with the literature on this topic, we expect that the presence of children will negatively influence both paid hours of work as well as the participation decisions of the mother.

As an institutional factor affecting time use choices, we take into account the availability of childcare services in the households area of residence, which may be considered a substitute for parents' childcare time, thus encouraging parents' paid work. In our model we therefore incorporate a specific interaction term between the percentage of children in kindergarten in the region and the presence of children under three in the household. We expect that women with very young children and with fewer childcare possibilities are likely to have lower participation rates and less hours of paid work among those who are employed.

Finally, we control for residence in Southern Italy. As shown below, our data confirm previous findings for Italy as regards the increase of the gender gap in unpaid work in that part of the country. As is well known, such differences in time allocation choices may arise from differences in culture and traditions, as well as in other unobservable factors conditioning the functioning of the local labour market.

#### **4. The data and estimation results**

Consistently with the literature on the allocation of time by gender and the model presented in Section 3, in order to test our hypotheses on the interaction of the choices in time allocation within Italian couples – taking the factors of working constraints into account with regards to regional heterogeneity in labour market conditions and childcare services – we need to use a dataset that allows us to account for regional variability while providing information on time allocation and household's socio-demographic characteristics. The dataset used is IT SILC 2007, providing information on 21,499 households and 54,152 individuals. The survey is included in the European Statistics on Income and Living Conditions EU SILC survey, which focuses on the socio-economic conditions of European countries, paying special attention to its multidimensionality. IT SILC has been carried out in this European framework since 2004, allowing for statistical significance at a regional level. Together with data on the household and information on individual members' income and labour market conditions, the survey provides information on individual socio-demographic characteristics and on the distribution of time. This allows us to access information on unpaid work and to evaluate its contribution to family wellbeing, as well as to estimate the model presented in Section 3, also accounting for regional variability in constraints. However, unlike Bloemen, Pasqua & Stanca (2010), due to the different source of data used, we cannot disaggregate unpaid work into care and housework activities, nor can we rely on time budget data: IT SILC 2007 records individuals' weekly hours of unpaid work. This information allows us to analyse unpaid working hours distributed by gender, but cannot allow for a distinction between care and domestic work. Moreover, by using only usual weekly working hours, we cannot detect changes in the effect of the relevant variables over weekdays or weekends as found in the literature using time use data (see for instance the evidence provided by Bloemen, Pasqua & Stanca, 2010).

The analysis on the allocation of time within Italian households confirms its unequal distribution by gender. Women's total work in double-income households exceeds men's total work by



about 10 hours a week, with or without children in the family (Table 1). The gender gap in unpaid work increases with the age of their members (Table 2). Consistently with other empirical literature on unpaid work by gender in Italy (Addabbo, Caiumi & Maccagnan, 2010; ISTAT, 2008), younger men undertake a higher level of unpaid work.

The gender gap in unpaid work increases in the South of Italy, both in single and double-income households (Table 3).

**Table 1** - Partners' allocation of time in one-earner (husband) and double-earner families with and without children, aged between 15-64 and t-test on the differences in the allocation of time by gender (\*: significant at 10%, \*\*: significant at 5%, \*\*\*: significant at 1%)

<b>Single earners</b>					<b>Single earners</b>				
	Paid	Unpaid	Total	Obs		Paid	Unpaid	Total	Obs
Husband	43.2	5.5	48.7	1896	Husband	42.3	4.2	46.5	1275
Wife	0	46.7	46.7	1896	Wife	0.0	40.3	40.3	1275
Gender Gap	-43.2	41.2	-1.9		Gender Gap	-42.3	36.2	-6.1	
sign.	***	***	-		sign.	***	***	***	
<b>Double earners</b>					<b>Double earners</b>				
	Paid	Unpaid	Total	Obs		Paid	Unpaid	Total	Obs
Husband	43.4	8.4	51.8	2540	Husband	42.7	5.6	48.3	1601
Wife	32.4	29.3	61.6	2540	Wife	36.1	22.5	58.7	1601
Gender Gap	-11.0	20.9	9.8		Gender Gap	-6.6	17.0	10.4	
sign.	***	***	***		sign.	***	***	***	

Source: IT SILC  
2007

**Table 2** – Weekly unpaid work distribution by gender and age

Age	Single earners			Double earners		
	Women	Men	Gender Gap	Women	Men	Gender Gap
18-24	46.53	8.06	38.47	26.39	17.31	9.08
25-34	41.66	5.85	35.81	24.07	8.34	15.73
35-44	45.80	6.47	39.33	27.02	8.22	18.80
45-54	45.99	4.52	41.47	27.95	6.24	21.71
55-64	35.81	3.58	32.23	26.57	5.86	20.71

Source: IT SILC  
2007

**Table 3** – Weekly unpaid work distribution by gender and region

	North			Centre			South		
	Husband	Wife	Gender Gap	Husband	Wife	Gender Gap	Husband	Wife	Gender Gap
<i>One earner</i>									
with children	6.0	45.9	-40.0	5.6	45.0	-39.4	5.2	47.7	-42.4
without children	4.1	40.2	-36.1	4.4	38.4	-34.0	4.2	41.4	-37.2
<i>Double earners</i>									
with children	9.1	28.7	-19.5	7.3	28.3	-21.0	7.5	31.6	-24.1
without children	5.7	20.5	-14.8	4.9	22.6	-17.7	5.8	29.4	-23.6

Source: IT SILC 2007

Table 4 – Weekly unpaid work distribution by gender and level of education

	Double Earners			Single Earners		
	Husband	Wife	Gender Gap	Husband	Wife	Gender Gap
<i>Primary school</i>						
With children	3.98	31.02	27.03	5.82	47.85	42.03
Without children	4.04	29.53	25.49	4.22	40.59	36.37
<i>Secondary school</i>						
With children	8.16	31.41	23.24	4.82	47.22	42.40
Without children	4.93	25.78	20.85	3.62	41.81	38.20
<i>High school</i>						
With children	8.98	29.63	20.65	6.72	46.94	40.21
Without children	6.24	21.14	14.90	4.75	39.70	34.95
<i>Degree</i>						
With children	8.32	25.96	17.64	4.73	39.95	35.22
Without children	5.74	18.53	12.79	4.58	29.84	25.27

Source: IT SILC 2007

Turning to the impact of education on the distribution of unpaid work within the couple, more educated partners tend to have a lower gender gap on average in terms of mean weekly hours of unpaid work. The gender gap in the weekly total of unpaid work in double-earner households ranges from 27 hours for the lowest level of education to 12.8 hours for couples with partners having completed tertiary education. The latter may be associated with higher wages, allowing for the marketization of family work.

One of the peculiarities of the Italian labour market is its regional heterogeneity, with a higher level of unemployment and female inactivity in the South of Italy (ISTAT, 2010a). Differences in the distribution of non-standard work also occur with regard to gender and regions, with non-standard work being more widespread amongst employed women than amongst men (ISTAT, 2010a) and with part-time work more widespread amongst women in Northern Italy (Addabbo & Favaro, 2010). Regions are also very heterogeneous as far as the distribution of childcare services for 0 to 2 year-old children is concerned (ISTAT, 2010b). The observed variability in employment opportunities and childcare services is expected to affect the allocation of time by gender.

In order to take into account the allocation of time by gender, we focused on couples with both partners present, both with and without children, considering both double and single-earner households, which leads us a sample of 6,250 households with partners aged between 20 and 64. Women are characterized by a higher likelihood of being unemployed, and of being in involuntary part-time positions, and are characterized by a lower likelihood of being employed (Table A1 Appendix).

We estimated a system of equations to investigate the factors affecting the joint distribution of paid and unpaid work within double and single-earner households. In keeping with the model presented in Section 3, the estimated model contains the following equations:

- Women's paid work
- Women's unpaid work
- Men's paid work
- Men's unpaid work

Due to the censored observations, women's paid work and men's unpaid work equations were estimated by using Tobit models, and women's unpaid and men's paid hours of work were estimated by using OLS regressions.

Table 5.a – The allocation of time in Italian households

	Women's paid work	Women's unpaid work	Men's paid work	Men's unpaid work
Age	3.25*** (5.24)	0.074 (0.21)	-0.066 (0.42)	0.083 (0.33)
Age squared	-0.045*** (6.25)	0.0044 (1.08)	0.00059 (0.33)	-0.0022 (0.78)
South	-3.02** (1.98)	2.89*** (3.23)	-1.76*** (4.24)	-1.56** (2.45)
Women's hourly earnings	0.38*** (4.69)	-0.37*** (6.48)	0.052 (1.56)	0.081** (2.23)
Men's hourly earnings	0.0077 (0.11)	-0.094** (2.25)	-0.20*** (4.51)	0.019 (0.61)
Woman with chronic illness	-1.71 (1.02)	-1.19 (1.11)	0.11 (0.24)	1.60** (2.56)
Man with chronic illness	1.73 (1.00)	2.56** (2.31)	-0.60 (1.26)	1.08* (1.70)
No. children 0-2	-9.08*** (5.36)	10.6*** (8.64)	-0.59 (1.37)	3.91*** (5.67)
No. children 3-5	-9.74*** (6.33)	7.72*** (7.53)	1.16*** (2.69)	2.53*** (3.71)
No. children 6-14	-7.62*** (8.53)	5.50*** (9.53)	0.85*** (3.45)	0.67* (1.80)
With children *	46.9*** (5.05)	-9.91 (1.64)	0.63 (0.23)	5.10 (1.37)
Kindergarten	-42.4*** (3.33)	22.1*** (3.15)	46.4*** (13.58)	1.66 (0.30)
Constant				
Observations	6,259			

Table 5.b – Tobit marginal effects<sup>3</sup>

	Women's paid work Marginal effects	Men's unpaid work Marginal effects
Age	1.09*** (5.24)	0.035 (0.33)
Age squared	-0.020*** (6.26)	-0.00094 (0.78)
South	-0.99** (2.02)	-0.65** (2.52)
Women's hourly earnings	0.13*** (4.75)	0.035** (2.24)
Men's hourly earnings	0.0023 (0.09)	0.0084 (0.61)
Women with chronic illness	-0.58 (1.05)	0.71** (2.49)
Men with chronic illness	0.58 (0.98)	0.48* (1.70)
No. children 0-2	-3.08*** (5.43)	1.68*** (5.67)
No. children 3-5	-3.30*** (6.41)	1.09*** (3.71)
No. children 6-14	-2.56*** (8.63)	0.29* (1.80)
With children * Kindergarten	15.8*** (5.12)	2.20 (1.37)
Observations	6,259	

*t* statistics in parentheses (estimated standard errors are robust).

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Source: IT-SILC 2007, own elaboration

Table 5c – Marginal effects of the probability of women working and of men being engaged in household activities

	Woman paid work Marginal effects	Man unpaid work Marginal effects
Age	0.05*** (5.68)	0.011 (1.36)
Age squared	-0.0007*** (6.63)	-0.0002* (1.79)
South	-0.05*** (2.52)	-0.06*** (2.63)
Women's hourly	0.005***	0.003**

<sup>3</sup> Reported marginal effects are calculated on the expected value of the dependent variable for censored observations at the mean of independent variables.

earnings	(4.78)	(2.17)
Men's hourly earnings	0.00002	0.0004
	(0.02)	(0.44)
Women with chronic illness	-0.03	0.053***
	(1.17)	(2.76)
Men with chronic illness	0.03	0.03
	(1.09)	(1.52)
No. children 0-2	-0.11***	0.14***
	(5.03)	(6.07)
No. children 3-5	-0.13***	0.08***
	(6.20)	(3.78)
No. children 6-14	-0.10***	0.02*
	(8.42)	(1.78)
With children *	0.59***	0.15
Kindergarten	(4.73)	(1.22)
Observations	6,259	6,259

*t* statistics in parentheses (estimated standard errors are robust).

\*  $p < 0.10$ , \*\*  $p < 0.05$ , \*\*\*  $p < 0.01$

Source: IT-SILC 2007, own elaboration

Taking into account the different childcare costs in parents' allocation of time on the basis of the varying availability of childcare services and school opening times, we included three explanatory variables on the number of children aged under three (childcare services are highly rationed in Italy for this age group) from three to five (public childcare is more widely provided in Italy for this group of children, however opening times are often not in line with parents' usual working day) and from six to 14 (school hours are not synchronized with parents' working time, especially for secondary schools – children aged between 11 and 14; moreover the availability of fulltime primary schools has decreased sharply due to the recent public budget cuts). In line with the literature on the labour supply, we confirm a discouraging effect of the number of children in the specified age groups on their mothers' working hours, while their fathers' working hours are not significantly affected by the number of children under three, nor do they increase with the number of older children. While we do find an increase in fathers' unpaid working hours when there are young children in the household, the effect is higher the younger the children are. This can be related to the increasing involvement of younger fathers in childcare activities (Addabbo, Caiumi & Maccagnan, 2010, ISTAT, 2008), and is consistent with evidence on the effect of small children on their fathers' childcare time found by Bloemen, Pasqua & Stancanelli (2010). Women's hours of paid work decrease, while women's unpaid working hours increase in the South of Italy, and this is consistent with the lower availability in this area of childcare services. While the worse labour market conditions in the South of Italy (higher unemployment and a higher incidence of involuntary part-time work) can explain the decrease in paid hours of work experienced both by men and women, living in the South of Italy has a different impact on unpaid working hours by gender. Living in the South tends to increase women's unpaid working hours and to decrease men's unpaid working hours, as also shown in the results obtained by Bloemen, Pasqua & Stancanelli (2010). This effect may be connected both to cultural factors (a higher probability of a more traditional distribution of labour within households in the South of Italy) and to the lower provision of childcare services in the South, increasing the need of childcare time by the main carer: predominantly the mother. The presence of kindergartens actually increases women's paid working hours and

decreases women's unpaid working hours, while leaving men's allocation of time unaffected, as shown by the estimated values and statistical significance of the coefficients of the variables measuring interaction between the presence of children in the family and the regional availability of childcare services.

Women's paid hours of work are positively affected by women's hourly wages, while their unpaid working hours tend to decrease as women's hourly wages increase. Consistently with an increase in women's bargaining power within the household, higher wages for women increase men's unpaid working hours. This is consistent with the results obtained by Bloemen & Stanca (2008) for French couples. We find that their unpaid hours of work are also negatively affected by an increase in men's hourly wages. This is consistent with a higher probability at a higher level of both parents' wages to substitute mothers with other people doing paid care work. One partner's illness is also reflected in an increase in the other partner's unpaid working hours.

Turning to the effect of the same factors at the extensive margin choices that women face as regards paid work, and men as regards unpaid work, it is worth noticing that the availability of childcare services is the main factor affecting the probability of participation in the labour market for Italian women in the presence of children. The number of children under 14 discourages their mothers' participation in the labour market, while a higher potential wage has a smaller though statistically significant positive effect on women's probability of participation (Table 5.c). Turning to fathers' participation in unpaid work (Table 5.c), living in the South decreases the probability of men's participation in unpaid work by 6%, in keeping with the effect of cultural factors. Men's participation in unpaid work increases in the presence of a partner affected by chronic illness, and in presence of children, the effect being higher the younger the child in the family is (in line with recent literature on the distribution of unpaid work within the couple in Italy).

By using the estimated coefficients, it is possible to simulate the expected paid working hours of women with certain characteristics. For example, a woman living in the South, with no chronic illnesses, with one child under three and with the other independent variables valued at the mean, is expected to work 16.3 hours a week. If – *ceteris paribus* – she lives in the North, the simulated working hours grow to 18.2. In order to analyze the different impact of regional variability in the incidence of kindergartens, we simulated women's paid hours of work in the two regions characterized by the highest (Emilia Romagna) and the lowest (Calabria) incidence of kindergarten presence for children under three. The results of the simulation evaluating all the other variables at the national mean show that a woman living in Emilia Romagna region with one child under three will on average provide 20.7 hours of paid work in the labour market, while the simulated paid hours of work go down to 16.7 if the woman lives in Calabria, characterized by the lowest presence of kindergarten. Our results are also consistent with the findings of Anxo et al. (2007) on the lower effect of the presence of children in countries where family-friendly policies are more widespread. In fact, in our analysis we find evidence of a lower impact of the presence of children on mothers' allocation of time in the Italian regions where childcare services are more developed.

### **Concluding remarks**

Given the very unequal distribution of time by gender in Italy, we focused in this paper on the allocation of time within couples with or without children, and estimated an econometric model that allows us to take into account the problem of censored information, particularly relevant as far as women's paid working hours and men's unpaid working hours are concerned.

The estimation shows a positive effect of women's hourly wages on their husbands' unpaid working hours. An increase in women's wages is therefore able to affect women's working time both directly

(via the positive effect of women's own hourly wages on their paid working time) and indirectly (via a more equal distribution of unpaid work within the couple). Pursuing the target of increasing women's participation in the labour force, one should therefore aim to increase women's wages.

The dataset used allows us to take into account regional variability in the availability of childcare services, which for households with children appears to have a positive impact on women's labour supply, measured in working hours. This effect is tangibly higher than the effect of living in the South (discouraging women's labour supply) or of their own wages: consistent with the literature on female labour supply, this is positive, yet tangibly lower than the impact of the presence of kindergartens. This effect, together with the negative effect on mothers' working hours of the number of children aged under 14, calls for an increase in the availability of childcare services and a better synchronization between working times and school opening times in order to increase women's labour supply.

## References

- Addabbo, T., Caiumi, A. and Maccagnan, A. (2010) 'Unpaid Work, Well-Being and the Allocation of Time in Contemporary Italy', Chapter 8 in Tindara Addabbo, Marie-Pierre Arrizabalaga, Cristina Borderias e Alastair Owens (eds) *Gender Inequalities, Households and the Production of Well-Being in Modern Europe*, II volume Gender and Well-being' Ashgate, Aldershot, UK and Burlington VT (USA) 2010.
- Addabbo, T. and Favaro, D. (2010) 'Part-time and temporary employment in a gender perspective', Chapter 3 in *Non standard employment and quality of work. The case of Italy* (eds Tindara Addabbo and Giovanni Solinas) Springer Verlag - AIEL series volume III, ISBN: 978-3-7908-2105-5.
- Anxo, D., Flood, L., Mencarini, L., Pailhé, A., Solaz, A., & Tanturri, M. L. (2007) *Time allocation between work and family over the life-cycle: A comparative gender analysis of Italy, France, Sweden and US*. IZA DP No. 3193.
- Becker, G. S. (1965) 'A theory of the allocation of time', *Economic Journal*, 75: 493–517.
- Blomen, H. and Stancanelli, E. (2008), *How do spouses allocate time: the effects of wages and income*. IZA DP No. 3679.
- Bloemen, H., Pasqua, S. and Stancanelli, E. (2010) '[An empirical analysis of the time allocation of Italian couples: are they responsive?](#)' *Review of Economics of the Household*, Springer, vol. 8(3): 345-369.
- Chiappori P. A. (1988) "Rational Household Labor Supply", *Econometrica*, 56 (1): 63-89.
- Chiappori P. A. (1997) "Introducing Household Production in Collective Models of Labor Supply" *Journal of Political Economy*, 105 (1):191-209.
- Connelly, R. and Kimmel, J. (2009), 'Spousal Influences on Parents' Non-Market Time Choices' *Review of Economics of the Household*, vol.7 (4) :361–394.
- Gronau, R. (1977) "Leisure, Home production and Work. The theory of the allocation of time revisited", *Journal of Political Economy*, Vol. 85:1099 - 1123.
- Gronau, R. and Hamermesh, D. (2008) 'The demand for variety: a household production perspective'. *Review of Economics and Statistics*, 90 (3), 562-72.
- Hamermesh, D. and Pfann, G. (2005) *The Economics of Time Use*. Amsterdam: North-Holland.
- Istat (2008) *Conciliare lavoro e famiglia, Una sfida quotidiana*, Argomenti, 33, Roma, Istat.
- Istat (2010 a) *Rapporto annuale sulla situazione del paese*, Roma, Istat
- Istat (2010 b) *La famiglia in Italia. Dossier statistico*, Roma, Istat.
- Jenkins, S. P. and O'Leary, N. C. (1995), "Modelling domestic work time", *Journal of Population*

*Economics*, 8, 265–79.

- Kalenkoski C., Ribar D. and Stratton L. (2009), “The Influence of Wages on Parents’ Time Allocation of Time to Child Care and Market Work in the United Kingdom”, *Journal of Population Economics*, vol. 22(2): 399-419.
- Kooreman, P. and Kapteyn, A. (1987), ‘A disaggregated analysis of the allocation of time within the household’, *Journal of Political Economy*, 95(2), 223–49.
- Mancini, A. L. and Pasqua, S. (2009), “Asymmetries and Interdependencies in Time Use Between Italian Spouses”, CHILD WP n.12/2009
- Mincer, J. (1962), ‘Labour Force Participation of Married Women: A Study of Labour Supply’, in H. G. Lewis (ed.), *Aspects of Labour Economics*. Princeton, NJ: Princeton University Press, 63–105.
- Pollak R.A. (2007), “Allocationg Time: Individuals’ Technologies and Household Technology”, Department of Economics and Olin School, draft.
- Roodman, D. (2008), ‘Cmp: Stata module to implement conditional (recursive) mixed process estimator’, <http://ideas.repec.org/c/boc/bocode/s456882.html>.

## Appendix

Table A1 – Descriptive statistics on the sample

Variables	Obs	Women		Men	
		Mean	Std. Dev.	Mean	Std. Dev.
Age	6,587	41.75	8.55	44.82	8.82
Primary School	6,587	0.09	0.28	0.09	0.29
Secondary School	6,587	0.32	0.47	0.36	0.48
High school	6,587	0.44	0.50	0.40	0.49
Tertiary education	6,587	0.15	0.36	0.14	0.35
Employed	6,587	0.59	0.49	0.97	0.16
Unemployed	6,587	0.04	0.19	0.02	0.12
Employee’s wage	3,307	11.04	5.28	12.09	5.93
Managerial/entrepreneurial	6,587	0.05	0.21	0.08	0.27
Involuntary part-time	6,587	0.02	0.14	0.00	0.06
Weekly hours of paid work	6,587	19.88	18.45	43.10	9.06
Weekly hours of unpaid work	6,426	33.74	20.75	6.60	8.88

Source: Our elaborations of IT SILC 2007 data



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- N. 105 - G. Marotta, *Credito commerciale e "lending view"*, Giornale degli Economisti e Annali di Economia, Vol. LIV, 1-3, gennaio-marzo, pp. 79-102; anche in G. Vaciago (a cura di) *Moneta e finanza*, Bologna, Il Mulino (1995), **WP No. 105 (1994)**.

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