Società italiana di economia pubblica
XV CONFERENZA

DIRITTI, REGOLE, MERCATO
Economia pubblica ed analisi economica del diritto

Pavia, Università, 3 - 4 ottobre 2003

THE LABOUR MARKET PARTICIPATION OF "SANDWICH GENERATION" ITALIAN WOMEN

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pubblicazione internet realizzata con contributo della

COMPAGNIA di San Paolo

società italiana di economia pubblica

dipartimento di economia pubblica e territoriale – università di Pavia

The labour market participation of "sandwich generation" Italian women*

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Preliminary version

September 11, 2003

Abstract

This article empirically examines the labour market participation of Italian women, with special emphasis on the role of intergenerational family links. Elderly relatives may play an important role in explaining the work patterns of women. First, they discourage the work participation of women by requiring unpaid help; secondly, they also provide household services such as child care, favouring the supply of labour by women. To capture the dual role of elderly relatives, using data from the Bank of Italy's 2000 Survey of Household Income and Wealth (SHIW 2000) we estimate a bivariate probit model where the two decisions to be in the labour force and to use informal help from the enlarged family are jointly determined. Our estimates show that informal care for the elderly decreases labour market participation, and that unpaid help provided by elderly relatives increases the probability of being engaged in paid work.

Key Words: Female labour market participation.

JEL classification: J22.

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1 Introduction

The standard model of labour supply is based on the study of the allocation decisions with respect to the individual's time between work and leisure, the latter being generally intended as time not devoted to activities on the market. The household production theory (Becker, 1965) underlines however that the choice actually regards the allocation of time among work on the market, household work and leisure. This extension of the standard model proves to be especially useful in studying female labour supply given the traditional division of roles within the family: the time that women do not spend on the market is mainly devoted to caring for family members and for household chores that, although unpaid, turn out to be productive.

The empirical literature regarding female labour supply, based on the model of the three-way choice - work for the market, household work and leisure - has evidenced how the presence of children, especially of pre-school age, reduces the amount of time spent on the market in favour of time devoted to caring for family members.

The rapid ageing of the population in the west countries, due to reduced fertility rates and to longer average age, has led in the last decade to consider the effect of the need to care for the elderly in the studies concerning female labour supply. In this regard, Ettner (1995) notes that, although the decision to care for a senior person and the decision of fertility differ in many aspects, the influence of the commitment to caring for the elderly can be studied similarly to the commitment towards children. Thus, the responsibility towards the elderly compounds the commitment towards children, and this has led to the definition of "sandwich generation" referred to women who have to provide care and support to both the preceding and the following generation.

However, a relevant issue relative to family links, so far overlooked by the current economic literature, is that cross-generational ties may work also in the opposite direction, as some women may be able to employ the help of the preceding generation in carrying out household chores and caring for family members. Support from seniors reduces the household productivity of women and this, according to the household production model, favours female labour market participation.

The ties with the original family produce, therefore, two opposing effects on women labour supply: on the one hand they reduces it when there is a senior person in need of care, on the other hand they increase it when the senior person can provide

help in household and care activities.

In the light of these considerations, and using as a reference the model of household production, the objective of this work is to distinguish and measure the two opposing roles played by the elderly on Italian women labour market participation.

Indeed, Italy represents a very interesting country to study in the above respect. In the first place, ties to the original family remain generally very strong throughout life. This results in a "cross-generation pact" whereby parents will help their children even when they have formed an independent family, and will get in exchange assistance and care if needed. This is especially true for women who are today of working age. Their parents and parents-in-law left the labour market early due to the low retirement age, and their mothers and mothers-in-law belong to generations which rarely worked for the market. This implies that often women, even after leaving the original family, can count on the support of parents who are still young before the latter will need to be cared for.

In addition, in Italy the percentage of old people on the total population is rising strongly and continuously and this entails that the need to care for them will increase as well.

In order to test the dual role of seniors on the probability of entering the labour market we use the information contained in the special section of Bank of Italy's Survey of Household Income and Wealth for the year 2000 (SHIW 2000) "Unpaid Labour and Services to the Family" that allow, for the first time in Italy, to separate the twofold care-giving and care-demanding role of elderly persons.

The remainder of the paper is organized as follows. In Section 2 we describe the conceptual model we use as a guide for estimation; Section 3 describes the econometric model used in the empirical analysis; Section 4 provides a description of the data and of the variables used; Section 5 contains a discussion of the main results; Section 6 briefly summarizes and concludes.

2 Conceptual model

The effect of family and cross-generational ties on the optimal allocation choice with regard to the women's time can be understood using the household production theory (Becker, 1965). According to this model, the utility of individuals depends on the total amount of goods and services, purchased on the market or home produced, and on leisure. Household production is based on a decreasing returns production

function in which time is one of the inputs; total time available to individuals is divided between household work and market work, which do not bring utility, and leisure.

The woman's care-giving responsibilities towards family members contribute in defining her household productivity. An increase in such responsibilities, for instance due to the needs of children compounded by those of elderly parents, determines a rise of the woman's household productivity[1]; in the case the woman receives help from relatives in doing domestic tasks her household productivity decreases. In both cases the optimal allocation of time changes.

The way in which intergenerational links affect labour supply may be better understood with the auxilium of Figure 1. The latter illustrates the overall budget set together with the woman's preferences. The budget set describes the maximum amount of goods obtainable with income from work, household production and non-wage income.

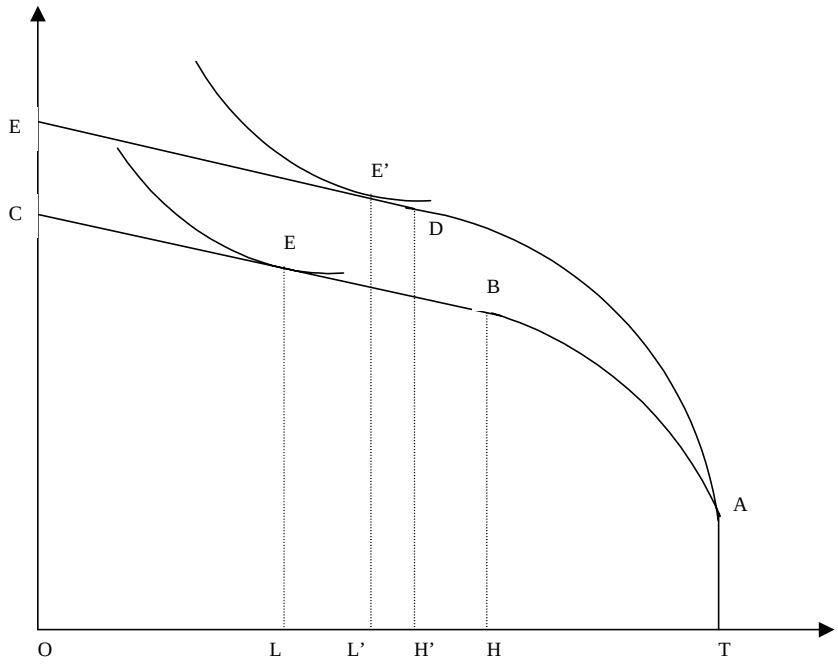

Figure 1: The total household budget line

Line TA represents the amount of goods that can be purchased with the family's

[1]The rise in productivity is due to increased opportunities for joint production and to economies of size (Bryant, 1990).

non-wage income. Assuming that the first hours of work are more productive if dedicated to household production (Bryant, 1990), the woman works exclusively for it until the household marginal productivity becomes higher than the market work productivity, equal to the real wage. At point B, where the production function has the same slope as the real wage, the woman's market productivity is equal to her household productivity. To the left of point B, as the market wage is higher than household productivity, the woman adds market work to household work.

Given the woman's preferences, the equilibrium is in point E. In Figure 1, therefore, the woman demands OL hours of leisure and offers LT hours of work, LH for the market and HT for household production.

A change in family responsibilities determines a change in the woman's household productivity and therefore a shift of the household budget set. For example, if the needs of elderly parents compound those of children, the budget set shifts upward to the position TADE. This shift modifies the woman's optimal allocation of time. First of all because household work becomes more productive and a production substitution effect is created, whereby the woman substitutes household work to work on the market. Secondly, the increase in productivity determines an income effect, which raises the demand for leisure and subsequently reduces even more the female labour supply. Thus, according to the model of household production, an increase in care responsibilities reduces the amount of time the woman spends on the market. In Figure 1 the new equilibrium is in point E'.

However, the ties with preceeding generations may also have the opposite effect on labour supply. Healthy seniors may provide assistance to women in carrying out household chores, reducing their household productivity and thus shifting the household budget line downward. As a result, women will tend to substitute work on the market to household work. In addition, the reduction in real income due to the decreased household productivity leads to a decrease in the demand for leisure, favouring participation.

To sum up, the effect of the ties to the original family on the participation choices of women depends on the role of senior family members. Their position of either care-demanding or care-giving subjects respectively discourages or favours market work.

However, the current empirical literature has not yet considered jointly the twofold impact of the seniors on women probability of being part of the labour force.

With regard to the care demanding role, the existing studies, predominantly based on US data, has not evidenced univocally the effect of the presence of a care-demanding senior on female labour supply. Wolf and Soldo (1994), estimating simultaneously the choice of employment and offer of care on a sample of married women, do not notice a decrease in the propensity to work for women who assist co-residing senior relatives. Ettner (1995), taking into account the possible endogeneity of care activities, shows that co-residing with a disabled senior person has a relevant discouraging effect on participation in the labour market, while such effect is lessened if the senior does not live within the family nucleus. In a later analysis, Ettner (1996) shows that the negative impact is higher for women than for men. Chang and White-Means (1995) find that the discouraging effect is particularly strong for low educated women co-residing with the senior person. Kolodinsky and Shirey (2000) test whether the effect of the presence and characteristics of elderly parents on women labour supply differs according to fact that they reside or not with the family nucleus. They find that co-residing increases the probability of participation, even if such probability decreases as the parent grows older (age can be interpreted as an indicator of health). The authors also check whether the woman's characteristics have a different impact on the probability of participation, depending on the parent being a co-resident or not. The results show that if the senior person co-resides with the family, the woman's age has a discouraging effect on participation.

The influence of the preceeding generation's support on female labour supply has not been explicitly treated in economic literature. A few indications may be gained from some studies dealing with the relationship between female participation and the offer of formal child care services; such studies have checked, in different ways, for the availability of support provided by the enlarged family. Their results generally show that, if the woman can count on the availability of senior parents, her probability of participating increases. Ribar (1992) measures the availability of informal child care services using the number of adults living in the family nucleus; the variable has a positive effect on participation. With specific reference to Italy, Chiuri (2000) assumes that the family can count on the help of the preceding generation if at least one member of the couple resides in the province where he/she was born, and notices a positive effect on the woman's labour supply. Del Boca (2002) employs as proxy for the help of the extended family the fact that at least one of the mother's parents be alive, and finds a positive effect of this variable on participation.

It is worth noticing, however, that in such studies the mere presence of a senior

parent is considered equivalent to the availability of his/her help to the family. This hypothesis overlooks the fact that the presence of old relatives does not necessarily mean they can help; indeed it can be an additional burden for the woman if the elderly person needs to be cared for.

Thanks to the information contained in the SHIW 2000 special section, in the subsequent study we will examine through econometric analysis the links between female participation and intergenerational ties, disentangling the dual role of care-giving/care-demanding of old parents.

3 Empirical model

The econometric specification we adopt in the following analysis is based on the two following hypothesis:

- the help obtained from parents for household chores derives from a choice by the woman;
- the caring she has to provide to her parents is exogenously determined.

With regard to the first hypothesis, help from relatives is assumed to be endogenous because, even when elderly are willing to provide assistance to their children, families may choose to demand instead formal household and child care services. For instance, families with pre-school children may prefer kindergartens and crêches, especially public-owned ones, as they are generally of higher quality because of the specific education of the teachers (Del Boca et al., 2003). Besides, kindergartens and crêches favour the socialisation of children.

As for the second hypothesis, the exogeneity of caring tasks is assumed because strong cross-generational ties mean that caring for elder parents represents a moral obligation for their children, usually spread evenly among them (Ettner, 1995). This assumption is supported by the fact that in Italy assisted living facilities and nursing homes are extremely uncommon; the percentage of children stating that their mother or father lives in such a facility is respectively 1.2 and 0.5 percent (Istat, 2001). It seems therefore reasonable to assume that caring for the elderly is not an object of choice by children, especially women.

Thus, the estimated model is a recursive bivariate probit model in which the two equations describe the decision to participate in the labour market and to employ

the help of senior parents. The variable describing the caring for elderly parents in need of assistance is included among the regressors of the two equations.

The general specification of the model is therefore:

$$\begin{cases} U_1^* = \beta_1^{'} X_1 + \gamma_1 Y_2 + \varepsilon_1 & Y_1 = 1 \; if \; U_1^* > 0, \; 0 \; otherwise \\ U_2^* = \beta_2^{'} X_2 + \gamma_2 Y_1 + \varepsilon_2 & Y_2 = 1 \; if \; U_2^* > 0, \; 0 \; otherwise \end{cases}$$

with

$$\begin{gathered} E(\varepsilon_1) = E(\varepsilon_2) = 0 \\ Var(\varepsilon_1) = Var(\varepsilon_2) = 1 \\ Cov(\varepsilon_1 \varepsilon_2) = \rho \end{gathered}$$

where U_1^* and U_2^* represent the net benefits respectively of participation and of the employing of help provided by senior parents. The vectors X_1 and X_2 contain the variables influencing respectively the two choices.

The dependent variables of the two equations, Y_1 and Y_2, take value 1 respectively if the woman participates in the labour market and employs the help of the family. These latter variables appear also in the right hand side of the equations. Indeed, from the one side the presence of elderly relatives contributing to family duties, and thus reducing the woman's domestic productivity, determines an increase in the probability of participating in the labour market; from the other side, the probability of demanding help from the preceding generation tends to be higher if the woman belongs to the work force. Therefore, since the two dependent variables are jointly determined, we just put each on the right-hand side of the other equation[2] (Greene, 1998).

4 The data

The empirical study is conducted on data taken from the Bank of Italy's 2000 Survey of Household Income and Wealth (SHIW 2000). This data set is the main source of information regarding the income and wealth of Italian families, their socio-demographic features and their position in the labour market. SHIW 2000 contains also the special section "Unpaid Labour and Services to the Family" that reports plentiful information on the household work and care activities carried out

[2]Simultaneity also regards the choice of employing formal help. However, the lack of information on the individual demand of paid services in the SHIW 2000 data set does not permit an estimation of the trivariate model.

by women and on the support that they receive by relatives. This is extremely important information, never before available with specific reference to Italy, for the study of the relation between work choices and family ties.

For the purpose of estimation, we have selected a sample of women in the age range 15-64 (that is, the female working age population) who are heads of family or spouses/live-in partners of the head of the family, with and without children[3]. Single women are therefore also part of the sample. Students and retired women are not included in the sample because the reason for their lack of participation is evident. Lastly, to isolate women who potentially can count on the support of a senior person, we have eliminated, according to the indications of Del Boca (2002), those who do not have at least one living parent or parent-in-law.

The participation dependent variable Y_1 is equal to 1 if the woman belongs to the labour force, that is being employed or unemployed[4]. The women whose stated main activity is "housewife" or "wealthy", plus those who are unemployed / first job seekers but have not actively sought a job in the last year, are not considered part of the work force.

The dependent variable Y_2 takes value 1 for women that employ, for household or care duties, the help of relatives not residing with the family, and also for those with a co-residing relative over 60 years old, for whom they do not perform care activities[5].

The explicative variables, beginning with those intended to account for the influence of the original family on participation, are divided into six groups:

Role of the enlarged family. This group comprises a dummy variable taking value 1 for women who stated that they devote time to caring for residing and/or non co-residing elderly relatives[6]. We have also inserted a variable measuring the

[3]We have excluded daughters, other relatives of the head of the family and other co-residing women, as for them family responsibilities are usually lower.

[4]The status of unemployment is defined by the individual's answer to the question on the prevailing condition in the year; this is however not tied to the requirements of the official definitions of unemployment. Nevertheless, we considered as not belonging to the work force those who stated they were unemployed or first job seekers, but who have not actively sought job during the last year. Obviously even with this correction the number of individuals belonging to the labour force is overestimated.

[5]In other words, we have assumed that if a relative over 60 lives within the family nucleus and does not need care, he/she provides household and child care support.

[6]The variable is built using information contained in the SHIW 2000 special section. In particular, it takes value 1 for women who state to dedicate time to caring for non co-residing relatives and for those coresiding with a senior above 60 years old different from the husband who affirm to

availability within the region of places for senior persons in public care facilities.

Human capital. Three dummy variables for the level of education belong to this group. The excluded category is tertiary education (college degree, graduate and post-graduate degrees). Age and its square are inserted as a measure for the potential work experience.

Family and cultural background. According to the results obtained by Del Boca et al. (2000), we have included two dummy variables taking value 1 in the cases, respectively, of mother and mother-in-law working at the present age of the interviewed woman and one dummy variable identifying women living in the South of Italy[7].

Characteristics of the spouse/live-in partner. The included variables are: total net income of the husband/partner in the year, three dummy variables accounting for the effect of the spouse/partner's level of education, and a series of dummy variables describing his position on the labour market (employee, self-employed and retired with respect to unemployed). We have also inserted a dummy variable identifying women without a spouse/live-in partner.

Role of children. This has been accounted for through a series of dummy variables checking for the presence of children and for the age of the youngest child, as suggested by Chiuri (2000). This group also includes a variable measuring the number of places in public crêches available, on a regional level, every 100 children between 0 and 2 years old[8].

City context. The model also includes a dummy variable identifying residence in a city with less than 50,000 inhabitants.

5 Results

The estimations have been conducted both on the entire sample (2062 women) and on the sub-sample of married/partnered women (1824 women) in order to control for husband/partner characteristics. Full information maximum likelihood estimates of the parameters of the bivariate probit model are given in Table 1 and in Table 2. We

care for "other residing family members" (with respect to children up to 14 years old).

[7]The choice of simply dividing the North and South of the country, rather than adopt the usual North-Centre-South division, is based on the fact that the results of the estimations have not evidenced statistically significant differences between the North and the Centre.

[8]We have not deemed it advisable to insert a variable accounting for the offer of services to children aged 3 to 5 because in Italy the demand for such services is not rationed.

have also computed the average predicted probabilities of participating for different values of the more interesting significant variables; the results are shown in Table 3. In both estimations, the t ratio on the coefficient of the correlation between the two structural disturbances suggests that the disturbances of the two equations are not correlated.

The significance of the coefficients relative to Y_1 and Y_2 confirms that the two choices are indeed jointly determined. As regards the impact of the other regressors, we note that in general they are statistically significant and the coefficients have the expected signs.

The role of family links

From the estimation of the participation equation it emerges, in accordance with the predictions of the household production model, a strong influence of the dual role of senior parents as care-demanding and care-giving subjects.

In the first place we note that, if the woman must dedicate time to caring for a senior member of the enlarged family, her probability of being employed or searching for a job decreases. For the sample of married women, the average predicted probability of participating is 45% for women who do not care for elderly relatives, whilst it is 34% for women who care for them. The same probabilities computed on the entire sample are respectively 53% and 44%. The importance of caring for seniors in determining the woman's attitude towards work on the market compounds, therefore, the need to care for children and to carry out household chores, further discouraging the participation to the labour market of the female population.

The offer of public care facilities at the regional level, that relieves the burden of caring for the elderly, favours women labour market attachment, as signalled by its positive and significant coefficient.

As regard to the care-giving role of the elderly, this study confirms that the effect of the original family's support in caring for children and performing household tasks is crucial in increasing the probability of entering the labour market for Italian women; the effect is quantitatively more relevant than the negative one due to the need to care for the elderly. This result is found both in the sample of the married/partnered women and in the one comprising also single women. Table 3 shows that the average probability of participating for women receiving help from relatives is notably higher than for those who do not, increasing respectively from 37% to 85% and from 46% to 95% in the two samples.

Table 1: Bivariate probit estimation - Married/partnered women

	Participation			Demand for family support		
	Coefficient		Std err	Coefficient		Std err
a) Participating woman				2.2152	***	0.1239
b) Enlarged family						
Help received	2.1643	***	0.1356			
Help provided	-0.1728	**	0.0692	0.1850	**	0.0737
Places in public senior care facilities	0.0141	***	0.0053	-0.0169	**	0.0070
c) Human capital						
Primary	-1.3779	***	0.1857	0.5961	**	0.2516
Compulsory	-0.9827	***	0.1667	0.7502	***	0.1678
Secondary	-0.4828	***	0.1581	0.2811	*	0.1505
Age	0.1285	***	0.0326	-0.1138	***	0.0397
Squared age	-0.0016	***	0.0004	0.0013	***	0.0005
d) Cultural attitude						
Working mother	0.1367	*	0.0727	-0.1191		0.0797
Working mother in low	0.2285	***	0.0748	-0.1934	**	0.0811
South	-0.1838	*	-2.0428	-0.0374		0.1813
e) Spouse/partner						
Spouse/partner income	0.0000	***	0.0000	0.0000	***	0.0000
Primary	-0.2770		0.1779	0.2330		0.2487
Compulsory	-0.1486		0.1564	0.1117		0.2027
Secondary	-0.3423	**	0.1463	0.3170		0.1928
Employee	-0.0908		0.1672	0.0446		0.1907
Self employed	-0.2710		0.1757	0.2509		0.1957
Retired	-0.1784		0.1902	0.2535		0.2575
f) Children						
Childless	1.1815	***	0.1710	-1.1850	***	0.1952
Youngest child 3-5 years old	0.3041	**	0.1481	-0.3087	**	0.1446
Youngest child 6-10 years old	0.4691	***	0.1413	-0.4716	***	0.1456
Youngest child 11-14 years old	0.7542	***	0.1510	-0.8187	***	0.1656
Youngest child over 14	0.6910	***	0.1448	-0.9660	***	0.1917
Places in kindergartens	0.0199	*	0.0117	-0.0163		0.0142
g) Other						
town < 50000 inhabitants	-0.0250		0.0662	0.0805		0.0844
constant	-2.2913	***	0.7355	0.0937		0.8908
correlation coefficient	-10.3476		52.2619			
Number of obs = 1824			Wald chi2(50) = 1097.33			
Prob > chi2 = 0.0000			Log likelihood = -1202.3058			

***, ** and * denote statistical significance respectively at the 1%, 5% and 10% level.

Table 2: Bivariate probit estimation - All women

	Participation			Demand for family support		
	Coefficient		Std err	Coefficient		Std err
a) Participating woman				2.0549	***	0.0938
b) Enlarged family						
Help received	1.9809	***	0.1106			
Help provided	-0.2179	***	0.0641	0.2251	***	0.0666
Places in public senior care facilities	0.0118	**	0.0048	-0.0144	***	0.0050
c) Human capital						
Primary	-1.2914	***	0.1305	0.4821	**	0.1946
Compulsory	-0.9222	***	0.1209	0.6415	***	0.1183
Secondary	-0.4830	***	0.1172	0.2571	**	0.1111
Age	0.1310	***	0.0277	-0.1154	***	0.0303
Squared age	-0.0016	***	0.0003	0.0014	***	0.0004
d) Cultural attitude						
Working mother	0.1439	**	0.0649	-0.1195	**	0.0678
South	-0.0798		0.1090	-0.1353		0.1237
e) Single	0.6742	***	0.1067	-0.5098	***	0.1141
f) Children						
Childless	1.1973	***	0.1505	-1.1368	***	0.1551
Youngest child 3-5 years old	0.2833	**	0.1242	-0.3046	**	0.1242
Youngest child 6-10 years old	0.4467	***	0.1177	-0.4600	***	0.1178
Youngest child 11-14 years old	0.7533	***	0.1346	-0.8344	***	0.1385
Youngest child over 14	0.6729	***	0.1252	-0.9688	***	0.1951
Places in kindergartens	0.0298	***	0.0105	-0.0216	**	0.0110
g) Other						
town < 50000 inhabitants	-0.0054		0.0593	0.0835		0.0666
constant	-2.8215	***	0.6049	0.6695		0.6278
correlation coefficient	-10.2016		58.7775			
Number of obs = 2062						
Wald chi2(36) = 1234.79						
Prob > chi2 = 0.0000						
Log likelihood = -1367.7993						

***, ** and * denote statistical significance respectively at the 1%, 5% and 10% level.

Table 3: Average predicted probabilities of labour market participation (%)

	Married		All women	
	yes	no	yes	no
Help received	85.41	37.08	95.37	45.95
Help provided	33.96	44.56	44.39	52.92
Primary	20.35		25.28	
Compulsory	37.95		43.51	
Secondary	50.34		62.28	
University degree	64.77		82.14	
Working mother	48.50	38.57	60.25	46.38
Working mother in law	59.14	36.43		
South	28.31	48.54	34.82	58.82
Single			76.18	47.07

Previous studies based on Italian data have measured the availability of support from relatives through the presence of at least one living parent or parent-in-law (Del Boca, 2002), the residence in the province of birth (Chiuri, 2000) or through both conditions (Bratti, 2003). Those studies have reached similar results to ours. However, since they do not take into account the possible care-demanding effect of the elderly person, they underestimate the effect on labour supply.

The presence and age of children has an impact consistent with theoretical expectations and with several empirical analyses conducted on Italian data (among others, Addabbo, 1999 and Chiuri, 2000). The presence of a child between 0 and 2 years old strongly discourages participation, both compared to the absence of children and to the presence of children in other age groups. The least large and less statistically significant differences are found with respect to women who have a child between 3 and 5. The offer at a regional level of child-care services favours female participation, although modestly. Evidence for Italy of the positive effect of the availability of child care services emerges among others from studies by Del Boca (1997), Chiuri (2000) and Bratti (2002).

Regarding the estimation of the informal support equation, we observe that the participation variable plays the major role in explaining the choice of employing the help of elderly parents, as evidenced by the statistical significance and by the high value of its coefficient. The request of help is less probable for women with a university degree, with the largest difference found with respect to women with compulsory education. The result is consistent with the hypothesis that women with a higher level of education are more sensitive to the high quality of formal services

and to their socialisation function[9].

Even after controlling for the age of children, the demand for informal care decreases with the woman's age; the fact that the mother-in-law was working at the woman's present age also reduces the probability of demanding help from the preceding generation for married/partnered women. From the estimation on the entire sample it emerges also that a previously working mother determines a lower attitude to demand informal help from relatives.

As expected, the demand for support in household and child-care activities is higher for women with children. Moreover, as the youngest child grows, the probability of demanding help decreases monotonically. The negative sign of the coefficient relative to the offer of public child care that results from the estimation on the entire sample signals that informal help acts as a substitute for these services.

Another interesting finding regards the "crossed" role of the original family: the probability of employing the support of parents or parents-in-law is higher if the woman is required to care for seniors not residing with the family; moreover, the demand of help decreases with the availability of public care facilities for seniors.

Finally, if the women is not married the demand of informal help is lower.

What determines labour market participation besides family ties?

The effect of the other regressors on the probability of participation is consistent with theoretical expectations and the findings of several previous empirical analyses (see Bratti, 2003 for a survey).

The human capital variables, all significant at the one percent level, are those better explaining the choice to participate, both on the entire sample and on that comprising solely women who are married or with a live-in partner. As the education level decreases so does, monotonically and in a relevant fashion, the probability of participating in the labour market. The differences in the average predicted probability between women with a primary and a tertiary level of education are respectively 45 (from 20% to 65%) and 57 (from 25% to 82%) percentage points in the two samples. The same effect has been found in several previous analyses conducted on Italian data (among others Tanda, 1994; Bettio and Villa, 1999; Addabbo, 1999; Chiuri, 2000; Bratti, 2002).

Participation is also growing and concave in age; in both estimation the prob-

[9]The effect of the level of education on the demand of informal care has turned out to be of the opposed sign in a specification not including the participation variable among the explicatives. This confirms a strong link between the woman's level of education and her work choices.

ability grows until 39 years of age and decreases rapidly in later years (See Figure 1A and 2A in the Appendix).

As verified by Del Boca et al. (2000) and Bratti (2002), the fact that women of the preceding generation were also working increases the probability of entering the labour market; it is interesting to notice that the role of the mother-in-law proves to be stronger than the mother's. For married/partnered women if the mother worked the average predicted probability of being in the labour force increases from 39% to 48%; if the mother-in-low worked the increase is from 36% to 59%. Residence in the South of Italy, where the traditional division of roles within the family is more common, implies a reduction of the probability of participation for the sample of married/partnered women. The result can be explained also with a higher discouragement effect for southern women caused by a worse-functioning labour market and by a notably higher female unemployment rate in the South than elsewhere in the country.

Labour supply decreases with the income of the husband/partner, even if the induced variation is quantitatively negligible. Indeed, the husband or partner's income could have two opposing effects on the probability of participation. On the one hand a negative impact caused by an income effect, and on the other hand a positive effect caused by assortative mating, a phenomenon already found in previous empirical analyses (Del Boca et al., 2000; Rossetti and Tanda, 2000), whereby as the husband/partner's income grows so does the probability that the woman can earn a high wage on the market, thus encouraging her participation. The probability of participating in the labour market is higher if the spouse/partner has a university degree, even if the only statistically significant dummy variable is the one identifying a high school degree. A discouraged worker effect does not appear from our estimates, while we find signs of an added worker effect: the coefficients of the three dummy variables identifying a working or retired partner are negative, even thought they are not significant.

Single women, *ceteris paribus*, are characterized by a higher probability of being in the labour force, probably because they cannot rely on the economic support of a spouse or partner. In our sample the average predicted probability grows from 47% to 76% if the woman is single rather than married/partnered.

Finally, our estimates show that the size of the city of residence does not impact participation. In this respect it is interesting to notice that the variable proves to be significant and positive in an estimation of the participation equation where the

variable identifying the demand of help by elderly parents does not appear among the regressors. Inserting this variable among the explicatives makes city size lose its statistical significance; this suggests that residing in a smaller city is a *de facto* indicator of the support of the enlarged family, because it makes using the informal child care services provided by relatives easier.

6 Conclusion

A fast demographic change is under way in Italy, due to the low fertility rate - one of the lowest among OECD countries - and to a longer average life span. According to forecasts, within the year 2020 the elderly dependency index, calculated as the ratio between the population over 64 and the working age population (age rank 15-64), will be above 30% (Visco, 2000). Besides the problems related to the sustainability of the pension system, this implies an increase in the demand of care by seniors which, according to the traditional division of roles within the family, is largely met by women: in 1998, 24.5% of women provided free support to non-co-residing persons, 26% of them to non-co-residing older persons (Istat, 2001). One must add to them the women who provide assistance to seniors residing within the family nucleus.

The responsibilities towards seniors - added to those towards children - has led to the definition of "sandwich generation" with reference to women who need to provide care for both the preceding and the following generation.

An increase in care obligations could discourage the presence of women in the labour market, which is already particularly low in Italy, where the participation and employment rates in 2001 were 48% and 42% respectively, versus an European Union average of 61% and 55%.

However, cross-generational solidarity also shows in another aspect, since women may be able to employ the help of the preceding generation in dealing with household chores and caring for family members, and this may play an important role in their participation decision.

This study has analysed thoroughly the relation between the work choices of women and cross-generational family ties. In particular, we have estimated a bivariate probit model where we have assumed that the two choices of being in the labour force and using informal family support are jointly determined.

After controlling for a wide range of variables, our empirical results indicate

that women demanding informal help are characterized by a remarkably higher probability to participate in the labour market; moreover, the positive effect of family support is greater in magnitude than the negative one associated with the commitment to care for elderly relatives.

The results have also shown a positive impact of institutional services, even thought this impact is lower than the one associated to informal help. This suggests the importance of the availability of care services at a low cost and with high flexibility, like those provided by elderly parents. With respect to child care services, for example, the low coverage, the high cost and rigidity of opening hours mean that the existing public services do not provide much assistance in combining household work with work on the market.

The Lisbon target, which translates for Italy into an increase of almost 20 percentage points of the female employment, cannot be reached simply through a natural trend, in place for some years now, towards more participation due mainly to a progressive, constant increase in the level of female education. The results we obtained show how a fast and sizeable increase in participation could be obtained through policies for the family that reduce the burden on women of household and family responsibilities, both towards children and elderly relatives.

References

[1] Addabbo, T. (1999), Labour Supply and Employment Probabilities in Italy: a Gender Analysis in a Regional Perspective, *Economia e Lavoro*, 33(3-4): 189-207.

[2] Banca D'Italia (2001), I bilanci delle famiglie italiane nell'anno 2000, Supplemento al Bollettino Statistico. Note metodologiche e Informazioni Statistiche, Banca d'Italia, Roma.

[3] Becker, G. (1965), A Theory of the Allocation of Time, *Economic Journal*, 75: 493-517.

[4] Bettio, F. and Villa, P. (1999), To What Extent Does It Pay to Be Better Educated? Education and Market Work for Women in Italy, *South European Society and Politics*, 4(2): 150-171.

[5] Bratti, M. (2002), Labour Force Participation and Marital Fertility of Italian Women: the Role of Education, forthcoming in *Journal of Population Economics*.

[6] Bratti, M. (2003), Offerta di lavoro: partecipazione e orario di lavoro, in Lucifora C. (ed.) *Mercato, occupazione e salari: la ricerca sul lavoro in Italia*, vol. I, Mondadori Università, Milano.

[7] Browning, M. (1992), Children and Household Economic Behavior, *Journal of Economic Literature*, 30(3): 1434-1475.

[8] Bryant, W. K. (1990), *The economic organization of the household*, Cambridge University Press, New York.

[9] Chang, C. and White-Means, S. (1995), Labour Supply of Informal Care-givers, *International Review of Applied Economics*, 9(2): 192-205.

[10] Chiuri, M.C. (2000), Quality and Demand of Child Care and Female Labour Supply in Italy, *Labour*, 14(1): 97-118.

[11] Del Boca, D. (1997), Intrahousehold Distribution of Resources and Labour Market Participation, in Persson, I. and Jonung, C. (eds.), *Economics of the Family and Family Policies*, Routledge Press, Londra.

[12] Del Boca, D. (2002), The Effect of Child Care and Part Time Opportunities on Participation and Fertility Decisions in Italy, *Journal of Population Economics*, 15(3): 549-573.

[13] Del Boca, D, Aaberge, R., Colombino, U., Ermisch, J., Francesconi, M., Pasqua, S. and Strom, S. (2003), Labour Market Participation of Women and Fertility: The Effect of Social Policies, paper presented at the FRDB CHILD Conference, Alghero, June 2003.

[14] Del Boca, D., Locatelli, M. and Pasqua, S. (2000), Employment Decisions of Married Women: Evidence and Explanation, *Labour*, 14(1): 35-52.

[15] Ettner, S. L. (1995), The Impact of "Parent Care" on Female Labor Supply Decisions, *Demography*, 32(1): 63-80.

[16] Ettner, S. L. (1996), The Opportunity Cost of Elder Care, *Journal of Human Resources*, 31(1): 189-205.

[17] European Commission (2000), European Council of Lisbon - An Agenda of Economic and Social Renewal for Europe, Contribution of the European Commission to the Extraordinary European Council in Lisbon, March 23-24, 2000, Bruxelles, February 28, 2000.

[18] Greene, W. (1998), Gender Economics Courses in Liberal Arts Colleges: Further Results, *Journal of Economic Education*, 29(4): 291-300.

[19] Istat (2001), Indagine Multiscopo sulle famiglie 'Aspetti della vita quotidiana' Anno 1998 - Parentela e reti di solidarietà, Istat, Roma.

[20] Kolodinsky, J. and Shirey, L. (2000), The Impact of Living with an Elder Parent on Adult Daughter's Labour Supply and Hours of Work, *Journal of Family and Economic Issues*, 21(2): 149-175.

[21] Nakamura, A. e Nakamura, M. (1994), Predicting Female Labor Supply: Effects of Children and Recent Work Experience, *Journal of Human Resources*, 29(2): 304-327.

[22] Nakamura, A. e Nakamura, N. (1992), The Econometrics of Female Labour Supply and Children, *Econometric Review*, 11(1): 1-71.

[23] OECD (2001), Employment Outlook, OCSE, Parigi.

[24] OECD (2002), Employment Outlook, OCSE, Parigi.

[25] Ribar, D. (1992), Child Care and Labour Supply of Married Women: Reduced Form Evidence, *Journal of Human Resources*, 27(1): 134-165.

[26] Rossetti, S. and Tanda, P. (2000), Human Capital, Wages and Family Interactions, *Labour*, 14(1): 5-34.

[27] Tanda, P. (1994), Partecipazione femminile in Italia: evidenza empirica su dati individuali, *Economia e Lavoro*, 28(1): 123-34.

[28] Visco, I. (2000), Welfare, invecchiamento della popolazione e lavoro: una prospettiva OCSE, *Moneta e Credito*, 209, 55-85.

[29] Wolf, D.A. e Soldo, B.J. (1994), Married Women's Allocation of Time to Employment and Care of Elderly Parents, *Journal of Human Resources*, 29(4): 1259-1276.

7 Appendix

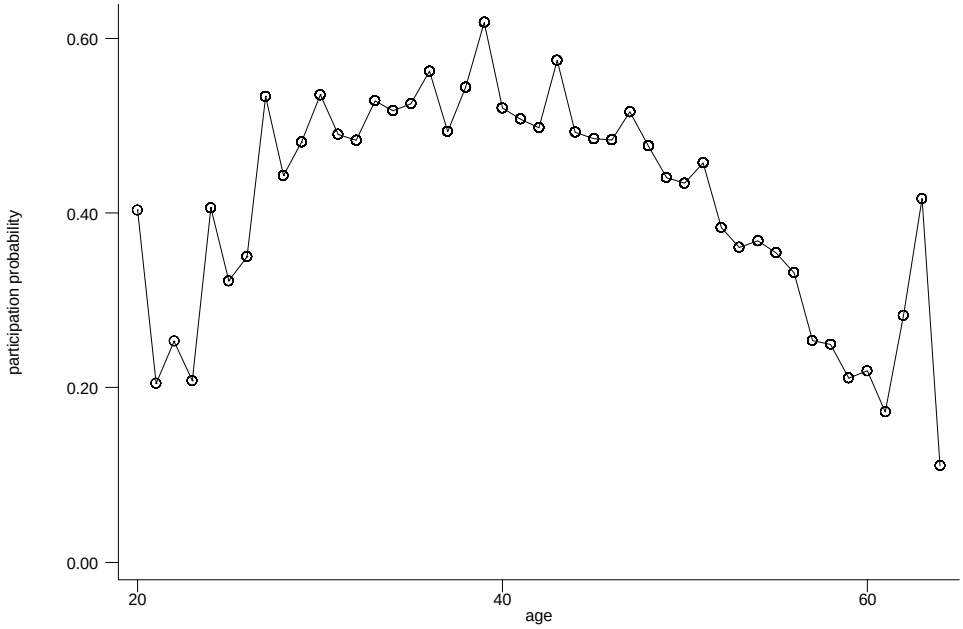

Figure 1A: Predicted participation probability - married/partnered women

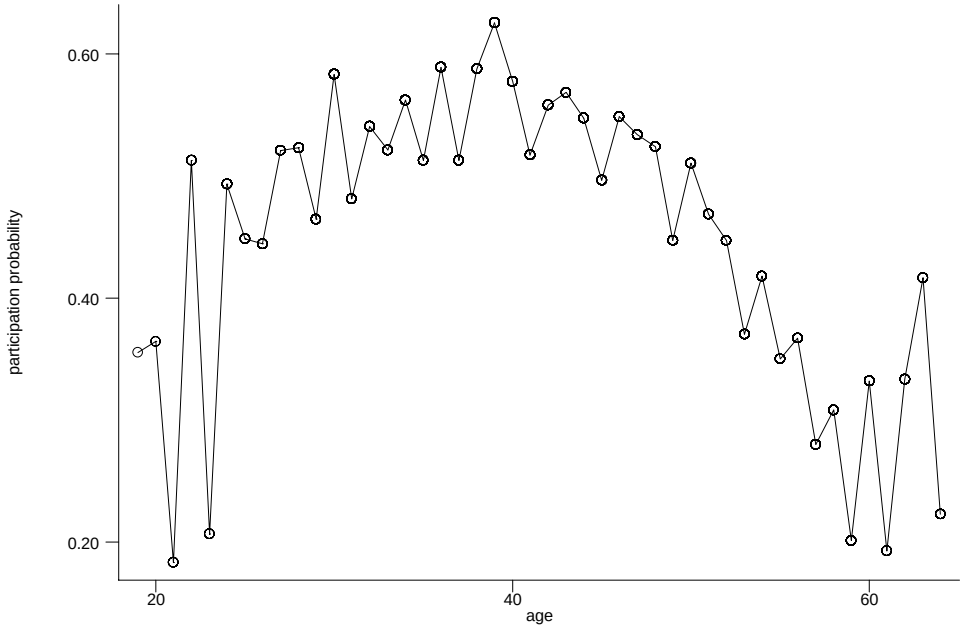

Figure 2A: Predicted participation probability - all women