Taxation and Labor Force Participation: The Case of Italy

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Abstract

Italy has the lowest labor force participation of women among OECD countries. Moreover, the labor force participation of Italian married women is positively correlated to their husbands' income. In this paper, we show that, despite an individual based tax system, the set of tax credits and cash transfers raises the tax burden levied on two-earner household, generating a disincentive to participate in the labor force for married women, typically the second earner of the family. Using micro data from EU-SILC, we estimate a structural model where men's labor supply and incomes are given, and women sequentially decide whether to work and accept a given job offer. We then use the estimated parameters to measure the behavioral effects of alternative tax systems: the joint family taxation, the gender-based taxation (*à la* Alesina, Ichino, and Karabarbounis (2011)), the Working Tax Credit, and a mixture of the Italian and the joint taxation system.

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Keywords: female labor force participation, Italian tax system, marginal tax rate, joint taxation, gender-based taxation, Working Tax Credit

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1 Introduction

The labor force participation of Italian women is the lowest among OECD countries. Moreover, while the labor force participation of married women is usually negatively correlated to their husband's income, in Italy this correlation is positive. In this paper, we argue that the taxation system can partly explain the coexistence of these two facts.

The Italian taxation system is based on an individual tax unit. It is characterized by a high tax schedule, and a set of tax credits for children and for the spouse who is not employed, and cash transfers for dependent children. The combination of these elements raises the tax burden, especially on two-earner households, generating a disincentive to participate in the labor force for married women, typically the second earner of the family. Moreover, such disincentive is stronger when the first earner, conventionally the husband, is low. More specifically, tax credits and universal cash transfers increase the marginal tax rate of a low-income married woman[1] relatively to an unmarried one. As tax credits and transfers are decreasing functions of the household income, their incidence on the marginal tax rate decreases in the household income, providing incentives to participate that augment in the household income. Moreover, the marginal tax rate is increasing in the number of children, and it reaches a maximum at low (less than 30,000 euros) husband's incomes. It is also decreasing in the wife's earnings, encouraging part-time and low skill jobs.[2]

In this paper, we use micro data from the EU-SILC (2007-2008) to estimate a structural model of labor supply that includes, as main ingredient, the characteristics of the Italian tax system.[3] In our model, the labor supply decisions of women are sequential. First, they decide whether to search for an occupation, and upon receiving a job offer, they decide whether to accept it or not. Men's labor supply and incomes

[1] We define the marginal tax as the amount paid on an additional unit of income if she works relatively to the case in which she is unemployed or out of the labor force.

[2] While the increase in more favorable conditions of part-time jobs may create incentives for (married) mothers to participate in the labor market, Manning and Petrongolo (2008) provide evidence of part-time jobs as potential sources of occupational segregation.

[3] In general, the choice of participating in the labor market depends upon several variables. It reflects the value assigned to domestic activities as housework and child care (Olovsson (2009)), and the amount of wealth owned. Moreover, social norms play an important role in the decision of women to work, especially in Italy. The *World Value Survey* reports that 80 percent of the Italian population, of both genders, thinks that a child younger than 3 years old suffers if the mother works. Even thought we recognize the importance of these variables in determining the labor supply decision, we do not include them in our analysis.

are given. All of the labor decisions depend on the net yearly income, hence on the characteristics of the taxation system. The model is able to generate the low level of the participation rate, and the positive correlation between women participation rate and husbands' income. It also matches the part-time and full-time employment rates.

Then, we use the estimated parameters to measure the behavioral effects of alternative (revenue neutral) tax systems: joint family taxation (in line with the French system), a system inspired by the (British and American) Working Tax Credit, a gender-based taxation (as the one proposed by Alesina, Ichino, and Karabarbounis (2011)), and a mixture of the Italian and the joint taxation system. We assume that all of the simulated tax systems are characterized by the same tax rate, with the exception of the gender-based tax system. The systems differ in the set of tax credits and transfers. We show that the joint tax system implies a substantial drop in female labor participation of married women. In particular, the decrease in the participation rate is increasing in the husband's income. On the contrary, the working tax credit and the gender-based system boost the participation rate of all women. The effects of the former concentrates on unskilled and low educated women (and hence, low skill and part-time jobs). In the latter, the reduced tax rates generate a positive shift of the participation rate. But, the tax credits for dependent spouse and children leave unchanged the negative incentives to low income households. The mixture system allows to choose the taxation system that implies the lowest tax burden. The effects on the labor force participation and employment are intermediary between those produced by the two systems separately. Women without children will be indifferent between the two systems, regardless of the marital status. Unmarried women without children choose the Italian system for low levels of income, as it gives the rights to tax credits and transfers for the children. For higher incomes, they choose the joint taxation system, as they benefit from the *quotient familial*. For this same reason, married mothers will also choose the joint taxation system.

Finally, we compare the effects on welfare of these systems by computing several poverty measures for the women in the sample. We show that the gender-based system increases the well-being of unmarried women, reducing the transfer needed to reach the poverty line. On the contrary, married women are better off in the mixture system.

Our paper is related to three main strands of literature. First, it relates to recent

works that argue that the taxation system may create a system of incentives to labor force participation, and that it may play an important role in explaining the cross-country differences in labor supply behavior. Some examples are Prescott (2004), Davis and Henrekson (2004), Olovsson (2009), and Rogerson (2006).

Second, our work belongs to the rich area of the empirical analysis of labor supply, both in the US and in Europe. A fundamental role in addressing the interest towards taxation has been played by Burtless and Hausman (1978), Hausman (1980), and Hausman (1985). In our paper, we concentrate the attention on Italian women, and use a framework similar to Colombino and Del Boca (1990). We enrich their results showing that the model is able to reproduce the positive correlation between wife's labor force participation rate and husband's income. Moreover, in the statistical procedure for the wage prediction, we correct for selection bias using a non-linear method that accounts for the probability that an individual with given characteristics opts for a certain labor supply choice.

Third, several studies examine the effect of tax reforms on the labor force participation. From a theoretical point of view, up to twenty years ago, the optimal taxation theory literature converged to an optimal scenario characterized by a basic income transfer and an almost flat income tax. More recently, the literature focused on in-work benefits (Blundell, Bozio, and Laroque (2011), Mooij (2008), Immervoll, Kleven, Kreiner, and Saez (2007), Colombino, Strøm, and Aaberge (2000), and Saez (2002)). Several studies have evaluated the expected labor supply effects from introducing in-work tax credits in the US and the United Kingdom. The most recent and relevant studies are for the United Kingdom Blundell and Hoynes (2003) and Blundell, Duncan, McCrae, and Meghir (2000) and for the U.S. Meyer and Rosenbaum (2001) and Fang and Keane (2004). The results from these studies suggest that there are strong incentive effects from tax credits. The broadening of the tax credit seems to have contributed to increased labor force participation and reduced welfare participation. Our results are also consistent with the findings of Eissa and Liebman (1996), Cavalli and Fiorio (2006), and Bar and Leukhina (2009).

This paper is organized as follows. In Section 2, we provide a description of the Italian labor market and taxation system. In Section 3, we specify the empirical strategy, we describe the data, and present the results. In Section 4, we measure the behavioral effects of alternative tax systems. Section 5 concludes.

2 Labor Market and Taxation System in Italy

2.1 Empirical Evidence

In this section we describe the main characteristics of the Italian labor market in 2007-2008[4], and how it differs from the rest of the OECD countries.

In table 4, we can see that, on average, about 70 percent of women aged 26-54 years old are employed, and the figure is over 85 percent for men. There are large cross-country differences in the gender gap, which is lower than 10 percentage points in United Kingdom and US. Italy stands out for a gender employment gap of over 20 percentage points, and for the lowest employment rate of women, that is about 6 percentage points lower than the average.

There are also gender gaps in the intensity of employment participation. In all of the countries, a much larger share of female employment is part-time when compared to male employment, with an average of 34 percent for women, and only 5 percent for men. While the largest gaps in the share of part-time/full-time employment among men and women is over 40 percent, in Italy, the gender gap is lower than the average of the countries.

The gender gap is very large in the general participation rate. Italy has the lowest participation rate of women, and a gender participation gap of about 24 percentage points against an average gap of 17 percentage points. The marital status considerably affects the decision to participate, with married women having a participation rate that is about 10 percentage points lower than unmarried women. Moreover, participation rates tend to be lower for mothers. On average 73 percent of married mothers are in the labor force, but only 64 percent in Italy.[5]

Another important feature of the Italian labor market can be observed in Figure 2, where we can see that the labor force participation of married women is positively correlated to their husbands' yearly income. This is in contrast with the other countries, where the labor force participation appears to be inelastic. This characteristics of the Italian labor force participation of married women has not been explored in the literature, and is the fact that mainly motivate our project.

[4]We focus on 2007 and 2008 as they are the last two years available of EU-SILC after a few changes in the tax system that took place from 2006 to 2007.

[5]From Figure 1, we can see that the gap in participation of married and unmarried Italian women persists during the life-cycle, especially for those who have children.

To get a measure of the correlation between the labor force participation of married women and the various demographic variables available in the EU-SILC dataset and IPUMS USA, we run a simple probit regression of this kind:

$$Pr(Y = 1|X) = \Phi(X'\beta) \tag{1}$$

where $Pr(Y = 1|X)$ denotes the conditional probability of participating in the labor market, Φ is the cumulative distribution function of the standard normal distribution, and the parameters β are estimated by maximum likelihood. The vector of controls X includes information on the (logarithm of the) gross yearly income of husbands, number of children, age of the wife, and years of schooling. We also add year fixed effects. We run a separate regression for Italy and the rest of the countries considered in our data analysis.

Results are in Table 6. Note that, the signs of the coefficients on the number of children, and years of schooling are consistent across countries. The presence of children decreases the probability of participating in the labor market, and the years of schooling have a positive impact on the probability of participating. But, Italy behaves differently than the other countries in the correlation between husband's income and labor force participation. In particular, a significative positive elasticity of 0.032 characterizes the Italian data, versus a negative elasticity which ranges from 0.201 (in Germany) to 0.032 (in United Kingdom) for the remaining countries.

In summary, the Italian labor market exhibits some distinctive features. In particular, there is a disparity between men and women in the participation rate, mainly regarding the married couples. Once employed, Italian women are more likely than men to have a part-time job (or a temporary contract). The next section bridges these facts to the Italian tax system.

2.2 The Italian Tax System

In this section, we describe the main characteristics of the Italian taxation system. The technical details can be found in the Appendix.

We define the second earner of a household as the worker with the highest elasticity of labor supply to income. Generally, in a married couple, the husband is considered to be the *first earner*, who participates to the labor market with certainty. The wife is the *second earner*. Her decision to participate depends on several

economic and non economic variables. In particular, it depends on the fraction of her expected gross income that will be disposable income, net of total household taxes. To understand the impact of taxes on the the decision to work, we make use of the concept of "marginal tax rate".

Let us define the marginal tax rate (or "second earner tax rate") as follows:

$$\text{Marginal Tax Rate} = \frac{\Delta T}{\Delta I} = \frac{Tax_1 - Tax_0}{I_1 - I_0}$$

where Tax_1 and Tax_0 are the total income taxes paid by the household if the wife works (Tax_1) and if she does not work (Tax_0). I_1 is the gross household income when she works, and I_0 if she does not work (i.e. she is either out of the labor force or unemployed).

Now, depending on the unit of the fiscal system (individual or family), the marginal tax rate and the average tax rate[6] of a married woman may be significantly different than those of an unmarried woman.

But, in Italy, where the tax system is based on the individual and not on the household, we should not observe a marital status dependence of the amount of tax paid. Nevertheless, tax credits for family dependents and universal cash transfers for children are decreasing functions of the household income and indirectly affect the fiscal burden related to the labor force participation status of the wife.

Let us illustrate the mechanism put at work by the tax credits and the universal cash transfers. Since 2007, the tax system grants a tax credit for dependent spouse who earns less than $2,840.51$ euros a year, a very low yearly labor income. The amount of tax credit for dependent spouse varies between 0 and 730 euros depending on the total household's income.

Consider the following examples.

(1) Assume that an unmarried woman (not currently employed) receives an offer to work part-time earning $7,200$ euros a year. As the current taxation system includes a no-tax area for yearly income lower than $8,000$ euros, her net disposable income would increase of $7,200$ euros a year. She would pay an marginal tax rate of 0.

(2) Assume now that this same woman is married to an employed man earning

[6]That is, the ratio between the total household taxes and the gross household income

35,000 euros a year. The tax credit system would grant 720 euros to the household if she did not work. If she were to accept the job offer, she would not depend on the husband anymore, and the husband would not receive the tax credit. The household disposable income would not increase of 7,200 euros a year, but of 6,480 euros a year, i.e. $(7,200-720)$. She would pay a marginal tax rate equal to 10 percent, that is $720/7,200$.

(3) Assume the husband earns 50,000 euros a year. The tax credit system would grant 517.50 euros to the household if she did not work. She would pay a marginal tax rate equal to 7.18 percent $(517.50/7,200)$.

(4) Assume the husband earns 100,000 euros a year. He would not receive the tax credit and the marginal tax rate would be zero.

These examples show that the amount of tax credit decreases with the total household income and is zero for incomes higher than 95,000 euros a year. The universal cash transfers for children put a similar mechanism at work in married households. For unmarried mothers, they have the positive effect of reducing the fiscal burden and create positive incentives to labor force participation.

Figure 3 plots the marginal tax rates on earnings of women against gross yearly earnings. In particular, the figures on the left column plot the marginal tax rates on earnings against the women's gross yearly earnings, for a level of husband's gross yearly earnings of 40,000 euros. The figures on the right column plot the marginal tax rate on earnings against the husbands's gross yearly earnings, for a level of woman's gross yearly earnings of 40,000 euros. The top panel is for women without children, and the bottom panel is for women with two dependent children.

In panel a), we can see that the married-unmarried difference in the marginal tax is particularly relevant for low earning households. Moreover, the marginal tax rate of unmarried women is equal to that of married women when the husband is not employed, or has a very low income. The pick in the marginal tax of married women occurs in correspondence to an yearly earning of 3,000 euros. At that level of earnings, husbands are not entitled to receives a tax credit for dependent spouse, and the marginal tax rate jumps from 0 to about 30 percent.

In panel b), the marginal tax rate of married women is constant until a level of husband's income of about 8,000 euros, as the husband's income belongs to the

no-tax area, and only the income of his wife is subject to taxation. After that point, both incomes are taxed and the marginal tax increases to about 35 percent.

In panel c) and d), we plot the marginal tax rates of households with children. In panel c), we can see that low earnings unmarried mothers are subject to negative taxation, as they are eligible to universal cash transfers for dependent children, which are higher than the amount of tax that they are supposed to pay. Married mothers are subject to a high marginal tax because of the (lower) amount of universal cash transfers for dependent children transferred to the husband. As earnings increase, the difference between the tax paid by married and unmarried women decreases. In panel d), we can see the impact of the universal cash transfers for dependent children. The marginal tax rate is increasing up to a yearly household earning of about 60,000 euros. After that point, households are not entitled to receive the transfers, and the marginal tax rate decreases.

In Figure 4, the effect of children by marital status becomes clear. In panel a), we observe that unmarried women with children have a marginal tax rate which is much lower than that of unmarried women without children, as the former receive cash transfers for the dependent children. For married women (panel b), the presence of children does not affect the marginal tax rate when the household income is low. On the contrary, for medium and high incomes, the marginal tax rate is always higher for households with children (contrary to the case of unmarried women). The reason is that, for a given level of husband's income, if the wife does not work, households with children receive cash transfers and tax credits; if the wife does work, the amount of taxes to be paid with or without children is about the same. Hence, for every level of (potential) wife's income, in households with children, the difference between the taxes to be paid when working and when not working is higher than in childless households.

In summary, the Italian tax system, even if based on individuals and not on households, generates a set of negative incentives to the female labor force participation. In particular, the universal cash transfers and tax credits for dependent children and spouse increase the marginal tax of married women relative to unmarried women. This distortion is increasing in the number of children for married women, and reaches a maximum at the husband's yearly earnings of about $10,000$ to $30,000$ euros. Finally, the marginal tax rate decreases with the wife's earnings (see Figure 5), having a high negative impact on married women employed in low income

jobs, or in part-time jobs.

In the next section, we present the model and the results of the estimations.

3 Estimation and Results

3.1 The Model and the Empirical Specification

We build a two-stage model of female labor supply. In the first stage, a woman decides whether to join the labor market and search for a job. If she does, she will enter the second stage and receive, for each possible amount of work time, $h \in H \subset \Re^+$ a job offer characterized by a level of gross yearly earning $w_f(h)$. She can accept one of them or reject them all and stays unemployed ($h = 0$).

We denote with $w_m(h)$ the husband gross earnings (which is 0 if the woman is not married) and with y the household gross income coming from other sources. Both $w_m(h)$ and y are taken as given. We assume that consumption equates disposable income

$$c = D(w_f(h), w_m, y, d) = w_f(h) + w_m + y - T(w_f(h), w_m, y, d)$$

where $T(\cdot)$ is the net transfer from the government, given by the difference between tax and benefits, which are functions of total income, and also of a set of demographic variables d including, for instance, the number of dependent children.

Household preferences are described by a stochastic utility functions $U_h^m(c, X)$, with m denoting marital status (0 for unmarried, 1 for married), c the household consumption and X, a set of individual variables. Notice that the shape of the utility function is allowed to vary also with labor supply h.

We solve the problem by backward induction, starting from stage 2. A woman in the labor market will maximize utility

$$U(w_m, y, d, X) = \max_h U_h(D(w_f(h), w_m, y, d), X)$$

In this stage, a woman faces a trade-off between the utility from non working (enjoying leisure and domestic work) and the accepting a job offer that augments the disposable income of the household.

In stage 1, the agent decides whether or not to enter the labor market. The

problem is the following:

$$\max_s U_s(w_m, X, y, d) = \max\{U_{-1}(w_m, X, y, d), E\left[U(w_m, y, d, X)\right]\}$$

where $s = \{-1, 0\}$ denotes the *out of/in* the labor market state, and $U_s(\cdot)$ the utility associated. Here, the utility of being in the labor market is $E\left[U(w_m, y, d, X)\right]$, that is the expected utility generated by the maximization problem of stage 2. To make her choice, she compares the utility from not participating and the expected utility from entering the labor market.

We assume a quadratic utility function:

$$\begin{aligned} U_h^m(c, X) &= \alpha_h^m + \beta_1^m c + \beta_2^m c^2 + \gamma_h^m X + \epsilon_h^m \\ U_{-1}(w_m, X, y, d) &= U_{-1}^m(c, X) = \alpha_{-1}^m + \beta_1^m c + \beta_2^m c^2 + \gamma_{-1}^m X + \epsilon_{-1}^m \end{aligned}$$

Notice that the marginal utility of income depends on marital status. Moreover, the effect of all other variables included in X varies with both m and h.

The difference $(\alpha_h^m - \alpha_0^m)$ captures the disutility of working (utility of leisure) for an amount of time h, and $(\alpha_0^m - \alpha_{-1}^m)$ is the disutility of searching for a job. Finally, ϵ_h is a stochastic error component.

We know that if ϵ is iid according to a type I extreme value distribution, the probability of observing a woman in the labor market, opting for a choice $h = k$ is

$$P_k = P(h = k|s = 1) = \frac{e^{U_k(D(w_f(k), w_m, y, d), X)}}{\sum_h e^{U_h(D(w_f(h), w_m, y, d), X)}}$$

Similarly, the probability of being (or not being) in the labor market is $P(s = 0)$ (or $P(s = -1)$)

$$\begin{aligned} P(s = 0) &= \frac{e^{E[U(w_m, y, d, X)]}}{e^{U_{-1}(w_m, X, y, d)} + E\left[U(w_m, y, d, X)\right]} \\ P(s = -1) &= \frac{e^{U_{-1}(w_m, X, y, d)}}{e^{U_{-1}(w_m, X, y, d)} + E\left[U(w_m, y, d, X)\right]} \end{aligned}$$

Finally, for a given observation sample $\{Z_i\}_{i \in I} = \{w_{mi}, w_{fi}(h), y_i, h_i, s_i, d_i, X_i\}_{i \in I}$, we can compute the log-likelihood function:

$$
\begin{aligned}
L(\{z_i\}_{i\in I}) &= \sum_{s_i=-1} \left(U_{-1}(w_m, X, y, d) - e^{U_{-1}(w_m,X,y,d)} + E\left[U(w_m, y, d, X)\right]\right) + \\
&+ \sum_{s_i=0} \sum_{k} I(h_i = k) \left(U_k(D(w_f(k), w_m, y, d), X) - \sum_{h} e^{U_h(D(w_f(h),w_m,y,d),X)} \right)
\end{aligned}
$$

where $I(h_i = k)$ is a binary variable which equals 1 if individual i chooses $h = k$ and 0 otherwise.

3.2 The Data

We use micro data from the EU-SILC, the Community Statistics on Income and Living Conditions. The survey collects information relating to a broad range of issues in relation to income and living conditions. SILC is conducted by the Statistics Offices of the European countries involved in the project on an annual basis, in order to monitor changes in income and living conditions over time.

EU-SILC provides two types of data: cross-sectional data pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions, and longitudinal data pertaining to individual-level changes over time, observed periodically over a four years period.

Every person aged sixteen years and over in a household is required to participate to survey. Two different types of questions are asked in the household survey: household questions, which cover details of accommodation and facilities together with regular household expenses (mortgage repayments, etc.). This information is supplied by the Head of the Household; personal questions, which cover details of items such as work, income and health, are obtained from every household member aged 16 years and over. We combine household and personal information to construct a data set which contains information on the spouse of the interviewed household member.[7]

We focus on the cross-sectional information of the years 2007 and 2008. We restrict the sample to women of age between 26 to 54 years old, to avoid the modeling of schooling and retirement decisions. Descriptive statistics are in Table 3.

[7]The detailed description of the construction of the data set and the list of the variables can be found in the Appendix.

The data set provide information about gross labor income of all members of the household (w_m,w_f), and total household income. By difference it is possible to compute non-labor income (y). Nevertheless it is necessary to compute *potential* income for all possible labor supply choices $h \in H$, including for the non-employed. To correct for the selection bias a non-linear procedure is adopted.

We assume that:

$$E(w_f(h)|X) = \beta X + \mu_h(q_0(Z), q_1(Z), ..., q_H(Z)) \tag{2}$$

where X is a set of exogenous variables and μ is a given function of $q_k(Z) = Pr(h = k|Z)$, which are the probabilities that an individual with characteristic Z opts for labor supply choice $h = k$.

We consider three possible labor supply choices: $h = \{0, 1, 2\}$, where $\{0, 1, 2\}$ denote unemployment, part-time and full time employment, respectively.

The propensity scores q are estimated by a standard probit procedure, with variables Z including: age, years of work experience, dummy variables for geographical regions, dummy variables for living with the parents (if unmarried), presence of dependent children, education, and net income from other sources (both husbands income, if any, and non labor income). The marginal effects obtained from the probit regressions are in Table 7. Afterwards, we compute the percentiles of the probability of being in the labor force and employed, and we use them in the OLS estimation of the wage equation. Table 8 reports the coefficients. Finally, we use the residuals of the wage equation estimation to compute the predicted wages for part-time and full-time employment choices.

3.3 Results

The model is estimated allowing the parameters to differ between married and unmarried women. That is, we allow the elasticity of the labor force participation to change with the marital status. We include several variables that affect the decision to participate in the labor market, as age, education level, years of past work experience, region of origin, and presence of children.

The model replicates the percentage of women in the labor force, and the percentage of women who are employed (in part-time and full-time jobs). This is shown in Figure 6. In Figure 7, we plot the participation rates of unmarried and married

women with and without children. Again, the model matches the rates in all of the subcases. We obtain a similar figure for the employment rates (Figure 8). In the last three panels of Table 11, we summarize the results of the estimation for the labor force participation and the employment rates (part-time and full-time).

Figure 9 plots the realized and predicted labor force participation of married women by percentile of husbands' income. The model overestimates the participation rates of women married to husbands in the lowest and in the highest percentiles. In Figure 10, we compare the actual labor force participation rates with those generated by the model, by husband's income, education level, and presence of children. This figure confirms that the model generates the positive correlation between husband's income and participation rate of women.

It is interesting to underline that the taxation system alone is sufficient to reproduce the main characteristics of the labor market, and especially the elasticity to husband's income.

4 Alternative Taxation Systems

In this section, we use the parameters obtained from the estimation of the model to simulate the labor force participation rate and the employment rate under four different taxation systems: joint family taxation, the gender-based taxation, the Working Tax Credit, and a mixture of individual (or Italian) and joint tax systems. In Tables 9 and 10, we summarize the main characteristics of these alternative systems.

The results of the simulations are in Table 11.[8] An important issue involved in our tax simulation exercises is that when different tax units and tax systems are considered, the total tax revenue might change. We analyze what happens to the family due tax in the case of constant total tax revenue. Constant tax revenue is achieved by increasing each marginal tax rate by a constant amount.[9]

Moreover, we compute several measures of poverty to compare the effects on the well-being of individuals for each of the taxation system that we consider.

[8] It is worth noting that these are results of a partial equilibrium model where the individuals' labor choices do not affect labor earnings.

[9] The joint tax system would imply a revenue loss of about 18%; the Working Tax Credit of about 2%; the gender-based system of about 11%.

4.1 Joint Family Taxation

The joint taxation system is currently implemented in Portugal, France and Germany. It provides tax advantages to large families with low income as the average tax rate[10] decreases with the number of household components. As shown by some existing literature[11], this system creates a system of negative incentives to participation for both of the spouses, and especially for women.

We simulate a taxation system similar to the one we find in France, where the gross income is the household income divided by the number of parts (the *quotient familial*, a coefficients which increases with the number of household components).

Let Y_1 and Y_2 be the gross yearly incomes of the two spouses, q be *quotient familial*, and $t(\cdot)$ be the tax rate. Then, the amount of tax is equal to $qt((Y_1+Y_2)/q)$ instead of $t(Y_1)+t(Y_2)$. In the simulation, we drop all of the tax credits for dependent spouse and the universal cash transfers. The *quotient familial* is assumed to equal the number of the household components.

As we can see from Table 11, this tax system implies an increase in the average tax rate (from 21 to 24 percent), and an even higher increase in the marginal tax rate. The increase concerns all the marital status, regardless of the presence of children.

The participation and employment rates decrease by about 3 percentage points. Under this system, unmarried women do not change their behavior significantly. Married women are the most negatively affected. In particular, married women without children decrease their participation rate by 6 percentage points, and married women with children decrease it by 5 percentage points. In both cases, 12 shows that the participation rate is decreasing in husband's income. This is also confirmed by Figure 13, where we can see that the marginal tax rate of married women increases in husband's income (panels b) and d)) and in their own income (panels a) and c)). The reason is that, without universal cash transfers, the marginal tax rate of the second earner is now equal to $q[t((Y_1+Y_2)/q)-t(Y_1/q)]/Y_2$, which is always positive and increasing in the incomes' difference, (Y_1-Y_2).

The employment rate, both part-time and full-time, shows a similar pattern.

[10] The average tax rate is computed as the ratio between the total household taxes and total household income.

[11] See Buffeteau and Echevin (2003) for France, Steiner and Wrohlich (2004) for Germany, and Aassve, Pazienza, and Rapallini (2007) for Italy.

4.2 The *Working Tax Credit*

The American *Earned Income Tax Credit* (EITC) and the British *Working Tax Credit* (WTC) are two systems of negative taxation. The tax unit is the individual. Based on them, households where both of the spouses are employed, have the right to receive a tax credit which is increasing in the size of the family and which can even become a transfer.[12] Chote, Emmerson, Leicester, and Miles (2007) provide evidence of an increase from 45 to 55 percent in employment rates of unmarried mothers in Great Britain. Eissa and Liebman (1996) and Ellwood (2000) obtain similar results for the EITC.

We assume that individual working tax credits are of the same amount of the Italian tax credits. Moreover, we eliminate the tax credits for dependent spouse and we set the universal cash transfers to 137 euros a month for the first child and 121 euros a month for the following children, regardless of the total household income.

This system provides incentives to married women (see Table 11 and Figure 14), especially when they have children. The model forecasts an increase in participation and employment rates of about 3 percentage points. There is no change for unmarried women. Contrary to the Italian system, the working tax credit has all of the characteristics of an individual taxation system. In fact, tax credits or transfers (hence, the marginal tax rate) do not depend on the spouse's income. This is shown in Figure 15, in panels b) and d).

Another interesting features of this system is that, it provides incentives to undertake low earnings jobs. As we can see in Figure 15, the marginal tax rate is increasing in women's income and it is particularly low (or even negative) at low levels of earnings. As we can read in Table 11, the working tax credit is the only system that generates an increase in part-time employment.

4.3 Gender-based Taxation

Alesina, Ichino, and Karabarbounis (2011) have suggested a gender-based taxation system which implies low tax rates for individuals characterized by a participation rate elastic to income. In other words, they propose a lower tax rate for women than for men, regardless of the marital status. They show that, this results in a

[12]For example, in the WTC, households with two parents working at least 16 hours a week can obtain a reimbursement of 80 percent of the child care costs.

higher participation rate of women. Moreover, the increase in bargaining power due to an increase in her net disposable income, affects the division of labor inside the household in their favor.

At the same time, the gender-based taxation favors high income women and would penalize low income men. Moreover, it would imply an equal treatment of two single parent families identical in income but different in the gender of the parents. Saint-Paul (2007) underlines the fact that there is not reason to believe that participation rate of women is always more elastic than that of men. For example, single women, with and without children, do not behave differently than men. Alternatively, Saint-Paul (2007) suggest to apply a lower tax rate to supplemental hours worked, regardless of the gender.

In the simulation, we apply a 50 percent reduction in the tax rate of women, and a decrease in the amount of tax credit for dependent spouse and universal cash transfers. The lower tax rates boost the participation and the employment rate of all women. Moreover, the tax credits for dependent spouses and cash transfers continue to generate the positive correlation between labor force participation and husband's income (see Figure 16).

From Figure 17, we can see that this system leads to a decrease of the marginal tax rate of every woman, event thought it maintains a high marginal tax rate on low-income married women (as we did not change the system of tax credit and universal cash transfers). From Figure 16, we can see that this implies an increase in the labor force participation rate of every married woman, regardless of her husband's income. In particular, it increases both participation and employment rates by more than 2 percentage points, regardless of the marital status and the number of children.

4.4 Mixture Individual and Joint Tax System

In this system, we allow agents to choose between the Italian and the joint tax system. In other words, they will choose the tax system that implies the lowest amount of taxes to be paid. Once the net income has been computed, the labor supply choice is estimated as in the previous cases.

The resulting participation and employment rates have values that are intermediate between the benchmark model and the simulated joint taxation system.

From Figure 18, we can see that under this mix system, the labor force partici-

pation is higher than the benchmark for low level husband's income, but it is lower than the benchmark (and decreasing) as the husband's income increases. This is especially valid is there are children in the household.

These results are driven by the choice of the Italian system for low income household; as the income increases, households switch to the joint taxation system. When the husband's income is higher than 30,000 euros, the preferred system is the joint taxation. Unmarried women prefers the Italian system at low levels of income. As the income increases, they switch to the joint taxation.

In panels b) and d) of Figure 19, we can see that the marginal tax rate of married women is still increasing in the husband's income (as in the joint taxation system). In panel a), the marginal tax rate of married women is slightly higher than the benchmark for incomes lower than 10,000 euros. As in the joint taxation system, the marginal tax rate of married women with children is almost invariant to their husbands' income.

4.5 Welfare Implications

In order to evaluate the welfare effects of the estimated and simulated tax systems, we compute several measures of poverty. The results are in Table 12. First, let us define $y_i(j)$ as the *equivalised disposable income* of individual i in household j, that is the total income of a household, after tax and other deductions, that is available for spending or saving, divided by the number of household members converted into equalised adults.[13] Second, the poverty measures are defined as follows:

(1) Head count index: it measures the proportion of the population for whom income is below the poverty line.[14] Let $s(j)$ be the number of members of household j and P the poverty line. Then, the head count index is defined as

$$HC = \sum_i HC_i = \sum_i \left(\frac{\mathbf{1}_P(y_i^j) * s(j)}{\sum_j s(j)} \right)$$

[13]See http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Glossary:Equivalised_disposable_income.

[14]The poverty threshold is reported by Eurostat (http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/Main_Page, File: At-risk-of-poverty rate and At risk poverty threshold in the EU, 2007). In Italy, it equals 9,007 euros in 2007.

where

$$\mathbf{1}_P(y_i(j)) = \begin{cases} 1 & \text{if } y_i(j) \leq P \\ 0 & \text{otherwise} \end{cases}$$

The head count index has the disadvantage of ignoring the differences in well-being between different poor individuals.

(2) Poverty gap: it is the average, over all individuals, of the gaps between the income of individuals that are below the poverty line and the poverty line. The gap is zero for everyone else. The poverty gap is

$$PG = \sum_i PG_i = \sum_i [HC_i * (P - y_i(j))]$$

(3) Aggregate poverty gap: it measures the average transfer (in euros) to poor households that is necessary to reach the poverty line.

$$APG = \sum_i \left[\frac{s(j) * \max[(P - y_i(j)), 0]}{1,000} \right]$$

Both (2) and (3) provide the amount of transfer that has to be transferred to an individual (2) and to an household (3) to bring their expenditure up to the poverty line.

In Table 12, we see that the joint taxation system stands out for the highest head count index, that is, it implies the highest percentage of women below the poverty line. The mixture system provides the lowest measures for married women. The gender-based system decreases the poverty measures for all unmarried women.

5 Conclusions

In this paper, we use micro data from EU-SILC to estimate a structural model of labor supply. In particular, men's labor supply and incomes are given, and women decide whether to search for an occupation, and upon receiving a given job offer, they decide whether to accept a it or not.

We show that the model matches the Italian labor force participation and employment rates, and replicates the positive correlation between wife's participation rate

and husband's yearly income. Moreover, we show that the Italian individual taxation system generates disincentives to women labor supply, especially when married with children. This is due to a set of tax credits for dependent spouse and children, and universal cash transfers for children that increases the fiscal burden of low income households, and the marginal tax rate of women married to low income or unemployed men.

We then use the estimated parameters to measure the behavioral effects of alternative tax systems: joint family taxation, a system inspired by the British Working Tax Credit, the gender-based taxation, and a mixture of the Italian and joint taxation system. We show that the first implies a substantial drop in the participation rate of married women. The working tax credit and the gender-based tax systems boost the participation rate, with the effects of the former being concentrated on unskilled and low educated women. Unsurprisingly, the mixture system generates a set of results that combines those of the Italian and the joint tax systems. The participation rate is higher than that produced by the joint tax rate but lower than the benchmark. Moreover, it generates a negative correlation between the participation rate and the husband's income, as in the joint tax system.

Overall, the results of the simulations show that moving towards a system of tax credits in line with the British or the American ones, would reduce the fiscal burden of low earnings workers, mostly married women. Moreover, cash transfers that are independent of the total household income would reduce the disincentives to work created by the Italian taxation system.

We could also expect that providing incentives to low income jobs would decrease the incentives of taking up irregular jobs.

Appendix

A Details of the Italian Tax System

The methodological information on personal system, compulsory social security contributions, universal cash transfers, parameter values, and tax equation, are from OECD (2010).

In the Tables 1 and 2, we report the tax schedule, the amounts of tax credits allowed by different levels of taxable income, and the amount of universal cash transfers. The equations for the Italian system (as on page 316 of OECD (2010)), are mostly repeated for each individual of a married couple. But the spouse credit is relevant only to the calculation for the principal earner and any child credit which the spouse is unable to use is transferred to the principal.

Table 1: Italian Taxation System - Tax Schedule, Tax Credits, and Universal Cash Transfers

Tax Schedule	
Bracket (EUR)	Rate (%)
Up to 15,000	23
Over 15,001 up to 28,000	27
Over 28,001 up to 55,000	38
Over 55,001 up to 75,000	41
Over 15,001	43
Standard Tax Credits	
Level of Taxable Income (EUR)	Amount of Tax Credit (EUR)
From 8,001 to 15,000	1,338
From 15,001 to 23,000	1,338
From 23,001 to 24,000	1,348
From 24,001 to 25,000	1,358
From 25,001 to 26,000	1,368
From 26,001 to 27,000	1,378
From 27,001 to 28,000	1,363
From 28,001 to 55,000	1,338
Up to 8,000	1,840
From 8,001 to 15,000	1,338+502*(15,000-Taxable Income)/7,000
From 15,001 to 55,000	Tax Credit*(5,000-Taxable Income)/4,000
Over 55,001	0

Table 2: Italian Taxation System - Tax Schedule, Tax Credits, and Universal Cash Transfers, cont.d

Tax Credits for Family Dependents (earning less than EUR 2,840.51)	
Level of Taxable Income (EUR)	Amount of Tax Credit (EUR)
Up to 15,000	800-110*Taxable Income/15,000
From 15,001 to 29,000	690
From 29,001 to 29,200	700
From 29,201 to 34,700	710
From 34,701 to 35,000	720
From 35,001 to 35,100	710
From 35,101 to 35,200	700
From 35,201 to 40,000	690
From 40,001 to 80,000	690*(80,000-Taxable Income)/40,000
Over 80,000	0

Tax Credits for Dependent Children		
	Younger then 3 years old	Older than 3 years old
1 child	900*(95,000-Taxable Income)/95,000	800*(95,000-Taxable Income)/95,000
2 children	900*(110,000-Taxable Income)/110,000	800*(110,000-Taxable Income)/110,000
3 children	900*(125,000-Taxable Income)/125,000	900*(125,000-Taxable Income)/125,000
4 children and over	200	200

Universal Cash Transfers				
		Number of Children		
		1	2	3
Both parents	Max amount (EUR)	137.50	258.33	375.00
Single parent	Max amount (EUR)	137.50	258.33	458.33
	Max household income (EUR)	65,210	71,445	83,494

There are fiscal deductions for families that bear child care or other similar costs. That is:

- it is possible to deduct from the tax amount, the 19% of the kindergarten fees paid for children younger than 3 years old. The max amount of the deduction is 632 EUR per child, that is a max of 120 EUR per child;
- it is possible to deduct from the taxable income, the social security contributions paid for housekeeping services (the max amount is 1,549.37 EUR).
- it is possible to deduct from the tax amount, the 19% of the costs paid for services related to physically impaired household members, for a maximum amount of 2,100 EUR a year.

We do not include these deductions on the simulation of the model as there is not information available on EU-SILC data set.

B EU-SILC and Variables

Table 3: Descriptive statistics, EU-SILC 2007-2008

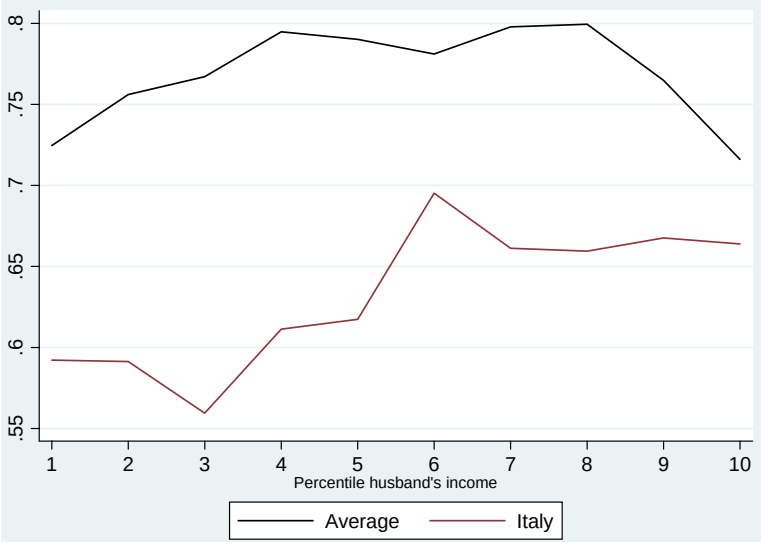
Variable	Women			
	Unmarried		Married	
	Mean	Std.dev.	Mean	Std.dev.
Number of observation	5,326		12,388	
Age	38.11	8.24	42.16	0.63
With children (%)	24.39		73.51	
Activity Rate (%)	84.73	0.36	62.74	0.48
Unemployment Rate (%)	12.36	0.33	10.30	0.30
Incidence of Part-time (%)	17.65	0.38	26.05	0.44
Average annual earnings (euros)	14,653.61	13,186.39	14,086.64	12,603.67
Hourly wage rate (euros)	9.49	7.24	9.64	7.82
Non-labor Income (euros)	18,045.01	22042.35	7,665.97	12,365.17
Average husband's earnings (euros)			18,872.72	18,661.40
Region				
North-West	23.75		19.92	
North-East	22.53		21.36	
Center	24.22		23.50	
South	21.65		25.45	
Islands	7.85		9.77	
Education				
<Secondary School	31.71		43.21	
Secondary School	39.34		38.28	
> Secondary School	28.95		18.51	

C Figures

Figure 1: Labor Force Participation of Italian Women

Source: Authors' computations from EU-SILC data (2007-2008)

Figure 2: Labor Force Participation of Women by Percentile of Husband's Income



Source: Authors' computations from EU-SILC data (2007-2008)
Note: The countries included in the average are: Germany, Spain, France, UK, and US.

Figure 3: Marginal Tax Rate

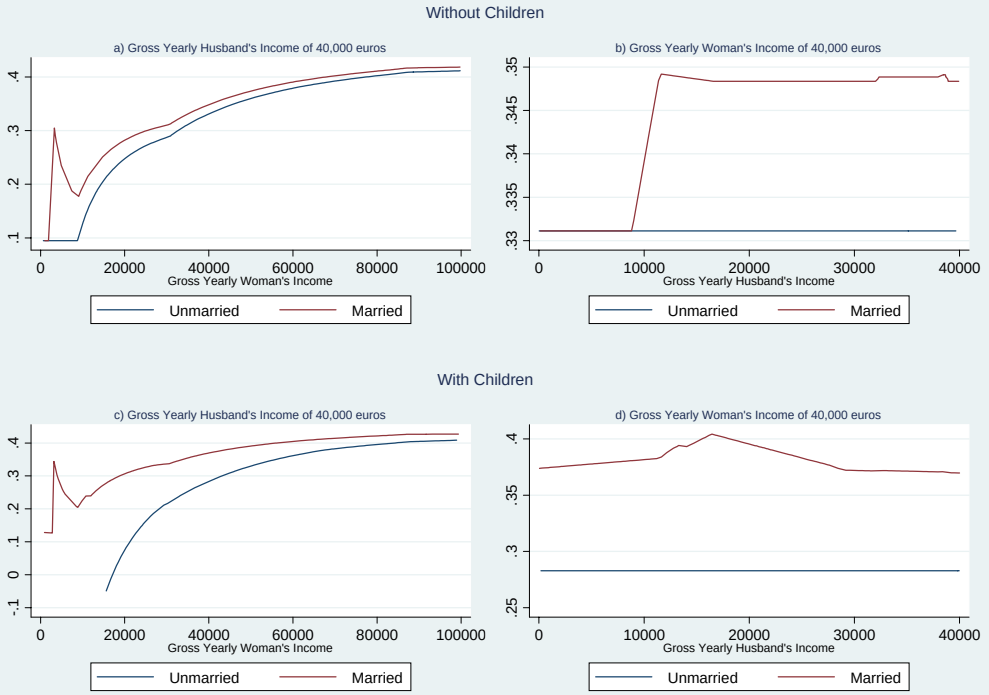


Figure 4: Marginal Tax Rate

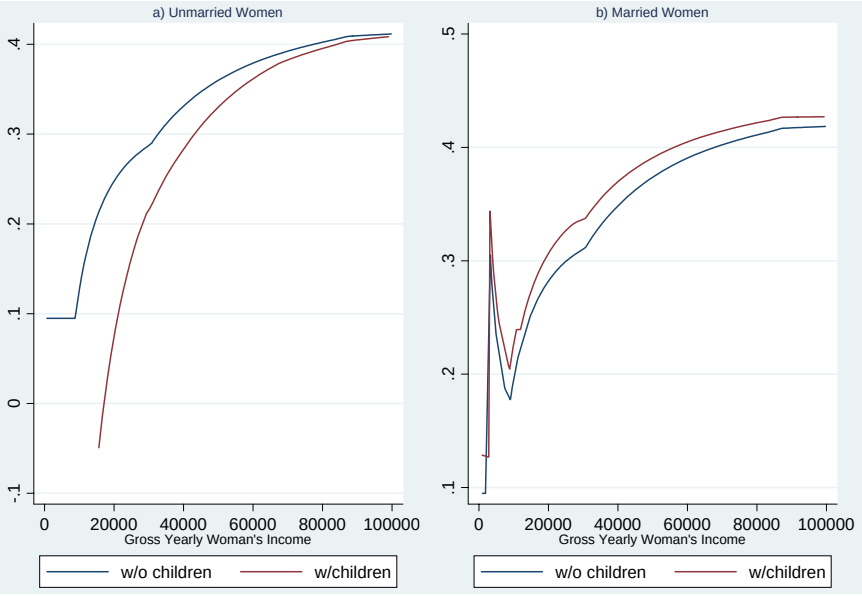


Figure 5: Marginal Tax Rate(Married) - Marginal Tax Rate(Unmarried)

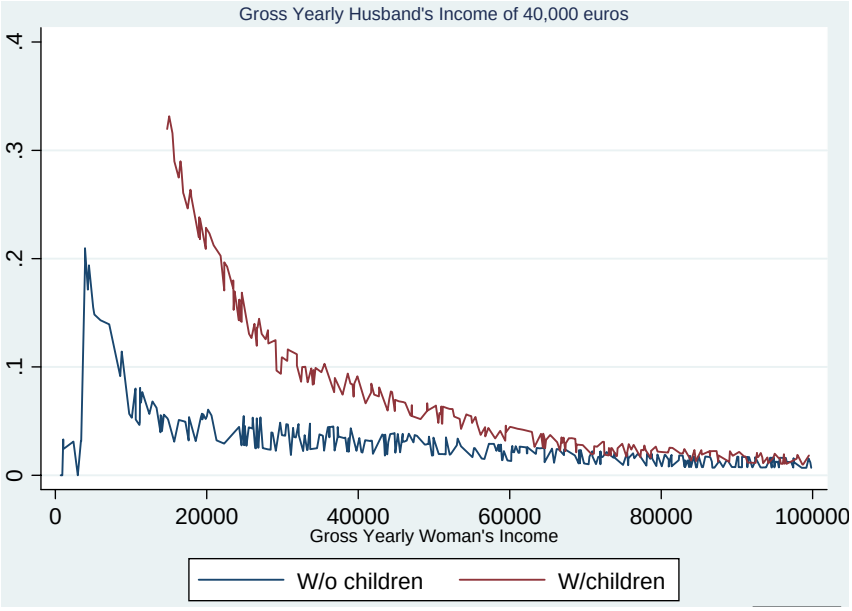


Figure 6: Results - Data vs Model

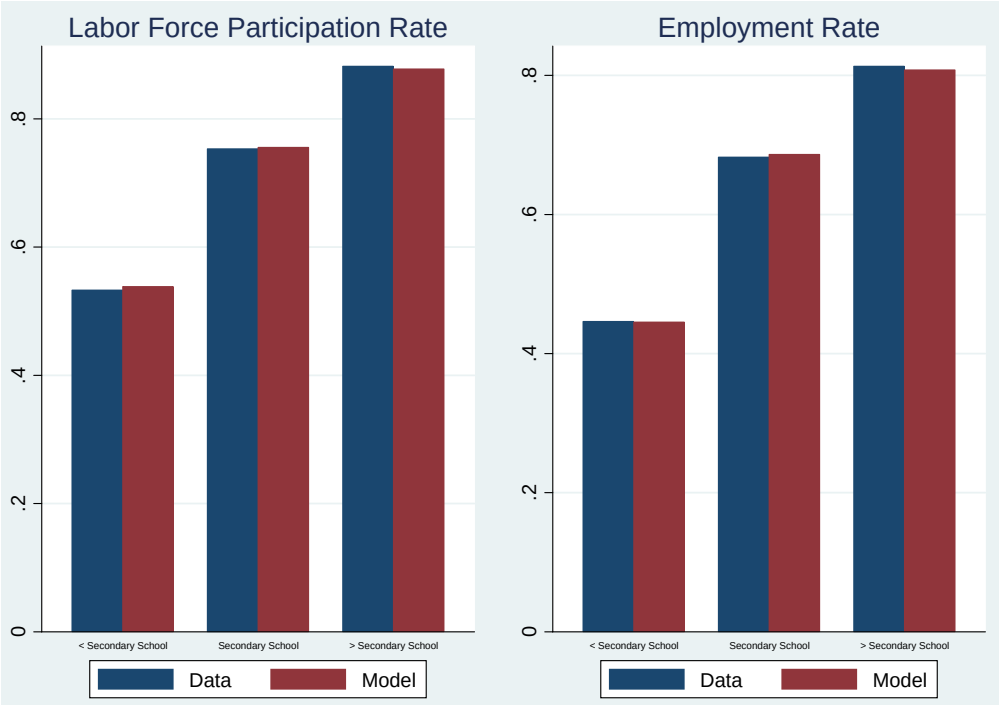


Figure 7: Labor Force Participation Rate - Data vs Model

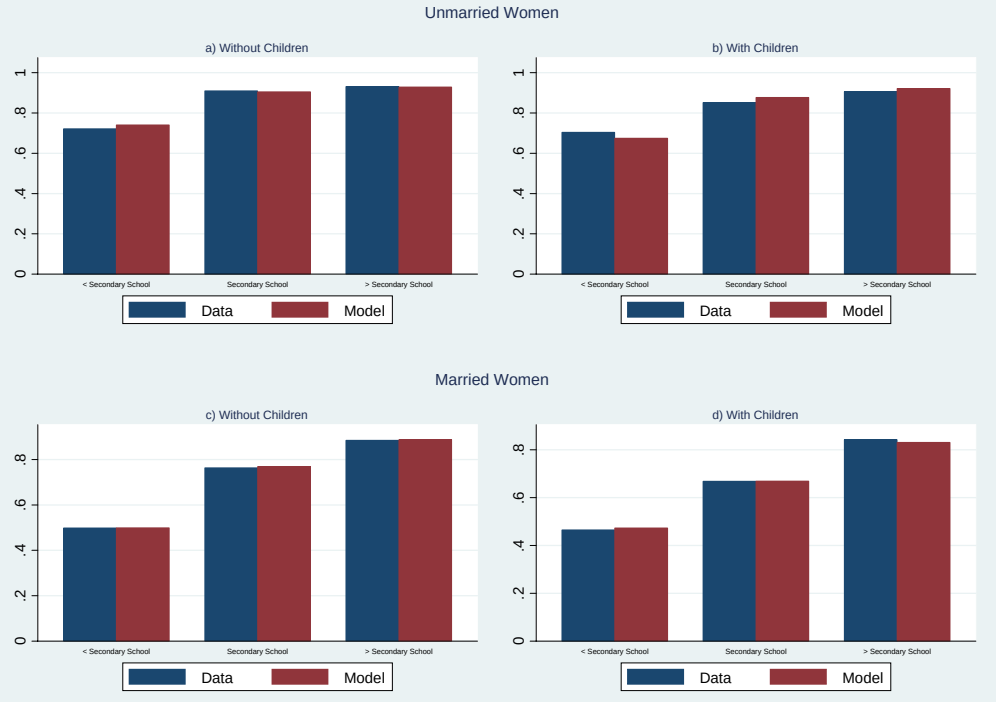


Figure 8: Employment Rate - Data vs Model

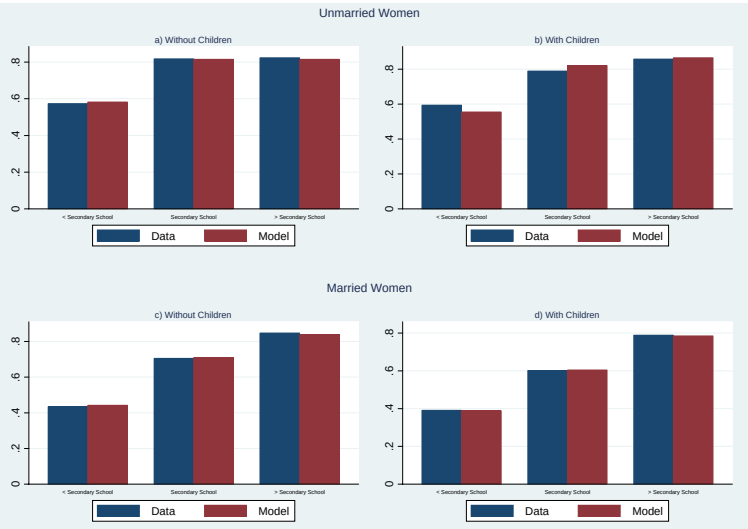


Figure 9: Labor Force Participation by Husband's Earnings - Data vs Model

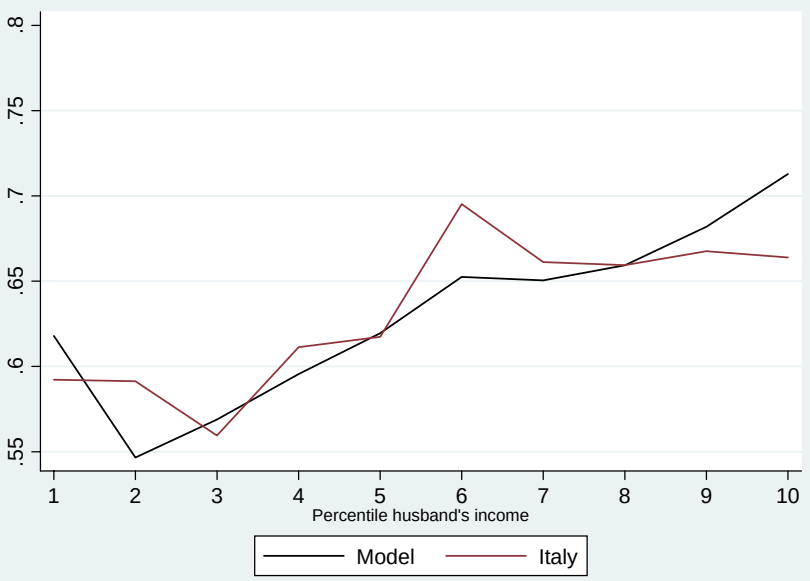
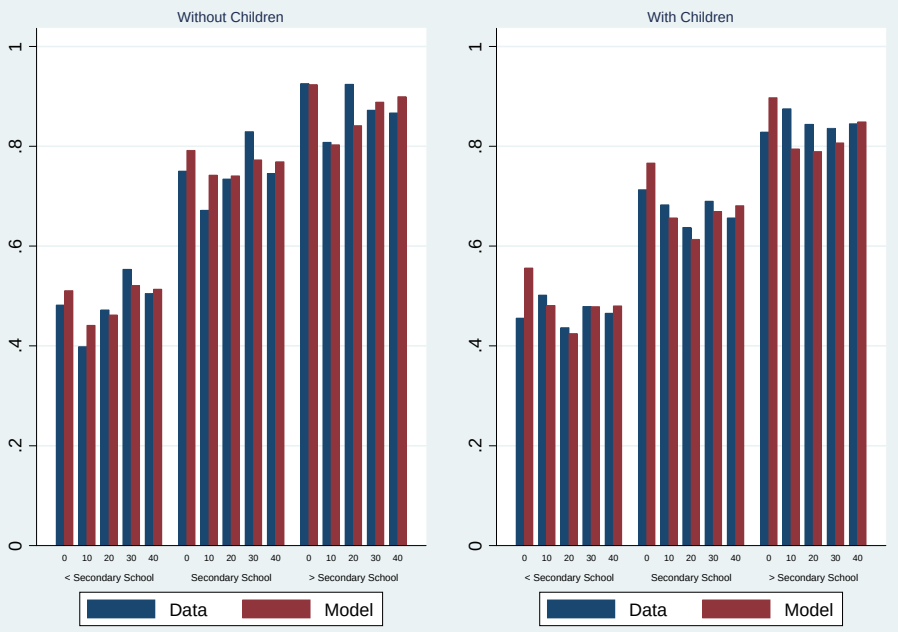


Figure 10: Labor Force Participation by Husband's Earnings - Data vs Model



Note: in the x-axis, 0 corresponds to the case in which the husband is unemployed, while $10-20-30-40+$ stands for the classes of husband's income, that is $1-10,000$ euros, $10,000-20,000$ euros, $20,000-30,000$ euros, $30,000-40,000$ euros, and $40,000$ euros and over.

Figure 11: Labor Force Participation of Italian Women - Model

Figure 12: Labor Force Participation by Husband's Earnings - Benchmark vs Joint Taxation

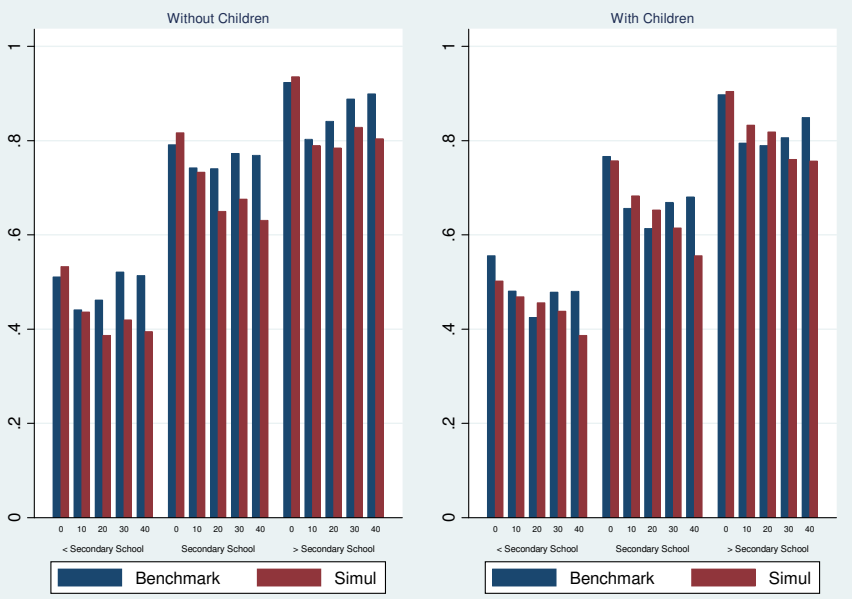


Figure 13: Marginal Tax Rate - Joint Taxation

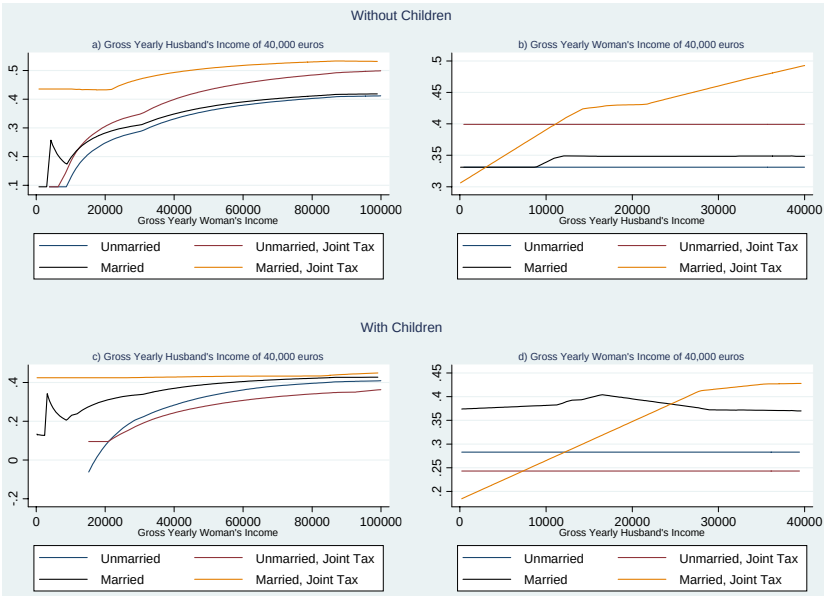


Figure 14: Labor Force Participation by Husband's Earnings - Benchmark vs Working Tax Credit

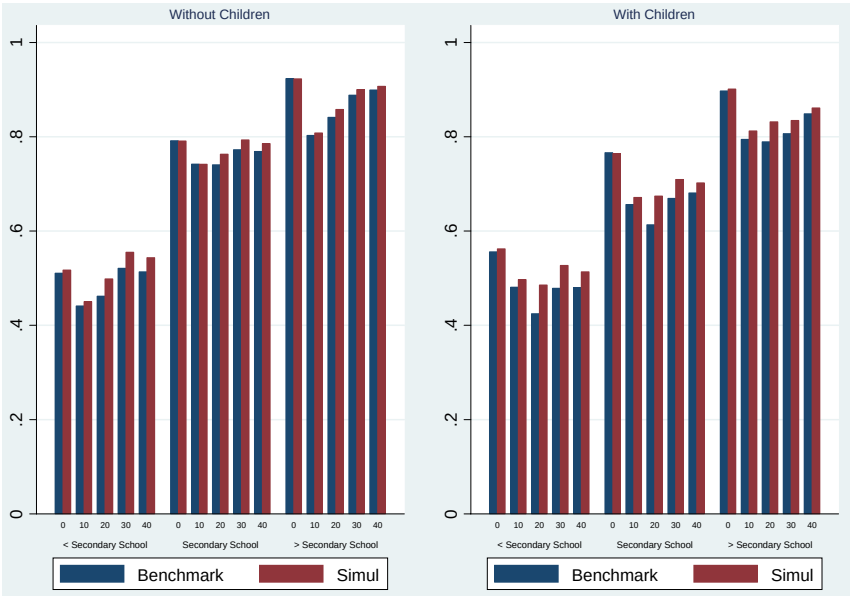


Figure 15: Marginal Tax Rate - Working Tax Credit

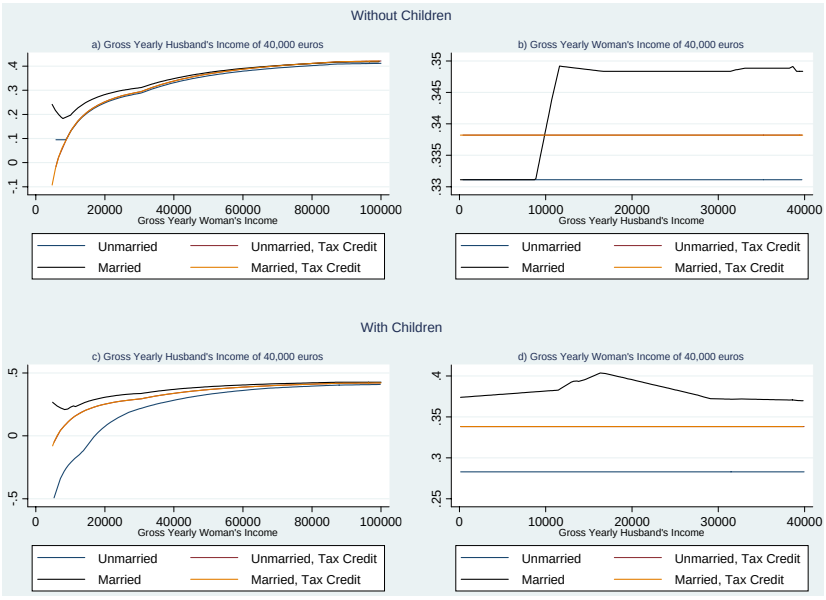


Figure 16: Labor Force Participation by Husband's Earnings - Benchmark vs Gender-based Taxation

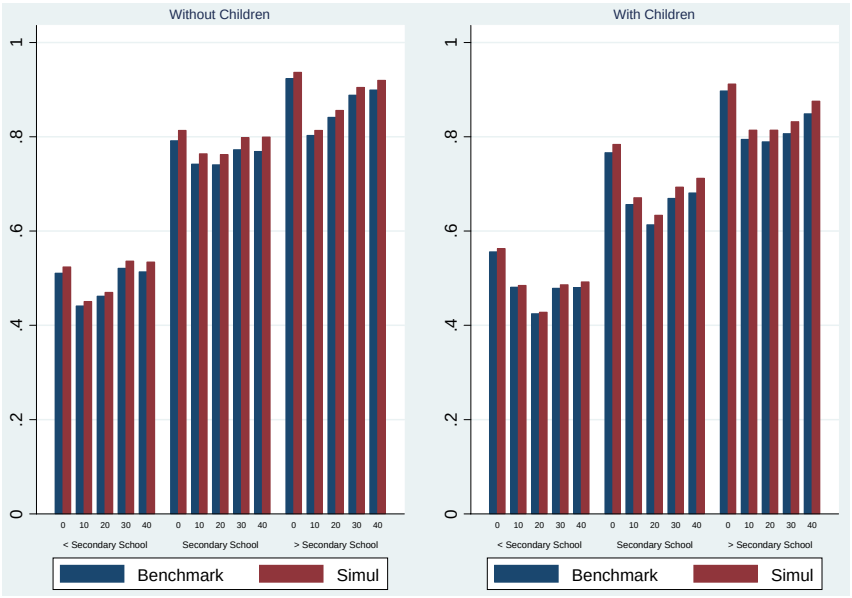


Figure 17: Marginal Tax Rate - Gender-based Taxation

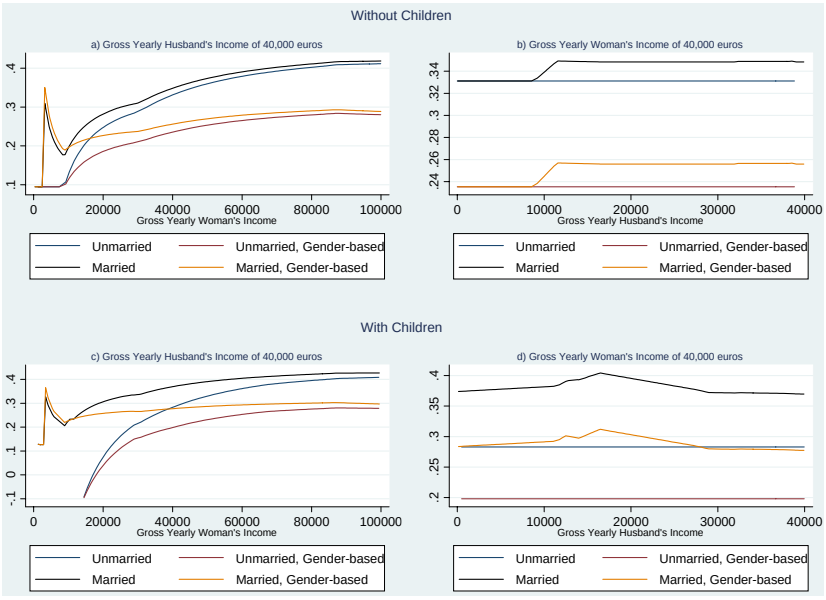


Figure 18: Labor Force Participation by Husband's Earnings - Benchmark vs Mixture Taxation

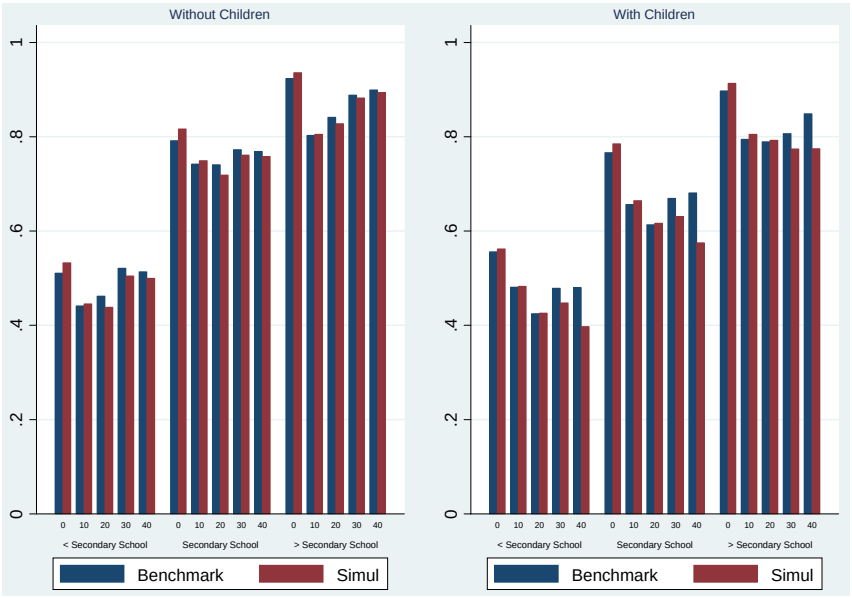
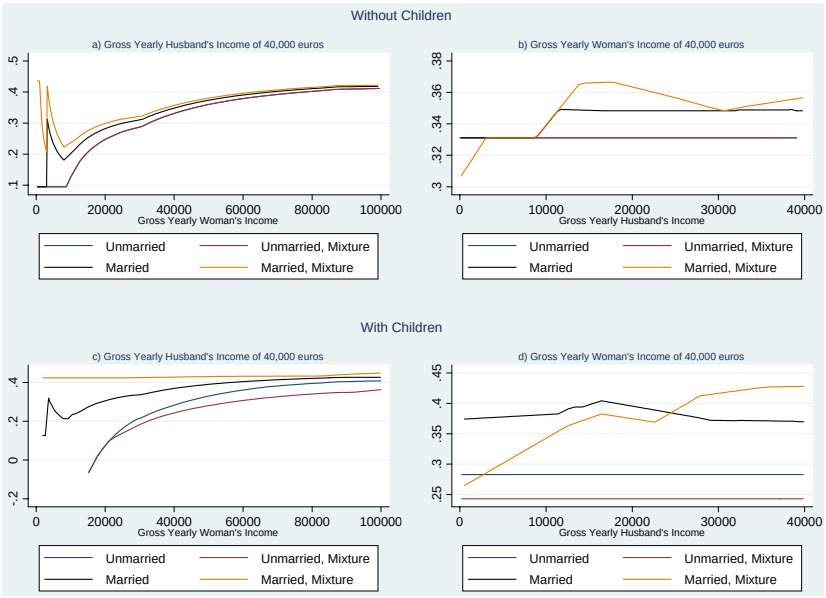


Figure 19: Marginal Tax Rate - Mixture Taxation



D Tables

Table 4: Labor Statistics for 25-54 years old, by gender, 2007-2008

	Employment rates		Share in part-time employment	
	Women	Men	Women	Men
Average	70.18	86.48	33.97	4.83
Germany	77.42	92.13	51.16	5.58
Spain	72.45	92.86	20.24	3.39
France	81.01	93.01	32.72	4.58
Italy	**64.00**	**89.82**	**22.89**	**3.71**
United Kingdom	75.82	78.41	38.73	4.69
United States	95.02	95.27	9.10	2.42

Source: Authors' computations from EU-SILC data (2007-2008) and IPUMS USA (2007-2008)

Table 5: Labor Force Participation for 25-54 years old, 2007-2008

			Married women		Unmarried women	
	Women	Men	w/children	w/o children	w/children	w/o children
Average	78.75	95.60	73.57	79.47	80.00	88.89
Germany	83.19	97.35	72.50	87.61	90.88	95.00
Spain	78.49	96.31	71.53	71.53	87.01	92.26
France	85.74	97.04	81.28	86.09	87.35	93.96
Italy	**71.72**	**95.58**	**63.76**	**65.57**	**81.53**	**86.61**
United Kingdom	76.40	79.81	81.83	90.72	71.72	77.13
United States	76.40	87.70	71.53	79.38	82.06	80.11

Source: Authors' computations from EU-SILC data (2007-2008) and IPUMS USA (2007-2008)

Table 6: Probit - Coefficients

$Y = 1$ (in labor force)	Italy	Germany	Spain	France	UK	US
log(husband's income)	0.032**	-0.201***	-0.084***	-0.096***	-0.032	-0.186***
	(0.013)	(0.021)	(0.021)	(0.034)	(0.023)	(0.002)
Children	-0.274***	-0.720***	-0.226***	-0.478***	-0.526***	-0.264***
	(0.026)	(0.039)	(0.032)	(0.067)	(0.046)	(0.004)
Age	0.086***	0.190***	0.080***	0.126***	0.064***	0.083***
	(0.008)	(0.014)	(0.011)	(0.020)	(0.013)	(0.002)
Age^2	-0.001***	-0.002***	-0.001***	-0.002***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Education:						
Secondary School	-1.090***	-0.686***	-0.927***	-0.872***	-0.786***	-1.044***
	(0.071)	(0.054)	(0.035)	(0.033)	(0.062)	(0.008)
> Secondary School	-0.539***	-0.346***	0.547***	-0.407***	-0.235***	-0.288***
	(0.033)	(0.032)	(0.040)	(0.064)	(0.043)	(0.003)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Log likelihood	-9406.54	-4564.177	-6021.921	1665.877	-2833.210	-422921.21
Obs.	16036	9235	11349	4141	6717	765408

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1
Source: Authors' computations from EU-SILC data (2007-2008) and IPUMS USA (2007-2008)

Table 7: Probit - Marginal Effects

	Unmarried Women		Married Women	
Dependent variable	$Y = 1$ (in labor force)	$Y = 1$ (employed)	$Y = 1$ (in labor force)	$Y = 1$ (employed)
Age	-0.004***	-0.001	-0.001	0.003***
(0.001)	(0.001)	(0.001)	(0.001)	
Work experience	0.001	0.001	-0.002**	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)
Living with parents	-0.051***	-0.132***	-	-
	(0.012)	(0.016)	-	-
Have children	-0.084***	-0.126***	-0.057***	-0.055***
	(0.013)	(0.017)	(0.010)	(0.010)
Partner's earnings	-0.001***	-0.001***	-0.001***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Non-labor earnings	-9.69e-07***	-5.64e-07*	-1.76e-06***	-2.16e-06***
	(0.000)	(0.000)	(0.000)	(0.000)
Education:				
Secondary School	0.108***	0.183***	0.170***	0.190***
	(0.008)	(0.011)	(0.009)	(0.010)
> Secondary School	0.133***	0.203***	0.297***	0.337***
	(0.008)	(0.012)	(0.001)	(0.013)
Regions:				
North-East	0.047***	0.065***	0.037***	0.050***
	(0.010)	(0.015)	(0.013)	(0.013)
Center	-0.002	-0.046***	-0.027**	-0.045***
	(0.011)	(0.016)	(0.013)	(0.013)
South	-0.123***	-0.286***	-0.199***	-0.256***
	(0.016)	(0.019)	(0.014)	(0.013)
Islands	-0.112***	-0.307***	-0.253***	-0.289***
	(0.022)	(0.028)	(0.018)	(0.017)
Log likelihood	-2313.844	-3119.533	-8199.144	-8479.242

Source: Authors' computations from EU-SILC data (2007-2008)

Table 8: Wage Equation - OLS, Coefficients

	Unmarried Women		Married Women	
	Part-time	Full-time	Part-time	Full-time
Age	0.041	-0.014	0.018	-0.032**
	(0.038)	(0.014)	(0.029)	(0.014)
Age^2	-0.001	0.000	-0.000	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Partner's age	0.006	-0.010	-0.012*	-0.010***
	(0.014)	(0.005)	(0.006)	(0.003)
(Partner's age)^2	9.67e-06	-0.000	-0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Work experience	0.055***	0.020***	0.025***	0.020***
	(0.011)	(0.004)	(0.008)	(0.004)
(Work experience)^2	-0.001***	-0.001***	-0.000**	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)
Partner's Work experience	-0.019	0.008	-0.007	0.007*
	(0.019)	(0.008)	(0.006)	(0.003)
(Partner's Work experience)^2	0.000	-0.000*	0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Education:				
Primary Education	-0.502***	0.007	-0.775***	-1.275***
	(0.162)	(0.056)	(0.184)	(0.102)
Lower Secondary Education	-0.607***	0.191***	-0.732***	-1.077***
	(0.133)	(0.064)	(0.173)	(0.093)
Upper Secondary Education	-0.183**	0.231***	-0.393***	-0.602***
	(0.085)	(0.071)	(0.103)	(0.052)
Tertiary Education	0.218**	0.433***	-0.135**	-0.292***
	(0.097)	(0.070)	(0.062)	(0.030)
Regions:				
North-East	0.167**	-0.064**	-0.046	-0.033**
	(0.070)	(0.026)	(0.044)	(0.025)
Center	-0.002***	-0.054*	-0.103**	-0.155***
	(0.070)	(0.025)	(0.047)	(0.025)
South	-0.315**	-0.145***	-0.408***	-0.506***
	(0.123)	(0.047)	(0.111)	(0.059)
Islands	-0.220*	-0.138**	-0.270**	-0.404***
	(0.134)	(0.056)	(0.135)	(0.071)
Ever worked	0.009	0.016***	0.010	0.026***
	(0.012)	(0.004)	(0.007)	(0.004)
(Ever worked)^2	0.000	-0.000	0.000	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Have children	-0.128*	-0.026	0.062	-0.037
	(0.063)	(0.025)	(0.044)	(0.021)
Pctile of Pr(in LFP)	yes	yes	yes	yes
Pctile of Pr(in LFP)*Pctile of Pr(empl)	yes	yes	yes	yes

Source: Authors' computations from EU-SILC data (2007-2008)

Table 11: Alternative (Revenue Neutral) Taxation Systems - Results (%)

Taxation System	Unmarried Women		Married Women		All women
	Without children	With children	Without children	With children	
			Average Tax Rate		
Benchmark Model	22.37	7.51	25.07	21.44	21.19
Joint Tax	27.36	16.66	27.82	22.38	24.12
Working Tax Credit	21.54	8.60	24.72	19.61	20.12
Gender-based Tax	17.34	5.09	23.79	21.35	19.30
Mixture Benchmark and Joint	26.99	16.40	27.37	21.87	23.84
			Marginal Tax Rate		
Benchmark Model	22.37	7.51	24.73	25.41	22.97
Joint Tax	27.36	16.66	36.37	33.26	28.31
Working Tax Credit	21.54	8.60	20.83	18.20	18.78
Gender-based Tax	17.34	5.09	20.56	21.95	19.00
Mixture Benchmark and Joint	26.99	16.40	35.11	30.03	28.95
			Participation Rate		
Data	86.69	81.09	65.32	61.82	69.48
Benchmark Model	86.43	80.82	65.42	62.05	69.54
Joint Tax	85.69	79.58	58.74	57.19	65.55
Working Tax Credit	86.41	80.60	67.29	65.43	71.62
Gender-based Tax	87.04	81.48	67.27	63.85	71.01
Mixture Benchmark and Joint	86.43	80.87	64.51	57.90	67.24
			Employment Rate : Part-time		
Data	11.53	18.51	10.67	16.18	14.27
Benchmark Model	11.55	18.35	10.69	16.15	14.25
Joint Tax	11.80	17.42	9.60	14.73	13.31
Working Tax Credit	11.75	18.37	11.15	17.14	14.89
Gender-based Tax	11.15	17.89	10.57	16.14	14.10
Mixture Benchmark and Joint	11.55	18.31	10.41	14.91	13.56
			Employment Rate : Full-time		
Data	63.05	54.43	49.22	38.87	47.42
Benchmark Model	63.15	54.33	49.07	38.94	47.41
Joint Tax	61.69	53.64	43.62	35.63	44.32
Working Tax Credit	62.94	54.10	50.42	41.16	48.74
Gender-based Tax	64.55	55.64	51.12	40.77	49.15
Mixture Benchmark and Joint	63.15	54.44	48.50	36.17	45.89

Source: Authors' computations from EU-SILC data (2007-2008)

Table 9: Alternative Taxation Systems - Main Characteristics

Bracket (euros)	Rate	Individual Tax Credit	Tax Credit for Dependent Spouse	Tax Credit for Dependent Children	Universal Cash Transfers
			Italian Taxation System		
0-15,000	23%	between 0 and 1,840 euros,	between 0 and 800 euros,	800euros per child,	137.50 euros monthly per child,
15,000-28,000	27%	decreasing in	decreasing in	decreasing in	decreasing in
28,000-55,000	38%	income	income	income	family income
55,000-75,000	41%				
more than 75,000	43%				
			Joint Tax System		
0-15,000	23%	between 0 and 1,840 euros,	0	0	0
15,000-28,000	27%	decreasing in			
28,000-55,000	38%	income			
55,000-75,000	41%				
more than 75,000	43%				
			British working tax credit		
0-15,000	23%	between 0 and 1,840 euros,	0	0	137.50 euros monthly per child,
15,000-28,000	27%	decreasing in			independent of income
28,000-55,000	38%	income			
55,000-75,000	41%				
more than 75,000	43%				

Table 10: Alternative Taxation Systems - Main Characteristics, cont.d

Bracket (euros)	Rate	Individual Tax Credit	Tax Credit for Dependent Spouse	Tax Credit for Dependent Children	Universal Cash Transfers
			Gender Based Taxation System		
			Men		
0-15,000	23%	between 0 and 1,840 euros,	between 0 and 800 euros,	800 euros per child,	137.50 euros monthly per child,
15,000-28,000	27%	decreasing in	decreasing in	decreasing in	decreasing in
28,000-55,000	38%	income	income	income	family income
55,000-75,000	41%				
more than 75,000	43%				
			Women		
0-15,000	11.50%	between 0 and 920 euros,	between 0 and 400 euros,	400 euros per child,	67 euros monthly per child,
15,000-28,000	13.50%	decreasing in	decreasing in	decreasing in	decreasing in
28,000-55,000	19.0%	income	income	income	family income
55,000-75,000	20.50%				
more than 75,000	21.50%				
			Mixture Individual and Joint		
			Agents choose between individual (Italian) and joint tax system		

Table 12: Poverty Measures - Women

		Head count Index (%) (1)	Poverty Gap (2)	Aggregate Poverty Gap (3)
		Benchmark Model		
Married	with children	15.504	442.235	21,030.047
	without children	9.459	256.793	9,491.913
Unmarried	with children	26.846	1,173.436	7,150.922
	without children	11.734	358.895	16,146.328
		Joint Tax		
Married	with children	16.524	520.412	24,747.667
	without children	9.440	256.933	9,499.081
Unmarried	with children	27.552	1,195.397	7,284.750
	without children	11.834	367.239	16,521.730
		Working Tax Credit		
Married	with children	16.554	457.929	21,776.337
	without children	9.507	249.910	9,239.425
Unmarried	with children	26.108	1,105.584	6,737.426
	without children	11.458	355.650	16,000.356
		Gender-based Tax		
Married	with children	15.595	444.291	21,127.818
	without children	9.526	257.531	9,521.187
Unmarried	with children	25.304	1,086.421	6,620.651
	without children	11.274	352.879	15,875.688
		Mixture Individual and Joint		
Married	with children	15.149	433.812	20,629.489
	without children	9.370	248.576	9,190.093
Unmarried	with children	26.748	1,155.420	7,041.131
	without children	11.616	354.682	15,956.796

Source: Authors' computations from EU-SILC data (2007-2008)

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