

LABOUR FORCE PARTICIPATION AND FAMILY POLICIES IN EUROPE: AN EMPIRICAL STUDY

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Abstract: The aim of our research is the identification of factors affecting labour force participation (LFP) in the EU in the years 1998-2007 with a specific focus made on family policies. We perform the analysis separately for men and women, taking into account differences in the LFP levels and patterns observable among age and country groups. Our main findings suggest that generally the family policies are relevant for the age groups 15-24 and 40-59 in determining their LFS, while less influential for the age group 25-39. Nevertheless, significant differences in the sign and the magnitude of the influence exist between specific policy instruments.

Keywords: labour force participation, family policies, age-group specific effects

INTRODUCTION

Over the last few decades, the continues focus of EU policy making on increasing employment was paralleled by gender specific discussion. The aim was put here on improving labour force participation of women, relative to men. Indeed, gender participation gap continues to persists, despite the fact that it decreased in the recent years. From the policy perspective, family policies were often seen as an instrument helping to close the gap. Such recognition led to formal steps taken at the European level: in 1996 the Council adopted the so called

Parental Leave Directive requiring from the member states to implement employment-related family policies permitting to reconcile the life-work balance of both men and women. More concrete, the directive was establishing a minimum of three months of parental leave on the occasion of the birth or adoption of a child. Further steps were taken at the EU summit in Barcelona in 2002. It was recommended that by 2010 member states would introduce childcare measures for at least 33% of children aged under three and for at least 90% of children between the age of three and the mandatory school age.

Considering such policy objectives, the paper investigates empirically the impact of family policies on the LFP of men and women in the EU. After offering a short theoretical background in the next section, in Section 3 we describe our empirical strategy, the data and analyse the results obtained. The last section concludes the paper.

LABOUR FORCE PARTICIPATION AND FAMILY POLICIES – A THEORETICAL VIEW

Determinants of labour supply

In the static labour supply model [Blundell and MaCurdy 1999], one can expect a diminishing demand for leisure following an increase in earnings from work. This is because the relative value of work increases with respect to leisure. This results in the so called *substitution effect*, according to which an increase in the wage rate will exercise a positive effect on labour supply. At the same time, however, the increase in non-labour income could have a negative effect on labour supply, as it enhances the valuation of leisure on the cost of labour activity. This effect is called *income effect*. Depending on the strength of the two effects, the net effect on labour supply is a priori unsure.

For the purposes of our investigation, it does make sense to consider the labour supply within a family or household framework. This context delivers a series of relevant considerations in terms of determinants of labour supply. Indeed, for each individual within the family, the income effect will depend not only on the own non-labour income, but also on wage and non-wage income of the other family members. Additionally, the decision over participation in the labour market could depend on other factors, like fertility rate, or labour market policy interventions, like taxation or the family policies [Blundell and MaCurdy 1999]. With this respect, the arrival of the family policies might result in disequilibrium, followed by an adjustment process towards a new equilibrium situation corresponding to a higher level of labour market participation. But the new equilibrium conditions will crucially depend on the precise characteristics of family policies. For instance, better childcare opportunities will incentive to increase the labour force participation, only if the wage rate – net of the cost of childcare – is sufficiently high to result in a positive substitution effect. On the contrary, long and

well-paid parental leave might contribute to a strong and long-lasting income effect, with the depressing effect on the life-time level of labour force participation.

Family policies

The broad group of family policies refers to different policy measures. According to Eurostat and OECD, a distinction often adopted is between family allowance, maternity and parental leave, other cash benefits and daycare. Such policies are part of a broader category of welfare-state policies. But more precisely, family policies are expected to impact in one way or another LFP of both men and women. Indeed, they influence the time distribution between working and family-related activities. The direction of the precise influence could favor either work or family, depending on the policy design and political goals adopted. For instance, long and generous maternity leave schemes could exercise a negative effect on women's LFP, as they would sustain income effect. Conversely, short and unpaid parental leave should enhance LFP of both men and women, as they would increase the opportunity cost of staying at home with respect to working and earning positive labour income.

From the above discussion it emerges that due to different policy priorities, the average outcome of the family policies on the labour market will be unsure, with diametrically different tendencies generated by single family policy measures. More precisely, Thevenon (2011) identifies six main goals of family policies: 1) poverty reduction and income maintenance, 2) direct compensation for the economic cost of children, 3) fostering employment, 4) improving gender equality, 5) support for early childhood development, and 6) raising birth rates. Regarding the third, the sixth and partly the fourth goal one could expect that they should encourage pro-LFP family policies. The remaining goals, instead, would be favourable to policy measures diminishing LFP. The effect here could be expected to be stronger for women than for men, given that women still more often assume family responsibilities. Thus, it becomes clear that the impact of family policies is ambiguous and as such is an empirical matter.

ESTIMATION STRATEGY

The main estimation strategy consists in estimating our baseline model considering different age groups and different geographic composition of the countries in the sample. More precisely, our overall sample consists of men and women from the 21 EU member states, observed annually over the period 1998-2007 and divided in four age groups: young (15-24), two prime-age groups (25-39 and 40-59) and old age group (60-64). In that way, we cover almost the whole working force, but moreover we are able to observe the between group heterogeneity that is perceived when looking at the specific determinants of labour force participation of men and women.

Concerning the empirical strategy, after comparing the results from different procedures, we decided to present the outcomes obtained from the heteroskedasticity robust pooled OLS and from feasible GLS (FGLS). The choice of pooled OLS is driven by the fact that we want to explore the panel dimension of our dataset and at the same time account for age group and country group effects, in addition to time dummies. In that vein, we consider pooled OLS superior over fixed or random effect estimations that would save some degrees of freedom, but at the same time would cancel out group specific effects that do not vary over time, yet are of interest for our conceptual framework. Moreover, we checked for the first order serial correlation in residuals that appeared to be a potential issue.¹ In this case, when $E(u, u') \neq \sigma^2 I$, it is reasonable to make use of feasible GLS rather than pooled OLS (Wooldridge, 2002). For this reason, after the first set of estimations, in which we compare FGLS to pooled OLS results, we configure our main estimations around the former method.

The model

The baseline model to estimate, each time separately for men and for women, is given by:

$$p_{kat} = \beta_1 + \mathbf{X}'_{kat}\beta_2 + \mathbf{Y}'_{kat}\beta_3 + \mathbf{Z}'_{kat}\beta_4 + \varepsilon_{kat} \quad (1)$$

where p_{kat} refers to the labour market participation rate, either of men or of women in country k , age group a and at time t . Nevertheless, in order to investigate more precisely whether there is some specific impact coming from our family policy variables on full-time participation, we compare the estimations using alternatively overall and full-time LFP rates. More precisely, overall LFP measures the average rate for men and women involved in either part-time or full time employment. Instead, full-time LFP refers to those being actively involved in full-time employment (or search thereof). In vectors \mathbf{X}_{kat} , \mathbf{Y}_{kat} and \mathbf{Z}_{kat} we classified our explanatory variables that, respectively, might be labeled as standard determinants of LFP considered in the past literature, or they refer to the public expenditure on family related policies, or, finally, they include age-group, time or regional dummies, depending on the specification.

More precisely, among the standard determinants, authors were usually considering some measure of potential earnings in order to account for the net outcome of two opposite effects, substitution effect and income effect, operating when persons are to choose between being active or not on the labour market. The positive net balance between the substitution and income effect will determine higher labour market participation [Blundell and MaCurdy 1999; Klasen and Pieters 2012]. Such effect might be expected to be stronger for women than for men, given that the former belong relatively more often to the not working part of

¹ For the reference on the methodology used, see Drukker D. M. (2003) Testing for serial correlation in linear panel-data models, *Stata Journal* 3, 168 – 177.

the population, for which the increase in wages provokes only the substitution effect to operate [Klasen and Pieters 2012]. The problem here is, however, in choosing the appropriate measure of the potential earnings. Taking average wages, observed for a specific age group, they reflect the actual earnings of the working population, so they more likely match the skills and thus self-selection into a particular group rather than determining the decision to participate or not. Moreover, it might be argued that not the level but an increase in wages might be more incisive in influencing the decision to participate.² As a proxy measure of potential earnings, the past literature used some measures of educational attainment of each particular age group.³ Our choice was to apply both the growth rate of wages and two measures of educational attainment, namely, the percentage ratio of persons with the secondary school and university attainment to the total population.

Other standard determinants comprise fertility rate, part-time employment and unemployment rate. Regarding fertility, it can be argued that becoming parents (mothers or fathers) should potentially influence the choice between assuming family responsibilities and market activity. In particular, the intensity of tasks connected with the parental responsibilities make parents leave the job market at least in the very first period of the child's life. However, the role played by public policies aiming at reconciliation between work and family would justify the positive association between fertility and labour market participation [Sleeboos 2003]. For women, the past literature on the link between LFP and fertility provides more evidence that there would be a negative association between both [Xie 1997; Kumar et al. 2006]. Additionally, Genre et al. (2010) find that such a negative impact is only observed, if country specific coefficients are allowed. Nevertheless, the reversal causality has been also investigated. Accordingly, in a study related to the UK women's labour market participation and fertility, McNown and Ridao-Cano (2005) find some evidence confirming reversal causality existing between the two variables. For men, both conceptual and empirical framework is missing, but we believe that similar arguments as for women are valid - all the more in a context of an increasing tendencies towards equalization between men and women. In our investigation, thus, we adopt the hypothesis that fertility might determine the decision to participate of both men and women. Moreover, we believe that this association is valid within the same year, but to cope with the endogeneity issues, we estimated our baseline specifications with fertility instrumented with its lags. The results confirmed the ones obtained without the instrumentation.

² Additionally, not the increase in real but in nominal wages might be more important in practice, given that this kind of information is more available for an average potential worker.

³ For the discussion of this and other determinants, see Genre V., Gomez Salvador R., Lamo A. (2010) European women: why do(n't) they work, *Applied Economics*, 42, 1499 – 1514.

Regarding part-time employment, the opportunity to reduce the working hours could additionally alleviate the balance between family responsibilities and working [Genre et al. 2010]. Nevertheless, we expect that the inclusion of the share of the part-time employment as an indicator of part-time opportunities might be sub-optimal. This is because the share of the actual part-time employment might not exactly correspond to the underlying framework of part-time jobs being available on the market. Moreover, there might exist endogeneity problems when including both part-time and unemployment variable, because both could result from similar economic causes related to the business cycle situation. This notwithstanding, to remain coherent with the past literature, in the first specification we include part-time employment.

Finally, unemployment rate is aimed to measure the prevailing economic circumstances and business cycle developments that could in principle have also some influence on labour force participation patterns [Bover and Arellano 1995; Genre et al. 2010].

We focus on different types of family related policies included in vector \mathbf{Y}_{kat} .⁴ Among them, we consider public expenditures as a share of per head GDP given as family allowance, parental leave, other cash benefits and daycare assistance. In the first set of estimations, we consider such policy variables irrespectively of the age group. Subsequently, however, and given the strong evidence showing the importance of age group differences, we interact each of the family policies with the three age group dummies, namely, for the groups 15-24, 25-39 and 40-59.

Finally, vector \mathbf{Z}_{kat} includes all remaining variables and, in particular, different dummy variables. More precisely, we include year dummies and – when suitable - age group dummies.

Data source and variables' definitions

Our major source of data constitutes Eurostat that provides extensive statistical information on labour market variables (including the aggregated data from the Labour Force Survey), on education and training, on income, social inclusion and living conditions as well as on social protection. Additionally, we referred to the OECD Social Expenditure database from which we obtained the information on public expenditure on family.

The variable of interest in our analysis refers to the labour force participation rate, measured as an annual average separately for men and women. This is defined as active persons in percentage of same age total population, where active

⁴ We have data on family related policies both aggregated and separately for different instruments. In our regressions, we concentrate on differences in the influence exercised by each single instrument, so we include only disaggregated variables. This notwithstanding, we run also the regressions with the aggregated variable that - probably due to differences in the direction of influence between single instruments - was almost always insignificant.

population comprises actually working and unemployed but currently searching work persons. Alternatively, in order to disentangle effects that are typical for full-time labour market participation, we consider two further dependent variables, namely, overall LFP and full-time LFP. The former is defined as the average (over men and women) labour market participation rate, whereas the latter expresses the residual rate between the overall LFP and the part-time employment rate.

Wage growth rate expresses the percentage change in the nominal wage index on the previous period. We include an educational variable, being the percentage share of the population with the secondary and tertiary educational attainment. Those variables are gender specific in our main estimations, whereas they are averaged over genders, when we estimate the equations for overall and full-time LFP.

Fertility rate is measured for each age group as the number of births to mothers of each group to the average female population of this group. Given the endogeneity concerns expressed before regarding fertility, we instrument this variable with its lags, as well as by including a variable expressing the number of children below 15 years for each woman in a given year.

The part-time variable expresses the part-time employment as percentage of the total employment. Regarding our measures of the economic conditions, we included the unemployment rate of the total population.

The original family policies variables refer to four distinctive categories of public expenditures expressed in current US \$ PPPs per head of population. The four categories include family allowance, maternity and paternal leave, other cash benefits and, finally, day care / home-help services. Nevertheless, given the differences in the degree of economic development still existing between the EU members, to enhance the interpretation of our results, we transform the per head of population variables into per head GDP measures. To this end, we retrieved the data on GDP per capita and on population from Penn World Tables (variables *cgdp* and *pop* from the version 7.1 of the database). Finally, all the policy variables are expressed in terms of natural logarithm.

In Table 1, we show the descriptive statistics referring to our dataset. LFP variables confirm the discussion offered in the previous section that men are on average more active than women. On the contrary, women are more often graduating from the tertiary education, whereas apparently no difference can be observed regarding the secondary educational attainment. The remaining variables are not gender specific.

Overall, we have the maximum of 840 observations, but for some variables, like fertility, this number shrinks to a little more than 618. Finally, the panel is unbalanced, as for some variables (educational attainment in particular) there are some observations missing in particular years. As the results, for our estimations we have around more than 430 observations, if the entire sample is considered

Table 1. Descriptive statistics

	Obs.	Mean	St. Dev.	Min.	Max.
LFP men	840	65.3	26.5	9.3	97.0
LFP women	840	53.4	25.2	3.1	91.4
LFP overall	840	58.4	25.5	6.8	92.8
LFP full-time	798	51.1	28.9	0.0	90.3
Standard determinants:					
Wage growth	840	1.70	0.80	-0.1	4.7
Uni men	738	0.28	0.11	0.001	0.64
Uni women	738	0.39	0.17	0.002	0.94
Sec. edu. men	742	0.56	0.17	0.013	1.43
Sec. edu women	742	0.60	0.18	0.015	1.17
Fertility	618	0.04	0.03	0.001	0.1
Part-time	798	8.50	9.30	0.7	60.8
Family policies:					
Family allowance	828	11.4	1.20	8.6	13.7
Parental leave	828	10.1	1.50	6	12.4
Other cash benef.	788	8.80	2.10	3.8	13.6
Daycare	828	10.9	1.50	7.4	13.5

Source: own calculations

Results

Comparing the outcomes reported in Tables 2 and 3, the results from the pooled OLS and FGLS estimations seem to broadly indicate the same direction of impact. In particular, among the standard determinants of labour force participation, wage growth doesn't seem to produce any significant effect. Instead, the educational attainment variable in terms of the tertiary education has a clear negative impact especially on women's LFP. This might be explained with the fact that through the university education women prolong their staying outside of the labour market even for a time going beyond their graduation: once completed the studies, they decide to set up family and become mothers. For men, this effect doesn't appear, although they seem to take some time out on the occasion of offspring, as the fertility variable would suggest. Finally, the part-time variable for both men and women (with a stronger effect for women than for men) suggests a positive impact on the LFP. Nevertheless, as mentioned before, this variable might be somehow misleading, as it measures the actual rates of the part-time employment and not the job market opportunities for part-time occupation. For that reason, we do not include this variable in the alternative specification.

Table 2. Determinants of men's labour force participation in the EU

	OLS		FGLS		OLS		FGLS	
<i>Standard determinants:</i>								
Wage growth	-0.212 (0.460)		-0.120 (0.173)		-0.553 (0.450)		-0.334 (0.173)	*
Uni	0.968 (3.012)		-0.824 (1.331)		-0.688 (3.145)		-1.195 (1.408)	
Sec. edu.	-7.364 (1.829)	***	-4.864 (0.780)	***	-1.680 (1.689)		-0.464 (0.862)	
Fertility	-45.220 (23.587)	*	-45.426 (14.694)	**	-90.769 (25.154)	***	-86.068 (13.363)	***
Unemployment	-0.077 (0.091)		-0.002 (0.042)		-0.112 (0.083)		-0.046 (0.040)	
Part-time	0.394 (0.046)	***	0.396 (0.032)	***				
<i>Family policies:</i>								
Family allowance	1.058 (0.455)	**	0.348 (0.203)	*	0.544 (0.456)		0.199 (0.183)	
Parental leave	-0.734 (0.283)	**	-0.303 (0.152)	**	-2.234 (0.374)	***	-1.181 (0.210)	***
Other cash benef.	0.704 (0.144)	***	0.595 (0.084)	***	0.651 (0.167)	***	0.477 (0.084)	***
Daycare	-1.052 (0.365)	**	-0.876 (0.183)	***	0.740 (0.470)		0.240 (0.213)	
<i>Other</i>								
Age group dummies	yes		yes		yes		yes	
Time dummies	yes		yes		yes		yes	
R2	0.939				0.928			
Wald			12607				15906	
N. obs.	438		438		450		450	

Note: *, ** and *** refer to 1%, 5% and 10% significance level, respectively. OLS means estimation the pooled OLS model, with heteroskedasticity-robust error terms. FGLS – feasible GLS model for serial correlation. Collinearity tests were applied, checking for and excluding all variables with VIF higher than 10. In parenthesis standard errors are reported.

Source: own calculations

Table 3. Determinants of women's labour force participation in the EU.

	OLS	FGLS	OLS	FGLS
<i>Standard determinants:</i>				
Wage growth	0.369 (0.608)	0.390 (0.402)	-0.152 (0.644)	-0.923 (0.330) **
Uni	-9.691 (2.790) **	-9.257 (1.904) ***	-7.729 (2.798) **	-5.025 (0.433) ***
Sec. edu.	2.415 (3.259)	-3.309 (1.806) *	12.649 (3.241) ***	9.087 (1.765) ***
Fertility	44.997 (35.697)	113.921 (25.375) ***	-109.113 (37.857) **	-77.823 (24.150) **
Unemployment	-0.379 (0.125) **	-0.029 (0.083)	-0.567 (0.127) ***	-0.376 (0.073) ***
Part-time	0.822 (0.054) ***	0.851 (0.041) ***		
<i>Family policies:</i>				
Family allowance	-0.440 (0.652)	-0.486 (0.333)	-1.030 (0.689)	-0.299 (0.328)
Parental leave	2.423 (0.372) ***	1.872 (0.242) ***	-0.626 (0.534)	-0.256 (0.216)
Other cash benef.	-0.276 (0.217)	-0.487 (0.138) ***	-0.345 (0.261)	-0.830 (0.140) ***
Daycare	-2.091 (0.603) **	-1.576 (0.340) ***	1.536 (0.692) **	0.839 (0.278) **
<i>Other:</i>				
Age group dummies	yes	yes	yes	yes
Time dummies	yes	yes	yes	yes
R ²	0.793		0.730	
Wald	4494		8101	
N. obs.	438	438	450	450

Note: *, ** and *** refer to 1%, 5% and 10% significance level, respectively. OLS means estimation the pooled OLS model, with heteroskedasticity-robust error terms. FGLS – feasible GLS model for serial correlation. Collinearity tests were applied, checking for and excluding all variables with VIF higher than 10. In parenthesis standard errors are reported.

Source: own calculations

Regarding the family policy variables, they seem to have significant influence on the LFP of both men and women, however, with some degree of variability between different forms, genders and econometric specifications. In particular, for men family allowance has a positive impact. Parental leave maintains a negative influence. The clearest positive influence comes from other cash benefits that seem to stimulate men's LFP. A similar conclusion is valid also for women. Additionally, the daycare assistance seems to play also a significantly

positive and strong influence in enhancing women's labour involvement. Instead, no clear statement can be made for family allowance and for parental leave variable.

Table 4. Determinants of labour force participation for men and women – age group specific effects

Age	Family policies	Man	Woman
15 - 24	Family allowance	-1.191 (0.509) **	-1.672 (0.473) ***
	Parental leave	-5.819 (0.161) ***	-6.500 (0.259) ***
	Other cash benef.	0.893 (0.182) ***	0.948 (0.203) ***
	Daycare	2.881 (0.436) ***	4.399 (0.436) ***
25 - 39	Family allowance	1.796 (0.256) ***	1.071 (0.334) **
	Parental leave	-0.255 (0.173)	0.769 (0.306) **
	Other cash benef.	0.095 (0.083)	-1.164 (0.174) ***
	Daycare	-0.636 (0.246) **	-0.422 (0.382)
40 - 59	Family allowance	-0.476 (0.239) **	-4.939 (0.874) ***
	Parental leave	-0.799 (0.092) ***	1.955 (0.485) ***
	Other cash benef.	0.887 (0.073) ***	-0.384 (0.262)
	Daycare	0.965 (0.195) ***	3.635 (0.831) ***
	Age group dummies	no	no
	Time dummies	yes	yes
	Wald	18628	8608
	Observation number.	450	450

Note: *, ** and *** refer to 1%, 5% and 10% significance level, respectively. All estimations were run according to the FGLS model, accounting for heteroskedasticity and serial correlation. Collinearity tests were applied, checking for and excluding all variables with VIF higher than 10. In parenthesis standard errors are reported.

Source: own calculations

Given, however, remarkable differences in the labour force participation of both men and women and between age groups, we performed further estimations trying to disentangle such age-group specific effects of family policies. The results

are summarized in Table 4 where we report the coefficient estimated for the interaction terms between the family policy measures and the three age-groups dummies. For brevity, we do not report the results for the standard determinants. Summarizing the results, independently of the age group and country group, family allowance exercises negative effect on labour force participation. This is true for women and almost true for men, except for the case of the first prime-age men group for whom enhanced participation due to paternal leave appeared to be the case. Also rather clear pattern of influence could be confirmed for maternity leave that for women contributed to more intensive labour force participation. Other cash benefits were influencing men almost always positively, whereas the evidence for women is mixed. Finally, similar but the reverse conclusion regards the daycare expenditures.

CONCLUSIONS

The importance of enhancing LFP of women and – related to this – of closing the gap in the labour market participation between men and women has been often confirmed in the European and national policy making. One of the ways to achieve such goals is supposed to be through adequately designed family policies. Nevertheless, due to a variety of other goals often assigned to family policies, the achievement of higher LFP is not assured.

Our study confirms generally that family policy variables have some significant influence on the LFP of both men and women. There seem, however, to exist differences between different forms, genders and age groups. In particular, family allowance has a positive impact for men. Parental leave exercises on average negative influence. The clearest positive effect on LFP of men and women comes from other cash benefits. For women the daycare assistance seems to play a particularly important role in enhancing their labour involvement. Also between the age groups differences in the influence persist. Whereas family policies were effective for the youngest women and women in the age group 40-59, the impact on the intermediate age group was very moderate.

From the policy perspective, thus, the establishment of particular forms of family policies should first of all clearly set the precise goals to achieve. Moreover, if the goal is the enhancement of labour force participation of women, the precise design of policy measures should account for significant differences in effectiveness of such policy schemes.

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