THE EFFECT OF FLEXIBILITY IN WORKING HOURS ON FERTILITY: A COMPARATIVE ANALYSIS OF SELECTED EUROPEAN COUNTRIES

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Abstract

The main aim of this paper is to measure the extent to which part-time work enhances fertility for married or cohabiting women of fertile age. The study covers eleven European countries. The data used are a pool sample of five waves of the European Community Household Panel. Given that we believe that the decisions concerning fertility and labor market status are taken jointly, we carry out a simultaneous estimation approach.

Results suggest that policy makers wishing to implement adequate part-time schedules so as to enhance fertility should look at the part-time schedules available in Belgium, Ireland and The Netherlands, which enhance fertility for women who take advantage of this flexibility measure so as to reconcile family and work.

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Introduction

Reconciliation of work and family life has long been an issue of great concern for the Council of the European Union and the Ministers for Employment and Social Policy (Resolution December 15, 1997 and Resolution June 6, 2000). European policymakers encourage implementation of measures such as flexible working hours, increase in public childcare provisions, broad availability of parental leave , etc. to help women to combine their labor market career with childbearing. However, the real impact of these measures on fertility is an empirical issue. Our main goal in this paper is to understand better women's behavior regarding fertility and their situation in the labor market. We focus on the relationship between flexibility of working hours, more specifically part-time work, and women's decisions concerning fertility in eleven European Community countries.

The question we try to address is whether the available part-time working schedule in the different countries has any impact on the decision of whether to have a child. Our ultimate goal is to learn whether a part-time job may be a good way to reconcile work and maternity for labor-market oriented women, given that we believe that these women decide over these issues (having a child and working part-time) simultaneously.

However, part-time work is not equally legislated in all the different European countries. Part-time workers' social benefits differ from country to country so that this option is not equally attractive to female workers from different countries. Moreover, labor market alternatives to part-time work to reconcile work with family, such as public childcare or parental leave provisions, also differ widely from country to country. Given these differences, the question we pose is not whether the introduction of part-time work has a positive or a negative impact for fertility, but rather whether the available part-time schedule in each of the selected countries has a positive impact on the fertility decision or not. The study has immediate implications for public policy, given that it can help us to know which of the available part-time schedules, if any, helps women to reconcile work life and family life.

We estimate a reduced form model the decisions concerning fertility and labor market status are taken simultaneously. The data used are from the European Community Household Panel. The analysis is performed separately for each of the eleven countries for which data are available[1].

Results show that for working women, the part-time schedule affects

fertility positively in Belgium, Germany, Ireland, Italy and The Netherlands, given that we find that women that make use of this possibility are, ceteris paribus, more likely to have a child. In the rest of the countries under analysis (Denmark, France, Greece, Portugal, Spain and the United Kingdom) the available part-time schedule does not seem to be used as a way of reconciling family life and work.

The rest of the paper is organized as follows: In Section 2 we present some theoretical considerations regarding the relationship between part-time work and fertility. Section 3 reviews the institutional background concerning part-time work for each of the countries under analysis, as well as other family policies such as childcare, parental leave and other family related benefits. Section 4 presents a descriptive analysis of the data concerning characterization of part-time work as well as the connection between part-time work and child status for the selected countries. In section 5 we present the empirical specification. Section 6 presents the results. Section 7 concludes.

Theoretical considerations

To understand the plausible determinants of changes in the labor market status of women right after birth, we can make use of the standard microeconomic consumer choice model between consumption and leisure. Imagine an economy facing a "rigid" labor market schedule, so that workers can only decide whether to work full-time or no work at all. Furthermore, assume that the work schedule of this economy is made more flexible, so that workers can decide over working full-time, part-time or no work at all. Some women that we observe choosing the alternative of full-time work in a "rigid" work framework (full-time work or no work) , might improve their utility switching to part-time, were this alternative available. These women obtain higher utility from a decrease in consumption (as a consequence of the decrease in hours worked) associated with an increase in leisure.

Let us briefly look at the consequences of introducing the possibility of working part-time after giving birth for women's decisions with respect to fertility. This would have a positive effect on fertility if, on average, women who decide to have a child under the possibility of working part-time would not have decided to do so had this option not been available. We cannot observe women's preferences, but if we observe women that have a child switching from full-time to part-time work after giving birth it is because the decrease in consumption is offset by the increase in leisure (which might be used for childbearing). Similarly, if we observe women that have a child switching from not working to part-time work

after giving birth it is because the increase in consumption (as a consequence of the increase in hours worked) offsets the decrease in leisure. The relative magnitude of these changes depends not only on women's preferences given their individual characteristics, but also on the provisions available for combining family life and working life. Facilities such as availability of public childcare, generous social benefits for part-time workers, etc. may help to change the net impact on fertility of the introduction of the possibility to access part time work after birth. Knowledge of these institutional characteristics concerning part-time and other family policies for each of the selected countries is crucial to understand and interpret the results derived from empirical analysis.

Institutional background - part-time work, childcare facilities, parental leave and family related benefits

Women's decisions about working and having children depend, among other things, on two important issues: On the one hand, the availability and good-quality of publicly funded childcare services and on the other hand the availability of part-time jobs with good working conditions in terms of job protection and social benefits. Family policies clearly affect women's fertility and participation choices. Among the different European countries, there are remarkable differences concerning these policies. In this section, we present the main aspects of part-time work, as well as some of the public family policies, such as childcare provisions, parental leave and other family related benefits, in the selected countries.

1. Part-time work

1.1. Part-time definition

Not all European countries define part-time work in the same way. Usually, a part-time job is defined compared to its full-time counterpart. Table 1 depicts the differences in the statistical definition of part-time work between the selected countries[2]. It can be seen that in some countries, such as Belgium, Denmark, France and Portugal, a worker is classified as a part-timer if he/she reports working part-time in the National Labor Force Survey (self-classification). In other countries, however, such as Ireland and The Netherlands, individuals are classed as part-timers if they report working a number of hours lower than a particular cut-off, which differs from country to country. Finally, in other countries, such as Germany, Greece, Italy, Spain and the United Kingdom, self-classification is used, but it is corrected depending on the number of hours worked

as reported by workers. Given these differences, we have decided to use a homogeneous measure of part-time work for the sake of comparability. Our approach is to follow the OECD recommendation regarding the definition of part-time work when making international comparisons, and adopt the 30 hours/week threshold recommended in OECD/GD(97)121. This recommended definition does not differ significantly from self reported part-time status in our database and we consider that it is easier to interpret.

Table 1 : Definition of Part-time in Selected European countries.

	Statistical definitions* of part-time work. Selected countries.	**Other features concerning part-time.**
Belgium	**Self classification**	
Denmark	**Self classification**	
France	**Self classification**	
Germany	**Combination**: Self classification, but if a self classified part-timer reports to work more than 36 hours/week is reclassified as full-timer.	Workers that work less than 15 hours per week have no social protection.
Greece	**Combination:** Self classification, but if a self classified part-timer reports to work fewer hours than stipulated in the collective agreement of his activity is reclassified as part-timer.	
Ireland	**Cut off**: 30 hours usually worked /week	
Italy	**Combination:** Self classification, but if a self classified part-timer reports to work fewer hours than stipulated in the collective agreement of his activity is reclassified as part-timer.	
Netherlands	**Cut off**: 35 hours usually worked /week	
Portugal	**Self classification**	
Spain	**Combination**: Self classification, but if a self classified part-timer works more than 35 hours/week is reclassified as full-timer; if a self classified as full-timer work less than 30 hours is reclassified as part-timer.	Workers that work less than 12 hours per week have no social protection.
United Kingdom	**Combination**: Self classification but, if a self classified part-timer reports to work more than 40 hours/week is reclassified as full-timer.	Workers that work less than 16 hours per week have no social protection (21% of female part-timers work less than 12 hours)

Source: Van Bastelaer, Lemaître and Marianna (1997), Koopmans and Schippers (2003), MTAS (2000)

Statistical definitions used in the National LFS. They may differ from administrative definitions of the Country, which usually are referred to

a fraction of the "normal hours" worked in similar full-time jobs.

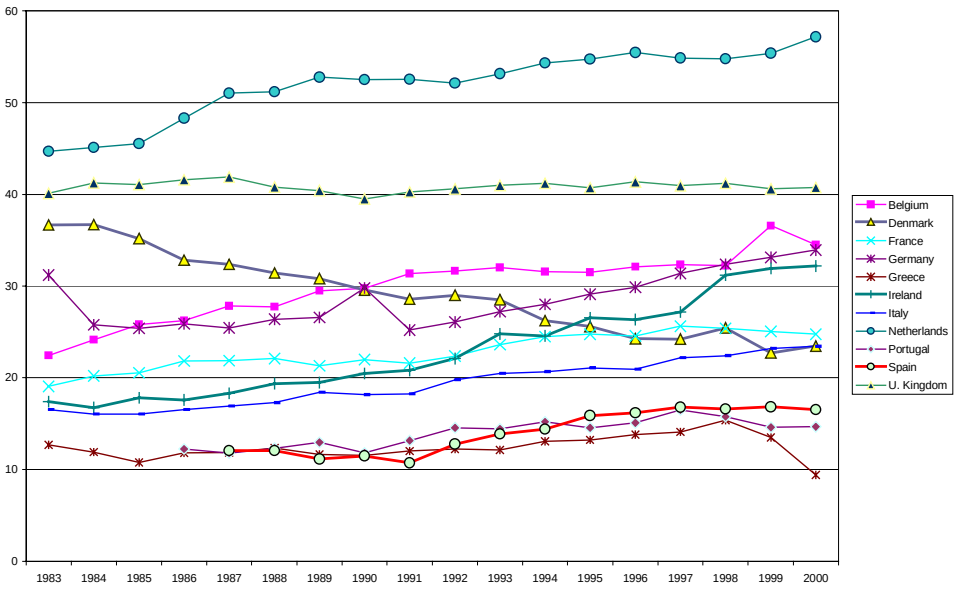
- Self Classification: Based on the individual response to the question "Main job: Full-Time / Part-Time ?" in the national LFS.
- Cut-off: Based on the individual response to the question "How many hours do you usually work per week?" in the National LFS. Then
- the National Statistics Institute establishes a *cut-off* which is used to classify individuals as part-timers or full-timers if they are below or above such threshold.
- Combination: The same as Self Classification but corrected for the National Statistics Institute following some threshold rule.

1.2. Incidence of and trend in part-time work

Figure 1 presents huge differences concerning the use and trends in part-time work between the selected countries. In the nineties we find countries such as The Netherlands, where more than 50% of workers are part-timers. At the other extreme, in countries such as Greece, Portugal and Spain, part-time work is used by less than 20% of workers. Between these two extremes, we find countries such as France, Italy and Denmark, where part-time work is used by 20-30% of workers, and finally, Ireland, Germany, UK and Belgium, where part-time work is used by 30-40% of workers[3].

Concerning the trend in part-time work over the last two decades, figure 1 also reveals that in some countries, such as Italy, Germany and Ireland, the use of part-time work has increased over time, whereas in others, such as Denmark and Greece, it has decreased.

Figure 1: Female Part Time Rates. Selected European Countries



Source: OECD. Part-timre Rates (% over total employment) based on a common definition.

Table 2: Distribution of Part-time, 1994-1998. Females, %, over total employment											
	Belgium	**Denmark**	**France**	**Germany**	**Greece**	**Ireland**	**Italy**	**Nether-lands**	**Portugal**	**Spain**	**U.K.**
Average	23.6	17.5	18.4	22.1	11.8	23.5	14.6	43.6	10.4	14.0	30.5
BY AGE											
16-20	19.1	31.5	31.2	4.8	13.9	17.6	11.7	32.0	6.1	17.1	28.7
21-25	19.6	12.4	19.0	6.7	10.6	10.3	11.9	18.9	5.5	15.8	12.8
26-30	16.8	10.3	15.4	14.6	11.4	14.7	13.0	23.6	5.9	13.8	19.9
31-35	28.4	12.7	18.4	25.1	11.4	24.0	14.6	46.0	6.2	14.4	33.9
36-40	26.6	14.1	17.8	28.4	9.0	32.6	15.3	58.7	7.6	13.5	37.8
41-45	25.4	15.9	18.3	27.4	8.3	36.9	15.9	55.4	10.0	13.9	33.1
46-50	20.3	21.0	19.2	27.0	11.7	33.8	15.1	53.8	13.6	12.9	32.8
>50	24.6	26.4	19.9	28.4	16.5	32.5	16.3	53.1	16.9	13.1	38.7
BY EDUCATION											
Primary	31.9	22.8	26.0	24.6	13.9	36.1	13.9	44.3	11.2	17.2	39.4
Secondary	25.6	17.8	17.3	23.4	7.6	22.3	13.2	45.0	4.1	12.9	32.2
Tertiary	20.4	14.2	13.4	17.0	12.1	15.0	21.6	39.8	11.2	10.2	22.3
BY MARITAL STATUS											
Single	12.2	15.7	15.2	5.8	9.3	11.0	10.7	16.9	7.9	12.9	15.3
Married	27.8	21.6	20.8	30.2	12.6	32.3	16.5	59.0	10.7	14.6	38.6
Other	17.7	10.3	14.1	17.4	12.0	34.4	11.6	38.0	14.3	15.9	27.9
BY TYPE OF CONTRACT											
Permanent	23.4	15.6	15.6	22.9	4.3	16.8	11.0	43.0	6.3	7.9	28.7
Temporal	27.9	14.7	36.9	20.4	17.4	11.5	16.3	49.7	4.8	17.6	39.9
REASON TO WORK PART-TIME (AMONG PART-TIMERS)											
Don`t want work more	19.6	39.5	14.3	4.2	20.6	23.3	12.3	25.7	5.9	7.3	9.2
Housework	48.0	26.8	29.3	34.5	23.6	43.1	31.9	52.8	24.9	27.7	18.0
Can't find Full-time	19.5	15.6	41.1	3.5	25.0	18.0	19.0	8.4	25.0	32.3	3.3
HOURLY WAGE (PART-TIMERS) / HOURLY WAGE (FULL-TIMERS)											
	1.11	1.06	0.95	1.11	1.02	0.94	1.25	1.04	1.05	0.92	0.91

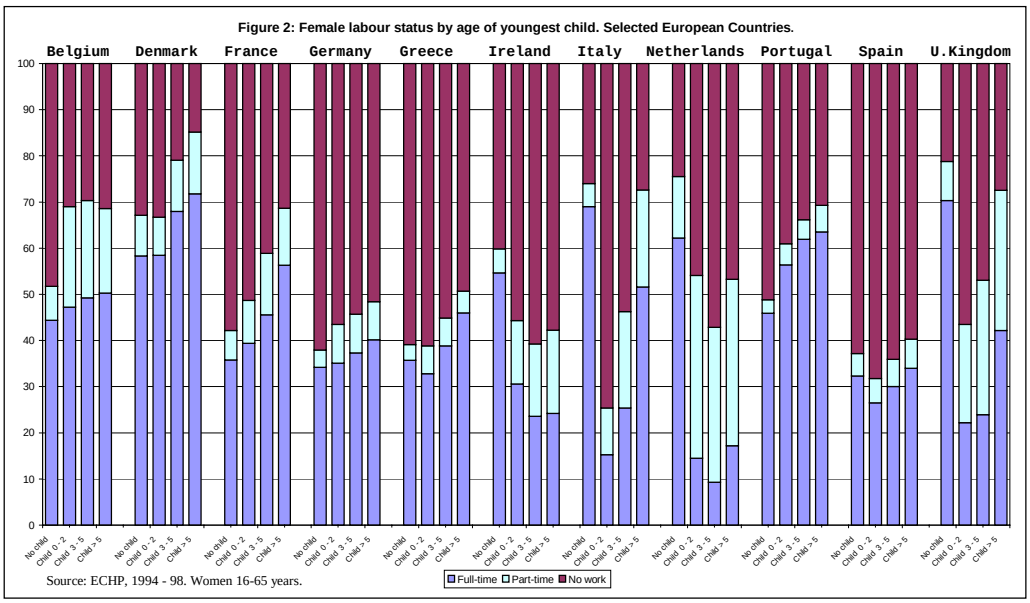
Source: ECHP, 1994-98. All figures are % part-time among female workers except *Reason to work Part-time* which is measured only among part-timers.

1.3. Characterization of part-time work

Table 2 presents the characterization of part-time by personal characteristics for each of the selected countries[4]. It can be seen that the use of part-time work increases with age for some countries, such as Belgium, Germany, Ireland, Italy and Portugal, whereas for others, such as Denmark, France, Greece, The Netherlands and the United Kingdom, it is relatively more extensively used by very young females (17-20), who are likely to be students. In all countries but Spain and France, part-time work is also used as a way towards retirement of older workers. With respect to education, in most countries part-time work is used more among less educated females. However, there are some exceptions in countries such as Italy, where most highly educated females seem to use part-time work more than less educated females. In Greece and Portugal, there are no significant differences in the use of part-time work between the least and most highly educated women. Furthermore, in all the selected countries, part-time work is more widely used among married women than among single ones. Regarding the type of contracts, part-time work is more widely extended among workers with fixed-term contracts in France, Greece and Spain. Finally, in France, Greece, Portugal and Spain part-time work can be characterized as mostly involuntary, given the high percentage of part-timers who would like to work full-time. On the same basis, in Denmark, Germany, Ireland, The Netherlands and the UK, part-time work can be characterized as mainly voluntary.

1.4. Part-time work around childbirth

Figure 2 presents the distribution of women in the labor market by children status, more particularly by the age of their youngest child. The first thing to note is that in Greece, Portugal and Spain, part-time work is very seldom used, no matter what women's child status may be. A second important issue that can be observed is that in Belgium, Ireland, The Netherlands, the UK and, to a lesser extent, Germany and Italy, the female labor market situation changes greatly when women become mothers, whereas in others, such as Denmark, France, Greece, Portugal and Spain there are very few changes concerning their labor market situation around childbirth. In those countries where changes in the use of part-time work is observed around childbirth, two issues are worth noting: (i) a significant fraction of women seem to quit the labor market when the youngest child is younger than 3, and (ii) in some countries such as Belgium, Ireland, and the Netherlands, the biggest increase in the use of part-time work takes place when women have a newborn child,



whereas in others, such as Germany, Italy and the UK, the incidence of part-time work among mothers increases as the child grows older.

2. Other family policies

2.1. Childcare facilities

In March 1992, the European Council passed a recommendation on childcare (92/241/EEC) in which Member States are encouraged ”to develop measures to enable men and women to reconcile their family obligations arising from the care of children and their own employment”. Member States should try to ensure that childcare services are available and affordable in all their regions. However, they are not bound by this type of legislation and this recommendation has been taken very differently by the different European countries.

Table 3: Childcare provisions in Selected European Countries

	Age of compulsory schooling	% children attending Public funded childcare * by age of child		Other institutional specific country aspects
		0-3 years	3-6 years	
Belgium	6	30	> 95	• *Reception families* allow a great hourly flexibility to parents. Parents can deduce up to 80% of the cost from their income taxes. • Hours of schooling are 7.
Denmark	7	48	82	•After school centres also available
France	6	23	99	•Only available in the mornings • *Halte Garderies* provide occasional care or for few hours • Allowance to families for the employment of a registered childminder (AFEAMA), pays the social security contributions when a childminder is employed and gives 800 francs to parents of children under 3 (400 if aged 3-6). Also a tax deduction up to 3750 francs a year. Not means-tested. • Allowance for childcare in the home (AGED), pays the social security of both employer and employee if a person is employed to look after children at home, for dual- earner families or lone parent employed. Payment up to a maximum of 4130 francs a month (1996). Recipients of AGED can deduct from their income tax a 50% of the actual cost of care, up to a limit of 45000 francs a year. Not means-tested.
Germany (West)	6	2	78	•Only available in the mornings • Childcare out of school very scarce.
Germany (East)	6	50	100	
Greece	6	3 (a)	70 (a)	•Greek schools hours shifts from morning to afternoon
Ireland	6	2	55	•Primarily served for low income families
Italy	6	6	91	• Public funded childcare system are very rigid and scarce.
Netherlands	5	8 (b)	71 (b)	•95% children attend a *nursery school* at four
Portugal	6	12	48	•Many care facilities open only five hours a day and close for lunch
Spain	6	2	84	• Very rigid and scarce childcare
U.K	5	2	60 (c)	•Primarily served for low income families

Source : European Commission Network on Childcare and Other Measures to Reconcile Employment and Family Responsibilities (ed.) (1996): A Review of Services For Young Children in the European Union 1990–1995. Luxembourg European Commission Directorate General V, Blossfeld and Hakim (1997), Del Boca (2002) and Koopmans and Schippers (2003)

(a) Greece statistics referred to age groups 0-2,5 and 2,5-5. (b) Dutch statistics referred to age group 0-4.

(c) British statistics referred to age group 0-5.

* Public funded: more than half of total costs are paid from public sources (usually between 75-100%)

Table 3 presents the extension of public childcare provisions in the selected European countries, as well as other institutional issues concerning childcare facilities. The first thing to note is that public childcare facilities for children aged between 3 and 6 are widely available in most countries. However, this is not so with respect to childcare facilities for children under 3 years. Countries, such as Belgium, Denmark, France and East Germany offer the highest childcare facilities for children under 3, whereas in West Germany, Ireland, Spain and the UK such facilities barely exist. Finally, there are some countries, such as France, where the state offers high subsidies for private childcare.

2.2. Maternity leave and Parental leave

In 1992, the Council of the European Community adopted a Directive on Maternity Leave (92/85/EEC) that entitles all working women to a 14-week leave of absence but not with full payment of wages. All member countries of the EU now have a statutory maternity leave of at least 14 weeks.

Table 4 presents legislation concerning maternity leave and parental leave in the selected countries. Germany, Ireland and the United Kingdom have the shortest entitlement to paid maternity leave, namely 14 weeks while the longest leave is granted in Italy (22 weeks), and France (at most 26 weeks).

Cash maternity benefits differ considerably from country to country. In a number of countries, such us Germany, Greece, France, The Netherlands and Portugal, maternity benefits are set at 100 per cent of wages. But it has to be said that in most of these countries the benefits are limited to a maximum. In Belgium and the United Kingdom the amount of cash benefits is lowered after a number of weeks. In Belgium maternity leave is paid at 82 percent of earnings for the first month and 75 per cent of earnings for the remaining period. In the United Kingdom payment for the first six weeks is 90 per cent of earnings, with a flat-rate payment (95 euros per week) for the remaining twelve weeks. (see Koopmans and Schippers, 2003).

The largest differences are observed in the right to parental leave. In some countries, such as Belgium, Denmark, Italy and Portugal it may extend up to six months while in other countries such as France and Germany, parental leave can last up to three years and in The Netherlands up to 48 months.

2.3. Family related taxes and benefits

Table 4 presents the main institutional features concerning family related taxes and benefits in the selected European countries.

Table 4 :Maternity, paternity and parental leave in Selected European Countries

	Maternity leave (paid)		Paternity leave (paid)		Parental leave (months)	Other
	weeks	**RR**	**Days**	**RR**		
Belgium	15	82-75	3	100	6-12	• Since 1996, career breaks are extended from a full/half career break to full, 1/5, 1/4, 1/3, 1/2 career breaks. • Career-breaks program allows the worker to take a paid leave of 3 to 12 months in relation to the birth of a child. • In 1998 a parental leave legislation entitles each parent to a full-time leave of 3 moths or a part-time leave of up to 6 months. The leave may be taken until the child is 4 years of age.
Denmark	18	flat rate	10	flat rate	6-12	• 1984 law entitles fathers to share the leave provided. • 1992 law entitles each parent to a full time leave of 13 weeks (which may be extended up to 26 weeks upon employers agreement). The leave may be taken if the child is under one year of age.
France	16-26	84	3	-	36	• Since 1997 the benefit may only be paid up to a social security ceiling. • Unpaid leave up to the child is 3 years of age. • Childrearing benefit, provides a flat-rate benefit of 2694 francs per month (in 1996) available to families with at least two children, being the youngest younger than 3 years if the mother or father stops working completely or reduces hours. Paid at a reduced rate if the mother (father) works part-time.
Germany	14	100	-	-	36	• Paid childcare leave up to the child's third birthday, since 1992. • Since 1992, parents receive a flat rate childcare payment during the first two years of children's life. This entitlement depends on household income.
Greece	16	100	-	-	3.5	• Legislation in 1984 entitles each parent to a leave of 3 months each. The leave may be taken until the child is 3.5 years old. • In 1996, the allowance for the third child increased from 103 € to 121€ per month. The age up to which this allowance could be received increased from 3 to 6.

Source: Gauthier, A.H., Bortnik, A. (2001), Drew, E., Emerek, R. and Mahon, E. (1998) and European Observatory in Family Matters (1997)

RR is Replacement Rate of normal earnings during the period of leave. (a): Parent entitled to work reduced hours-

non transferable.

Table 4 :Maternity, paternity and parental leave in Selected European Countries (cont.)

	Maternity leave (paid)		Paternity leave (paid)		Parental leave (months)	Other
	weeks	RR	Days	RR		
Ireland	14	70	-	-	-	• Since 1981 exists a dual benefit system. The basic flat rate continued to be offered but a new system provided 70% earnings for employed women only. • Since 1998, both parents may take a separate leave of 14 weeks each, until the child is five years of age. • Job Sharing, is an individual responsibility (not promoted) that allows mothers to reduce hours of work by half reducing their net income approximately a third.
Italy	22	80	-	-	6	• Duration of leave is 5 months (2 months before and 3 months after birth). • Since 1973 a paid childcare leave of six months is available.
Netherlands	16	100	-	-	48[a]	• Legislation introduced in 1990 entitles each parent to an unpaid part-time leave of six months (parent must work at least 20 hours per week). Leave is not transferable and may be taken until the child is eight years of age. • Government guarantees minimum income to every adult. A couple wit h a 10 years old child receives 909 € per month.
Portugal	18	100	-	-	6-24	• 1984 law entitles parents to an unpaid leave of 26 weeks which may be extended to 2 years in special circumstances.
Spain	16	75	2	100	12-36	• the maternity benefit is the 100% of benefit base. This may not mean 100% of wage. • Since 1980 parents are entitled to a full time unpaid leave until the child is 3 years of age. During the first year the employee is entitled to return to his/her former job. After one year, the employee is only entitled to return to a job of the same level.
United Kingdom	14	flat rate	-	-	-	• Legislation in 1991 created a dual system of benefits. The basic flat rate benefit continued to be offered as the "State Maternity Allowance". • *Statutory Maternity Pay* is offered to employed women. Mothers are paid 90% of earnings for the first 6 weeks, then a flat rate benefit for the following 12 weeks. • Since 1979 working mothers may be absent of work up to 29 weeks.

Source: Gauthier, A.H., Bortnik, A. (2001), Drew, E., Emerek, R. and Mahon, E. (1998) and European Observatory in Family Matters (1997)

RR is Replacement Rate of normal earnings during the period of leave. (a): Parent entitled to work reduced hours-non transferable.

Legislation concerning the tax system of both spouses affects the incentive of the household's second earner to work. In particular, the joint tax system has a disincentive to the second earner (normally the woman) to work, given that her earnings are added to those of the man and thus overall household earnings accrue tax at a higher rate than in an individual tax system. Many studies stress that an individual tax system (where each member of the couple is charged as a different unit) encourages female participation (Grift, 1998; Gustafsson, 1992). In table 5 we can see that France, Germany, Greece and Portugal have a joint tax system, whereas in the rest of the selected countries, the tax system is either individual or optional.

Table 5 : Family related taxes and benefits. Selected European countries.

	Tax system of the couple	Non income related family benefits	Income related family benefits	Tax allowances	Other benefits
Belgium	optional	Vary according to number of children, age of the child, employment status	non- existent	Vary according to number of children, age of the child	some tax relief for children expenditure
Denmark	individual	Vary according to age of child, lone parents	non- existent	non- existent	
France	joint	Vary according to number of children, age of the child, lone parents, mother's employment status	Vary according to number of children, age of the child, lone parents, mother's employment status	Vary according to number of children	
Germany	joint	Vary according to number of children, age of the child	non- existent	Vary according to number of children, fixed accounts for each child	special tax allowances for lone parents
Greece	joint	Vary according to number of children, age of the child, (taxable)	Vary according to number of children, lone parents	Vary according to number of dependants	
Ireland	optional	Vary according to number of children	Vary according to number of children	Tax exemption limit is increased according to marital status and number of children	

Source: Gauthier, A.H., Bortnik, A. (2001), Drew, E., Emerek, R. and Mahon, E. (1998), Koopmans and Schippers (2003) and European Observatory in Family Matters (1997)

Table 5 : Family related taxes and benefits. Selected European countries (cont.)

	Tax system of the couple	Non income related family benefits	Income related family benefits	Tax allowances	Other benefits
Italy	individual	non existent	Vary according to number of persons in the household, lone parents	Vary according to number of children	some school costs are deducted from taxable income
Netherlands	individual	Vary according to number of children, age of the child	non- existent	tax free allowance received according to age of the child	
Portugal	joint	Vary according to number of children, age of the child	(various schemes)	tax deduction according to marital status and number of dependants	
Spain	optional	non existent	Vary according to number of children	tax deduction pre-school care costs deducted from taxable income, couples can be taxed separately	
United Kingdom	individual	Vary according to number of children, lone parents	Vary according to age of the child	non-existent	lone parents can receive a personal allowance

Source: Gauthier, A.H., Bortnik, A. (2001), Drew, E., Emerek, R. and Mahon, E. (1998), Koopmans and Schippers (2003) and European Observatory in Family Matters (1997)

Given the above mentioned differences in the institutional features between countries, the effect of part-time work will be different depending on its characteristics but also on the institutional facilities that each country offer women to reconcile motherhood and work.

We now move on to an empirical analysis to measure the effect of the existing availability of part-time work after giving birth on the decision whether to have a child for each of the selected European countries.

Data and descriptive analysis

The data we use are taken from the European Community Household Panel (henceforth ECHP) carried out by Eurostat. ECHP is a survey based on a standardized questionnaire that involves annual interviewing of a representative panel of households and individuals in each country regarding issues such as income, health, education, demographics and employment characteristics. The total duration of the panel is 8 years (1994-2001) , but not all waves are available yet. Approximately 130,000 adults aged 16 years and over were interviewed in the 12 Member States at that point of time[5]. Austria, Finland and Sweden joined the project later, so full data are not available for them.

The most remarkable characteristics of ECHP are its multidimensional coverage of a range of topics, the standardized methodology across countries, and the panel design so as to study changes over time at the micro level. In order to provide representative cross-sectional pictures over time, ECHP follows up those persons who move or form a new household. At any time the survey covers all persons cohabiting with any of the original sample persons in the same household[6] We have made use of all countries but Luxemburg, given that its small sample size leaves us with very few observations for our purposes.

For each of the eleven selected countries, we consider all women between 17 and 44 years (fertile years) who are married or cohabiting[7]. The survey lacks labor market information on those individuals who report working less than 15 hours per week, so we dropped such women from the sample[8].

We use a pool of five waves of the ECHP to estimate a reduced form model where the decisions concerning fertility and labor market status are estimated simultaneously. Given that our interest lies in capturing whether part-time status is being used by women to combine work with childbearing, labor market status for those women observed having a child at time t is the one reported at $t+1$. [9]

The distribution by labor status of our women can be seen in Table 6A[10]. This table reveals that full-time work is the most frequent status for women in Denmark, France, Germany, Greece, Portugal, Belgium and the United Kingdom. Most women are not working in Ireland, Italy, The Netherlands and Spain. The proportion of women working part-time in the sample is highest in the Netherlands, followed by the United Kingdom, Belgium and Ireland. Regarding the labor status of those women who have a child during the observation period it can be seen that the percentage of births among women out of the labor force is

higher in France, Germany, Denmark, Greece, Portugal, Spain and the United Kingdom. part-timers have the highest proportion of births in Belgium, the Netherlands, Italy and Ireland.

Table 6A: Distribution of births by labor status of the mother

	BELGIUM		DENMARK		FRANCE		GERMANY		GREECE		IRELAND	
	Total	***% births***	***Total***	***% births***	***Total***	***% births***	***Total***	***% births***	***Total***	***% births***	***Total***	***% births***
No Work	3111	*7.4*	853	*16.9*	4486	*12.1*	5112	*10.0*	6075	*12.1*	2271	*9.6*
	28.0		*19.5*		*30.3*		*23.3*		*39.8*		*45.1*	
Part-Time	2069	*11.4*	534	*10.3*	1752	*9.1*	3530	*2.3*	946	*9.6*	816	*13.2*
	18.6		*12.2*		*11.9*		*12.1*		*6.2*		*16.2*	
Full-Time	5926	*8.3*	2933	*10.9*	8545	*6.2*	13277	*6.1*	8238	*6.9*	1953	*9.8*
	53.4		*68.3*		*57.8*		*60.5*		*54.0*		*38.7*	

	ITALY		NETHERLANDS		PORTUGAL		SPAIN		U. KINGDOM	
	Total	***% births***	***Total***	***% births***	***Total***	***% births***	***Total***	***% births***	***Total***	***% births***
No Work	5326	*9.0*	6959	*9.5*	3013	*9.4*	7721	*6.7*	2823	*13.5*
	49.1		*35.8*		*33.6*		*52.9*		*32.0*	
Part-Time	956	*11.3*	6446	*14.3*	461	*8.7*	991	*6.2*	1884	*10.7*
	8.8		*33.1*		*5.2*		*6.8*		*21.4*	
Full-Time	4570	*7.2*	6060	*3.9*	5325	*7.4*	5878	*5.2*	4106	*5.0*
	42.1		*31.1*		*61.2*		*40.3*		*46.6*	

Source: ECHP, 1994-98. Sample: Women aged 17-44, with partner, at any moment in the sample

A closer look at the relationship between labor market status and fertility for our sample is presented in Figure 3. Two issues are presented in this figure: (i) the distribution of our sample of women in the labor market, and (ii) the distribution in the labor market of those who report having a child. A comparison of these two columns reveals whether the distribution of part-time work changes around childbirth or not for each country. In countries such as Belgium, Ireland, The Netherlands, the UK and, to a lesser extent, Italy, it can be observed that the percentage of part-timers among women around childbirth increases relatively to the whole sample of women. In others, such as France, Greece, Portugal and Spain, the percentage of part-timers among the whole sample remains very similar to that of women who give birth. Finally, in Germany and, to a lesser extent, Denmark, the percentage of part-timers among women who give birth decreases

compared to the whole sample. A clearer picture of the transitions to part-time work undertaken by women who decide to have a child is shown in Table 6B. We see that in those countries where part-time work is not a common alternative (such as Greece, Italy and Spain) more than 10% of those women not working switch to work part-time after giving birth.

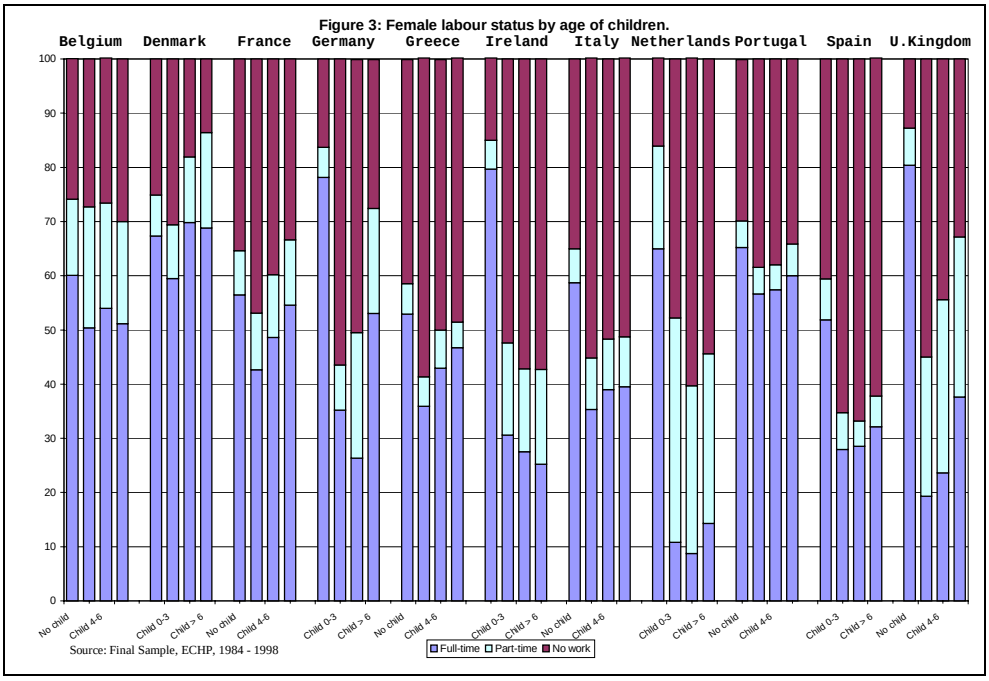


Table 6B: Transitions to part-time of mothers. % of women that are in each status before birth and move to part-time after.

PREVIOUS LABOR STATUS	*BELGIUM*	*DENMARK*	*FRANCE*	*GERMANY*	*GREECE*	*IRELAND*	*ITALY*	*NETHERLANDS*	*PORTUGAL*	*SPAIN*	*U. KINGDOM*
Full-time	14.6	36.4	22.5	22.1	18.8	37.4	36.4	10.4	25.7	14.5	25.8
Part-time	83.3	53.0	68.8	66.8	70.5	50.5	46.1	86.3	57.1	67.1	62.3
Inactivity	2.0	9.1	5.7	10.05	7.5	9.9	12.1	2.5	14.3	13.1	11.6
Unemployment	0	1.5	2.9	0.05	3.2	2.2	4.4	0.8	2.9	5.3	0.3

Source: ECHP, 1994-98. Sample: Women aged 17-44, with partner, at any moment in the sample.

The econometric model

We try to assess whether the available part-time status in each of the selected countries has a positive impact on women's fertility decisions or not. However, given the endogeneity of part-time status for fertility, we must estimate both decisions simultaneously. The ideal dataset would be to observe the fertility decision of each woman first under part-time status, and then under non part-time status. However, we lack information regarding the individual fertility decision under the labor status that is not chosen.

In order to cope with this lack of information , following Manski et al (1992), we split the sample into two groups, the first one made up of those women who work part-time and the second one by those women that do not work part-time. Then we can estimate and predict the fertility decision separately for each group. From the comparison of the two predictions, we can estimate the impact of part-time work on fertility. In order to do this we need to define some variables, as follows:

- F_1, the fertility decision of those females who work part-time, and are therefore observed using the part-time work schedule[11]. F_1 takes the value of one if these females have a child and 0 if not.

$$F_1 = 1 \text{ if } \beta_1' X + \varepsilon_1 > 0 \qquad [1]$$

$$F_1 = 0, \text{ otherwise}$$

- F_0, the fertility decision of those females who do not make use of flexible working hours. It takes the values of 1 for females who have a child and 0 for those who do not.

$$F_0 = 1 \text{ if } \beta_0' X + \varepsilon_0 > 0 \qquad [2]$$

$$F_0 = 0, \text{ otherwise.}$$

where, X, a set of covariates that affect F_1 and F_0, such as age, education or family income and $(\varepsilon_1, \varepsilon_0)$ are error terms.

However if the decision to work part-time is correlated with the decision to have a child, the estimated parameters would not be unbiased. If this is the case, we must take into account that the labor market status concerning part-time work may be the result of a decision process, and therefore, estimate both decisions jointly, that is, whether or not to have a child and whether or not to work part-time. Let us define a new variable:

- PT, the part-time variable, which takes the value of 1 for those females whom we observe to have made use of flexible working hours and 0 for the rest.

$$PT = 1 \text{ if } \lambda' Z + \nu > 0 \qquad [3]$$

$$PT = 0, \text{ otherwise.}$$

where Z includes a set of covariates that affect PT (some of them may also be included in X), such as age, education and the age of the youngest child.

Given that we cannot observe the same women in the two possible labor market status, we can estimate fertility decision and the labor market status jointly by estimating a Switching Probit Regression Model with endogenous switching. This model is formed by equations [1], [2] and [3] where the disturbances $(\nu, \varepsilon_1, \varepsilon_0)$ represent the contribution of the unobserved factors to the determination of fertility and use of part-time work . We assume that $(\nu, \varepsilon_1, \varepsilon_0)$ are jointly normally distributed with zero mean vector and covariance matrix

$$\sum = \begin{pmatrix} 1 & \rho_{\varepsilon_0\varepsilon_1} & \rho_{\varepsilon_0\nu} \\ . & 1 & \rho_{\varepsilon_1\nu} \\ . & . & 1 \end{pmatrix} \qquad [4]$$

Identification is ensured by non linear equations and the normality assumption (see Manski et al, 1992). However, some exclusion restrictions are advisable in order to improve identification[12].

The log-likelihood function is formed by four kinds of contribution: 1) women who have a child and work part-time , 2) women who do not have a child and work part-time, 3) women who have a child and do not work part-time and 4) women who do not have a child and do not work part-time . Thus, the log-likelihood
is:

$$L(\beta_0, \beta_1, \lambda, \rho_{\varepsilon_0\nu}, \rho_{\varepsilon_1\nu}) = \sum_{F_1=1} \log\left(\Phi(\lambda Z) - \Phi(-\beta_1 X) + \Phi(-\beta_1 X, -\lambda Z; \rho_{\varepsilon_1\nu})\right) +$$

$$\sum_{F_1=0} \log\left(-\Phi(-\beta_1 X) - \Phi(-\beta_1 X, -\lambda Z; \rho_{\varepsilon_1\nu})\right) +$$

$$\sum_{F_0=1} \log\left(\Phi(-\lambda Z) - \Phi(-\beta_0 X, -\lambda Z; \rho_{\varepsilon_0\nu})\right) +$$

$$\sum_{F_0=0} \log\left(\Phi(-\beta_0 X, -\lambda Z; \rho_{\varepsilon_0 v})\right)$$

The effect of working part-time on the probability of having a new born is calculated as the difference between the estimated probability of having a baby of those women who work part-time and those women who do not:

$$\Pr(F_1 = 1/X) - \Pr(F_0 = 1/X) \qquad [5]$$

Intuitively, what we do is to predict the probability of childbirth for those women who work part-time on the one hand, and for those women who do not work-part time on the other, taking into account the endogeneity of part-time work for fertility decisions. The difference between these predicted probabilities is precisely the effect of part-time work on fertility.

6. Empirical results

Before getting into the description and interpretation of the empirical results, we would like to point out that the impact of part-time work on fertility has been measured for two groups of women: On the one hand, we consider all female workers (married or cohabiting with a partner); for these women, the alternative to working part-time is working full-time and hence, interpretation of results is rather straightforward. However, the fact of taking only female workers would not allow us to make inference regarding the impact of part-time work on fertility for the whole female population (married or cohabiting with a partner) if working females do not behave similarly to non-working ones regarding fertility, which might well be expected. This is what has led us to extend the analysis of the impact of part-time work on fertility to the whole female population (working and non-working married or cohabiting women). A priori, given that in most countries births are more concentrated among non-workers, we should expect the prediction of fertility for non part-timers to be higher when all females (full-timers and non-workers) are included than when only workers are included and hence the impact of part-time work to be smaller than when only workers are taken into account. This is in fact what the results reveal, which suggest that there is still a long way to go if governments want to make work fully compatible with family.

Getting into the results, Tables 7 (7A and 7B) and 8 (8A and 8B) present the results of the estimation of the system of equations (1), (2) and (3). Table 7A and 8A present the results for workers, whereas tables 7B and 8B present the

results for all females. Starting with the group of workers, Table 7A shows the results from the estimation of fertility for those workers whose decision is to do part-time work $(\widehat{F_1})$ and for those whose decision is not to do part-time work $(\widehat{F_0})$, i.e., for those that work full-time. The dependent variable in the fertility equation is a binary variable which takes the value of one if the woman has a child in that particular year and zero otherwise. Explanatory variables include education, number of children, family non-labor income, age of the youngest child, year dummies and when available, dummies for region and dummies for occupations of both partners. We have altered the basic model in those countries where we lack information concerning these variables[13], do not have enough observations in some categories, or face convergence problems[14]. In all countries we have included at least one variable in Z (part-time equation) that is not in X (fertility equation) to improve identification.

In the estimation of fertility among part-time workers ($\widehat{F_1}$ in Table 7A), the effect of age on the probability of having a child is negative in all cases (older women are more likely to have a child), the effect of non labor income is positive in Belgium, France, Ireland, The Netherlands, Spain and the United Kingdom; non significant in Denmark, Germany, Italy and Portugal and negative in Greece.

Table 7A: Estimation of Fertility - Workers Sample										
Variables	**BELGIUM**		**DENMARK**		**FRANCE**		**GERMANY**		**GREECE**	
	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$
Constant	0.55	-0.47	-4.61	-1.37	-4.18	-1.10	-0.25	-0.89	-0.38	-0.67
	(0.43)	(0.66)	(2.06)	(0.70)	(0.91)	(0.38)	(0.89)	(0.48)	(0.47)	(0.27)
Age	-0.06	-0.08	0.0002	-0.02	-0.04	-0.02	-0.07	-0.06	-0.04	-0.06
	(0.008)	(0.005)	(0.01)	(0.006)	(0.01)	(0.004)	(0.01)	(0.003)	(0.005)	(0.003)
FEMALE COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(a)]										
University	0.29	0.18	0.13	0.07	0.17	-0.07	0.30	-0.20	0.55	0.44
	(0.06)	(0.08)	(0.21)	(0.07)	(0.17)	(0.06)	(0.12)	(0.07)	(0.11)	(0.05)
Secondary	-0.05	0.01	-	-	0.25	-0.08	0.50	0.04	0.32	-0.09
	(0.06)	(0.08)			(0.14)	(0.06)	(0.14)	(0.05)	(0.10)	(0.05)
PARTNER COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(b)]										
University	-0.07	0.02	0.36	0.14	0.02	0.08	0.01	0.19	-	-
	(0.06)	(0.07)	(0.26)	(0.08)	(0.19)	(0.06)	(0.10)	(0.07)		
Secondary	-0.12	0.03	-0.13	0.06	0.12	0.001	0.03	0.005	-	-
	(0.06)	(0.07)	(0.26)	(0.06)	(0.15)	(0.05)	(0.12)	(0.05)		
HOUSEHOLD INCOME [(c)]										
Log family income	0.23	0.20	0.20	0.12	0.47	0.11	0.10	-0.05	-0.16	0.10
	(0.07)	(0.09)	(0.29)	(0.09)	(0.13)	(0.05)	(0.12)	(0.06)	(0.07)	(0.04)
AGE OF THE YOUNGEST CHILD- REFERENCE: NO CHILD [(d)]										
<3 years	-	-	-	-	-0.47	0.15	-	-	-	-
					(0.15)	(0.05)				
3-6 years	-	-	-	-	-0.44	0.11	-	-	-	-
					(0.17)	(0.06)				
>6 years	-	-	-	-	-0.93	-0.25	-	-	-	-
					(0.16)	(0.07)				
$\rho_{\varepsilon_1 v}$	-0.95	-	0.29		0.05	-	-0.51		0.95	
	(0.02)		(0.60)		(0.36)		(0.08)		(0.07)	
$\rho_{\varepsilon_0 v}$	-	0.40		-0.91	-	-0.79		0.98		0.01
		(0.24)		(0.05)		(0.07)		(0.21)		(0.01)

Standard error in brackets. Other variables included are: year dummies, dummies for region and occupation dummies when available.

Notes: (a) In Ireland education variables for females have been excluded for convergence problems. Very few observations in Denmark in the reference, so the reference in this country is secondary or lower (b) Not included in Belgium , Denmark, Germany, Greece, Ireland and Spain, due to convergence problems. (c) Log family income is the log of monthly net earning of the family minus wage of the women, measured in Euro. (d) Not included in Belgium, Denmark, Germany, Greece Ireland and Spain due to lack of observations or convergence problems.

Table 7A: Estimation of Fertility - Workers sample (cont.)												
Variables	**IRELAND**		**ITALY**		**NETHERLANDS**		**PORTUGAL**		**SPAIN**		**U. KINGDOM**	
	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$
Constant	-2.02 (0.73)	-4.60 (0.76)	-0.18 (1.20)	-0.01 (0.61)	-5.49 (0.44)	-12.30 (28.02)	-2.32 (1.10)	-0.66 (0.45)	-3.23 (1.02)	0.40 (0.40)	-2.43 (0.53)	-2.84 (0.71)
Age	-0.05 (0.01)	-0.04 (0.008)	-0.06 (0.02)	-0.03 (0.008)	-0.03 (0.004)	-0.01 (0.006)	-0.02 (0.02)	-0.04 (0.005)	-0.05 (0.01)	-0.04 (0.004)	-0.03 (0.007)	-0.001 (0.006)
FEMALE COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS[(a)]												
University	-	-	0.44 (0.28)	-0.06 (0.14)	-0.02 (0.09)	-0.02 (0.15)	0.13 (0.30)	0.07 (0.11)	0.32 (0.17)	0.30 (0.07)	0.009 (0.08)	0.01 (0.10)
Secondary	-	-	0.32 (0.16)	0.09 (0.08)	0.13 (0.08)	0.01 (0.12)	-0.12 (0.43)	0.16 (0.08)	-0.17 (0.20)	-0.21 (0.08)	0.01 (0.10)	0.08 (0.12)
PARTNER COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(B)]												
University	0.34 (0.16)	-0.06 (0.12)	-0.11 (0.21)	0.31 (0.12)	-	-	-0.36 (0.39)	0.08 (0.12)	0.44 (0.17)	0.22 (0.07)	0.11 (0.08)	-0.09 (0.08)
Secondary	0.01 (0.14)	0.04 (0.10)	-0.37 (0.15)	0.02 (0.08)	-	-	-0.89 (0.48)	0.09 (0.08)	0.73 (0.15)	-0.05 (0.07)	0.10 (0.12)	-0.30 (0.14)
HOUSEHOLD INCOME[(C)]												
Log (family income)	0.29 (0.10)	0.58 (0.11)	0.16 (0.15)	-0.09 (0.08)	0.55 (0.06)	0.62 (0.11)	-0.21 (0.17)	0.05 (0.06)	0.33 (0.14)	-0.07 (0.05)	0.17 (0.07)	0.16 (0.09)
AGE OF THE YOUNGEST CHILD- REFERENCE: NO CHILD [(d)]												
<3 years	-	-	-0.21 (0.21)	0.25 (0.12)	1.07 (0.06)	0.85 (0.15)	0.04 (0.20)	-0.04 (0.07)	-	-	0.44 (0.14)	0.91 (0.19)
3-6 years	-	-	-0.14 (0.24)	-0.28 (0.13)	0.05 (0.10)	-0.48 (0.24)	-0.75 (0.36)	-0.34 (0.11)	-	-	0.30 (0.16)	0.51 (0.23)
>6 years	-	-	-0.66 (0.22)	-0.53 (0.12)	-0.26 (0.08)	-0.26 (0.11)	-0.94 (0.29)	-0.47 (0.09)	-	-	0.05 (0.14)	0.15 (0.18)
$\rho_{\varepsilon_1 v}$	0.48 (0.17)	-	-0.28 (0.41)	-	0.73 (0.13)		0.55 (0.39)	-	-0.04 (0.20)		0.78 (0.13)	
$\rho_{\varepsilon_0 v}$	-	0.30 (0.20)	-	0.39 (0.69)	-	0.71 (0.13)	-	0.35 (0.62)		-0.52 (0.09)		-0.41 (0.18)

Standard error in brackets. Other variables included are: year dummies, dummies for region and occupation dummies when available.

Notes: (a) In Ireland education variables for females have been excluded for convergence problems. Very few observations in Denmark in the reference, so the reference in this country is secondary or lower (b) Not included in Belgium , Denmark, Germany, Greece, Ireland and Spain, due to convergence problems. (c) Log family income is the log of monthly net earning of the family minus wage of the women, measured in Euro. (d) Not included in Belgium, Denmark, Germany, Greece Ireland and Spain due to lack of observations or convergence problems.

For non-part-timers (i.e. full-timers), $(\widehat{F_0})$, the effect of non labor income is positive in Belgium, France, Greece, Ireland, The Netherlands and the United Kingdom and not significant in Denmark, Germany, Italy, Portugal and Spain. Female education has a positive effect among part-timers in Belgium, Germany, Greece and Italy and is non significant in Denmark, France, Ireland, The Netherlands, Portugal, Spain and the United Kingdom.

Table 7B: Estimation of Fertility - All women

Variables	BELGIUM		DENMARK		FRANCE		GERMANY		GREECE	
	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$
Constant	0.56	1.58	-2.75	-2.48	-2.85	-0.17	-3.50	-0.58	0.08	1.34
	(0.42)	(0.10)	(2.54)	(0.36)	(1.00)	(0.15)	(0.96)	(0.22)	(0.73)	(0.16)
Age	-0.12	-0.08	-0.04	-0.005	-0.03	-0.02	-0.06	-0.04	-0.06	-0.08
	(0.02)	(0.004)	(0.03)	(0.003)	(0.01)	(0.003)	(0.01)	(0.002)	(0.01)	(0.002)
FEMALE COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS										
University	-0.17	0.16	0.09	0.10	0.12	0.09	0.44	-0.18	0.60	0.37
	(0.10)	(0.05)	(0.17)	(0.05)	(0.15)	(0.04)	(0.19)	(0.04)	(0.15)	(0.04)
Secondary	-0.50	-0.13	-	-	0.21	0.06	0.77	0.03	0.29	0.08
	(0.12)	(0.06)			(0.13)	(0.03)	(0.15)	(0.03)	(0.13)	(0.03)
PARTNER COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(a)]										
University	-	-	0.28	0.02	0.12	0.004	-0.42	0.24	0.34	0.23
			(0.25)	(0.04)	(0.16)	(0.04)	(0.15)	(0.04)	(0.15)	(0.04)
Secondary	-	-	0.10	-0.03	0.10	-0.002	-0.33	-0.02	-0.09	0.10
			(0.23)	(0.04)	(0.14)	(0.03)	(0.11)	(0.03)	(0.12)	(0.03)
HOUSEHOLD INCOME										
Log family income	0.42	0.08	0.16	0.21	0.36	-0.01	0.31	0.07	-0.20	-0.12
	(0.17)	(0.06)	(0.25)	(0.05)	(0.11)	(0.02)	(0.13)	(0.03)	(0.09)	(0.03)
AGE OF THE YOUNGEST CHILD- REFERENCE: NO CHILD [(B)]										
<3 years	-	-	-	-	-0.46	0.09	-	-	-	-
					(0.12)	(0.03)				
3-6 years	-	-	-	-	-0.55	0.08	-	-	-	-
					(0.15)	(0.04)				
>6 years	-	-	-	-	-0.89	-0.05	-	-	-	-
					(0.14)	(0.04)				
$\rho_{\varepsilon_1 v}$	-0.55	-	0.38		-0.10	-	0.74		0.85	
	(0.27)		(0.68)		(0.31)		(0.07)		(0.15)	
$\rho_{\varepsilon_0 v}$	-	0.67		-0.99	-	-0.97		-0.90		0.81
		(0.19)		(0.004)		(0.01)		(0.01)		(0.25)

Standard error in brackets. Other variables included are: year dummies, dummies for region when available.
Notes: (a) Not included in Belgium , Ireland and The Netherlands, due to convergence problems. (b) Very few observations in Denmark in the reference, so the reference in this country is secondary or lower. (c) Not included in Belgium, Denmark, Germany, Greece and Spain due to lack of observations or convergence problems. (d) Log family income is the log of monthly net earning of the family minus wage of the women, measured in Euro.

Table 7B: Estimation of Fertility - All women (Cont.)												
Variables	**IRELAND**		**ITALY**		**NETHERLANDS**		**PORTUGAL**		**SPAIN**		**U. KINGDOM**	
	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$	$\hat{F}_1$	$\hat{F}_0$
Constant	-0.46 (1.44)	-0.51 (0.26)	-0.37 (1.26)	1.10 (0.28)	-1.98 (0.64)	-2.14 (0.37)	0.40 (2.44)	0.01 (0.28)	-2.09 (0.79)	0.02 (0.20)	-2.71 (0.68)	0.02 (0.31)
Age	-0.03 (0.01)	-0.02 (0.005)	-0.07 (0.02)	-0.04 (0.004)	-0.05 (0.005)	-0.02 (0.004)	-0.04 (0.03)	-0.04 (0.008)	-0.04 (0.008)	-0.06 (0.002)	-0.04 (0.009)	-0.02 (0.004)
FEMALE COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS												
University	0.04 (0.20)	0.15 (0.07)	0.64 (0.22)	-0.05 (0.11)	0.11 (0.11)	-0.007 (0.08)	0.15 (0.45)	0.07 (0.12)	0.26 (0.11)	0.06 (0.04)	0.16 (0.09)	0.01 (0.05)
Secondary	0.02 (0.16)	0.17 (0.05)	0.28 (0.14)	0.01 (0.05)	0.16 (0.10)	-0.04 (0.06)	0.48 (0.56)	-0.02 (0.07)	-0.14 (0.13)	-0.04 (0.04)	0.12 (0.11)	0.07 (0.07)
PARTNER COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(a)]												
University	-	-	0.10 (0.20)	0.16 (0.08)	-	-	-0.04 (0.41)	0.07 (0.12)	0.22 (0.13)	0.20 (0.04)	0.05 (0.09)	-0.10 (0.05)
Secondary	-	-	-0.29 (0.14)	-0.04 (0.04)	-	-	-1.06 (0.54)	-0.02 (0.07)	0.29 (0.10)	-0.01 (0.04)	0.08 (0.13)	-0.23 (0.08)
HOUSEHOLD INCOME												
Log (family income)	0.19 (0.10)	-0.02 (0.03)	0.07 (0.14)	-0.14 (0.04)	0.30 (0.08)	0.07 (0.05)	-0.03 (0.19)	0.01 (0.04)	0.04 (0.10)	0.05 (0.03)	0.28 (0.09)	-0.12 (0.04)
AGE OF THE YOUNGEST CHILD- REFERENCE: NO CHILD [(B)]												
<3 years	-0.62 (0.26)	0.36 (0.07)	-0.30 (0.17)	-0.06 (0.05)	0.50 (0.07)	1.33 (0.07)	-0.10 (0.24)	-0.15 (0.05)	-	-	-0.05 (0.19)	0.52 (0.07)
3-6 years	-0.99 (0.26)	0.20 (0.09)	-0.26 (0.22)	-0.52 (0.07)	-0.54 (0.10)	0.21 (0.08)	-0.57 (0.34)	-0.38 (0.08)	-	-	-0.06 (0.23)	0.39 (0.10)
>6 years	-1.17 (0.26)	-0.02 (0.13)	-0.79 (0.25)	-0.75 (0.07)	-0.89 (0.09)	-0.11 (0.07)	-0.95 (0.34)	-0.59 (0.09)	-	-	-0.31 (0.23)	0.12 (0.09)
$\rho_{\varepsilon_1 v}$	-0.24 (0.49)	-	0.50 (0.28)	-	0.03 (0.12)		0.32 (0.86)	-	0.95 (0.07)		0.67 (0.21)	
$\rho_{\varepsilon_0 v}$	-	-0.86 (0.10)	-	0.24 (0.43)	-	0.04 (0.17)	-	-0.55 (0.44)		0.51 (0.32)		-0.45 (0.14)

Standard error in brackets. Other variables included are: dummies for region when available.

Notes: (a) Not included in Belgium , Ireland and The Netherlands, due to convergence problems. (b) Very few observations in Denmark in the reference, so the reference in this country is secondary or lower. (c) Not included in Belgium, Denmark, Germany, Greece and Spain due to lack of observations or convergence problems. (d) Log family income is the log of monthly net earning of the family minus wage of the woman, measured in Euro.

In Table 8A we present the results of the part-time equation for workers. Age affects the probability of working part-time positively in Germany, The Netherlands and Portugal, negatively in Greece in Italy and is non-significant elsewhere. Having a child aged 1-3 positively affects the probability of being in part-time work in all countries except Portugal and Denmark. Finally, having higher education affects the probability of working part-time negatively in Belgium, Ireland and the United Kingdom, positively in Italy and is not significant elsewhere.

Results for the whole sample are shown in tables 7B and 8B. As can be seen from the tables, the impact of the different variables differs significantly when non-workers are included in the estimation, as expected. For instance, the effect of higher education on part-time work turns from non-significant to positive in most countries.

Table 9 presents the impact of part-time work on fertility for each of the selected countries and for each of the groups of women selected for the analysis. Given the use of predicted values, the standard errors of such predictions are corrected[15].

The first interesting result is that for the sample of workers, the impact of the available part-time work schedule affects the fertility decision positively in Belgium, Germany, Ireland, Italy and The Netherlands, and negatively in Denmark, France, Greece, Portugal, Spain and the United Kingdom. Furthermore, when both working women and non-working women are considered, the effect of part-time work on fertility decreases, as expected, given that non-working women have the highest birth rate. Moreover, when the sample is not restricted to workers, in Belgium, Germany and Italy, the positive effect turns to negative, whereas in The Netherlands and Ireland, the impact of part-time work on fertility remains positive no matter what group of women is considered.

The positive effect found for The Netherlands and Ireland is very consistent with the institutional background described above for these two countries and shown by the descriptive analysis presented in graphs 2 and 3. The Netherlands and Ireland are the two countries where the percentage of births among part-timers is highest. Therefore, we can conclude that for these two countries, the available part-time schedule enhances fertility.

Table 8A: Estimation of Part-time - Workers sample.											
	BELGIUM	DENMARK	FRANCE	GERMANY	GREECE	IRELAND	ITALY	NETHERLANDS	PORTUGAL	SPAIN	U. KINGDOM
Constant	-0.64 (0.11)	-1.11 (0.17)	-1.53 (0.09)	-2.46 (0.09)	-0.98 (0.11)	-0.91 (0.38)	-1.62 (0.20)	-1.28 (0.07)	-1.62 (0.18)	-1.47 (0.12)	-1.31 (0.11)
Age	-0.005 (0.003)	-0.005 (0.005)	0.002 (0.002)	0.009 (0.002)	-0.008 (0.003)	0.006 (0.005)	-0.01 (0.005)	0.01 (0.002)	0.02 (0.004)	-0.005 (0.003)	0.001 (0.003)
FEMALE COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(a)]											
University	-0.43 (0.04)	0.02 (0.06)	0.09 (0.05)	0.03 (0.04)	0.03 (0.05)	-0.58 (0.10)	0.47 (0.08)	-0.005 (0.04)	0.09 (0.10)	-0.07 (0.05)	-0.15 (0.04)
Secondary	-0.12 (0.04)	-	0.008 (0.04)	0.25 (0.03)	-0.17 (0.04)	-0.27 (0.07)	0.13 (0.05)	0.05 (0.03)	-0.46 (0.09)	-0.19 (0.04)	0.09 (0.05)
PARTNER COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(b)]											
University	0.12 (0.04)	-	0.11 (0.05)	-	-0.08 (0.05)	-	0.12 (0.09)	0.02 (0.04)	0.25 (0.13)	-0.01 (0.04)	-0.10 (0.04)
Secondary	-0.002 (0.04)	-	0.05 (0.04)	-	-0.08 (0.04)	-	0.01 (0.05)	-0.06 (0.03)	-0.20 (0.09)	-0.01 (0.04)	-0.04 (0.06)
AGE OF THE YOUNGEST CHILD- REFERENCE: NO CHILD [(c)]											
<3 years	0.42 (0.04)	-0.06 (0.08)	0.29 (0.04)	1.26 (0.04)	0.12 (0.05)	1.06 (0.08)	0.43 (0.07)	1.54 (0.03)	-0.07 (0.07)	0.42 (0.05)	1.23 (0.05)
3-6 years	0.16 (0.05)	-0.08 (0.10)	0.22 (0.05)	1.51 (0.05)	0.18 (0.06)	1.14 (0.10)	0.40 (0.08)	1.58 (0.05)	-0.11 (0.09)	0.22 (0.06)	1.25 (0.07)
>6 years	0.17 (0.05)	0.21 (0.08)	0.15 (0.04)	0.94 (0.03)	0.05 (0.05)	1.07 (0.10)	0.44 (0.07)	1.18 (0.03)	-0.16 (0.07)	0.15 (0.05)	0.98 (0.05)
$\rho_{\varepsilon_1 v}$	-0.95 (0.02)	0.29 (0.60)	0.05 (0.36)	-0.51 (0.08)	0.94 (0.06)	0.48 (0.17)	0.34 (0.36)	0.74 (0.13)	0.55 (0.39)	-0.04 (0.20)	0.93 (0.11)

Standard error in brackets. Other variables included are: year dummies, occupation dummies of the partner.
Notes: (a) Not included in Belgium , Ireland and The Netherlands, due to convergence problems. (b) Very few observations in Denmark in the reference, so the reference in this country is secondary or lower. (c) Not included in Belgium, Denmark, Germany, Greece and Spain due to lack of observations or convergence problems.

It is worth looking at the reasons underlying the differences between the effect of part-time work on fertility in Italy and Germany when the group of women under analysis is extended to include non-workers[16]. Regarding Italy, as Del Boca (2000) suggests, part-time work is very restricted from the demand side. Employers do not want to hire workers part-time, given that in order to achieve flexibility, fixed-term contracts are preferable. However, part-time working is a desired labor market status for many women of fertile age, as Del Boca (2000) and our descriptive analysis (table 2) suggest. In this context, our result may indicate that part-time work enhances fertility for workers that have access to it. However, given the scarcity of facilities for the use of part-time work, many females have to quit the labor market given the impossibility of accessing it so as to combine family and work. With respect to Germany, the use of part-time work is not very frequent but we can see from table 2 that those women who work part-time do so mainly to combine family life and work and very few seem to choose it because

they cannot find a full-time job. This means that part-time work in Germany is mainly voluntary.

Table 8B: Estimation of Part-time - All women

	BELGIUM	DENMARK	FRANCE	GERMANY	GREECE	IRELAND	ITALY	NETHERLANDS	PORTUGAL	SPAIN	U.KINGDOM
Constant	-1.54 (0.10)	-2.28 (0.15)	-1.80 (0.08)	-3.08 (0.10)	-1.86 (0.10)	-1.73 (0.14)	-2.07 (0.16)	-1.88 (0.06)	-2.13 (0.17)	1.63 (0.08)	-2.26 (0.10)
Age	-0.0002 (0.003)	0.03 (0.004)	0.005 (0.002)	0.003 (0.002)	-0.003 (0.002)	0.002 (0.004)	-0.005 (0.004)	0.02 (0.002)	0.01 (0.004)	0.004 (0.003)	0.005 (0.003)
FEMALE COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS											
University	-0.09 (0.04)	-0.05 (0.05)	0.10 (0.04)	0.15 (0.04)	0.47 (0.05)	0.15 (0.06)	0.66 (0.07)	0.20 (0.04)	0.45 (0.09)	0.11 (0.04)	0.04 (0.04)
Secondary	-0.007 (0.04)	-	0.10 (0.03)	0.26 (0.03)	0.03 (0.04)	0.20 (0.05)	0.21 (0.04)	0.05 (0.03)	-0.25 (0.09)	-0.05 (0.04)	0.15 (0.05)
PARTNER COMPLETED EDUCATION - REFERENCE: PRIMARY OR LESS [(a)]											
University	0.10 (0.04)	-	0.06 (0.05)	0.30 (0.04)	-0.03 (0.05)	-	0.09 (0.08)	-0.09 (0.04)	0.28 (0.13)	0.05 (0.04)	-0.08 (0.04)
Secondary	0.07 (0.04)	-	0.08 (0.03)	0.18 (0.03)	-0.07 (0.04)	-	-0.002 (0.04)	-0.18 (0.03)	-0.12 (0.09)	-0.03 (0.04)	-0.01 (0.05)
AGE OF THE YOUNGEST CHILD- REFERENCE: NO CHILD [(B)]											
<3 years	0.32 (0.05)	0.09 (0.07)	0.08 (0.04)	0.24 (0.04)	0.08 (0.05)	0.58 (0.07)	0.21 (0.06)	0.64 (0.02)	-0.02 (0.07)	-0.05 (0.04)	0.75 (0.05)
3-6 years	0.13 (0.06)	0.14 (0.09)	0.11 (0.05)	1.02 (0.04)	0.19 (0.06)	0.52 (0.09)	0.22 (0.07)	0.36 (0.04)	-0.08 (0.09)	-0.22 (0.06)	0.92 (0.06)
>6 years	0.16 (0.05)	0.22 (0.07)	0.11 (0.04)	0.91 (0.03)	0.04 (0.05)	0.61 (0.08)	0.28 (0.06)	0.24 (0.03)	-0.06 (0.07)	-0.15 (0.05)	0.80 (0.05)
$\rho_{\varepsilon_1 v}$	-0.55 (0.27)	0.38 (0.68)	-0.10 (0.31)	0.74 (0.07)	0.85 (0.15)	-0.24 (0.49)	0.50 (0.28)	0.03 (0.12)	0.32 (0.86)	0.96 (0.07)	0.67 (0.21)

Standard error in brackets. Other variables included are: year dummies, occupation dummies of the partner.
Notes: (a) Not included in Belgium , Ireland and The Netherlands, due to convergence problems. (b) Very few observations in Denmark in the reference, so the reference in this country is secondary or lower. (c) Not included in Belgium, Denmark, Germany, Greece and Spain due to lack of observations or convergence problems.

On the other hand, childcare service is very limited for children under 3 years of age and the length of parental leave is very long, up to three years. These facts may explain why the effect of part-time work on fertility is positive among workers, but turns negative when non-workers are included in the sample, given that non-working women have the highest birth rate.

Table 9: Effect of Part -Time on Fertility

	BELGIUM	DENMARK	FRANCE	GERMANY	GREECE	IRELAND
All $\hat{F}_1 - \hat{F}_0$	-0.22	-0.22	-0.09	-0.02	-0.07	0.10
	(0.01)	(0.008)	(0.005)	(0.001)	(0.007)	(0.01)
workers $\hat{F}_1 - \hat{F}_0$	0.56	-0.18	-0.05	0.07	-0.06	0.02
	(0.11)	(0.01)	(0.004)	(0.004)	(0.005)	(0.0009)
	ITALY	**NETHERLANDS**	**PORTUGAL**	**SPAIN**	**U. KINGDOM**	
All $\hat{F}_1 - \hat{F}_0$	-0.03	0.01	-0.003	-0.02	-0.06	
	(0.01)	(0.0007)	(0.0003)	(0.001)	(0.005)	
workers $\hat{F}_1 - \hat{F}_0$	0.13	0.05	-0.04	-0.02	-0.05	
	(0.01)	(0.003)	(0.002)	(0.002)	(0.003)	

Standard error in brackets. $\hat{F}_1$ is the prediction of Fertility obtained in the estimation in Table 3 for part-timers. $\hat{F}_0$ is the prediction for non part-timers. Standard errors obtained by the Delta Method.

Finally, to interpret the negative effect of part-time work on fertility found in some countries, we would need more detailed data regarding the use and extent of family provisions so as to introduce it in the empirical analysis. Given that these countries have very different institutional characteristics, it is very likely that the negative effect of part-time on fertility has to be interpreted in different terms.

7. Conclusion

Our main aim is to analyze the relationship between availability of part-time work and fertility for eleven European Community countries. Part-time work is not equally legislated in the different countries. Part-time workers' social benefits differ from country to country so this option is not equally attractive for women workers from different countries. Moreover, labor market alternatives to part-time work to reconcile work and family, such as public childcare or parental leave provisions, also differ widely from country to country. Therefore, we try to assess whether the existing part-time schedule in each of the selected countries has a positive impact on the fertility decision or. The study has immediate implications for public policy, given that it can help us to know which of the available part-time schedules, if any, helps women to reconcile work life and family life.

We estimate a reduced form model where the decisions concerning fertility and labor market status are estimated simultaneously. The data we used are a pool of the available waves from the European Community Household Panel. The analysis is performed separately for each of the eleven countries for which data are available.

Results show that for working women, the part-time schedule affects fertility positively in Belgium, Germany, Ireland, Italy and The Netherlands, given that we find that women that make use of this possibility are, ceteris paribus, more likely to have a child. In the rest of the countries under analysis (Denmark, France, Greece, Portugal, Spain and the United Kingdom) the available part-time schedule does not seem to be used as a way of reconciling family life and work.

The lesson to be learned from this study is that if policy makers want to implement adequate part-time schedules so as to enhance fertility, they should look at the part-time schedule available in countries like Belgium, Ireland and The Netherlands, which clearly enhances fertility for women who decide to make use of this flexibility measure.

Notes

[1]The countries included in the analysis are: Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain and UK. For the rest of the countries included in the panel, the information is too incomplete for our analysis.

[2]By statistical definition we mean the definition used by each National Institute of Statistics.

[3]It is interesting to note that in some countries, such as Germany, Spain and United Kingdom, part-timers who work less than a particular number of hours enjoy very low job protection. Whereas in Germany and Spain, where the thresholds are 12 and 15 hours per week, respectively, the percentage of these workers among part-timers is less than 1 percent, in the UK, where the threshold is 16 hours, 15 percent of part-timers fall into this category.

[4]Blossfeld and Hakim (1997) offer a very wide perspective on the institutional background of part-time work in most of the European countries included in this study.

[5]The Member States at the beginning of this project were Belgium, Denmark, France, Germany, Greece, Ireland, Italy, Luxemburg, The Netherlands, Portugal, Spain and the United Kingdom.

[6] More information on the panel can be found at http://forum.europa.eu.int/irc/dsis/echpanel/info/data/information.html.

[7]For most countries, the survery contains very few women who have a child with no partner. Furthermore, we do not focus on the determinants underlying marriage or cohabitation, although we are aware that this may be a first step for the decision to have a child.

[8]We include them as part-timers when analysing the whole sample of women, but we cannot include them when only working women are considered.

[9] Although the labor market status is decided simultaneously with the fertility decision, we only observe the result of such decision, revealed at t+1.

[10]We drop all women for whom information concerning labour status is not available. This includes women that work less than 15 hours per week. We consider three possible labor market statuses: not working, working part-time and working full-time. Non-workers are those women who are either inactive or unemployed.

[11]More exactly, we consider that females make use of flexible working hours if we observe them to be in part-time work at each point of time. For those that do have a child in a particular year t, we consider that they make use of part-time work if either in the same year t or in $t+1$ we observe them working part-time.

[12]Variables included in X but excluded from Z are the log of yearly family net income and regional dummies. Variables included in Z but excluded from X are occupational dummies of the partner and year dummies. These are the most robust variables for exclusion purposes.

[13]We lack information about regions in Denmark and The Netherlands.

[14]In Belgium, Denmark, Germany, Greece and Spain we had some convergence

problems when age of the youngest child was included in the fertility equation, so these variables have been included only in the part-time equation.

[15]We have used the delta method to correct the standard errors.

[16]In Belgium the effect of part-time on fertility also turns from positive to negative when the sample is extended to include non-working women. However, the empirical results for Belgium are to be taken with care, given that they are not robust to small changes in the specification.

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