

Employment decisions of European women after childbirth¹

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Abstract

This paper describes and compares transitions into employment of mothers of newborn children in several European countries. Although female labour participation has increased everywhere, women are still likely to interrupt their career, when they have a child, for a period of time longer than the basic maternity leave. Using data from ECHP, we select women who have a child during the survey and we observe how long they take to start working. In order to estimate the factors which influence mothers' decisions to work, we use a discrete time hazard model. Results show that women in different parts of Europe take different amounts of time which depend on their human capital and on parental leave arrangements. Highly educated women behave quite homogeneously across countries so that the difference in post birth participation in Europe is given by differences in participation among the less educated women. Moreover, long parental leave seem to delay the return to work of low and medium educated women but they do not affect highly educated women's participation.

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1. Introduction

Although female labour participation has increased in all European countries in the last thirty years, a large number of women still interrupt their career with the birth of their children for a period of time longer than the basic maternity leave. This is mainly due to the care the newborn needs and to the parents' preferences of having the child at home when she is very young.

Several considerations lead us to study labour market transitions of women after their childbirth.

From a policy point of view, the ageing process of the population in all industrialized countries threatens welfare system regimes: in order to maintain them, the European Community encourages a higher labour market participation by women (as well as a higher level of fertility), stressing the role of reconciling policies (OECD, 2001).

From a private point of view, it is important that women develop their own human resources and do not sacrifice their financial independence. First, the possibility to keep accumulating human capital is particularly important today, as women study more than in the past. Second, the chance of relying on their own income is fundamental for lone mothers, whilst married women can still choose to specialize in home and family care; but increasingly they seem not to accept this role for themselves (Ermisch, 1996). Moreover, the increased probabilities of divorce and job loss among middle-aged male workers give more importance to female work (OECD, 2004).

From the perspective of the child's well being, however, it is desirable that she spends a good deal of time with her parents, especially when very young, which would imply women do not return to the labour market when they have a young child (Ermisch, Francesconi, 2002). But as today women study at least as much as men, the most efficient solution should lead both the parents to take part in the labour market and, consequently, to divide family tasks. For the child's development, spending an equal share of time with each of the parents can also be more stimulating (Pruett, 1997).

Studying and comparing what happens, in the member states, to women's career around their childbirths can help understand the effect of different country specific policies in Europe. We cannot identify the effect on the probability of post birth employment but we

can examine whether or not a faster return to work is correlated, at the country level, to the presence of some of these policies.

In this paper, we analyse employment decisions of mothers after childbirth, using the European Community Household Panel (ECHP) and treating the data in a survival perspective. We first report some previous results about motherhood and labour market participation (part 2) and then the methodological framework (part 3). The ECHP data are illustrated in part 4, while part 5 comprises the empirical results. Conclusions follow (part 6).

2. Literature and Institutional Background

Several studies in the last ten years are concerned with labour force transitions of mothers in connection with childbirth. In these, two key-variables have emerged: the woman's level of human capital, which increases the probability of starting work after the childbirth; and, the environment the woman faces in terms of social policy, labour market conditions and social attitudes concerning the gender division of familiar duties.

The higher opportunity cost and attachment to work of high skilled women lead them to work after the childbirth. But different family policy regimes and economic environments may have an important role in weakening the effect of human capital on a woman's decision to work: the diffusion of flexible employment arrangements, the availability of childcare and generous parental leave may encourage less educated women to start working again. This result is confirmed in several works carried out on different European countries. Gustafson, Wetzels, Vlasbom and Dex (1996) find that human capital is very important in explaining differences in post birth work behaviour in Germany and in the UK, while in Sweden less educated women also enter the labour force by the child's second birthday. Similar results are found by Gutierrez-Domenech (2005) who, studying mothers' work interruptions after the first child among several European countries, finds that education represents a key factor, except in Sweden, where generous public childcare provision enables both more and less educated women to work after childbearing.

The possibility to work when the child is young is constrained by the availability of childcare and, later, by the pre-primary and primary school system. Better access to care services for children as well as high quality and low costs can reduce the cost of working for the mothers, reducing their preferences of having the child at home.

	<i>Infants</i>			<i>Pre school aged children</i>		
	<i>Coverage</i> (%)	<i>Public funding</i> (%)	<i>Opening hours</i> (per day)	<i>Coverage</i> (%)	<i>Public funding</i> (%)	<i>Opening hours</i> (per day)
DK	55	75	10.5	90	75	10.5
SE	40	85	11	72	85	11
FR	39	78	10	87	100	8
BE	30	83	9	99	100	7
FI	23	85	10	42	85	10
GE	9	82	10	73	82	6
PT	12	80	7	72	100	5
AT	10	82	7	70	82	6
IT	6	80	10	87	91	8
LU	3	83	9	76	100	5
EL	3	80	9	48	100	4
ES	5	80	5	77	100	5
IE	2	100	9	50	100	4
NL	2	65	10	66	100	7
UK	2	94	8	60	100	5

Table 1: percentage of slots per 100 children, percentage of costs covered by public funding and number of hours covered in per day in European countries (source: De Henau J., Meulders D., O’Dorchai S., Périvier H, 2005).

We see large differences in the public availability of childcare among European countries, especially for children under 3 (Table 1). In Denmark 55 young children out of 100 are looked after in a public crèche while less than 5 in Southern countries, in the UK, in Ireland and in the Netherlands. In almost all countries a high percentage of fees (around 80%) are covered by public funds, but the effect of such a relative low cost is made meaningless by the rationing of the service (Del Boca, Vuri, 2004). Finally, the opening hours may or may not coincide with the “normal” working day: in Denmark, Sweden, the Netherlands and France the service is open for more than 10 hours a day; in Greece the service covers only 5 hours a day with a lunch break in the middle of the day. A shorter daily service may force parents to work less hours or to find some informal solution to complement the formal ones. The situation changes dramatically if we look at the arrangements for children aged 3 and more (Table 1): the coverage is more than 70% in almost all countries; the public funding is on average between 80 and 100% while the opening hours remain more or less

the same. These differences are often due to the Authority with responsibility for these sectors: infants fall under the auspices of Social Affairs while pre-school children are under the responsibility of the Ministry of Education (De Henau et al, 2005). The Barcelona council of March 2002 has stressed the necessity of improving the childcare system, adopting two very precise targets: by 2010, EU member states should provide, at least, 50 places every 100 children under 3 and 90 every 100 children above 3.

In countries where the preference is given to children looked after at home, policies tend to offer very generous leave provisions in terms of length and wage replacement and fewer care services. The effect of the leave arrangements is not clear a priori: in the absence of it, some women could anticipate the difficulties associated with being a working mother and decide not to work at all; but, on the other hand, women on parental leave have longer interruptions from work with possible negative implications on their future employability and career (De Henau et al, 2005). The EC directive requires a minimum of 14 weeks of maternity leave and of 3 months of parental leave (Table 2). While the length of the maternity leave and the replacement ratio (most of them over 80%) are quite homogenous (14 - 22 weeks) among countries, parental leave differs substantially in terms of length, of paid period and of incentives for fathers' take-up.

	<i>Maternity leave</i>		<i>Parental leave</i>			
	<i>Period (weeks)</i>	<i>Average replacement rate (%)</i>	<i>Total leave duration (months)</i>	<i>Paid period (% of the total leave)</i>	<i>Father period (months)</i>	<i>Transferable months</i>
IT	22	80	12	55	6	0
DK	18	62	11	70	0	11
IE	18	70	7	0	3.5	0
UK	18	43	8	0	4	0
FI	18	66	36	100	0	36
PT	17	100	6	8	3	0
EL	17	50	7	0	3.5	0
ES	16	100	36	0	0	36
FR	16	100	36	100	0	36
LU	16	100	12	100	6	0
NL	16	100	6	0	3	0
AT	16	100	36	100	6	24
BE	15	77	6	100	3	0
GE	14	100	36	67	0	36
SE	14	80	18	79	2	12

Table 2: maternity leave and parental leave in Europe (source: De Henau J., Meulders D., O'Dorchai S., Périvier H, 2005).

We see for Belgium, Portugal, and the Netherlands the minimum period of 3 months for each parent while very long leave of 3 years exists in France, Spain, Austria, Germany and Finland. The right to leave can be individual or family based: in the first case, if one parent does not take the leave, it is lost for the family. In this sense, parental leave could play an important role in re-equilibrating the work division in the couple and promoting gender equality: short leaves, well paid and with no possibility to transfer months from the father to the mother (see last column in Table 2) could lead fathers to share this task more frequently. In all countries the whole leave is protected, with the exception of Spain where the protection covers just one year and in the Netherlands where the employment is guaranteed in some collective agreements. But in some countries they lose pension and seniority rights (UK, Netherlands, Ireland, and half of them in Austria and France). In this work we cannot identify the effect of these features (childcare availability and generosity of leave system) on the probability of post birth employment but we examine whether or not a faster return to work is correlated, at the country level, to the presence of these characteristics.

3. The methodological framework

Suppose a woman takes labour market participation decisions in order to maximize the household's lifetime utility. When out of employment the household utility u (measured in terms of consumption goods) depends on the husband's labour income (when in a partnership), on her private income and on her productivity at home, which varies with the number and ages of children. When in paid employment, the wage she receives in the labour market is an additional determinant of the household utility (Ermisch, Wright, 1991).

After childbirth, she decides whether or not to work according to the wage offers she receives, which are assumed to be from a distribution $F(w, X)$ where X represents fixed characteristics of the woman. Let $V_2(X, H)$ be the expected discounted lifetime income when not in employment and $V_1(X, H, w)$ that when employed at wage w in a household

with characteristics represented by H . The expected value of the best option, over an infinite span of life, is given by

$$T(X) = \int_{-\infty}^{+\infty} \max\{V_2(X, H), V_1(X, H, w)\} dF(w, X).$$

Burdett et al (1985) show that there is a stopping rule that guarantees the existence of this maximum: she will decide to be employed if and only if $V_1(X, H, w) > V_2(X, H)$, where $V_1(X, H, w)$ is strictly increasing in w . Burdett et al (1985) derive that the correspondent maximizing strategy is characterized by a reservation wage function $z(X, H)$ so that she decides to be employed if $w > z(X, H)$. We see that the larger is her utility for the time spent at home, the lower the probability to be employed, while the larger is her expected wage (which depends on her human capital) the higher the probability of employment.

When she has a child, the reservation wage may raise as motherhood increases the demand for her time in childcare activities, or it may decrease as a consequence of the increased demand for market goods required for home production (Ronsen, Sundstrom, 1996). Depreciation and the foregone accumulation of human capital lower the wage she can get from working outside the household. At the same time, when the child grows up the reservation wage falls down, as she becomes less time intensive and the demand for market goods may increase. On the whole, as time since childbirth passes, her participation behaviour will depend on the relationship between the loss in human capital which affects her potential wage and the loss in her productivity at home (due to the child's age) which affects her reservation wage.

In order to study mothers' participation in the labour market, we estimate a reduced form model of labour market participation where the dependant variable is defined as the duration elapsed since childbirth to entering the labour market. The higher is the probability of returning to work, the smaller is this duration. In this study the event of interest, the transition from non-work to work, may occur at any particular instant in time, but data are provided in discrete intervals of time, which leads us to use a discrete hazard model. We observe a random sample of women from the moment of their childbirth on, and we follow

them till the spell ends or until the end of the survey³: subsequently, we may or may not observe the transition into work. These latter observations are right censored. We assume that the process which gives rise to the censoring is independent of the survival time process.

Call the time spent out of the labour market T , which ends in one given interval of time $[t_{j-1}, t_j)$. The hazard rate, for an individual i , is given by

$$h_{ij} = \Pr[T_i \in [t_{j-1}, t_j) | T_j \geq t_{j-1}],$$

which is the probability of leaving the state of inactivity in the interval $[t_{j-1}, t_j)$, given she has not worked until t_{j-1} .

The likelihood contribution for a censored spell is given by

$$L_i = \prod_{k=1}^j (1 - h_{ik}),$$

while the likelihood contribution for a completed spell is given by

$$L_i = \frac{h_{ij}}{1 - h_{ij}} \prod_{k=1}^j (1 - h_{ik}),$$

so that the likelihood for the whole sample is equal to

$$L = \prod_{i=1}^n \left[\left(\frac{h_{ij}}{1 - h_{ij}} \right)^{c_i} \prod_{k=1}^j (1 - h_{ik}) \right],$$

which implies that

³ We therefore have an “inflow” sample (Jenkins, 2004).

$$\log L = \sum_{i=1}^n c_i \log\left(\frac{h_{ij}}{1-h_{ij}}\right) + \sum_{i=1}^n \sum_{k=1}^j \log(1-h_{ik}),$$

where c_i is 1 if the spell is completed, 0 otherwise. This expression has the same form as the likelihood for a common binary regression, where y_{ik} is equal to 1 when $c_i=1$ and T_i is included in the interval $[t_{j-1}, t_j)$ (Jenkins, 2004).

$$\log L = \sum_{i=1}^n \sum_{k=1}^j [y_{ik} \log h_{ij} + (1-y_{ik}) \log(1-h_{ik})]$$

The hazard rate h may depend on the time already spent in inactivity and on some other characteristics of the woman, the household and the social and economic environment she faces. We choose a complementary log-log model specification, which is consistent with a continuous time model and interval censored survival time data (Jenkins, 2004). The hazard rate into work for a woman i at time j is given by

$$h_{ij}(t_j, X_i, H_i, E_r, S) = 1 - \exp[-\exp(\alpha + \eta_i + \beta X_i + \delta H_i + \lambda E_i + \vartheta S + \gamma(J-1))] \quad (1),$$

a function of the characteristics of the woman (X), of the household (H), of the regional economic performance (E) and of the social framework designed by institutions (S), plus a duration interval specific parameter.

We estimate a model with a woman specific variable η_i , which follows a normal distribution and is assumed to be independent from both time and the other explanatory variables. In fact, women in our sample may be more work or family attached and our covariates may not adequately identify this difference. If omitted variables are correlated with any of the included regressors, it will cause bias of the usual kind. But, even if they are not correlated, results will be biased and the bias will be different if we look at the estimated time dependence or at the estimated coefficients of the regressors: the model will tend to overestimate the negative effect of the time spent in the state, while the size of the estimated parameters will be underestimated (Lancaster, 1979; Nickell, 1979).

When time in inactivity passes, women tend to lose some human capital with a negative impact on the mean of the wage offer distribution, while the children become less time intensive with a consequent lowering of the reservation wage. The net effect of these reductions is caught, in our econometric specification, by the impact of the time spent out of the labour market. By introducing the time spent in inactivity ($J-1$) among the regressors we assume each year in inactivity contributes linearly to the probability of being employed. As we will see in the empirical part, we cannot include in our specification information about social policies (e.g. availability of childcare, parental leave arrangements) since they either do not show any variability through the sample or they are not observable. While the labour supply equation (I) is the actual one, we are able to estimate

$$h_{ij}(t_j, X_i, H_i, E_r) = 1 - \exp[-\exp(\alpha' + \eta_i + \beta X_i + \delta H_i + \lambda E_r + \gamma(J-1))]$$

where

$$\alpha' = (\alpha + \vartheta S)$$

if there is no interaction between S and the included regressors. In this simple framework, the social environment (i.e. free childcare) affects each woman's behaviour to the same degree, regardless of her characteristics.

If S and any of the included regressors interact (e.g. φSX with $\varphi \neq 0$), we will have

$$h_{ij}(t_j, X_i, H_i, E_r) = 1 - \exp[-\exp(\alpha' + \eta_i + \beta' X_i + \delta H_i + \lambda E_r + \gamma(J-1))]$$

where

$$\alpha' = (\alpha + \vartheta S),$$

$$\beta' = (\beta + \varphi SX).$$

For example, when childcare is not free, its availability will differentially affect women with different characteristics (women with higher wages can purchase more services). These last considerations will help us in comparing the estimated parameters obtained when analyzing different countries.

4. The data

For empirical analysis we use data from the European Community Household Panel (ECHP), a dataset provided by Eurostat which covers a wide range of topics and allows us to compare the member countries and is available for the years 1994-2001. We select women who have a child between 1994 and 2001 in all countries available in the panel but Sweden⁴, and we follow them over time: our dependant variable is defined as the duration, in years, between childbirth and entering the labour market⁵.

In order to see when the woman starts to work after she has had a child, we define a variable using the work status stated in the ECHP but also the hours worked, the monthly wage and the annual labour income (which should be different from zero for a working person). In fact, we are interested in studying when the woman actually returns to work but women in long and well protected parental leaves may be likely to state they are working when they just have a protected job⁶.

From the ECHP we extract information regarding family composition, household income and the mother's work activity. For all mothers we know whether or not they worked before childbirth and some features of their previous employment position (kind of contract, wages, hours worked).⁷ We do not observe the end of all inactivity spells: in some cases, we do not observe them because they start working after 2001 or, in some cases, because some women will never participate in the labour market.

In order to study which factors make women more likely to work, we estimate a complementary log-log model with random effects. The regressions are estimated for each country separately. With reference to equation (2) we include variables related to the woman, her household and the regional economic environment. In the hazard function we include the woman's potential wage to estimate its effect on her participation decision. The potential wage is estimated on the whole ECHP sample of women aged 16-45 (fertile

⁴ The Swedish dataset is not a panel.

⁵ In the dataset, monthly activity information is available, but the high presence of missing values leads to use the information stated at the time of the interview.

⁶ This new variable is just slightly different from the original activity status in the ECHP in all countries, with the exception of Germany and Austria, which are two countries with long parental leaves and high take up (De Henau et al, 2005).

⁷ This information is available in the previous interview, when available, or in a set of questions regarding previous jobs.

period) by using a Heckman regression (Tables A1-A3, see Appendix). We estimate the logarithm of the wage by using the level of schooling (third, second, less than second)⁸, the age and its square, and a set of year dummies⁹. We also include, in the selection equation, the following variables: married or cohabitant (single, excluded), with one or more than one child (childless, excluded), household income (excluding woman's earnings) and a set of dummies related to the region of residence. In this way we are able to predict the logarithm of the potential wage for women in our sample, which has been made unconditional to their work decisions and represents what they could earn participating in the labour market. Moreover, in the discrete hazard model (2), we include the number of years they spent in inactivity to see if the hazard into work increases or decreases as the child grows up and how this pattern varies across countries. We construct a variable to assess the family structure of the household: she may live in a couple, in a couple with at least one grandparent (extended family) or without any partner (lone mother, regardless of the presence of grandparents). We include household income to take into account its negative effect on the reservation wage. The household income is composed of social transfers, private incomes and labour incomes of her partner and her (their) grandparents. Although potentially endogenous, we include two variables regarding the fertility decisions of the woman: a dummy variable indicating the first childbirth compared to subsequent ones and the presence of children born during the inactivity spell. We include them in order to maintain comparability among countries with different fertility behaviours. By including the variable "first childbirth", we assume that the effect of the regressors is the same for all childbirths, but for a shift, parameter captured in this variable. A better alternative could be to include only women at the first childbirth but, first, small samples available do not allow us this and, second, the possibility to observe the same woman more than once makes it easier to treat unobserved heterogeneity. Finally, we include the regional unemployment rate in order to consider the economic environment where women live. The regional unemployment rate is drawn by REGIO, a dataset from Eurostat which provides descriptive statistics on each country's labour market, year by year, region by region. All covariates

⁸ Given the incoherencies in the education variable between waves, we make this variable constant over time. We include the level of education stated in the first wave they are interviewed since the first years of the panel look more reliable when compared with OECD statistics.

⁹ We do not have years of work experience in the survey.

change over time, with the exception of the potential wage and the dummy “first childbirth” which are constant over the spell.

In Table 3 we summarize the characteristics of our samples at the beginning of the spell. We have 14 countries in which we analyze from a minimum of 596 spells of inactivity (1,439 year-observations, Austria) to a maximum of 1,527 spells (3,960 year-observations, Italy). The percentage of mothers returning to work the year after childbirth varies from 27% in Spain to 55% in Belgium. The mean potential wage shows some variability across countries, going from 3 *PPPs* each hour in Portugal to 10 *PPPs* in Luxembourg: these differences may be due to the characteristics of labour markets, to the level of wealth of the country as well as to a different self selection processes (for example, in Portugal less educated women may be more likely to have children, leading us to see only the bottom of the wage distribution). We see differences among countries in family structure: lone mothers are quite numerous in Ireland, in the UK and in Austria while the extended family is more common in Italy, Spain, Greece, Portugal and Austria.

	<i>Work</i>	<i>Potential wage</i>	<i>Household income</i>	<i>Lone mother</i>	<i>Extended family</i>	<i>First child</i>	<i>Other kids</i>	<i>Regional unemployment rate</i>	<i>N. spells</i>	<i>N. year-observations</i>
	(%)	(<i>PPPs</i>)	(<i>PPPs</i>)	(%)	(%)	(%)	(%)	(%)		
DK	38.2	8.46	21,157	3.5	0.6	43.9	4.3	5.7	717	1,494
NL	46.8	8.78	20,372	3.0	0.2	42.6	3.1	4.5	1,126	2,646
FI	34.6	6.87	17,592	2.8	1.2	39.1	2.8	11.0	892	1,793
UK	38.8	9.00	19,565	10.1	3.1	45.2	1.4	6.3	1,080	3,185
IE	35.2	8.35	21,713	17.4	3.6	35.2	1.0	10.0	841	2,097
FR	43.0	7.52	18,079	5.3	1.0	46.0	1.5	11.0	1,553	3,490
BE	55.2	7.61	22,661	3.1	1.8	42.7	1.8	10.1	668	1,313
LU	40.9	9.58	37,511	5.0	7.6	46.8	0.9	2.7	627	1,638
GE	27.9	6.93	22,569	6.1	2.5	47.8	2.0	8.4	1,342	3,817
AT	41.9	7.66	25,056	14.1	15.3	46.6	2.2	4.1	596	1,439
IT	38.5	6.80	16,273	2.5	9.8	55.8	1.4	13.9	1,527	3,960
EL	33.5	3.98	15,120	1.1	17.1	50.5	2.2	9.6	881	2,497
ES	27.0	5.79	15,561	4.0	10.8	52.1	1.7	19.8	1,237	3,577
PT	50.8	2.93	12,271	6.7	21.0	58.7	0.9	5.5	1,059	2,188

Table 3: descriptive of the samples, the year after childbirth (source: our elaboration from ECHP).

Household income is generally higher in the North than in the South. While a high percentage of this income (Table A4, see Appendix) is from employment in couple families (from 50% in Finland to 90% in Southern European countries), the contribution of social transfers is larger for lone mothers (from 25% in Portugal to 90% in Finland). Looking at

these figures, the lack of social support is quite evident in Southern Europe. Obviously, income in couple families is generally higher than in lone mother's families. While the means of the "first childbirth" variable reflect different levels of fertility in Europe, the presence of children born during the spell gives an indication of the proportion of women having another birth without working in the meantime. While having two children in two following years is quite rare (at most, 4.5% in Denmark) the probability of having a second child, without returning to work increases dramatically when the previous child is aged 3 years or older (Table 4). These probabilities are particularly high in Finland and Denmark (50% and 40%), where few women stay out of the market for so long (see the decreasing number of observations), and are lower in the South (around 15%) in spite of the larger number of not working women.

<i>Probability of having a second child when the first child is</i>					
	<i>1 year old</i>	<i>2 years old</i>	<i>3 years old</i>	<i>4 years old</i>	<i>5 years old</i>
DK	4.5 (443)	15.6 (231)	30.5 (128)	45.9 (61)	67.6 (34)
NL	3.8 (599)	11.5 (433)	24.9 (317)	34.6 (240)	41.7 (163)
FI	3.9 (583)	23.3 (326)	49.4 (154)	66.7 (87)	80.8 (26)
UK	1.6 (754)	8.6 (532)	24.3 (400)	34.4 (294)	43.3 (208)
IE	1.5 (545)	8.6 (372)	23.7 (266)	32.1 (190)	37.7 (130)
FR	1.6 (885)	8.2 (599)	18.1 (398)	33.9 (251)	42 (162)
BE	1.3 (299)	6.1 (180)	22.8 (127)	28.1 (89)	37.5 (56)
LU	1.3 (375)	6.8 (310)	22.3 (233)	35.8 (165)	37 (119)
GE	2.2 (967)	7.7 (758)	19.3 (559)	33.4 (389)	41.2 (250)
AT	2.3 (346)	10.5 (258)	19.6 (163)	30.8 (120)	35.6 (73)
IT	1.4 (939)	3.9 (725)	13.2 (538)	22.5 (396)	28.9 (266)
EL	1.7 (586)	8.8 (445)	18.7 (347)	27.3 (260)	31.6 (177)
ES	1.9 (903)	5.9 (660)	12.6 (506)	21.8 (354)	24.4 (254)
PT	0.8 (521)	9.0 (324)	17.0 (212)	31.3 (150)	40.2 (102)

Table 4: probability to have a second child when the first one is growing up, for women still in inactivity (source: our elaboration from ECHP).

5. Mothers' participation after childbirth

In Table 5 we compare survival times in inactivity as the child grows up. In Belgium and Portugal more than 50% of mothers start working before the child is 1 year old, while in most of Europe only 25% returns to work when the child is so young. In the second group of countries (Denmark, Finland, Austria, France, United Kingdom) compared to the third one (Netherlands, Ireland, Luxembourg, Germany, Greece, Spain, Italy and Spain) the stock of women working is, at the end, higher, given the window of time we can observe (at most, 8 years). The countries where the return to work takes longer, participation prior the childbirth is also very low (below 70% except in the Netherlands).

	<i>Survival time (25%)</i>	<i>Survival time (50%)</i>	<i>Survival time (75%)</i>	<i>Participation before (%)</i>
BE	1	1	3	79.9
PT	1	1	4	77.3
DK	1	2	3	87.4
FI	1	2	4	80.6
AT	1	2	5	74.8
FR	1	2	6	72.8
UK	1	2	8	74.7
NL	1	2	-	77.1
IE	1	3	-	69.3
LU	1	3	-	66.0
GE	1	4	-	69.7
EL	1	4	-	60.7
IT	1	4	-	57.7
ES	1	5	-	61.8

Table 5: survival times in the inactivity status and participation rate the year before the childbirth (source: our elaboration from ECHP).

We report the estimated parameters of the participation equations in tables 6-8. We find that the potential wage has a positive and significant effect: women with a higher opportunity cost associated with maternity tend to start working very early after the childbirth. As the child grows up, the likelihood for a woman to work will depend on the relationship between the depreciation of the potential wage and the lowering of her productivity at home. We estimate the sum of these effects by looking at the impact of the time spent out of the labour market. We find that this has a positive and significant effect in Germany, Denmark, UK and Finland, but a negative one in the Netherlands, Belgium, Luxembourg and Italy. We should take into account, however, that these results may be

strongly affected by such a short panel (at most, 8 years). Looking at the household characteristics we find a negative effect of household income on the hazard rate into work, as expected. Lone mothers tend to work less than partnered women in the UK, the Netherlands and Belgium while the role of the extended family is an important factor in Greece and Spain, as well as in Luxembourg. In most countries, the first childbirth compared to subsequent ones raises the hazard into work, while the birth of other children reduces it. Finally, the regional unemployment rate has the expected negative sign, which is often significant.

	<i>Denmark</i>	<i>Netherlands</i>	<i>UK</i>	<i>Ireland</i>	<i>Finland</i>
Potential wage	3.730 (.532)	4.576 (.635)	4.571 (.511)	3.668 (.484)	4.818 (.985)
Time	.403 (.061)	-.172 (.053)	.092 (.046)	-.008 (.060)	.642 (.073)
Income	-.015 (.007)	-.028 (.007)	-.011 (.004)	-.012 (.005)	-.013 (.006)
Lone parent	-.215 (.261)	-1.096 (.395)	-.427 (.216)	-.143 (.254)	-.037 (.336)
Extended fam.	.595 (.643)	-19.248 (7835.828)	-.250 (.480)	-1.193 (.530)	-.342 (.699)
First childbirth	.219 (.120)	1.240 (.143)	1.068 (.128)	.963 (.162)	-.361 (.131)
Kids	-.581 (.178)	-.575 (.217)	-.861 (.209)	-.953 (.294)	-.817 (.191)
Unemployment	-1.361 (.580)	-3.305 (.456)	-.197 (.329)	-.949 (.252)	-.558 (.314)
Constant	-7.766 (1.224)	-9.143 (1.394)	-11.262 (1.170)	-8.144 (1.099)	-9.464 (1.913)
Rho	.343 (.039)	.649 (.026)	.596 (.029)	.588 (.036)	.559 (.030)

Table 6: estimated parameters for Northern countries (standard errors in brackets).

	<i>France</i>	<i>Belgium</i>	<i>Luxembourg</i>	<i>Germany</i>	<i>Austria</i>
Potential wage	2.598 (.255)	4.503 (.544)	3.436 (.543)	3.561 (.462)	1.258 (.560)
Time	.010 (.041)	-.133 (.065)	-.189 (.083)	.244 (.045)	.043 (.061)
Income	-.015 (.004)	-.005 (.004)	-.032 (.006)	-.017 (.005)	-.005 (.004)
Lone parent	-.198 (.223)	-1.428 (.455)	1.364 (.451)	.040 (.249)	-.067 (.239)
Extended fam.	-.045 (.603)	-.412 (.539)	.883 (.454)	-.283 (.514)	.278 (.256)
First childbirth	.960 (.103)	.481 (.139)	1.607 (.221)	1.206 (.140)	.506 (.156)
Kids	-.945 (.216)	-.043 (.277)	-1.391 (.496)	-1.250 (.222)	-.117 (.225)
Unemployment	-.913 (.220)	-.903 (.221)	-14.934 (3.587)	-.211 (.188)	-.018 (1.098)
Constant	-5.203 (.575)	-8.464 (1.097)	-4.601 (1.505)	-8.824 (.953)	-3.647 (1.271)
Rho	.518 (.028)	.438 (.043)	.686 (.034)	.659 (.024)	.502 (1.271)

Table 7: estimated parameters for Central countries (standard errors in brackets).

	<i>Italy</i>	<i>Greece</i>	<i>Spain</i>	<i>Portugal</i>
Potential wage	5.929 (.483)	2.981 (.330)	3.738 (.309)	1.738 (.209)
Time	-.216 (.046)	.004 (.053)	-.015 (.043)	-.074 (.053)
Income	-.022 (.006)	-.010 (.006)	-.009 (.006)	.002 (.006)
Lone parent	.466 (.378)	.731 (.718)	.191 (.344)	-.389 (.233)
Extended fam.	.311 (.218)	.528 (.251)	.445 (.242)	-.050 (.153)
First childbirth	.434 (.119)	.166 (.154)	.483 (.132)	.466 (.116)
Kids	-.251 (.261)	-.061 (.240)	-.448 (.241)	-.524 (.246)
Unemployment	-1.071 (.097)	.277 (.422)	-.701 (.120)	.250 (.3.64)
Constant	-11.030 (.936)	-5.854 (.604)	-7.126 (.608)	-2.512 (.308)
Rho	.610 (.023)	.671 (.027)	.601 (.028)	.446 (.032)

Table 8: estimated parameters for Southern countries (standard errors in brackets).

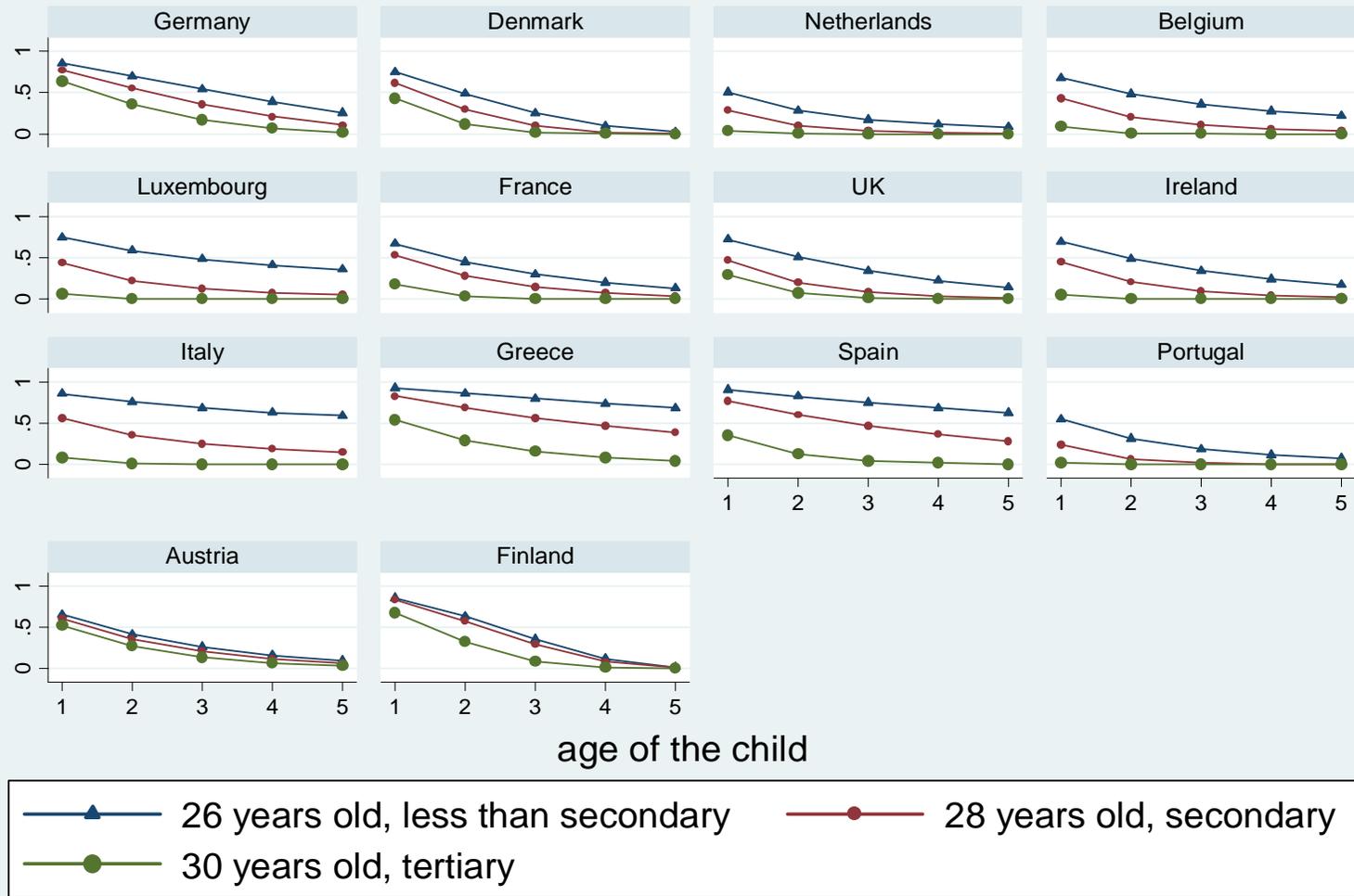
To illustrate how behaviour differs between environments, we simulate some cases and we compare them across countries (Figure 1). To focus on the behaviour of women most likely to have a child, we simulate the cases of a woman aged 26 with less than the second level

of schooling; of a woman aged 28 with the second level of schooling; and of a woman aged 30 with the third level of schooling¹⁰. We first give an idea of the average level of labour market participation for new mothers in different countries when they have the first child, and then we investigate the role played by education in order to ascertain how the reconciliation between work and family depends on the woman's characteristics rather than on the social and cultural environment. The impact of social policies and/or cultural attitudes may differ with women's levels of human capital. We simulate the survivor functions in inactivity with the potential wage for the three different women specified above, in each country, assuming they have a partner, a household income equal to the national average for a couple, and face an unemployment rate stated in the OECD statistics for 2001.

Figure 1 indicates that in countries with generous statutory parental leaves (Finland, Germany, Austria and France), a large proportion of mothers is out of the labour market the year after the childbirth. About 80% of mothers with a medium level of schooling are inactive in Germany and Finland (where the statutory parental leave is 3 years long), and this proportion decreases over time in Germany and dramatically in Finland. In Finland the payments mothers receive during the first year is related to their wage (a replacement rate of 66%), but it decreases radically in the subsequent two years, and this may explain the leaning shape of the survivor function. In Germany mothers receive lump sum payment during the whole time, leading mothers (especially the less educated ones – see the three different survivor functions) to take advantage of it. In Austria and in France, women with a medium level of schooling have a 50-60% probability of not working just after childbirth. In both countries the statutory leave is long (3 and 2 years and a half, respectively), but while in Austria mothers are paid for the whole leave period, in France mothers at the first child, are paid just for the first six months¹¹. This may explain the highest average post first-birth employment compared with other countries with long parental leave provisions. Moreover, in France the difference in behavior between the first and the second childbirth is very large, suggesting that mothers of more than one child tend to stay out of the labour market for a longer period.

¹⁰ 26, 28, 30 are the most likely ages to have a child, given the respective level of education, in Europe.

¹¹ According to the programme "allocation parentale d'éducation".



Graphs by country code

Figure 1: survivor functions in the inactivity status, in each country, for three different women.

The three countries with the fastest return to work are those in which women have the right to shortest parental leave (3 months in Portugal, Belgium and Netherlands). In Portugal and the Netherlands women are paid very little during this period, while in Belgium women receive lump sum payments for the whole period, which may explain a higher percentage of women out of the labour market when the child is 1 year old.

The situation is different in other Southern European countries. Spain and Greece exhibit lower labour market participation after childbirth as well as flat survivor functions compared to other countries. The low level of labour market participation may be explained by the fact that just 70% were working before childbirth, while the flatness of the survivor functions may be due to the low incentives to return to work. The leave arrangements are not very generous (the job is protected for 1 year and they do not receive any payment during the leave) and the availability of childcare services is very low. In Italy, as in Spain and Greece, the percentage of women working before childbirth is relatively low. However for those who did work, the connection with the previous job is stronger: the job is protected and they receive just 30% of their wage for the 6 months of parental leave. What emerges in these three countries is the differences between the three women: education plays a bigger role than in most of the other countries. It is interesting to see that more educated women in Italy behave like highly educated women in other countries, even if they represent just 10% of the female population in this age group.

In Denmark, women seem to use parental leave (which is completely paid and protected) to look after the child but they start working after this break, probably helped by the high availability of childcare places. In UK and Ireland, most of the mothers are working when the child is 2. The lower participation rate when the child is 1 is due to the statutory leave which protects the job for 7/8 months but it does not provide any payment. As a result more educated women are significantly less likely to take the leave. Finally, in Luxembourg, where the leave is protected and paid for the whole period of 6 months, we see very large differences among the three kinds of women.

Generally, we observe that different leave arrangements in force seem to give a shape to survivor functions in inactivity in different countries, but the most important result is that more educated women are quite similar among countries, and most of the difference in post birth participation in Europe is due to differences in labour market participation among less

educated women. Indeed, we obtain a significant and positive correlation between the length of parental leave¹² and the proportion of mothers (medium and low level of education) still in inactivity¹³ while the correlation is not significant for highly educated mothers¹⁴. Moreover, the difference in participation percentage points between a highly educated mother and a lowly educated one is larger in countries where the availability of childcare¹⁵ is lower¹⁶. From a policy point of view, this fact suggests that policies to encourage low educated women to work would be particularly effective. FIGURE 1

6. Conclusions

This paper describes and compares transitions into employment of mothers of newborn children in several European countries. Although female labour market participation has increased everywhere, women are still likely to interrupt their career, when they have a child, for a period of time longer than the basic maternity leave. Using data from ECHP, we select women who have a child during the survey and follow them over time. Results show that in Europe just 25% of mothers return to work before the child is 1 year old. When the child ages, large differences emerge among countries. For instance, in the UK 50% of mothers are already working by the time the child is 2 years old, but in Ireland this does not happen until the child is 3, and in Italy not until the child is 4.

The amount of time mothers take to return to work depends, to different degrees, on their human capital and on parental leave arrangements. The three countries which show the fastest return to work are the three where women have the right to shortest parental leave (Portugal, Belgium and Netherlands) while women in countries with long parental leave (Finland, France, Germany, Austria, Spain) tend to delay their return. However, in these latter countries, there can be strong incentives for women not to give up their careers, such

¹² The length of parental leave is given by the number of months due to the mother, if the father does not take any period (Table 2).

¹³ The proportion of mothers in inactivity is given when the child is between 0 and 4 years old, before the mandatory school.

¹⁴ The correlation is 0.33** for low educated mothers, 0.28** for medium educated mothers and 0.07 for highly educated mothers.

¹⁵ Number of places in public childcare (Table 1).

¹⁶ The correlation is -0.31**.

as job protection, maternity benefits (earnings-related but time-limited) and the preservation of pension and seniority rights.

In all countries analysed, human capital characteristics are important predictors of mothers' participation; however the role played by education is stronger in Southern countries. In countries without policies to facilitate combining work and family life, human capital has a larger effect on participation than in those with a large availability of childcare. Indeed, it is interesting to observe that highly educated women behave homogeneously, and most of the difference in post birth participation in Europe is due to differences in participation among the less educated women.

Appendix

	<i>Denmark</i>	<i>Netherlands</i>	<i>Finland</i>	<i>UK</i>	<i>Ireland</i>
Log wage					
Age	.807**	1.358**	.058	.979**	.797**
Age square	-.104**	-.182**	-.005	-.134**	-.098**
Tertiary	.196**	.211**	.174**	.200**	.467**
Secondary	.091**	.056**	.031**	.136**	.162**
Constant	.557**	-.350**	1.706**	.421**	.451**
Select					
Age	1.043**	3.224**	2.426**	2.055**	2.943**
Age square	-.094**	-.429**	-.273**	-.248**	-.425**
Tertiary	.613**	.596**	.443**	.190**	1.004**
Secondary	.204**	.095**	.100**	.054*	.705**
Married	.529**	.196**	.280**	.358**	.070*
Cohabitant	.299*	.372**	.234**	.342**	.274**
Income	-.020**	-.012**	-.023**	-.003**	-.004**
One child	-.125**	-.912**	-.337**	-.996**	-.536**
More children	-.068	-1.305**	-.242**	-1.381**	-1.044**
Constant	-1.713**	-4.714**	-4.322**	-2.859**	-4.303**
Obs	9,443	20,120	10,375	19,283	11,960
Rho	-.231	-.300	-.744	-.523	-.229
Sigma	.211	.262	.279	.355	.352
Lambda	-.049**	-.078**	-.208**	-.185**	-.080**

Table A1: Heckman regressions for Northern countries (year dummies and region dummies included, but not reported).

	<i>France</i>	<i>Belgium</i>	<i>Luxembourg</i>	<i>Germany</i>	<i>Austria</i>
Log wage					
Age	.778**	.414**	1.379**	1.715**	.956**
Age square	-.086**	-.041**	-.176**	-.236**	-.124**
Tertiary	.450**	.337**	.501**	.142**	.224**
Secondary	.120**	.133**	.220**	.055**	.072**
Constant	.272**	.927**	-.450**	-1.061**	.310**
Select					
Age	3.722**	4.378**	3.289**	1.593**	1.400**
Age square	-.472**	-.602**	-.478**	-.169**	-.188**
Tertiary	.534**	1.140**	.727**	.635**	.813**
Secondary	.423**	.439**	.362**	.169**	.431**
Married	.096**	.419**	-.586**	.048*	-.163**
Cohabitant	.148**	.547**	.276**	.313**	.240**
Income	-.011**	-.012**	-.015**	-.021**	-.006**
One child	-.098**	-.313**	-.578**	-.849**	-.114**
More children	-.663**	-.621**	-1.050**	-1.119**	-.544**
Constant	-6.698	-7.338**	-3.757**	-2.012**	-1.876**
Obs	22,473	11,245	9,481	24,771	10,732
Rho	-.208	.346	-.163	-.564	-.797
Sigma	.364	.237	.396	.401	.424
Lambda	-.075**	.082**	-.064**	-.219**	-.338**

Table A2: Heckman regressions for Central countries (year dummies and region dummies included, but not reported).

	<i>Italy</i>	<i>Greece</i>	<i>Spain</i>	<i>Portugal</i>
Log wage				
Age	.130**	1.053**	.460**	.260**
Age square	.002	-.124**	-.036**	-.019**
Tertiary	.411**	.560**	.528**	.998**
Secondary	.190**	.231**	.209**	.467**
Constant	1.355**	-.891**	.486**	.264**
Select				
Age	2.729**	3.107**	2.914**	3.420**
Age square	-.346**	-.404**	-.379**	-.488**
Tertiary	.841**	.906**	.848**	1.071**
Secondary	.467**	.309**	.208**	.282**
Married	-.013	-.347**	-.189**	.196**
Cohabitant	.235**	.126	.082**	-.062
Income	-.015**	-.014**	-.010**	-.012**
One child	-.304**	-.252**	-.390**	-.054
More children	-.529**	-.438**	-.689**	-.463**
Constant	-4.166**	-5.540**	-4.663**	-5.393**
Obs	31,362	17,572	28,634	19,128
Rho	-.363	.506	-.029	.084
Sigma	.299	.363	.369	.43
Lambda	-.108**	.184**	-.010**	.029**

Table A3: Heckman regressions for Southern countries (year dummies and region dummies included, but not reported).

	<i>Couples</i>				<i>Lone mothers</i>			
	<i>Amount PPP's</i>	<i>Labour income</i>	<i>Social transfers</i>	<i>Private incomes</i>	<i>Amount PPP's</i>	<i>Labour income</i>	<i>Social transfers</i>	<i>Private incomes</i>
DK	24,014	65.1	33.0	1.9	15,740	6.9	92.1	1.1
NL	22,672	88.1	10.2	1.7	9,891	8.4	90.2	1.4
FI	19,957	50.6	43.3	6.0	10,596	5.0	89.4	5.6
UK	21,633	80.0	16.5	3.5	13,233	21.2	75.4	3.4
IE	25,566	84.4	13.8	1.8	17,624	43.7	53.4	2.9
FR	20,725	74.1	22.9	3.0	14,973	29.9	66.3	3.9
BE	25,138	69.5	24.0	6.6	14,247	13.4	77.9	8.8
LU	41,264	73.1	24.3	2.6	24,467	32.4	61.7	5.9
GE	26,163	77.1	19.8	3.2	13,667	28.4	61.0	10.6
AU	27,110	70.4	26.9	2.7	25,347	52.8	41.2	6.0
IT	16,798	88.2	7.2	4.5	17,104	66.7	31.5	1.8
EL	15,879	88.1	7.0	4.9	11,672	69.1	19.3	11.6
ES	16,412	88.2	9.8	2.0	14,100	57.0	38.3	4.7
PT	12,522	84.5	14.5	1.0	13,512	72.0	26.0	2.0

Table A4: average income for couple and lone mother families (source: our elaboration from ECHP).

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