Couples' careers and fertility
An event-history analysis of the ECHP samples of Denmark, Italy, Spain, and United Kingdom

PRELIMINARY AND INCOMPLETE VERSION

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Abstract

This paper investigates the effects on fertility of the combined labor force participation of both partners of a couple, and specifically the effects of unemployment, temporary contracts and part-time. These effects are shown to be highly dependent on the national institutions and on specific labor market regulations.

A longitudinal sample of the European Community Household Panel is used for the analyses, concerning the years 1993-2000. Event-history methods are used, where the processes of labor market participation and fertility are modeled simultaneously.

The results show that women experiencing job instability have lower fertility, while women working part-time or in the public sector have higher birth rates. Men's employment combined with housewifery has a positive impact on second births in United Kingdom and Italy, while in Denmark the impact is negative. In Spain, temporary jobs or unemployment of one or both members of the couple have a strong depressing impact on fertility.

Introduction

Women labor force participation levels have a clear tendency to converge among younger birth-cohorts across Western Europe, in particular for childless women. This is in contrast with actual employment rates of women and with participation levels of women with low age child(dren), and strikingly so with observed fertility patterns, which do not show a similar evolution (Billari and Kohler, 2002). Although generally exists a negative relationship between fertility and women's employment at the individual level, there is important variation across countries[1]. For instance, in several Nordic countries this relationship has been found to be positive, while the Mediterranean countries seem to be at the other end of the spectrum (e.g. Andersson, 2001; Symeonidou, 2001). Most studies show that fertility exerts a negative influence on work force participation, in the sense that women with a new-born baby (or during pregnancy, as we will see) often leave the labor market or refrain from participate in it, although this effects tends to be temporary and diminish as the child gets older. The reverse effect running from employment to fertility is much more debatable (Bernhard, 1993).

At the heart of the discussion lies the degree of compatibility between the role of mother (and father) and the role of worker. Critical in that respect are the social organization of work and of childcare, which have been considered to lead to variations in the degree of conflict between the mother and the worker roles across advanced industrial economies (Rindfuss and Brewster, 1996). The gender system prevailing in a society is intimately related to the organization of these dimensions, which influence, for instance, the acceptability of combining paid work for mothers with low age children and the involvement of men in childcare and housework. This perspective also highlights the interest of considering the labor force status of each partner of a couple and the income associated to it, as fertility and labor force decisions of both members of a couple are intimately related. Furthermore, the greater the detail in the analysis of the labor force status, the more it will be possible to link each effect with the existing organization of institutions. For instance, only a few studies distinguish students from housework and

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[1] Several studies have analyzed the change in the relationship between labor force participation and fertility at the aggregate level that has taken place in the last two decades (Engelhart et al. 2002; Anh and Mira, 2001).

from the unemployed. The fact of holding a temporary contract, or a part-time job, or to be employed in the public sector, may prove crucial in some particular labor markets.

It is likewise important, in order to conduct meaningful analyses, to distinguish between different stages of the family building processes. First births are thus distinguished here from subsequent births, as many variables have been shown to act in a different way. Moreover, in the analyses of first births, I have preferred to start the duration analyses at age 15 and not at the moment of entering a marriage or a cohabitation, since these events are clearly interrelated with having a child (Baizán et al, 2003). In the analyses of second or subsequent births, I restrict the population studied to women living in a couple (married or unmarried), since the probabilities of giving birth outside unions is very low in most European countries, and the effect of several variables differ between marital statuses.

The aim of the paper is to make an empirical analysis of the impact of labor force status of both members of the couple on fertility. In order to do so, I start by giving a brief account of some theoretical tools that have been used in building the models. In section three I provide some information about the database used, the European Community Household Panel, and the construction of the sample and variables used. In section four I present the models employed and a brief explanation of the technique used to control for the endogeneity between the processes of labor force participation and fertility. In the last section I present and discuss the results obtained in the analyses.

Theoretical considerations and hypotheses

Economic theories dealing with the decisions of labor force participation and fertility make they dependant of such factors as market prices and wages, the preferences or 'tastes' of individuals concerning fertility and participation, and maternal time costs over the life cycle. However, many empirical studies essentially focus on the interplay of two main mechanisms: the "income effect", and the mother's "price-of-time" (reviews of the theoretical literature can be found in Hotz, Klerman and Willis, 1997, and Ermisch, 2003). Men's income and labor market prospects are assumed to have positive effect on the demand for children, since husbands are not usually involved in childcare activities. Moreover, men's income and involvement in paid work may be even intensified with the presence of children in the household. The resulting sign of the

effect for mothers is less clear since it depends on which of the mentioned effects dominates. According to Becker's (1981) ideas about optimal division of labor within the household, maternal time costs lead to a retreat of wives from the labor market. Household expected lifetime utility is maximized either by deferring the onset of motherhood or by limiting the period of childrearing out of the labor market.

In addition to women's own human capital considerations, several studies have emphasized that the cultural and institutional setting will influence couple's decisions about childbearing and participation (Gustafsson, 2002; Del Boca, 2002). The above mechanisms of maternal time costs and of couple's income are to large extent dependent on the economic incentives for those choices existent in a society. Social policies will influence the feasibility of the crucial issue of the combination of work and family after the first child is born, through arrangements concerning, e.g. maternity and parental leave, and provision of childcare. Policies also fundamentally shape labor market institutions and regulations, as well as the general levels of employment. This last type of influences is examined in the following paragraphs.

The most important determinants of maternal time costs are time spent out of paid work and foregone human capital investments. The penalties of interrupting work are accumulative across the life cycle, and they include: wage losses during interruptions, skills erosion, less experience, and lost of seniority. Several studies show that these effects are can be huge (Joshi, 1998; Datta Gupta and Smith[2], 2001). Furthermore, these effects may be compounded with active discrimination from employers to mothers and pregnant women (Güell, 2003). A first aspect to consider is the shape of the earnings pattern across the life cycle, that induces a postponement of the onset of childbearing[3]. A rational woman will estimate when in her career is optimal to have a child, i.e. when the opportunity costs are lower. This will lead to form a family when she gets established in her job, in order to avoid being hampered in the advancement of her career track. Long term standard of living and income security considerations, clearly relevant to take a long term decision as having a child, will be also important, especially in labor markets in which precarity among the young and women, is widespread[4]. Differences according to educational level will arise, since the earnings profile of lower

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[2] These last authors find moderate costs, mainly consistent in loss of human capital, for Denmark.
[3] In the extreme case of a woman that spends all her lifetime after her first childbirth in full-time home making, she will maximize her lifetime earnings by deferring motherhood to the biological limit.
[4] This concerns specially, but no exclusively, Southern European labor markets.

educated women is flatter than the profile of highly educated women, leading to stronger incentives to postpone motherhood for the highly educated[5]. Furthermore, highly educated women will start their activity after a longer period of school enrolment, delaying fertility.

A second aspect is the length of the period out of work for childrearing and the associated probability to re-enter the labor market. In this respect, the difficulties to re-enter labor market after an interruption due to childbirth are at issue. These difficulties differ widely across countries, according to the levels of unemployment and several labor market regulations. In addition, the time costs are by no means limited to periods out of employment or (paid) child leave, but include periods of part time work subsequent to childbirth. Part time often involves less pay per hour of work and limited opportunities for promotion. Furthermore, this type of jobs tend to contribute to segregation of women in the labor market (they are often "female" jobs), and probably also to maintain the sexual division of labor inside households. Again, part time jobs opportunities widely differ among countries. Where they are easily available, this can contribute to ease the decision to temporarily leave the labor market and to facilitate re-entry after childbirth; they also contribute to keep a link with the labor market for women during the child rearing years. Part time jobs are thus expected to have a positive effect on childbirth, as an intermediate situation between full involvement in labor market and housewifery.

The decision to leave the labor market to rear children is conditioned on the determinants just stated, in addition to other social policies, as mentioned above. It can therefore be expected that, among the countries studied, in Denmark predominates the income effect, since the incompatibility between participation and childrearing is the lowest. In the other countries analyzed, one can expect that the price-of time effect predominate, given that the institutional framework impose serious constraints to the simultaneous fulfillment of the roles of care-giver and worker. As a result of those circumstances, in most countries housewives will have higher probabilities of giving birth, with respect to employed women (and may be also compared to the unemployed, as will be discussed below), and certainly with respect to students, who are investing in human capital and usually have little resources.

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[5] Differences across countries in the earnings profiles according to educational level and the overall degree of wage dispersion are thus likely to influence this effect.

Relatively little empirical research has been conducted on the effect of unemployment. In principle, the above "price-of-time" effect should apply, as far as the women wants to be available for work, leading to reduction of fertility. Income effects should also be taken into account, as unemployment may restrict the resources available, especially in the longer run (if the women receives unemployment benefits). It has to be taken into account that in some instances, unemployment may be an occasion to have children. This will be especially the case if the woman receives unemployment benefits, and if the duration of entitlement is relatively long. This possibility is also to a large extent dependent on the income and employment security of the husband. The precise meaning of unemployment, and its expected effects on fertility, are thus related to the level of unemployment and rate of exits and entries to jobs in each particular country and the corresponding uncertainty associated to finding a job. The coverage and level of unemployment benefits will be also relevant.

Differences between employed individuals may also be important. I expect that individuals with a temporary contract will have a particularly low fertility, given that, in addition to time constraints (as other employed individuals), they suffer from uncertainty in their future income and may be also in other aspects such as in their future every-day time organization, leading to a low fertility. More crucially, having a (-n additional) child may interfere their chances of obtaining a more stable employment, and more generally with getting established in a career track. As a consequence, it is expected that employed individuals with temporary or fixed-term contracts will have a particularly low level of fertility. This can be so specially in Spain, and to a lesser extent Italy, where the segmentation of the labor market is based in the distinction between temporary/permanent contracts, and where obtaining a consolidated position in the labor market often involves a "toll" in terms of long periods of temporary contracts in a firm (or public administration) before being eligible for a permanent contract. In those circumstances, leaving the labor market not simply involves losing income and experience, but losing a hard-won position in a "queue" for employment. Even may be the case that having a child is interpreted by the employer as a weakening of commitment to work and lead to a penalty (e.g. not renewing a temporary contract).

Differences among individuals in several other categories are also relevant, such as between self employed as opposed to employees, and working in the public or the private sector, since the argument concerning different levels of security in employment

should also apply, due partly to very specific regulations concerning those groups in each country.

Differences according to birth order in the impact of labor market and educational factors are expected. The age at first birth will reflect the career planning motive explained above and the corresponding differences according to educational level and labor force attachment. This should lead to a sharp contrast between women in each labor force status, especially between women out of the labor force (and not students) and those women who are still consolidating their position in the labor market (in some instances, this will include women holding temporary jobs, the unemployed, or students/professional training). While women with permanent jobs, better income or higher positions, proceed to childbearing in a more favorable situation.

The labor force decisions taken at the time of first birth, or surrounding first birth, may heavily condition subsequent births decisions. It has been shown that in labor markets were it is difficult to re-enter and to get part-time jobs, a sharp and long lasting dichotomy is established around the time of first birth between women who decide to stay in the labor market and those who withdraw from it (Adam, 1996). This may lead to relatively small differences between women in each labor market situation in the probabilities of second and subsequent births. On the contrary, in less segmented labor markets, especially if part time work abound, more similar conditions between first and subsequent births will apply. Finally, were, as in Denmark, relatively little trade-offs are involved in the decision of having a child, the effects of labor market participation according to birth order should be minimal.

In addition to those differences, one can keep in mind that highly educated women and women with a strong attachment to the labor market may have several reasons to speed their transition to the second birth. These may include: the desire to reduce the period out-of labor market and a higher incentive to conform to parental leave time limits, income effects from better jobs (resulting from past earnings or from higher pay during parental leave), and economies of scale on childcare costs. Obviously, on should also control for the effect of delay of first births related to longer school enrolment[6].

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[6] In addition tho the age affect, one should take into account selection effects, motivated by the different proportions of women of a given age and educational level to have given birth to a first child (see Kravdal, 2001).

Some comments on the impact of fertility on labor force participation can usefully complement the picture provided so far. The effect of a birth (or a pregnancy) on employment is supposed to be driven by the increase in the value of a mother's time within the home, leading many women to make the optimization choice to work only within the home. This will lead to a negative effect of being pregnant/having a child on entering employment, while a positive effect on exiting employment can be expected. However, this last effect may be attenuated by the fact that some job exits are involuntary dismissals, unrelated to childbearing. Conversely, if the dismissal itself is due to a pregnancy (in spite that this discrimination by employers is illegal in the EU), the effect of this category would obviously be increased. The effect of a pregnancy in exiting the labor market should be lower in Denmark than in Spain and in Italy, due to the differentials in the trade offs involved, and particularly strong in labor markets where it is easy to reenter employment, and where part-time jobs are available, as in the United Kingdom.

Finally, in order to distinguish the mutual effects of participation in paid work and fertility decisions mentioned above from spurious association due to joint determination, one needs to address the issue of the possible endogeneity of the processes of entering/exiting the labor market and the fertility. Quitting the labor market may be jointly determined by fertility intentions, as well as the decision to enter the labor market. The postulated joint determination may result from the existence of norms and values (or preferences) concerning the attachment to labor force participation and to family building (Hakim, 2002), and the extent to witch the roles of mother and worker are incompatible. In this respect, the strength of the correlation between fertility and participation processes is connected to the incompatibility between them. In countries where the incompatibility is highest, women jointly determine their behavior in the two domains. Whereas, in countries with low incompatibility between these roles, the decision concerning labor market and fertility can be taken more independently from each other.

Data source and sample description

The data used for the analyses are from the European Community Household Panel survey (ECHP). This data source has several features that make it suited for the purposes of the paper. The longitudinal design of ECHP makes it possible to follow up

and interview the same set of private households and persons over several consecutive years. It thus supplies data on all household members in a dynamic way, a crucial feature for this study. The ECHP offers detailed data on the fertility and partnership careers, and particularly on the labor market trajectories of each member of the household. For instance, it contains monthly data on labor force status, and yearly income for each member of the household, according to the source of income. It additionally contains a wealth of information on a number of individual characteristics, such as -inter alia- educational background and health.

The first wave of the survey took place in 1994, and the last available data belongs to the 2001 wave. Although most of the data refers to the wave year or to the previous year, the survey also offers a limited amount of retrospective information, including date of birth of each individual of the household[7] and the dates of entry into the labor market and start of current job.

Empirical approach

The mutual effects of the labor market biography and the fertility career may be biased in the conventional applications of event history analyses, because of non-random decisions to have a child and to participate in paid work. As discussed above, unmeasured attributes may affect both, the rate of second birth and the rates of paid work participation. A possible modeling strategy to overcome this situation is to run a joint multiprocess model of fertility and paid work participation. In such models, a heterogeneity component is included to the equation that estimates each process, and the possible correlation between these heterogeneity components allows to account for the existence of common factors. Furthermore, the outcome of the endogenous parallel process enter as a time-varying covariate in the estimation of each process, making it possible to estimate their net impact.

I therefore make use of structural-equation event history models with correlated unobserved heterogeneity of the type introduced by Lillard (1993). The specification consists of four simultaneous hazard rate equations capturing time from: a) age 15 to first birth (minus nine months, i.e., conception time); b) since previous birth to a

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[7] In the case of Denmark, the month of birth of most individuals is not known. This unavoidably introduces some small bias in the results.

subsequent birth (conception time); c) from last exit from the labor force (or from age 16) to entering the labor force; and d) a fourth equation that captures time since the last entry into the labor force to the exit from labor force.

$$\ln h^{B1}(t) = y^{B1}(t) + \sum_j a_j x_j + \sum_i \alpha_i w_i(t) + \varepsilon$$
$$\ln h^{B2}(t) = y^{B2}(t) + \sum_j a_j x_j + \sum_i \alpha_i w_i(t) + \varepsilon$$
$$\ln h^{J}(t) = y^{J}(t) + \sum_j \phi_j x_j + \sum_i \pi_i w_i(t) + \delta \qquad (1)$$
$$\ln h^{U}(t) = y^{U}(t) + \sum_j b_j x_j + \sum_i \beta_i w_i(t) + \eta$$

where $\ln h(t)$ is the log-hazard of each process. The superscripts *B1, B2, J,* and *U* denote, respectively, first birth, second or higher order birth, entry to the labor force, and quitting the labor force. The subscript for an individual is suppressed for simplicity. Duration-dependence is modeled by using linear splines on the log-rate (piecewise Gompertz formulation). Each *y(t)* denotes a piecewise linear spline[8] that captures the effect of the duration on the intensity. The effect of age is also modeled as a piecewise linear spline.

The vector $\{x_j\}$ denotes fixed time-invariant covariates; and $\{w_i(\cdot)\}$ is a set of time-varying covariates whose values change at discrete times in the spell, and is constant over the time span between those changes. Note that the outcomes of one process enter as time-varying covariates in the other process. The random variables ε, δ, and η capture unobserved heterogeneity. In particular, ε reflects unobserved factors influencing the timing of births, δ reflects unobserved factors influencing the timing of entering the labor force, while η reflects unobserved factors influencing the timing of exiting the labor force. ε, δ, and η and are assumed to follow a joint tri-variate normal distribution:

$$\begin{pmatrix} \varepsilon \\ \delta \\ \eta \end{pmatrix} \sim N\left(\begin{pmatrix} 0 \\ 0 \\ 0 \end{pmatrix}, \begin{pmatrix} \sigma_\varepsilon^2 & \rho_{\delta\varepsilon} & \rho_{\eta\varepsilon} \\ \rho_{\varepsilon\delta} & \sigma_\delta^2 & \rho_{\eta\delta} \\ \rho_{\varepsilon\eta} & \rho_{\delta\eta} & \sigma_\eta^2 \end{pmatrix} \right) \qquad (2)$$

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[8] Piecewise linear splines are used to approximate continuous functions (such as a baseline hazard or a non-proportional relative risk), by using function that are linear within each (possibly open-ended) interval. Those linear functions are connected at knots given *a priori*: piecewise linear splines are then also continuous functions.

In (2), $\rho_{\varepsilon\delta}$ and $\rho_{\varepsilon\eta}$ represent the correlation between the unobserved heterogeneity terms of the processes of entering the labor force and fertility, and the correlation between the heterogeneity terms of exiting the labor force and fertility[9] respectively, while $\rho_{\eta\delta}$ refers to the correlation between exiting and entering employment. Model estimation was performed using full-information maximum likelihood, as implemented in the software package aML (Lillard and Panis, 2000).

Results

Selection effects

Before examining the results concerning the impact of employment on fertility, some attention will be paid to the heterogeneity components included in the models and their correlations (reported in table 1). The variance of the heterogeneity components is significant in the countries studied for each of the three processes. This indicates that indeed there are unmeasured factors with an impact on those processes, in spite of the numerous variables included in the models. Fertility and labor force participation are therefore affected by the presence of groups of women with different proneness to experience the events analyzed. These heterogeneities in orientations towards each process could be related e.g. to attitudinal variables not observed in these models, as explained in section 2.

A second step in the analysis is to check if there exist any correlation between the heterogeneity components of each process, the presence of which would indicate the existence of endogeneity between the processes involved. This type of correlation has been found to be significant for the United Kingdom between the processes of fertility and exiting the labor market. In this country individuals more prone to have a child are also more likely to leave the labor market, i.e. the decisions in both domains are taken simultaneously in an interrelated way. This feature may be related both, to the difficulty to combine paid work and maternity, and to the existence of a highly flexible labor market that favors the possibility to reenter it. By contrast, in Denmark, Italy and in Spain no significant interrelationship between fertility and exiting the labor market has

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[9] We do not include a separate analysis of union dissolution, which may be correlated with the processes we study here. Individuals who disrupt a union are censored at the moment of their disruption. This last event is then considered to be independent, given the array of covariates we include in the analysis.

been found, indicating that the decisions in each of the domains are taken more independently. Likewise, the correlation between the heterogeneity components of the processes of entering the labor force and fertility is not significant in any of the countries studied. Of course, the possible correlation depend of the extent to which the variables included in the models capture the existing heterogeneity in the population.

Table 1. Variance of heterogeneity components and correlation between them.

	Spain			United Kingdom			Italy			Denmark		
		Sig.	s.e.			s.e.			s.e.			s.e.
Standard deviation σ_ε (fertility)	0.47	***	0.07	0.53	***	0.05	0.44	***	0.06	0.34	***	0.10
Standard deviation σ_δ (entering L.M.)	0.56	***	0.08	n.s.			1.18	***	0.15	n.s.		
Standard deviation σ_η (exiting L.M.)	0.63	***	0.09	0.35	***	0.09	0.78	***	0.20	0.43	***	0.14
Correlation ε - δ	n.s.			n.s.			n.s.			n.s.		
Correlation ε - η	n.s.			0.73	***	0.27	n.s.			n.s.		

Note: *** = p<0.01, ** = p<0.05, * = p<0.10

The results for the models that not include the heterogeneity component are presented for comparative purposes (Model 1 for first births in table 2, and Model 2 for second or higher order births in table 3). However, here I will only discuss the results with heterogeneity, as they capture in a more precise way causal influences of labor force variables on fertility, given that they get rid of selection effects (Model 3, in tables 4 and 5 for first births and second or higher order births, respectively). In the case of United Kingdom I present and discuss the model including, in addition to a heterogeneity term, the correlation with the process of exiting the labor market (Model 3).

First births
The results of the variable "employment status" are generally very significant and show clear differences between countries. This time varying variable comprises the categories

"employed" (reference), "unemployed", "student", and "other" situations. This last category has its most positive impact in the United Kingdom (with a coefficient of 1.88), and very strong impact in Spain (1.08) and Italy (1.01), while in Denmark its impact is negative but not significant (-0.19). As it mostly reflects the situation of housewives, the results obtained are consistent with the hypothesized dominance of the "income effect" in Denmark, and the "price of time" effect in the other countries. This seems to be specially so in the United Kingdom, where leaving the labor market to have children has lower long term implication in terms of attachment to the labor market, since it is relatively easier to reenter.

As expected, being a student has a strong negative effect on first births in all countries.

The effect of unemployment differs widely between countries. In Italy (-0.79) and Spain (-0.57) is significant and highly negative with respect to employed women, while in Denmark the effect is not significant (-0.28), may be due to a higher support and coverage of unemployment benefits. By contrast, in the United Kingdom the effect of unemployment is strongly positive and significant (0.51), suggesting that it acts as an opportunity to childbirth, rather than reflect a precarious situation in the a labor market or a lack of income.

The inspection of the results concerning several other dimension of the job situation of women complement the picture sketched so far. Consistently with what is known from Southern labor markets, the fact of holding a temporary contract in Italy (0.30) and specially in Spain (-0.56) delays very significantly first births. The importance of these results is highlighted by taking into account that often those with temporary contracts and the unemployed are the same individuals at different points in time. In the United Kingdom and in Denmark the results of the variable "type of contract" are not significant, suggesting that this is a much less relevant dimension. In addition, the self employed do not show a significantly different behavior with respect to the employees with no temporary contracts, probably in part as a consequence of their very low numbers in all countries studied.

A little surprisingly, working in the public sector only provides significant positive coefficients in Spain, stressing again the importance of long term stability in income and job situation, in order to start a family in this last country.

Finally, the results for the variable "part time" parallel to some extent those of housewives, as they show that this job situation significantly accelerates childbearing in the United Kingdom (0.52), in Spain (0.37), and in Italy (0.28), and diminish first birth

probabilities in Denmark (-0.18, not significant). As hypothesized, this may reflect not only the dominance of the price of time effects in the former three countries with respect to Denmark, but also the fact that in the United Kingdom this is a much more institutionalized way to combine job and motherhood than in Italy and Spain.

Second or higher order births

Turning now to the effects of labor market situation on second and subsequent births, it can be reminded that here the career advancement and consolidation motives will be less important than for first births. The fact of doing already the role of mother and the decisions previously taken around first birth will heavily condition advancement to higher parities. Furthermore, the length and variance of spell durations is smaller. These considerations are relevant in interpreting the much less contrasted effects between employed women and housewives for second and subsequent births (compared to first births). Nevertheless, the results show the same pattern, as the strongest effect is found in the United Kingdom (0.67), somewhat less important effects in Italy (0.38) and Spain (0.29), and not significant, but positive effects in Denmark (0.32). Unemployment has a negative not significant effect in Italy, Spain, and Denmark, and positive significant effects in United Kingdom (0.55). Temporary contracts still have significant negative effects in Spain (-0.47), reflecting the specific role they play in the Spanish labor market, while in the other countries the effects are negative but not significant. Working in the public sector has positive effects for the advancement to higher parities in all countries, although they are only significant in Italy and in Denmark. Finally, working part time, surprisingly, does not have a significant impact in any of the countries studied.

In the models concerning second and higher order births I have also included the husband's income, as it may have a positive (income) effect on fertility. This prediction of the economic literature is only partially confirmed in Spain and in the United Kingdom. In the first country the effect is clearly not linear, and is concentrated only in individuals pertaining to the highest income category. By contrast in the United Kingdom only the category for husbands with very low income have significant negative effects. In Denmark and in Italy the coefficients have a U shaped form, although the only significant results are for the "very low" income category in Denmark.

These results suggest that the effects of men's income may not be as straightforward as predicted by the economic literature. Educational, social or labor market attachment homogamy between partners may also influence fertility decisions. In the following I present the impact of interactions between the labor force status of each of the partners of a couple on second or higher order births. The reference category adopted is a combination of a permanent job for the women and the men, and the other categories are: temporary job, unemployed and inactive, and all the resulting combinations. Results are not presented where cell sizes are too small.

Second or higher order birth. Interaction of labor force status of spouses. United Kingdom.

Men / Women	Permanent	Temporary	Unemployed	Not in L. F.
Permanent	Ref.	-0.10	-0.05	-0.32*
Temporary	-0.39	-	-	-
Unemployed	-0.29	-	0.76	0.78**
Not in L. F.	0.50***	0.04	0.61***	0.10

Note: ***=p<0.01, **=p<0.05, *=p<0.1.

Control variables: age of youngest child, age of mother, birth order, educational level, health status, and a heterogeneity term.

Second or higher order birth. Interaction of labor force status of spouses. Italy.

Men / Women	Permanent	Temporary	Unemployed	Not in L. F.
Permanent	Ref.	-0.20	0.01	-0.43
Temporary	-0.01	0.19	0.67	-
Unemployed	-0.13	0.03	-0.26	-1.51
Not in L. F.	0.22**	0.44*	0.26	0.10

Note: ***=p<0.01, **=p<0.05, *=p<0.1.

Control variables: age of youngest child, age of mother, birth order, educational level, health status, and a heterogeneity term.

The results of United Kingdom, Italy, and to a much lesser extent Spain, show a clear opposition between men's and women's labor market situations. When the woman is inactive, whatever the labor force situation of her husband, the coefficients are positive, thought not always significant. The most significant results for the former two countries

are obtained for the cell combining a permanent job for the men and an inactivity situation for the women, just as one might expect for a traditional division of labor between the partners that maximizes in the one hand, men's income security and in the other hand, women's availability of time at home. In the United Kingdom this positive effect also holds when the women is unemployed in combination with men's inactivity or unemployment, which seem a little surprising since in this case men's income will tend to be low. At the opposite corner of the classical men's breadwinner situation, it is found the combination of an inactive men with a women holding a permanent job, that leads to a negative coefficients in all countries (significant in the United Kingdom, but also in Denmark). More generally, all cells that involve inactivity, or to a lesser extent unemployment, for men show negative coefficients in most instances. This result suggest that the labor force situation of men and women are not interchangeable, even in societies with relatively high gender equality, as in Denmark.

The Spanish results merit a separate discussion since in that country, what seems to matter for fertility, is employment security for both members of the couple, more than a traditional division of labor between the partners. In fact, the cell combining a permanent job situation for men with inactivity for women is not significant. By contrast, negative impacts are found for the combinations that involve temporary jobs or unemployment for men and women. They turn to be significant for the cells: men with a temporary job and women unemployed or with a temporary job, and remarkably for women with a temporary job and men with a permanent job.

In Denmark, the results are consistent with a dominance of income effects and a positive impact of labor force attachment of both members of the couple for fertility. Inactivity of women has a significant negative effect, as the men's inactivity (though this last effect is strongest), and the combination of both partners inactivity, not surprisingly leads to a very negative significant effect. In the case of Denmark, many inactivity situations involve students or individuals engaged in professional training.

Second or higher order birth. Interaction of labor force status of spouses. Spain.

Men Women	Permanent	Temporary	Unemployed	Not in L. F.
Permanent	Ref.	0.03	-0.21	-1.29
Temporary	-0.55**	-1.00**	-0.75	0.25
Unemployed	-0.13	-0.93**	-0.06	-0.62

Not in L. F.	0.17	-0.14	0.16	-0.66

Note: ***=p<0.01, **=p<0.05, *=p<0.1.

Control variables: age of youngest child, age of mother, birth order, educational level, health status, and a heterogeneity term.

Second or higher order birth. Interaction of labor force status of spouses. Denmark.

Men *Women*	Permanent	Temporary	Unemployed	Not in L. F.
Permanent	Ref.	0.48*	0.01	-0.95***
Temporary	-0.20	-0.97	1.03	-0.85
Unemployed	-0.26	1.19	-0.34	-0.27
Not in L. F.	-0.39*	0.30	-1.46	-0.92**

Note: ***=p<0.01, **=p<0.05, *=p<0.1.

Control variables: age of youngest child, age of mother, birth order, educational level, health status, and a heterogeneity term.

Finally, some comments on the results concerning the processes of entry and of exit from/to the labor market can complement the picture of the patterns found in each country. As stated above, no significant correlation of the heterogeneity components of fertility and entry to the labor market was found in the countries analyzed. The results (not presented) show that any of the potentially endogenous variables related to fertility show significant coefficients (pregnancy, number of children, and age of the youngest child). The addition of the variable being single, as opposed to living in a couple seems to capture all the effects, as being single has a clear positive effect on entering the labor market (not significant in Italy).

A very strong positive effect of being pregnant of a second or higher order birth for exiting the labor market is found in Italy, United Kingdom and in Spain. This result points to the importance of this short period of time for taking decisions about labor market participation. The trade-offs to which couples are confronted would manifest themselves with acuteness during pregnancy. On the contrary, the effects of the number of children are not significant in any of these countries, and the positive impact of having a child of low age is only significant in the United Kingdom. This last result would be consistent with the alleged bifurcation of labor force trajectories at the

moment of first birth in Spain and Italy, to stabilize once the first child is born, and a more flexible situation at that point in the United Kingdom.

Conclusions

In this article I have argued that the relationship between fertility and labor market participation of both members of a couple is highly dependant on each particular labor market context and the institutions governing it. The results show on the whole a nice match between the relationships found at the individual level and the type of welfare state regime or even to institutions specific to a particular country's labor market. Of course, the empirical patterns can be related not only to labor market characteristics, but also to the functioning of other institutions that could not be analyzed here. Relevant in that respect are parental leave regulations, the social service system (child care), and more generally, the gender system (e.g. involvement of fathers in childcare). Therefore, empirical analyses can be misleading if they pool data from countries with different systems of welfare without proper attention to those differences.

The mechanisms of "income effect" and price-of-time" effect, postulated by the economic theory, have been used in interpreting the results obtained and showed to be useful in most instances. However, some of the results seem to point that, rather than a maximization of lifetime income, the attainment of a minimum level of income and attachment to the labor market may be more relevant for many couples in terms of fertility behavior. This may be the case not only in Southern labor markets where employment insecurity is pervasive, but also Denmark.

The difficulties in combining motherhood and childrearing may lead to a retreat from the labor market (or to never accessing it) to many women in United Kingdom and in Italy and Spain. This possibility may be especially appealing to women holding traditional values, as suggest the test for endogeneity between the processes of fertility and participation. These situations have been represented in the models by the category "housewife" (and may be also by the category "unemployed", especially in United Kingdom). This can also result from poor long term perspectives in the labor market or long lasting situations of precarity. If that is the case, it may happen that some of these women enter motherhood as a kind of substitute, as the only meaningful social role accessible to them and allowing them to enhance their social status (Lindenberg, 1991). Motherhood could even act as a means to reduce uncertainty (Friedman et al, 1994).

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Tables

Table 1. *First birth (month of conception). No heterogeneity: Model 1*

Variable	Spain		United Kingdom		Italy		Denmark	
	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.
Age (spline)								
15-18	**0.3452**	.40244	**-0.0052**	.20748	**0.6905**	.63998	**-0.0278**	.46235
18-25	**0.0723 ****	.03336	**0.0217**	.03245	**0.1838 *****	.03116	**0.3279*****	.05844
25-29	**0.1753 *****	.03695	**0.1474 *****	.04382	**0.1351 *****	.03128	**0.1221****	.05298
29-35	**-0.0591 ***	.03219	**-0.0498**	.03658	**-0.0733 *****	.02759	**-0.1103****	.04892
35+	**-0.5222 *****	.13959	**-0.3015*****	0.1011	**-0.2267*****	.08481	**-0.1954**	.14007
Educational level								
(ref. = low)								
Middle	**0.0638**	.11029	**-0.3406 ****	.16834	**-0.0403**	.07928	**-0.0315**	.21768
High	**-0.2114 ****	0.1051	**-0.2324 ****	.10757	**0.1325**	.12211	**-0.0809**	.22913
Employment status								
(ref. = Employed)								
Unemployed	**-0.5841 *****	.13945	**0.4891 ****	.20496	**-0.7887 *****	.12176	**-0.2808**	.25982
Student	**-2.3938 *****	.26473	**-1.7237*****	.27115	**-2.2610 *****	.24144	**-0.8373*****	.20199
Other	**1.0290 *****	.11193	**1.8677 *****	.12299	**0.9745 *****	.08819	**-0.2072**	0.3581
Sector								
Private (ref)								
Public	**0.3546 ****	.14471	**-0.0264**	0.132	**-0.0906**	.12149	**0.0008**	.15545
Type of contract								
Permanent(ref.)								
Self employed	**-0.0420**	.21578	**-0.4352**	.30393	**-0.1696**	.15601	**-0.5039**	.52358
Temporary	**-0.5517 *****	.13521	**-0.3974**	.26255	**-0.2895 ***	.16915	**0.0400**	.20809
Working hours								
Full time								
Part-time	**0.3632 ****	.17513	**0.5077 ****	0.2273	**0.2696 ***	.15566	**-0.1782**	.27948
Health								
Good								
Bad	**-0.9731 *****	.20775	**-0.3072 ****	.14505	**-0.6535 ****	0.2595	**-0.0886**	.19278
Missing inf.	**-0.3515 *****	.09319	**-0.1492**	.10472	**0.0863**	.07362	**0.0129**	0.1374
Intercept	**-4.2345 *****	1.1625	**-2.6740*****	.57795	**-5.9983 *****	1.8833	**-3.9978*****	1.3208

Note: ***=p<0.01, **=p<0.05, *=p<0.1.

Table 2. *Second or higher order birth (month of conception.) No heterogeneity: Model 2*

	Spain		United Kingdom		Italy		Denmark	
	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.
Age of youngest child (spline)								
0-1 years	**1.5598*****	*.44317*	**2.2721*****	*.31523*	**1.8854 *****	*0.3802*	**1.4403 *****	*.32397*
1-4 years	**0.1518 ****	*0.0608*	**-0.0628**	*.05473*	**0.1180 ****	*.05536*	**0.0994**	*.07307*
4-6 years	**-0.0338**	*.08138*	**-0.3285 *****	*0.0978*	**-0.0339**	*.08141*	**-0.3747 *****	*.14119*
6+ years	**-0.1212 *****	*0.0331*	**-0.1143****	*.05237*	**-0.1558 *****	*.03327*	**-0.1217**	*.07895*
Age (spline)								
15-21	**0.1632**	*.31714*	**0.1632**	*0.1169*	**0.4437**	*.43649*	**0.2278**	*0.6691*
21-28	**-0.0505**	*.03701*	**0.0082**	*.02723*	**-0.0061**	*.03542*	**0.0193**	*.04871*
28-33	**-0.0212**	*.03166*	**-0.0445**	*.02987*	**-0.0280**	*.02921*	**-0.1019 ****	*.04041*
33+	**-0.1493 *****	*.03921*	**-0.1306 *****	*.03929*	**-0.1837 *****	*.03708*	**-0.1304 *****	*.0498*
Birth order								
Second								
Third	**-1.5820 *****	*.12467*	**-1.1007 *****	*.09972*	**-1.4301 *****	*.11316*	**-1.1674 *****	*.13318*
Fourth or higher	**-1.3501 *****	*.19163*	**-1.5696 *****	*.14493*	**-1.5976 *****	*.19841*	**-1.5033 *****	*.21703*
Educational level (ref. = low)								
Middle	**0.0257**	*.13331*	**-0.1269**	*.11821*	**0.1413**	*.09643*	**-0.0746**	*.15221*
High	**0.2437 ***	*.14145*	**0.2960 *****	*0.1017*	**0.5522 *****	*.17628*	**-0.0862**	*.21573*
Activity status (ref. = Employed)								
Unemployed	**-0.0542**	*.18186*	**0.5342 ***	*.29959*	**-0.1228**	*.20967*	**-0.0163**	*.18625*
Housewife	**0.2711 ***	*.14482*	**0.6620 *****	*0.1067*	**0.3384 *****	*.11562*	**0.3084**	*.24031*
Student	**-0.9868**	*0.71*	**-0.2628**	*0.4779*	**-1.2358**	*1.0747*	**-0.9818 *****	*.34702*
Sector								
Private (ref)								
Public	**0.2813**	*.19466*	**0.1286**	*0.1426*	**0.3097 ****	*.13879*	**0.2583 ***	*0.1418*
Type of contract								
Permanent (ref.)								
Temporary	**-0.4530 ****	*0.2264*	**-0.4230**	*.33861*	**-0.0038**	*.23266*	**-0.3340**	*.23369*
Self employed	**0.2067**	*.21913*	**0.0818**	*.25523*	**0.0910**	*.17598*	**-0.4046**	*.41564*
Working hours								
Full time								
Part-time	**0.0398**	*.23846*	**0.1222**	*.16839*	**-0.1760**	*.18011*	**0.1947**	*.21578*
Husband's income								
Very low (ref. = low)	**0.0084**	*.15334*	**-0.2653**	*.16413*	**0.1061**	*.13728*	**0.4366 ****	*.19441*
Middle	**0.0981**	*0.1093*	**-0.0233**	*.09703*	**-0.0495**	*(.10311*	**0.1831**	*.13454*
High	**0.4577 *****	*0.1487*	**0.0152**	*.13465*	**0.1023**	*.13016*	**0.2090**	*0.1906*
Health								
Good								
Bad	**-0.6736 ****	*.28209*	**-0.4197 *****	*.13377*	**0.1602**	*0.276*	**-0.0114**	*.17431*
Missing inf.	**0.0528**	*.09803*	**0.0318**	*.09986*	**0.0006**	*.09241*	**-0.0140**	*.12984*
Intercept	**-6.8934**	*6.6121*	**-6.9667 *****	*2.3697*	**-13.2848**	*9.0824*	**-7.4155**	*14.01*

Note: ***=p<0.01, **=p<0.05, *=p<0.1.

Table 3. *First birth (month of conception). With heterogeneity: Model 3*

	Spain		United Kingdom		Italy		Denmark	
	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.
Age (spline)								
15-18	**0.35**	*0.40*	**0.03**	0.20	**0.67**	*0.63*	**-0.04**	*0.43*
18-25	**0.08 ****	*0.03*	**0.03**	0.03	**0.19***	*0.03*	**0.33***	*0.06*
25-29	**0.19 ****	*0.04*	**0.15 ****	0.04	**0.14***	*0.03*	**0.13****	*0.05*
29-35	**-0.05**	*0.03*	**-0.04**	0.04	**-0.07 ****	*0.03*	**-0.11****	*0.05*
35+	**-0.53 ****	*0.14*	**-0.31 ****	0.10	**-0.23 ****	*0.09*	**-0.20**	*0.13*
Educational level								
(ref. = low)								
Middle	**-0.08**	*0.11*	**-0.37 ****	0.17	**-0.06**	*0.08*	**-0.04**	*0.04*
High	**-0.24 ****	*0.11*	**-0.28 ****	0.11	**0.11**	*0.13*	**-0.09**	*0.23*
Employment status								
(ref. = Employed)								
Unemployed	**-0.57 ****	*0.14*	**0.51 ****	0.21	**-0.79***	*0.12*	**-0.28**	*0.25*
Student	**-2.37***	*0.26*	**-1.73 ****	0.27	**-2.26***	*0.24*	**-0.84***	*0.19*
Other	**1.08 ****	*0.12*	**1.88 ****	0.13	**1.01***	*0.09*	**-0.19**	*0.34*
Sector								
Private (ref)								
Public	**0.37 ****	*0.15*	**-0.07**	0.14	**-0.08**	*0.13*	**0.00**	*0.51*
Type of contract								
Permanent(ref.)								
self employed	**-0.05**	*0.22*	**-0.38**	0.31	**-0.18**	*0.16*	**-0.53**	*0.53*
Temporary	**-0.56 ****	*0.14*	**-0.41**	0.27	**-0.30 ***	*0.17*	**0.02**	*0.21*
Working hours								
Full time								
Part-time	**0.37 ****	*0.18*	**0.52 ****	0.24	**0.28 ***	*0.16*	**-0.18**	*0.27*
Health								
Good								
Bad	**-0.96***	*0.21*	**-0.32 ****	0.15	**-0.63 ****	*0.26*	**-0.09**	*0.19*
Missing inf.	**-0.39 ****	*0.09*	**-0.20 ***	0.10	**0.04**	*0.07*	**-0.02**	*0.14*
Intercept	**-4.35***	*1.15*	**-2.87 ****	0.57	**-6.03***	*1.87*	**-3.40***	*1.23*

Table 4. *Second or higher order birth (month of conception.) With heterogeneity: Model 3*

	Spain		United Kingdom		Italy		Denmark	
	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.	Hazard	s.e.
Age of youngest child (spline)								
0-1 years	**1.62 ***	*0.43*	**2.37 ***	*0.32*	**1.93***	0.37	**1.45 ***	*0.31*
1-4 years	**0.17 ***	*0.06*	**0.01**	*0.06*	**0.14**	0.05	**0.11**	*0.07*
4-6 years	**-0.03**	*0.08*	**-0.34 ***	*0.10*	**-0.02**	0.08	**-0.38***	*0.14*
6+ years	**-0.16 ***	*0.04*	**-0.16***	*0.05*	**-0.19***	0.03	**-0.15 ***	*0.08*
Age (spline)								
15-21	**0.15**	*0.33*	**0.18**	*0.12*	**0.43**	0.43	**0.26**	*0.55*
21-28	**-0.03**	*0.04*	**0.03**	*0.03*	**0.01**	0.04	**-0.03**	*0.05*
28-33	**0.02**	*0.03*	**-0.00**	*0.03*	**0.00**	0.03	**-0.08***	*0.04*
33+	**-0.12***	*0.04*	**-0.11 ***	*0.04*	**-0.15***	0.04	**-0.11 ***	*0.05*
Birth order								
Second								
Third	**-1.76 ***	*0.13*	**-1.24 ***	0.11	**-1.57***	0.12	**-1.25 ***	*0.14*
Fourth or higher	**-1.74***	*0.23*	**-1.93 ***	0.17	**-1.95***	0.24	**-1.71 ***	*0.26*
Educational level (ref. = low)								
Middle	**-0.02**	*0.14*	**-0.19**	0.13	**0.09**	0.10	**0.13**	*0.16*
High	**0.13**	*0.15*	**0.22 ***	0.12	**0.42**	0.19	**-0.17**	*0.22*
Activity status (ref. = Employed)								
Unemployed	**-0.03**	*0.18*	**0.55 ***	0.31	**-0.12**	0.21	**-0.02**	*0.19*
Housewife	**0.29***	*0.15*	**0.67 ***	0.11	**0.38***	0.12	**0.32**	*0.24*
Student	**-0.93**	*0.71*	**-0.24**	0.49	**-1.25**	1.08	**-1.00***	*0.34*
Sector								
Private (ref)								
Public	**0.29**	*0.20*	**0.08**	0.15	**0.34***	0.14	**0.26 ***	*0.14*
Type of contract Permanent (ref.)								
Temporary	**-0.47 ***	0.22	**-0.42**	0.35	**0.01**	0.23	**-0.34**	*0.23*
Self employed	**0.2016**	0.2271	**0.17**	0.27	**0.10**	0.18	**-0.44**	*0.42*
Working hours Full time								
Part-time	**0.0243**	.24606	**0.17**	0.18	**-0.18**	0.18	**-0.19**	*0.22*
Husband's income Very low	**0.0082**	0.156	**-0.31 ***	0.17	**0.11**	0.14	**0.45***	*0.19*
(ref. = low) Middle	**0.0964**	.11176	**-0.02**	0.10	**-0.05**	0.10	**0.18**	*0.13*
High	**0.4629 ***	.15328	**0.02**	0.14	**0.11**	0.13	**0.20**	*0.19*
Health Good								
Bad	**-0.6925 ***	.28693	**-0.45 ***	0.14	**0.18**	0.27	**-0.02**	*0.17*
Missing inf.	**0.0690**	.09993	**0.16**	0.10	**0.07**	0.09	**0.03**	*0.13*
Intercept	**-6.8003**	6.8462	**-7.72 ***	2.46	**-13.32**	8.93	**-8.22**	*11.50*

Table 6. *Exiting the labor market. With heterogeneity: Model 3*

	United Kingdom	
	Hazard	*s.e.*
Baseline (spline)		
0-0.5 years	**-0.03**	0.40
0.5-1 years	**-0.21**	0.29
1-3 years	**-0.22 *****	0.08
3-6 years	**0.01**	0.05
6+ years	**-0.02**	0.01
Age (spline)		
16-21	**-0.04**	0.05
21-28	**-0.00**	0.02
28-33	**-0.00**	0.03
33+	**-0.05 *****	0.02
Educational level		
(ref. = low)		
Middle	**0.07**	0.010
High	**-0.02**	0.08
Activity status		
Employed (ref)		
Unemployed	**0.62 *****	0.12
Sector (ref=private*)*		
Public	**-0.60 *****	0.11
Type of contract		
Permanent (ref.)		
Temporary	**0.28 ****	0.14
Self employed	**0.12**	0.14
Working hours		
Full time (ref)		
Part-time	**0.42 *****	0.09
Job category		
Elementary occ. (ref)		
Skilled worker	**-0.61 ***	0.32
Service workers	**-0.26 *****	0.09
Higher occupations	**-0.65 *****	0.11
Pregnant	**2.54 *****	0.10
No. of Children		
One	**0.05**	0.29
Two	**-0.21**	0.30
Three or more	**0.21**	0.31
Age of youngest child		
0-3	**0.64 ****	0.29
3-6	**0.73 ****	0.29
6+	**0.29**	0.29
Single	**-0.10**	0.10
Spouse activity		
Employed (ref)		
unemployed	**0.15**	0.18
inactive	**-0.11**	0.11
Husband's income		
Very low	**-0.145**	0.16
(ref. = low)		
Middle	**-0.05**	0.09
High	**0.24 ****	0.12
Good Health (ref)		
Bad Health	**0.12**	0.09
Missing inf.	**0.03**	0.08
Intercept	**-1.04**	1.06