

Adsera, Alicia

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**Where Are the Babies?  
Labor Market Conditions and Fertility in Europe**

Alicia Adsera

April 2005

# Where Are the Babies? Labor Market Conditions and Fertility in Europe

**Alicia Adsera**

*University of Chicago, University of Illinois at Chicago  
and IZA Bonn*

Discussion Paper No. 1576  
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IZA

P.O. Box 7240  
53072 Bonn  
Germany

Phone: +49-228-3894-0  
Fax: +49-228-3894-180  
Email: [iza@iza.org](mailto:iza@iza.org)

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## ABSTRACT

### Where Are the Babies? Labor Market Conditions and Fertility in Europe\*

Cross-country differences in both the age at first birth and fertility are substantial in Europe. The paper uses the European Community Household Panel 1994-2000 to investigate the relationship between unemployment of both women (and their spouses) with the timing and number of children. Maternity postponement is acute in countries with high and persistent unemployment since the mid 1980s. Moreover, the paper examines how fertility varies, for a similar level of unemployment, as a function of country-specific institutional arrangements. Wide access to part-time and to permanent positions (such as those in the public sector) is correlated with faster transitions to births. Short-term contracts are associated with delayed fertility instead.

JEL Classification: J13, J2, J6, H3

Keywords: fertility, unemployment, public sector, part-time, short-term contracts, maternity benefits

Corresponding author:

Alicia Adsera  
Population Research Center  
University of Chicago  
1155 E. 60th Street  
Chicago, IL 60637  
USA  
Email: [adsera@uic.edu](mailto:adsera@uic.edu)

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## **INTRODUCTION**

During the last two decades developed countries have experienced a dramatic fall of total fertility rates to previously unseen levels. This rapid fall in fertility has captured the attention of policymakers because of its implications for population decline (Van de Kaa 1987, United Nations Population Division 2003, Lee 2004). Still, within that general downward trend, fertility has varied significantly across countries. In Southern Europe, Germany and Austria the fertility rate has plummeted to 1.3 or below – to what some refer as the lowest-low fertility levels (Kohler, Billari and Ortega 2002). By contrast, the highest fertility rates (from around 2 to 1.75) are found in France, Ireland and Scandinavia. This study investigates differences in fertility between 13 European countries and asks whether fertility levels are related to labor market institutions and stability of employment.

Table 1 conveys in a powerful way the extent of the changes in fertility patterns in the advanced world. Since synthetic indexes such as total fertility rates may not be precise measures of fertility in the presence of sharp alterations in the timing of children (Boongarts 1999), I present actual fertility for the cohort of women born from 1960 to 1962 in 13 European Union countries by the time they reach age 39. Individual fertility histories are drawn from the first seven waves (1994-2000) of the European Community Household Panel Survey (ECHP). The percentage of childless women is under 20% in all countries except Luxembourg. In most countries over two thirds of women have at least two children. The proportion, however, is lower in some Southern European countries such as Italy and Spain where only 55% and 61% of women have a second child. Cross-country differences are particularly large in the numbers of women who become mothers for a third time by age 39. The proportion ranges from one half in Ireland and about one third in Nordic countries to one

fourth in most of the other countries. In Southern Europe less than 20% of women have three children or more.<sup>1</sup>

With the massive entry of women in the labor market during the last decades, balancing work and family has become a central concern in the developed world. Time spent in childbearing implies forgone wages as well as an increased risk of unemployment, particularly in the midst of the turbulent times experienced by European labor markets during the 1980s and 1990s. In line with a growing research, this study shows how different labor market institutions and the stability of employment are currently related to fertility decisions of women (Gustafsson et al. 1994, Esping-Andersen 1999, Pampel 2001, Rindfuss et al. 2003, Adsera 2004). First, high and persistent unemployment in the country or region of residence is associated with delays in long-term family decisions such as childbearing. Second, wide access to part-time employment and to permanent positions (such as those in the public sector) is coupled with faster transitions to births whereas short-term contracts are associated with delayed fertility.

An added advantage of showing how cross-country differences in such labor markets arrangements are related to fertility choices is that it also accounts for the fact that fertility rates and both female participation in the labor market and female employment rates have become positively correlated across OECD countries since the 1980s (Morgan 2003, Adsera 2004). Where female participation is high, such as the United States, New Zealand or Nordic nations,

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<sup>1</sup> The sum of the first three columns in Table 1 is close to the average number of children women bear in each country by age 39. As expected, cohort numbers are slightly larger than the prevailing fertility rates. Still with the exception of Ireland and Nordic countries, the average number of children is well below replacement rate.

fertility rates are relatively high. By contrast, in countries with lower levels of female labor market attachment, such as Spain or Italy, fertility rates are very low.

In this paper I take advantage of the cross-country institutional differences in 13 European Union countries to analyze the differences in the spacing of births in a sample of over 50,000 women during the last thirty years. The first section lays out the hypothesis of how persistent unemployment may be coupled with lower fertility and how some types of contractual arrangements temper economic uncertainty for new mothers. The second section estimates transitions to first, second and third births of European women, using time-varying institutional and economic indicators at the country level since 1969. A second set of estimates also includes individual labor market information to analyze transitions to second and third births during the last ten years. The paper ends with some conclusions.

## **ANALYTICAL FRAMEWORK**

**Preferences.** Changes in the preferences of couples toward smaller families, larger investments per child and dual-careers appear as obvious explanations for the extraordinary reduction in the number of children per women. In the last three decades women have participated more intensively in the labor market and traded-off children for less time-demanding alternatives (Butz and Ward 1979, Becker 1981, Galor and Weil 1996). Female labor force participation rates in the European Union climbed from 41% in 1960 to almost 47% in 1975 and then to 63% by the late 1990s. In addition, changes in values such as the emphasis on individual preferences within couples as well as secularization have long been considered independent causes of family change during the last decades (Bumpass 1990: 483). Widespread access to family planning in these countries facilitated those choices.

Preferences alone cannot explain, however, the wide variation in fertility rates observed in the data -- even if they may be central to the overall decline in family size (Boongarts 2002). Recent data from the 2001 Eurobarometer show that the ideal number of children is relatively homogenous for women 20-34 in the 15 European Union countries, though lower than for those in their late 30s and 40s, with an average close to replacement level 2.1 and with Austria and Germany slightly below 2 (Goldstein, Lutz and Testa 2003).<sup>2</sup>

Postponement of first birth has been singled out as an explanation for the gap between stated preferences and completed fertility since it “brings risks that women will not have all the children they intend” (Morgan 2003: 599). In an attempt to balance work and family demands, European women are becoming mothers at a later age and, as a result, are expected to bear fewer children by the end of their fertile life (Kohler et al. 2002). This explanation is, nonetheless, insufficient to explain the overall trend in Europe because the degree of postponement is not uniform across countries. The last two columns in Table 1 present the proportion of mothers by age 30 in each country among women born either in 1957-60 or in 1965-68. In Italy and Spain the proportion has moved down more than 20 points from about 70% to less than 50%. The decrease has been minor in Nordic countries, France and Belgium. These country differences persist in the transitions to higher parities.

**Labor Market Institutions and Economic Uncertainty.** A central explanation to cross-country variation in postponement of first birth and fertility lies in how labor market institutions mediate the competing demands of home and the workplace. Labor market arrangements vary widely across Europe (Gustafsson et al. 1994, Esping-Andersen 1999, Pampel 2001). These broad differences, coupled with a sharp increase in unemployment and

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<sup>2</sup> Of course, employing the ideal number of children as a measure of preferences has some limitations. For a detailed discussion, see Westoff and Ryder (1977).



economic uncertainty, have become more relevant for fertility decisions during the 1980s and the 1990s, as Europe witnessed an increased entry of women in the labor market.

High unemployment has been at the center of European economic performance for the last two decades. Unemployment rates started to climb from very moderate levels at the end of the 1970s. The increase was particularly sharp in Southern Europe where female unemployment lingered above 20% for many years. In the United Kingdom and Sweden, female unemployment was less persistent and remained below 10% for most of the period. Table 2 shows that unemployment rates of women under age 25 were close to 50% in Spain and around 37% in Italy and Greece in 1995. Rates were more moderate in the rest of Europe. Over 50% of unemployed women in Italy, Ireland, Spain, Portugal and Belgium had been out of work for more than one year (long-term unemployment rate) (OECD Employment Outlook, various years).

Although a standard microeconomic model of fertility predicts that the associated fall in opportunity costs makes a temporary unemployment spell a good time for childbearing (Butz and Ward 1979, Galor and Weil 1996), long-term unemployment may affect childbearing differently. In fact, the persistence of recent European unemployment and its intensity among young workers and women may be coupled with reductions in family size. First, a weak attachment to the labor market, particularly early in life, increases the risk of long-term unemployment with associated losses in future wages and benefits. Since maternity demands may require a short (partial) withdrawal from the market, women would rather postpone childbearing until they accumulate sufficient human capital through experience (or through education) to secure future employment. In 1998, Italy and Spain, the countries with the highest unemployment rates, had the highest proportion in the OECD of 25-29 year-old women studying yet not in the labor force (OECD 2001). The largest postponement in

childbearing and household formation took place in Southern Europe where unemployment was particularly acute (Ahn and Mira 2001, Adsera 2002, Holdsworth and Irazoqui-Solda 2002). Second, besides adverse aggregate conditions, a personal experience of (long-term) unemployment should further discourage childbearing through its negative effect on household income. Finally, parents facing job market uncertainty may limit the number of their offspring to invest more per child and improve their future outlook (Becker, Murphy and Tamura 1990).

Certain types of contractual arrangements moderate women's uncertainty when coping with work and family demands in the context of rampant unemployment. Part-time and government employment (and other forms of permanent employment) are among the most significant. Disparities in the provision and regulation of such positions, which are the result of policy choices influenced by differences in welfare state models (Esping-Andersen 1999, Pampel 2001, Rindfuss et al. 2003), are strongly related to the recent cross-country differences in the postponement in childbearing shown in Table 1.

Wide access to part-time arrangements make women's dual roles more compatible and increase their certainty of re-employment should they decide to temporarily withdraw from the market after childbirth. Data in Table 2 demonstrate that the prevalence of such positions varies substantially across Europe. Part-time as a share of total employment ranges from close to 40% in the Netherlands, to over 20% in the UK and Sweden to a low 7% in Southern Europe. Two-thirds of Dutch women work part-time whereas only 8% of Greek and 12% of Italian, Portuguese and Finnish women do. Even though the share of part-time workers over total employment is an equilibrium result of market forces, important differences in part-time regulation are largely responsible for its wide disparity across Europe. Labor legislation in some European Union countries penalizes part-time positions by either not ensuring pro-rata entitlements (i.e. entitlements proportional to the hours of work) such as seniority allowances,

wage rates or vocational training, or by setting social security charges and other pay roll taxes at the same rate that those of full-time workers (OECD 1995). These regulations render part-time employment unattractive for both the workers and the employers. The prevalence of part-time employment in the Netherlands swelled from the moment workers were granted pro-rata entitlements in exchange for pro-rata social insurance contributions.

In addition, uncertainty is also low if jobs are protected and women are guaranteed to return to their previous employment after childbirth. Here, two institutional structures play a key role: short-term contracts and public employment. Whereas in Europe most mature workers hold permanent positions protected by high firing costs, young workers hold more unstable jobs. Changes in the types of contracts available, mainly for the young, were enacted as a response to deteriorating economic conditions and to stimulate new employment, particularly in Southern Europe. In 1984, for example, the Spanish government partially reformed the labor market and allowed non-permanent contracts with temporary subsidies for new hires. The percentage of female workers holding temporary contracts in Spain increased from around 5% in 1984 to over 35% in less than 10 years. Temporary employment also rose in Italy as employers were searching for means to reduce non-wage costs. The emergence of unstable and short-term contracts increased turnover in the labor market and somewhat cut-down the unemployment numbers during the mid 1990s –though they still remained high. However, it did not imply stable employment for young couples, a pre-condition for securing mortgages and accelerating household formation in most European countries.

On the other hand, government employment constitutes a unique source of tenured jobs in Europe – both for men and women – that guarantees stable job prospects after childbirth. These positions offer generous parental leave and work schedules and possibly subsidized child-care (Rosen 1996). All these benefits provide a strong incentive for women to be

employed full time before childbirth and then return to work as benefits stop (Gustafsson and Stafford 1994, Gustafsson et al. 1996, Ronsen and Sundstrom 1996).

Public sector employment, in Table 2, ranges from around 30% of total employment in Nordic countries (and close to 25% in France) to half that size in most of the other countries in Europe. The extensive public sector in Nordic countries is part of a “policy mix that benefits two-earner family according to an ideology of individual responsibility and equal role sharing” (Gustafsson et a. 1996: 224). Rosen (1996) notes that employment growth in Sweden since 1970 to the early 1990s was confined to the local public sector, mostly to women, and that it was meant to encourage both fertility and female labor market participation.

## **TRANSITIONS TO BIRTHS AND LABOR MARKET CONDITIONS**

### **Empirical Strategy**

This study sets out to understand the aggregate economic conditions under which recent changes in childbearing behavior occurred. Following a large literature, dating from the seminal work of Newman and McCulloch (1984), I estimate Cox proportional hazard models of the timing of births across the European Union. For women  $i = 1, 2, \dots, N$  who each enter a state (e.g. first birth) at time  $t=0$ , the (instantaneous) hazard ratio function for  $i^{th}$  person at time  $t>0$  is assumed to take the proportional hazards form

$$\lambda_{it} = \lambda_0(t) \exp (X'_{it} \beta ) \quad (1)$$

where  $\lambda_0(t)$  is the baseline hazard function;  $\exp (.)$  is the exponential function;  $X_{it}$  is a vector of covariates summarizing observed differences between individuals as well as the characteristics of the labor market where they live at time  $t$ ; and  $\beta$  is a vector of parameters to be estimated. I use a grouped robust variance as estimated by Lin and Wei (1989). The dependent variable in

all estimates is months to a birth from either the previous birth or age 16 in the case of the first birth. Estimates in the tables are presented in hazard ratios.

I draw individual fertility histories from the 1994-2000 waves of the European Community Household Panel Survey (ECHP), a unique dataset produced by the European Union Statistical Office (Eurostat) that presents comparable micro-level household information across the 15 European Union member states.<sup>3</sup> Since the survey does not include exact month of birth for children in Germany and Denmark, these countries are not included in the analysis. The 13 countries considered are Austria, Belgium, Finland, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

The ECHP does not provide retrospective fertility history. To minimize excluding children who have already left the household, the sample includes only women who were 40 years old or under at the time of the first interview. The sample includes observations starting in 1969 and it contains 50,789 women with 24,994 first births, 16,661 second births and 5,145 third births.

In the analysis I use the variation in the characteristics of the labor market across countries to understand how they are they related to the timing of fertility choices. These institutional differences determine the compatibility between work and childbearing, particularly given the constraints of high structural unemployment European women face in this period. To study cross-country differences, the models are estimated without country dummies. Then to analyze within country changes each table also includes results with country fixed effects.

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<sup>3</sup> The dataset also includes, for later waves, observations from the Luxembourg and the British household panels (PSELL and BHPS) converted for comparability with the ECHP.

To measure the underlying uncertainty women face in the labor market I employ female unemployment rates and long-term unemployment rates in the country of residence. I use the shares of public sector and part time employment to account for the availability of contractual arrangements that reduce the implicit cost of uncertainty.

Additional country controls include share of self-employment, male unemployment, GDP per capita in purchasing power parity terms of \$ of 1995 and the weeks of maternity leave interacted with the replacement rate (a percentage of previous earnings). Time-varying economic conditions are lagged one year since fertility decisions are obviously taken some months prior to actual birth. The Appendix includes sources and cross-country descriptive statistics of the data. Most series are available for 1968-2001. Part-time employment and long-term unemployment are only available for 1979-2001.

In addition, estimates include a few demographic controls such as women's education, birthplace as well as information on previous fertility history such as age at first birth, time intervals between births and the gender of previous children. The education categories include less than upper secondary, upper secondary (omitted) and tertiary education.

## **Results**

Table 3 presents hazard ratios estimates of the Cox proportional hazard models. Columns (1) to (4) refer to transitions to first birth from age 16, columns (5) and (6) to transitions to second births and, finally, columns (7) and (8) to third births.

**Unemployment.** European unemployment experienced a sharp increase since the mid-eighties. It became less cyclical and more prevalent among workers of fertile ages. The main hypothesis of the paper is that, since the mid eighties, the negative income effect due to the persistence of unemployment overcame the positive effect on fertility associated with lower

opportunity costs during an unemployment shock. To see whether there is a change in the relation of unemployment and childbearing during the period under investigation, I use the longest available sample starting in 1969 to estimate a model of transitions to first birth that includes both female unemployment rate alone and interacted with a time dummy from 1985 onwards. Results are presented in Table 3 columns (1) and (2), with and without country dummies. The hazard ratio of female unemployment alone is above one and significant. Transitions to motherhood occur faster when unemployment increases, as expected by the opportunity costs argument. However, the hazard ratio for unemployment after 1985 is only 0.97 and highly significant. The combined estimates are consistent with the hypothesis that since the mid eighties fertility postponement is relatively larger in countries with higher unemployment and also that, within countries, first births occur later during the highest unemployment periods since 1985.

Estimated hazard ratios for female unemployment are under one in columns (3) to (8) and are significant in all but (8). Thus, maternity postponement is more acute in countries with higher female unemployment for the period 1980-2001 and the negative effect of high unemployment persists into the second and third births.

In Table 4 I further explore the link of persistent unemployment and childbearing postponement. I use the percentage of all unemployed who have been out of work for a period of 12 months or more as a measure of aggregate persistent unemployment. The interaction of this measure with female unemployment rates provides an indicator of the percentage of active females that have been unemployed for more than a year.<sup>4</sup> Thus, in a country with a 20%

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<sup>4</sup> I use total instead of female long-term unemployment rates because data series are more complete. Both rates move closely though female rates are slightly higher in Southern Europe

female unemployment rate and a 60% long-term unemployment rate, 12% of women in the labor market are long-term unemployed. Column (1) presents results for the transition to first births of the pooled sample. While female unemployment enters positively and significantly, the coefficient of the interactive variable is negative as indicated by a hazard ratio under one. Hence, while women in countries with short-term unemployment may transit to motherhood at an earlier age, postponement is significant in countries with long-term unemployment. Figure 1 presents the predicted survival function under different unemployment scenarios. Persistence clearly matters more as the underlying female unemployment rate increases. Almost two-thirds of women become mothers by age 30 in countries where female unemployment is low, around 5%, and only 30% of the unemployed are jobless for over 12 months. Only 45% of them are mothers in countries where unemployment affects 25% of active females and 55% of the unemployed are out of work more than one year, such as in Southern Europe. Notice that this proportion is remarkably similar to that of the 1965-68 cohorts in Italy or Spain, as shown in Table 1. By age 35, the rate of motherhood in the first group of countries reaches 80%, but only 65% in the second.

Estimates in column (2) include country fixed effects. The hazard ratios for the three variables of interest are all under one. They are not separately significant but the value of the joint chi test indicates that they are jointly significant at 1% level. Simulations of these results are similar to those obtained from column (1). Over 63% of women are mothers by age 30 in countries with low temporary unemployment. By contrast, only 50% are in countries with high and persistent unemployment.

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and are slightly lower in the UK and Ireland, countries with moderate unemployment. As a result, using female long-term unemployment would only strengthen the results.



**Public employment.** Estimates in Table 3 include a nonlinear specification of government employment. The estimated hazard to first births in column (3) increases with the size of public sectors. Women in countries with large government sectors transit faster to motherhood than those with fewer opportunities of public employment. Simulations in Table 5 show how the combined effect of female unemployment and the provision of public sector jobs accounts for the cross-national differences in the timing of births in Europe. Less than half of the women are mothers at age 30 in countries with high female unemployment rates, around 25 per cent, and small government sectors, 15 per cent of total employment. By contrast more than 70 percent of women are mothers at age 30 in countries with low unemployment, around 5 per cent, and large public sectors, 30 per cent of employment. As a matter of fact, these values correspond very closely to the behavior of recent cohorts, as shown in Table 1, and to the underlying institutional arrangements of either Spain and Italy or Sweden, respectively.

The combined hazard ratio to second births across public sector employment is somewhat U-shaped but exhibits only moderate variation. Eight years after the first birth, the proportion of mothers with a new child ranges from 83% to 80.5% in countries with 5% female unemployment rate and either 30% or 15% of workers in government employment. The connection between public sector employment and transition to third births is strong. Even if the estimated hazard hardly varies for public sectors under the mean size, it increases for those comprising more than 18 % of total employment such as those in Nordic countries and France. For countries with a female unemployment rate of 5%, the proportion of mothers with a third child eight years after the second birth ranges from 50% to 43% in Table 5. Yet simulations show that differences in female unemployment are clearly the driving force in the cross-country variation of third-time mothers. For government sectors that comprise 15% of total employment, the proportion of two-time mothers with a third child varies from 43% to only

half that much if female unemployment rates range from 5% to 25%. Finally, in the last two rows of Table 5 I combine the proportion of mothers by age 40 (or age 35) jointly with the proportion of women who transit to a second or third birth by eight years from the previous child to obtain a raw estimate of total fertility under different labor market conditions. Estimates range from a high of 2.07 (or 1.99) to a low of 1.31 (or 1.21). These two values correspond very closely to the actual fertility rates of Northern and Southern Europe respectively. A close look at Table 5 reveals two main findings. First, even if access to public sector jobs is important, the association between the unemployment level and cross-country variance in fertility rates is the strongest. Fertility rates fluctuate considerably from 1.81 to 1.31 in countries with a similar 15 percent of public sector employment but either 5 per cent or 25 per cent female unemployment rates. Second, it is in the context of high unemployment where government employment accounts for a larger variation in fertility. This is consistent with the hypothesis that the stability and benefits of a public sector position are particularly suitable to reduce the trade-off of motherhood and work in the presence of an adverse labor market.

With country fixed-effects, the simulated hazard ratio for different government employment sizes in the transition to a first birth declines for levels under the average and is flat thereafter. This result is not surprising: countries that expanded public employment most extensively during these last years were those departing from minimal public sectors and, even after the expansion during the years of rising unemployment, their government sectors still remain at below-average size.<sup>5</sup> For the second and third births, the hazard ratio starts out flat but picks up briskly after levels of 18 % of employment.

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<sup>5</sup> When I control for growth in public employment in the past 5 years, in estimates not presented here, the coefficient of government size remains strongly positive whereas the coefficient on its recent growth is negative and significant.

**Part-time.** The share of part time employment is included both alone and interacted with female participation rates in columns (3) to (8) in Table 3. The coefficient of part-time employment is negative and that of its interactive with female labor force participation is positive in column (3). Simulated results indicate that, in countries with 50% female activity rates (the mean for the period) and 20% part-time employment, 77% of women become mothers by age 40. If female participation reaches 60%, the proportion increases to 80%. If the rate of part-time work is only 7%, those proportions stand at 82% and 85% respectively. To better understand these overall interactions of participation and part-time employment, the coefficient on female activity needs to be taken into account. In columns (1) and (3) estimates indicate that countries with higher female participation experience, on average, faster transitions to a first birth. This accords to the positive cross-country correlation between fertility and female participation found since the mid eighties as younger mothers are expected to bear more children. Notice that, as expected by the standard microanalysis of fertility choices and by the data presented in Table 1, within-country increases in female participation are coupled with delays in childbearing in columns (2) and (4).

The coefficient of part-time employment is positive both for the second and third birth estimates. Wide access to part-time positions is associated with faster transitions to a second child in all countries and to a third child in countries with low levels of female labor market participation. Eight years after the first birth, there is a 12-point difference, from 74 percent to 86 percent, in the proportion of second-time mothers in countries with an average participation rate of 50 percent and either 7% or 20% of their work force in part-time. In separate estimates I find that among those born after 1962, the implied difference is even larger. Interestingly, as seen in Table 2, part time sectors are particularly small in countries with low female participation, such as in Southern Europe. Lack of flexibility in the market to adjust their

careers to their childbearing circumstances has led women in these countries to face a choice between either dropping out of the market – with low chances to reenter- or keeping precious full-time positions and either postponing or abandoning further maternity (Adam 1996).

These findings indicate that women may initially aim for full-time positions and later balance their career-family demands by reducing the hours of work. This may explain why access to part-time work is not associated with faster transition to motherhood, but it is for higher parities. Yet the link between part-time work and overall fertility is modest. In countries with average participation rate of 50 percent, the implied fertility rate, as calculated in the same way as in Table 5, is 1.67 if the share of part-time is 7 percent and 1.69 if the same share is 20 percent. Note that this is simulated at the mean of all the other variables and that countries with hostile part-time regulation also had high unemployment during this period.

**Controls.** Education enters with a negative (and a positive) coefficient in the transition to a first (and to a second) birth as shown in Table 3. The estimated relation between a third child and a woman's education is U-shaped. This has been previously found in the European literature and attributed partly to selection (Hoem and Hoem 1989, Kravdal 2001). The fact that women with upper secondary education, on average, face more economic uncertainty than college-graduates in a high unemployment setting may add to the selection effect.

The longer women postpone a first birth, the less likely they are to transit to higher parities. The coefficient for the gender of the first child is not significant in the model of second births but having two previous children of the same gender boosts third births. Foreign-born women transit faster to motherhood but only those born outside of the European Union transit faster to third births than others.

Second births occur faster in countries with large maternity benefits.<sup>6</sup> As countries grow richer, first time motherhood is postponed. However, the transition to higher parities, particularly third births, happens faster among recent cohorts in wealthier countries in Europe. Male unemployment enters positively when included jointly with female unemployment. This result is not surprising since, even if both measures are correlated, the variance of female unemployment rates across Europe is much larger than that of males. The difference between both rates is wider in countries with high female unemployment (Bertola et al. 2002, Azmat, Guell and Manning 2004). Thus, results confirm that it is in countries with high and relatively female unemployment that fertility has decreased most sharply. If male unemployment is included alone instead of female unemployment the estimated hazard ratio is significant and under one for all parities.

## **INDIVIDUAL EMPLOYMENT CONDITIONS**

### **Empirical Strategy**

This section estimates the interplay of both individual labor market information and aggregate economic conditions in Cox proportional hazard models of the timing to second and third births.

The ECHP provides labor market information on the year of the interview and the previous year as well as dates of start and end of current and last job. Additionally it includes information on unemployment during the 5 years previous to the first interview and on the first

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<sup>6</sup> This is consistent, for example, with the fact that, if Swedish women have a child before the first is 30 months old, their previous earnings before the first birth are the basis for the benefits (Gustafsson et al. 1996). This creates an incentive for “speeding up” births without reentering work.

job. On the basis of the available information I restrict the sample to women who had their first or second child January 1992.<sup>7</sup> The sample for second births contains data on 8,041 women with 3,362 observed second births, and that for third births, 6,463 women with 1,075 observed third births. The size of the sample per country across years is fairly stable. Around 6% of the individuals are lost in each interview but a similar proportion is added from the new mothers and the new surveyed. For those who are lost before a new birth occurred, the observation is censored at the date of the last available interview.<sup>8</sup> The proportion of women in the sample with a second child eight years after their first birth ranges from 84% and 81% in the Netherlands and Finland to 52% and 63% in Portugal and Italy. Country variation is larger for those with a third child eight years after the second birth: from over 50% of Irish women to less than 20% in all Southern European countries.

Estimates include covariates for working and unemployment status for both the woman and her spouse, when present, and inactivity is the omitted category. The following job characteristics are considered: full or part time (30 hours and less), self-employed and sector of employment (public or private).

Given that labor supply and fertility are jointly determined, coefficients on the women's labor market status cannot be given a direct causal interpretation (Lehrer and Nerlove 1986,

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<sup>7</sup> The restricted labor market information available poses problems to estimating first births.

Many childless women enter the risk pool before 1992 (left truncation) and they are likely different from those who had a first child before that date (selection bias). Estimates with those who turned 16 on January 1992 or after are too short to produce meaningful results.

<sup>8</sup> Several works conclude that attrition biases in the ECHP are relatively mild and low for individuals living in couples as the majority in this sample (Nicoletti and Peracchi 2002, Ehling and Rendtel 2004).

Browning 1992).<sup>9</sup> Women who are unemployed and seeking work are likely to have lower hazards to birth than economically inactive women for two reasons. First, women who participate in the market instead of remaining economically inactive are less inclined to trade off work for further offspring. Second, as argued in the analytical section, a negative shock in the context of persistent unemployment is expected to induce postponement of childbearing. Among those economically active, the estimates provide information on the types of positions that are associated with faster transitions to second and third births. Given the substantial differences in the provision of some of these jobs across European countries, as seen in Table 2, results have aggregate country implications for fertility levels.<sup>10</sup>

Since women may change their employment status just before the birth, I lag all time varying employment and income covariates by seven months to reduce the reversed causality problem.<sup>11</sup> Nonetheless this problem is lesser for second and third births since most employment reallocation occurs around the first birth (Browning 1992).

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<sup>9</sup> This problem is minor for men because their participation rates have been traditionally very high.

<sup>10</sup> Where part-time work is hard to obtain and entails a reduction in benefits, for example, only women more inclined to motherhood self-select to those positions. Easier access to part-time jobs would first affect childbearing decisions of those at the margin. Still, a drastic change in regulation could alter, over time, the expected costs of maternity and the decisions of other women.

<sup>11</sup> Results are robust for seven to twelve month lags and seven are chosen to maximize the sample.

## Results

Tables 6 and 7 present estimated hazard ratios to the transition to second and third births. Working mothers experience substantially slower transitions to both second and third births than mothers who stay at home. This is consistent with the standard expectation that working mothers trade off children in favor of less time demanding alternatives (Becker 1960, 1981, Willis 1973, Butz and Ward 1979). Still a complete analysis of hours of employment as well as the sector reveals large differences among mothers who are working. Woman's part-time and public sector employment coefficients are significant and positive in Tables 6 and 7. Figure 2 simulates the instantaneous hazard ratio to second and third birth for women with different degrees of labor market attachment using estimates in columns (1) in Tables 6 and 7. Simulations obtained with column (2) that includes country dummies are fairly similar. Women working full time in the private sector have the lowest hazard to a second birth, a third lower than inactive women. Working in the public sector, as opposed to the private sector, or working part-time, as opposed to full time, brings the ratio close to inactive women. A woman working part-time in the public sector has a hazard ratio almost 10% higher than an economically inactive woman.<sup>12</sup> Unemployed women have the lowest hazard ratio only after those working full time in the private sector. The coefficient is only marginally significant in most estimates but clearly significant when income is included in columns (5) and (6). Still, women's unemployment enters highly significantly in all the estimates when Sweden, for which available individual labor market information is limited, is excluded from the sample.

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<sup>12</sup> In country-specific estimates not included here, the hazard ratio for public sector work is particularly large in France. This country has the youngest cohort of public employees in Europe and females constitute almost 60% of them (OECD 2001 b).



Figure 3 presents the simulated survival curve to second birth from column (1) under different individual labor market status. Eight years after becoming mothers, 80% of mothers working part-time in the public sector would already have a second child, as compared to only 59% or 66% of those working full time in the private or the public sectors. Around 73% of mothers who are either inactive or working part-time in the private sector would have had a second child by then but only 66% of those unemployed.

For third births the hazard ratio for those working in the private sector is again the lowest, at 0.74. The hazard of those unemployed is smaller for third than for second births. The estimated hazard ratio of women either in public sector or part-time jobs is equal to that of stay-at-home mothers, while that of part-timers in the public sector is a 12% larger. The coefficient of public employment is significantly larger when I include work income in columns (3) and (4) while that of part-time work is lower. Thus, among similarly paid jobs, the stability and benefits that come hand in hand with public sector employment seem to be valued characteristics in the attempt to balance work and family. The fact that part-time work is associated with faster transitions to second birth in a most definite way while the estimated hazard ratios for public employment are relatively larger for third births is consistent with the aggregate findings of the first part of the paper.

Women with a spouse working as a bureaucrat or working part-time do not have significantly higher hazards to transitions to a higher birth than others in the cross-country sample. Yet second births are faster among women with a spouse working in the public sector when country dummies are included in Table 6. Spouse's unemployment enters negatively and significantly in Table 6 when either country dummies or earnings are excluded. The coefficient for a self-employed spouse is positive and significant in all estimates in Tables 6 and 7. Several explanations are consistent with this finding. The flexibility of spouse's schedules may

constitute an asset. Earnings of self-employed, though apparently lower than the average, may be underreported in some sectors. Further, self-employment has been an alternative to standard work for young workers in a period of high unemployment, particularly in Southern Europe.

Columns (3) and (4) in Table 6 include a dummy for a woman's experience of a long-term unemployment spell during the last five years. Controlling for their current employment status, these women transit more slowly to higher birth parities. The coefficient of women's long-term unemployment spells on the transition to third birth is also negative and significant in estimates not included here.

Columns (5) and (6) include work income as well as the type of contract for both the woman and her spouse. The sample is considerably smaller due to missing information. As noted, job stability has become a crucial issue for workers during periods of high unemployment in Europe in the last twenty years. Precarious short-term contracts proliferated, mainly in Southern Europe, after several partial labor reforms were passed since the mid-eighties in an attempt to reduce unemployment. These positions are characterized by lack of tenure, benefits and stable earnings and make difficult long-run financial planning. In columns (5) and (6) women with non-permanent contracts have significantly slower transitions to second births. Eight years after the first birth there is a 7-point difference in the proportions of new mothers working in the private sector among those holding either permanent or non-permanent contracts. The simulated difference is even larger when the sample is restricted to Southern Europe.

Results on work income in the columns (5) and (6) in Table 6 are as expected. A higher income from the spouse is associated with a higher hazard to second birth, while the opportunity cost of higher earnings, discourages woman from fast transitions. In Table 7,

columns (3) and (4), a woman's with high work income experiences slow transitions to a third child, other things being equal, but the coefficient of men's income is not significant.

The following exercise aims to measure the expectations about access to a part-time job in either the public or the private sector that each woman forms before deciding on childbearing. I calculate the proportion of all workers interviewed in each wave who are part-timers separately for the private sector and for the public sector. I construct two interaction variables by multiplying a one-year lag of these measures with indicators of either private or public employment of women respectively. Both coefficients in column (7) in Table 6 are positive and highly significant. When country dummies are included in column (8), the coefficient of access to part-time in the public sector is not significant. Thus, within countries, wider access to part-time is associated with faster transitions to second births among those working in the private sector only. The characteristics of public sector jobs already help to balance the demands of motherhood and work on their own. The estimated hazard ratio in column (7) for women working in a private sector with 10% of part-timers, such as Spain, is barely under 0.6, but it is almost twice as large in countries where part-time extends to almost 50% of the working population, such as the Netherlands. Numbers for the public sector are similar. Simulations show that, eight years after the first birth, around 80% and 77% of women working in a public or private sector with 50% of part timers would have had a second child, but only around 66% and 56% of those working either in the public or private sector with only 10% of part time positions would.

Estimated coefficients on both personal characteristics and aggregate labor market conditions conform to results on aggregate country measures. In addition to the demographic variables in the first set of estimates I now include the spouse's education and whether individuals live in marriages, consensual unions or on their own (omitted category). Whereas

married women transit to second births faster, there are no significant differences between marriages and unions in the transition to third birth. Finally, the positive and significant coefficient of a spouse's college education estimated in Tables 6 and 7 points to a positive income effect. Country specific estimates, not included here, reveal that women with a highly educated spouse (and/or employed in the public sector) transit to higher parties faster in Southern Europe where families still rely more heavily on spouse's employment and face higher job uncertainty than elsewhere in Europe (Ahn and Mira 2001, Adsera 2002).

## **CONCLUSIONS**

Fertility rates across the OECD have plummeted since the late 1960s. In several Southern European countries they are already below 1.3. Delayed childbearing appears as a key reason for the lower completed fertility, as late starters tend to have fewer children (Kohler et al. 2002, Morgan 2003). Nevertheless there are substantial differences in both the degree of postponement and actual fertility across Europe. This paper has shown that this variation is connected to the wide range of labor market institutions that mediate the competing demands of home and the workplace and to (persistent) unemployment in the European Union during the 1980s and 1990s.

Childbearing postponement is significant in countries with both high and lasting unemployment, particularly since the mid 1980s. Simulations from results in the paper show that whereas 80% of women are mothers by age 35 in countries with an unemployment rate of 5% combined with a long-term unemployment rate of 30%, only 65% had had a child in countries with an unemployment rate of 25% combined with a long-term unemployment rate of 55%.

Besides moderate unemployment, public sector jobs which provide security and benefits are associated with faster transition to motherhood. Using the estimates for the first three births, the simulated fertility rate, in Table 5, is around 2.07 in countries with a 5% unemployment rate and about 30% of their workers employed in the public sector. By contrast, in countries with a 25% unemployment rate and a 15% share of government employment, the simulated fertility rate is 1.31. As a matter of fact, these two values correspond very closely to the actual fertility presented in Table 1 (and underlying institutional arrangements) of Northern and Southern Europe respectively. Similarly, wide access to part-time employment is associated with faster transitions to second births in all countries and to third births in countries where female labor market participation is still moderate.

The positive cross-country relation between female labor force participation and fertility in the OECD since the mid-eighties is consistent with these findings. The findings suggest that as women enter the labor force, the flexibility of the labor market as well as its ability to generate employment have a determinant role in the number of children families are willing to have. Although family size across all the OECD countries has decreased with the fast entry of women in the labor market, the decline has been most acute in countries departing from relatively lower levels of female activity rates. In countries with high female participation and either flexible employment (and low joblessness), such as the United Kingdom, Netherlands, or large government sectors (where childbearing and participation go together hand in hand), such as the Nordic countries and France, fertility rates are amongst the highest. By contrast, in countries with lower levels of participation, such as Spain or Italy, where small government sectors and rigid markets have not tapered the uncertainty of young workers in the presence of rampant unemployment, fertility rates have fallen sharply.

As women enter the labor force and participation rates across OECD countries slowly converge to the highest levels, work and family will be compatible only in those countries where institutions reduce the uncertainties connected with childbearing (Rindfuss et al. 2003, Adsera 2004). Low unemployment, flexible markets and laws that do not penalize part-time employment emerge as the most appropriate strategies. Bianchi (2000) shows that, even as they enter the labor force, mother's time with children is fairly constant and women use part-time or temporary exits from the labor force to accommodate those needs. Southern European countries, with laws penalizing part-time employment, need to rethink the long-term consequences of these regulations – in terms of both population decline and the constraints they impose on the fertility preferences of the couple. Further, policies geared towards full-employment are likely to bring about pro-natalist effects in countries with the lowest fertility rates. Smaller future cohorts could result, absent massive migration flows, in improved economic conditions due to lower pressure in labor and housing markets. This would potentially boost fertility rates. However, this latter outcome would only take place in the long run. Without significant institutional reforms, fertility rates are not likely to rebound to the replacement level in the near future (Lesthaeghe and Moors 2000, Boongarts 2001).

## APPENDIX. Descriptive Statistics and Data Sources

Variable	Mean	Std.Dev.	Min	Max
<i>1980-2001</i>				
Log Income p.c.95 ppp	9.8	0.3	9.2	10.7
Maternity Weeks x Replacement rate	18.2	10.2	8.4	60.0
% Self-Employment	20.0	11.6	7.1	51.9
% Government Employment	17.8	5.8	9.3	33.4
% Male Unemployment	7.0	4.3	0.5	20.5
% Female Unemployment	10.2	6.1	1.1	31.8
% Long-Term Unemployment	39.5	17.03	4.2	77.5
% Part time Employment	13.05	5.9	4.6	33
% Female Active	54.7	11.9	31.9	80.6

### *Labor market and income per capita (1968-2001)*

OECD *Labour Force Statistics*, OECD *Economic Outlook* and national official statistics.

Part-time employment and long-term unemployment (1979-2001). Public sector employment for Luxembourg is available from 1985 and long-term unemployment from 1985 for Portugal and from 1991 for Luxembourg, Italy and Greece.

### *Maternity benefits (1968-2001)*

*Social Security Programs throughout the World* (US Department of Health and Human Services, various years), *The Jobs Study* [OECD 1991], *Maternity Benefits in the eighties: An ILO global survey 1964-1984* (International Labor Organization 1985) and *Employment Outlook* (OECD, various issues).

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**Table 1.** Proportion of women with at least one, two or three children by age 39 and of mothers by age 30 across European countries.

	Proportion of women born 1960-62 by age 39			Number of Children	Proportion of mothers by age 30	
	At least one child	At least two children	At least three children		1957-60	1965-68
Netherlands	0.80	0.70	0.23	1.73	0.64	0.46
Belgium	0.87	0.64	0.28	1.78	0.72	0.68
Luxembourg	0.77	0.57	0.26	1.60	0.64	0.52
France	0.86	0.69	0.29	1.84	0.71	0.67
United Kingdom	0.84	0.62	0.24	1.70	0.65	0.58
Ireland	0.85	0.71	0.51	2.07	0.69	0.52
Italy	0.82	0.55	0.15	1.52	0.69	0.45
Greece	0.86	0.72	0.17	1.74	0.78	0.60
Spain	0.82	0.61	0.14	1.56	0.70	0.49
Portugal	0.84	0.61	0.21	1.66	0.81	0.66
Austria	0.82	0.65	0.23	1.70	0.74	0.63
Finland	0.89	0.75	0.38	2.01	0.73	0.64
Sweden	0.90	0.77	0.32	2.00	0.72	0.71

Note: Own calculations with data from European Community Household Panel 1994-2000. Number of Children is an approximation of the average number of children for women born 1960-62 calculated by adding the first three columns.

**Table 2** Youth Unemployment, Long-Term Unemployment and Prevalence of Public Employment and Part Time Employment across European Countries in 1995

	Unemployment		Public Sector <sup>a</sup>	Part-Time	
	% of female under 25 years	% total +12 month	% total employed	% total employed	% female employed
Austria	6.2	27.5	22.5	13.9	26.9
Belgium	23.7	62.4	19.0	13.6	29.8
Denmark	12.3	28.1	30.2	21.6	35.4
Finland	28.1	37.0	23.3	8.2	11.1
France	32.2	42.3	24.6	15.6	28.9
Germany	8.0	48.3	15.5	16.3	33.8
Greece	37.7	51.2	12.2	4.8	8.4
Ireland	17.4	61.4	13.3	12.1	23.1
Italy	37.6	63.6	17.9	6.4	12.7
Luxembourg	7.8	23.2	10.8	7.9	20.3
Netherlands	12.7	46.8	12.0	37.4	67.2
Norway	11.8	26.5	31.2	26.5	46.5
Portugal	17.6	50.9	18.4	7.5	11.6
Spain	49.1	56.9	15.5	7.5	16.6
Sweden	14	15.8	32.1	24.3	40.3
United Kingdom	12.2	43.6	14.2	24.0	44.3

**Source:** *OECD Employment Outlook* OECD (Paris), various issues. Part-Time employment data use national definitions. (a) Data 1994

**Table 3** Hazard Ratios of Transition to First, Second and Third Births and Aggregate Labor-Market Conditions in 13 European Countries.

	Transition to 1 <sup>st</sup> Child				Transition to 2 <sup>nd</sup> Child		Transition to 3d Child	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Country Conditions</i>								
<i>Unemployment</i>								
Female								
Unemployment rate	1.018	1.016	0.976	0.978	0.976	0.979	0.945	0.995
	(5.66)	(3.99)	(-9.83)	(-4.25)	(-8.13)	(-3.27)	(-10.4)	(-0.44)
Female								
Unemployment rate								
* time 1985-01	0.971	0.978						
	(-9.54)	(-6.48)						
<i>Government Sector</i>								
% Gov Employment	0.992	0.887	0.985	0.894	0.908	0.868	0.929	0.886
	(-1.26)	(-7.93)	(-1.60)	(-4.76)	(-8.78)	(-4.84)	(-3.74)	(-2.27)
Sq. % Government								
Employment	1.001	1.003	1.001	1.002	1.002	1.004	1.002	1.003
	(4.48)	(6.29)	(3.55)	(3.38)	(8.37)	(4.85)	(4.02)	(1.97)
<i>Part Time</i>								
% Part time			0.976	1.001	1.089	1.042	1.118	1.008
			(-2.41)	(0.07)	(7.41)	(2.15)	(5.60)	(0.23)
% Part time x								
Female Activity			1.000	1.000	0.999	0.999	0.998	1.0001
			(1.15)	(1.06)	(-5.73)	(-2.35)	(-6.21)	(0.15)
<i>Country controls</i>								
Female Activity Rate	1.007	0.985	1.006	0.972	1.002	1.014	1.019	0.990
	(5.71)	(-5.77)	(2.06)	(-4.71)	(0.47)	(1.86)	(2.98)	(-0.80)
Male Unemployment								
Rate			1.023	1.016	1.032	1.019	1.094	1.006
			(5.73)	(2.09)	(6.94)	(2.15)	(11.7)	(0.36)
Log Income p.c.	0.673	0.754	0.757	0.654	0.791	0.349	1.241	0.934
	(-7.87)	(-1.95)	(-4.17)	(-2.39)	(-2.85)	(-4.74)	(1.48)	(-0.18)
Weeks Maternity *								
Replacement Rate	0.999	1.010	0.995	1.009	1.009	0.994	0.984	0.989
	(-0.85)	(3.36)	(-2.63)	(2.96)	(4.43)	(-1.71)	(-4.61)	(-1.77)
% Self-employed	1.006	0.993	1.003	0.985	0.995	1.000	0.984	0.967
	(5.70)	(-1.70)	(2.22)	(-2.15)	(-2.77)	(-0.04)	(-5.02)	(-2.19)
<i>Fertility History</i>								
Age First Birth					0.995	0.995	0.934	0.932
					(-2.24)	(-2.24)	(-14.3)	(-14.6)
First Boy					0.989	0.990		
					(-0.68)	(-0.61)		
Two Boys							1.222	1.223
							(5.91)	(5.92)
Two Girls							1.227	1.220
							(5.83)	(5.68)
Months 1 <sup>st</sup> to 2 <sup>nd</sup>							0.990	0.991
							(-17.9)	(-17.1)
<i>Birthplace (re:</i>								

Native)									
Abroad	1.185 (5.60)	1.140 (4.20)	1.180 (5.18)	1.179 (5.12)	0.944 (-1.51)	0.947 (-1.41)	1.010 (0.14)	1.000 (0.00)	
Abroad *outside EU	0.957 (-1.04)	0.982 (-0.43)	0.958 (-0.97)	0.953 (-1.08)	1.020 (0.37)	1.020 (0.38)	1.278 (2.73)	1.302 (2.92)	
<i>Educational Attainment</i> (re: Up Secondary)									
Tertiary	0.688 (-23.0)	0.674 (-23.7)	0.723 (-19.0)	0.699 (-20.7)	1.134 (5.99)	1.104 (4.66)	1.247 (5.65)	1.238 (5.39)	
Less Up Secondary	1.483 (27.1)	1.565 (29.9)	1.462 (23.8)	1.502 (25.1)	0.959 (-2.21)	0.993 (-0.35)	1.145 (3.99)	1.149 (4.00)	
Country Dummies	No	Yes	No	Yes	No	Yes	No	Yes	
Subjects	50,789	50,789	47,352	47,352	23,811	23,811	16,088	16,088	
Failures	24,994	24,994	21,557	21,557	15,493	15,493	4,952	4,952	
Log Likelihood	-246006	-245699	-208774	-208524	-142958	-142813	-44687.9	-44565.7	

Note: Estimated hazard ratios from Cox Proportional Hazard Model. T-statistics in parentheses. Year dummies included. For first births, exposure starts at age 16 and, for second and third, it starts at the time of the previous birth. The period of estimation is 1969-2001 for columns (1) and (2) and 1980-2001 for columns (3) to (8). All country variables are lagged one year.

**Table 4.** Hazard Ratios of Transition to First Birth and Unemployment Persistence in the country.

	(1)	(2)
<i>Country</i>		
Female Unemployment rate	1.015 (3.00)	0.998 (-0.27)
Long Term Unemployment rate	1.0003 (0.27)	0.998 (-1.36)
Female Unemployment rate * Long Term Unemployment rate	0.941 (-6.37)	0.981 (-1.46)
Country dummies	No	Yes
Joint Test Chi (3)		22.93
Subjects	47,167	47,167
Failures	21,372	21,372
Log Likelihood	-206841	-206635

Note: Estimated hazard ratios from Cox Proportional Hazard Model with individual characteristics, year dummies, maternity benefits, shares of government and self-employment, log income per capita, part-time, female activity and the interactive of them. T-statistics in parentheses. The sample period is 1980-2001. All country variables are lagged one year.



**Table 5** Predicted proportions of women transiting to births of different order according to country's female unemployment rate and share of government employment.

		Female Unemployment Rate						
		5%			15%			25%
% Government Employment		15%	20%	30%	15%	20%	30%	15%
<i>First Birth</i>								
By Age 30		0.620	0.646	0.742	0.532	0.557	0.654	0.490
By Age 35		0.789	0.812	0.887	0.706	0.731	0.819	0.662
By Age 40		0.839	0.859	0.922	0.762	0.786	0.866	0.720
<i>Second Birth</i>								
8 years after 1 <sup>st</sup>		0.804	0.777	0.831	0.722	0.692	0.752	0.679
<i>Third Birth</i>								
8 years after 2 <sup>nd</sup>		0.435	0.426	0.503	0.278	0.271	0.328	0.217
TFR1		1.808	1.811	2.074	1.465	1.476	1.730	1.314
TFR2		1.701	1.711	1.994	1.357	1.373	1.637	1.208

Note: Simulations are based on Table 3, columns (3), (5) and (7). All other variables set at the mean. TFR1 and TFR2 are approximations of the total fertility rate. TFR1 is calculated with the proportion of women who are mothers at age 40 and those who have had second and third births after 8 years from the previous. TFR2 uses the proportion of mothers at age 35 instead.

**Table 6** Hazard Ratios of Transition to Second Birth from First Births occurred on January 1992 or after.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<i>Woman Employment</i>								
(re: Inactive)								
Work (t-7)	0.679 (-8.01)	0.723 (-6.60)	0.687 (-7.76)	0.727 (-6.51)	0.798 (-3.30)	0.840 (-2.53)	0.530 (-9.32)	0.688 (-4.95)
Unemployed (t-7)	0.919 (-1.61)	0.934 (-1.27)	1.009 (0.17)	0.992 (-0.14)	0.897 (-1.87)	0.883 (-2.11)	0.909 (-1.81)	0.934 (-1.28)
Work *Public Sector (t-7)	1.231 (3.84)	1.221 (3.71)	1.231 (3.84)	1.221 (3.71)	1.326 (4.59)	1.330 (4.68)	1.385 (3.71)	1.318 (3.00)
Work *Part-time (t-7)	1.446 (6.67)	1.256 (3.97)	1.446 (6.66)	1.265 (4.09)	1.351 (4.76)	1.142 (2.00)		
Work*Self-employed (t-7)	1.068 (0.71)	1.121 (1.21)	1.068 (0.71)	1.122 (1.22)	0.985 (-0.14)	1.004 (0.04)	1.079 (0.80)	1.113 (1.11)
Long-term unemployment spell in 5 past yrs.			0.764 (-4.96)	0.840 (-3.14)				
No Permanent contract (t-7)					0.829 (-2.79)	0.838 (-2.57)		
Work Public Sector (t-7) * % Part-time Public sector (t-12)							2.813 (4.32)	1.172 (0.57)
Work Private Sector (t-7) * % Part-time Private sector (t-12)							4.351 (7.18)	1.598 (1.92)
<i>Spouse Employment</i>								
(re: Inactive)								
Work (t-7)	0.972 (-0.56)	1.036 (0.68)	0.986 (-0.27)	1.044 (0.83)	1.020 (0.26)	1.028 (0.35)	0.958 (-0.84)	1.038 (0.72)
Unemployed (t-7)	0.842 (-2.13)	0.902 (-1.25)	0.870 (-1.67)	0.896 (-1.30)	1.006 (0.06)	1.026 (0.25)	0.841 (-2.16)	0.906 (-1.21)
Work *Public Sector (t-7)	1.077 (1.42)	1.123 (2.18)	1.078 (1.43)	1.122 (2.16)	1.082 (1.41)	1.129 (2.13)	1.083 (1.52)	1.119 (2.12)
Work *Part-time (t-7)	1.187 (1.08)	1.092 (0.53)	1.179 (1.03)	1.082 (0.47)	1.284 (1.56)	1.141 (0.77)	1.149 (0.86)	1.097 (0.55)
Work*Self-employed (t-7)	1.187 (3.25)	1.267 (4.39)	1.187 (3.25)	1.262 (4.30)	1.267 (4.06)	1.338 (4.91)	1.198 (3.44)	1.267 (4.39)
Long-term unemployment spell in 5 past yrs.			1.029 (0.47)	1.099 (1.51)				
No Permanent					0.999	1.066		

contract (t-7)									
<i>Work Income</i>									
Woman (t-7)									
Spouse (t-7)									
<i>Country Conditions</i>									
Female									
Unemployment (t-12)	0.980	0.962	0.984	0.963	0.985	0.978	0.982	0.964	
	(-6.32)	(-2.51)	(-5.07)	(-2.46)	(-4.42)	(-1.19)	(-5.68)	(-2.39)	
% Government									
Employment (t-12)	1.001	0.999	1.002	0.998	0.990	0.992	1.007	1.000	
	(0.24)	(-0.08)	(0.38)	(-0.11)	(-1.82)	(-0.40)	(1.54)	(-0.02)	
Weeks Maternity									
Leave * Replacement									
Rate (t-12)	1.023	0.997	1.022	0.997	1.022	0.996	1.022	0.996	
	(8.87)	(-0.65)	(8.43)	(-0.64)	(5.81)	(-0.45)	(8.43)	(-0.73)	
Log Income p.c. (t-12)	1.544	0.387	1.524	0.398	1.658	0.789	1.394	0.364	
	(4.57)	(-2.41)	(4.42)	(-2.34)	(4.75)	(-0.48)	(3.37)	(-2.56)	
<i>Fertility History</i>									
Age at First Birth	0.963	0.961	0.963	0.961	0.954	0.954	0.962	0.960	
	(-9.42)	(-9.85)	(-9.44)	(-9.78)	(-9.69)	(-9.70)	(-9.53)	(-9.90)	
First Boy	1.007	1.000	1.004	0.999	0.973	0.967	1.007	0.999	
	(0.20)	(-0.01)	(0.13)	(-0.04)	(-0.69)	(-0.85)	(0.21)	(-0.03)	
<i>Marital Status</i> (re: no spouse)									
With Spouse	1.206	1.453	1.180	1.421	0.957	1.057	1.248	1.447	
	(2.38)	(4.04)	(2.10)	(3.78)	(-0.28)	(0.33)	(2.80)	(4.00)	
With Spouse *									
Married	1.782	1.930	1.792	1.932	1.521	1.704	1.797	1.939	
	(9.45)	(10.43)	(9.53)	(10.4)	(6.40)	(7.96)	(9.58)	(10.5)	
<i>Birthplace</i> (re: Native)									
Abroad	0.876	0.923	0.883	0.924	0.840	0.928	0.925	0.927	
	(-1.65)	(-0.96)	(-1.55)	(-0.94)	(-1.86)	(-0.77)	(-0.98)	(-0.91)	
Abroad * outside EU	1.032	0.971	1.026	0.968	1.153	1.020	0.961	0.961	
	(0.28)	(-0.25)	(0.23)	(-0.28)	(1.08)	(0.14)	(-0.36)	(-0.35)	
<i>Educational Attainment</i> (re: Less Upper Secondary)									
Woman									
Tertiary	1.317	1.191	1.308	1.190	1.450	1.278	1.305	1.185	
	(5.86)	(3.57)	(5.68)	(3.55)	(6.79)	(4.34)	(5.66)	(3.48)	
Upper Secondary	1.157	1.088	1.151	1.088	1.135	1.053	1.146	1.088	
	(3.60)	(2.03)	(3.47)	(2.01)	(2.77)	(1.09)	(3.36)	(2.02)	
Spouse									
Tertiary	1.438	1.295	1.420	1.286	1.319	1.196	1.430	1.294	
	(7.76)	(5.37)	(7.46)	(5.22)	(5.09)	(3.22)	(7.64)	(5.36)	
Upper Secondary	1.130	1.047	1.123	1.044	1.075	0.999	1.117	1.046	
	(3.00)	(1.11)	(2.84)	(1.02)	(1.57)	(-0.02)	(2.71)	(1.06)	

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Country Dummies	No	Yes	No	Yes	No	Yes	No	Yes
Subjects	8041	8041	8041	8041	6488	6488	8041	8041
Failures	3362	3362	3362	3362	2540	2540	3362	3362
Log Likelihood	-27157	-27039	-27145	-27033	-19505	-19604	-27150	-27044

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Note: Estimated hazard ratios from Cox Proportional Hazard Model. T-statistics in parentheses. The period of estimation is 1992-2001. Exposure to second birth starts at the time of the first birth.

**Table 7.** Hazard Ratios of Transition to Third Birth from Second Births occurred on January 1992 or after.

	(1)	(2)	(3)	(4)
<i>Woman Employment (re: Inactive)</i>				
Work (t-7)	0.739 (-3.26)	0.725 (-3.43)	0.834 (-1.54)	0.872 (-1.13)
Unemployed (t-7)	0.863 (-1.57)	0.822 (-2.06)	0.865 (-1.44)	0.825 (-1.88)
Work *Public Sector (t-7)	1.344 (2.92)	1.342 (2.92)	1.506 (3.60)	1.537 (3.78)
Work *Part-time (t-7)	1.313 (2.59)	1.187 (1.62)	1.239 (1.84)	1.069 (0.57)
Work*Self-employed (t-7)	1.034 (0.19)	1.176 (0.92)	0.950 (-0.27)	1.042 (0.21)
<i>Spouse Employment (re: Inactive)</i>				
Work (t-7)	0.945 (-0.64)	0.946 (-0.60)	1.076 (0.57)	0.971 (-0.23)
Unemployed (t-7)	1.202 (1.39)	1.100 (0.71)	1.354 (1.87)	1.112 (0.64)
Work *Public Sector (t-7)	0.973 (-0.28)	1.018 (0.18)	0.968 (-0.32)	1.024 (0.23)
Work *Part-time (t-7)	0.984 (-0.06)	0.879 (-0.50)	0.929 (-0.27)	0.823 (-0.72)
Work*Self-employed (t-7)	1.294 (2.78)	1.365 (3.39)	1.185 (1.59)	1.260 (2.15)
<i>Work Income</i>				
Woman (t-7)			1.000 (-2.27)	1.000 (-3.12)
Spouse (t-7)			1.000 (-1.54)	1.000 (-1.16)
<i>Country Conditions</i>				
Female Unemployment (t-12)	0.981 (-3.14)	0.982 (-0.61)	0.979 (-3.19)	0.977 (-0.63)
% Government Employment (t-12)	1.010 (1.20)	1.069 (2.41)	1.007 (0.75)	1.061 (1.94)
Weeks Maternity Leave * Replacement Rate (t-12)	1.001 (0.19)	0.997 (-0.31)	1.004 (0.58)	0.991 (-0.56)
Log Income p.c. (t-12)	2.569 (5.64)	1.960 (0.92)	3.183 (6.19)	2.125 (0.83)
<i>Fertility History</i>				
Age at First Birth	0.916 (-10.1)	0.913 (-10.32)	0.917 (-8.26)	0.914 (-8.46)
Two Girls	1.305 (3.56)	1.322 (3.75)	1.293 (3.00)	1.310 (3.16)
Two Boys	1.330 (3.96)	1.374 (4.43)	1.422 (4.34)	1.482 (4.84)

Months1 <sup>st</sup> to 2 <sup>nd</sup> child	0.988 (-8.35)	0.989 (-7.59)	0.985 (-8.11)	0.987 (-7.26)
<i>Marital Status</i> (re: no spouse)				
With Spouse	1.375 (2.22)	1.216 (1.20)	1.516 (1.27)	0.878 (-0.36)
With Spouse * Married	1.133 (1.15)	1.154 (1.33)	0.936 (-0.58)	0.940 (-0.54)
<i>Birthplace</i> (re: Native)				
Abroad	0.838 (-1.22)	0.938 (-0.42)	0.722 (-1.87)	0.799 (-1.23)
Abroad * outside EU	1.341 (1.53)	1.313 (1.40)	1.339 (1.25)	1.381 (1.33)
<i>Educational Attainment</i> (re: Less Upper Secondary)				
<i>Woman</i>				
Tertiary	1.044 (0.50)	0.962 (-0.44)	1.176 (1.62)	1.083 (0.78)
Upper Secondary	0.888 (-1.63)	0.849 (-2.21)	0.919 (-1.06)	0.868 (-1.75)
<i>Spouse</i>				
Tertiary	1.419 (4.15)	1.373 (3.77)	1.379 (3.33)	1.312 (2.83)
Upper Secondary	1.088 (1.16)	1.074 (0.97)	1.041 (0.49)	1.008 (0.10)
Country Dummies				
Subjects	No 6463	Yes 6463	No 5571	Yes 5571
Failures	1075	1075	838	838
Log Likelihood	-8628.96	-8562.82	-6421.29	-6351.09

Note: Estimated hazard ratios from Cox Proportional Hazard Model. T-statistics in parentheses. The period of estimation is 1992-2001. Exposure to third birth starts at the time of the second birth.

Figure 1. Predicted Survival Curves to Transition into motherhood from Table 4 by levels of Female Unemployment and Long-Term Unemployment (LTU)

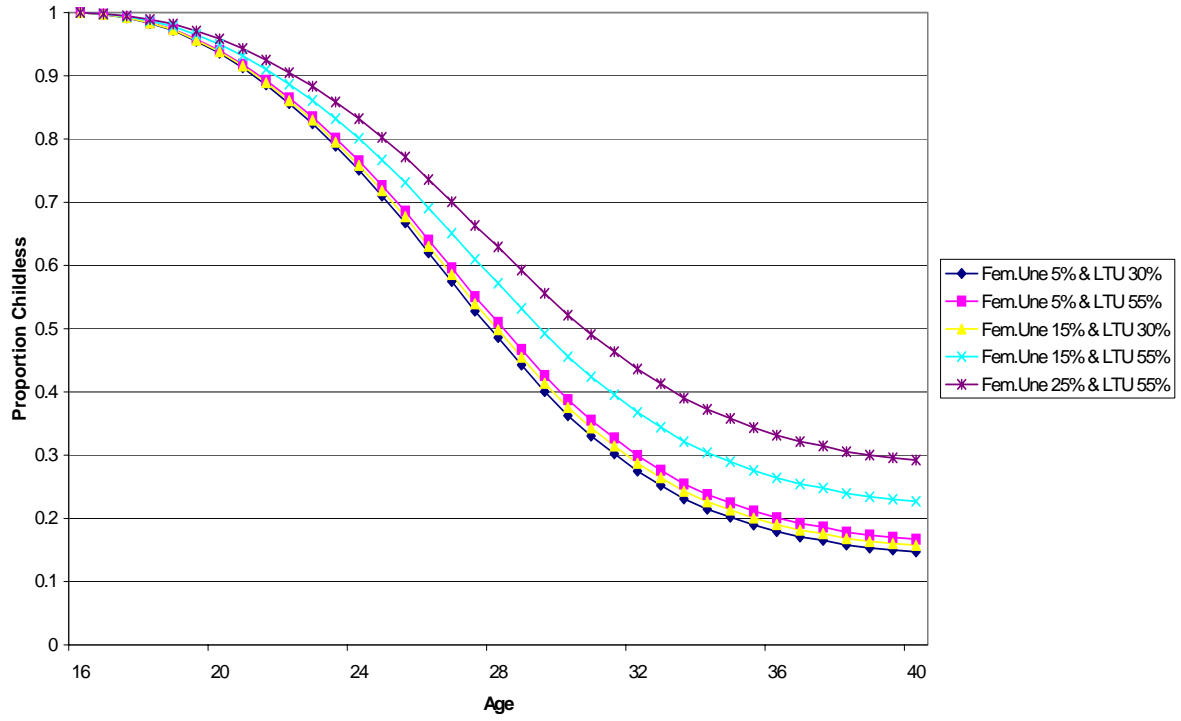


Figure 2. Woman Employment status seven months ago and Hazard ratio to Second and Third Births from column (1) in Tables 6 and 7.

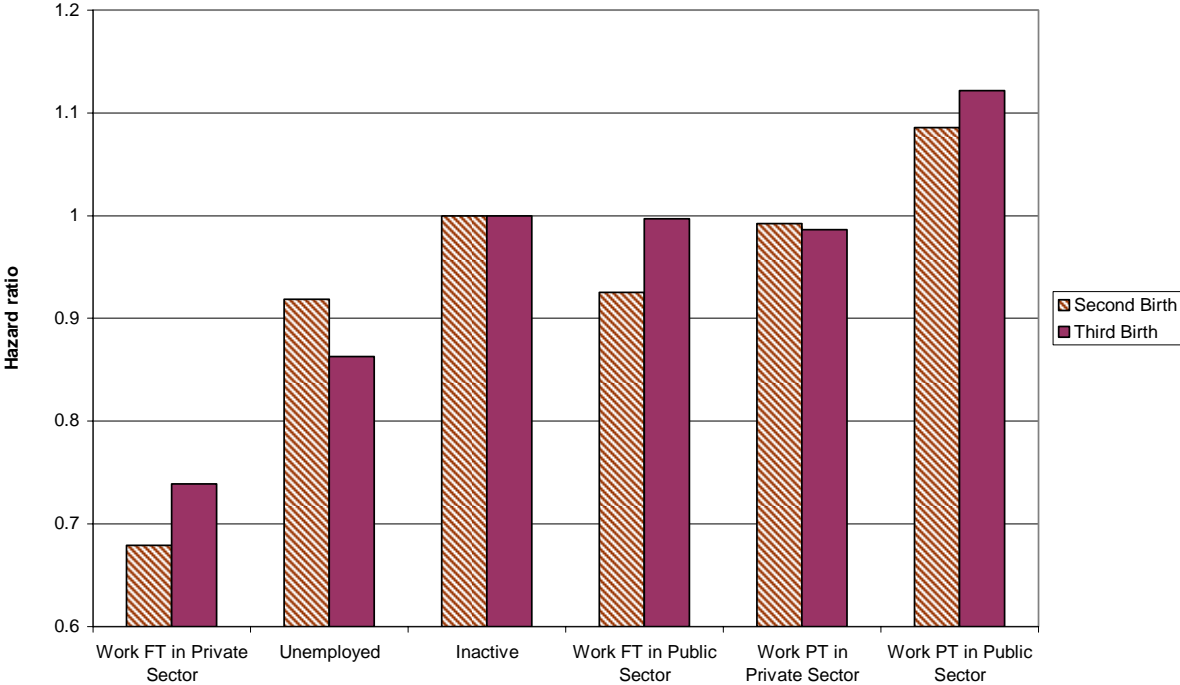




Figure 3. Predicted Survival to Second Birth from Table 6, by the Woman's Employment Status

