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

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Abstract

Cross-country differences in both the age at first birth and fertility are substantial in Europe. This paper uses distinct fluctuations in unemployment rates across European countries during the 1980s and the 1990s combined with broad differences in their labor market arrangements to analyze the associations between fertility timing and the changing economic environment with close to 50,000 women from thirteen European countries. First, it employs time varying measures of aggregate market conditions in each woman s country as covariates and second, it adds micro-measures of each woman s labor market history to the models. High and persistent unemployment in a country is associated with delays in childbearing (and second births). The association is robust to diverse measures of unemployment and to controls for family-friendly policies. Besides moderate unemployment, a large public employment sector (which provides security and benefits) is coupled with faster transitions to all births. Women with temporary contracts, mostly in Southern Europe, are the least likely to give birth to a second child.

1 Introduction

During the last two decades European countries have experienced a dramatic fall of total fertility rates to previously unseen low levels. This rapid fall in fertility has captured the attention of policymakers because of its fiscal and social implications (Lee 2003). Still, within that general downward trend, fertility behavior differs significantly across countries. In Southern Europe, Germany and Austria, the fertility rate had plummeted to 1.3 or below by the end of the 1990s – to what some refer as the “lowest-low fertility” levels (Kohler et al. 2002). By contrast, the highest fertility rates in Europe (between 2 to 1.75) are found in France, Ireland and Scandinavia.

This variation in fertility rates between countries and over time has prompted a substantial body of research in the last years, along two empirical strategies. On the one hand, several studies have exploited sharp and relatively unexpected policy changes to measure the impact of those legislative modifications on fertility behavior: Hoem (1993), Rønsen (2004) and Lalive and Zweimüller (2009) estimate the fertility consequences of an extension of maternal leave in Sweden, Norway, Finland and Austria respectively; Milligan (2005) exploits the introduction of transfers to families having a child in Quebec; Laroque and Salanié (2008) examine wage-induced variations in benefits and tax credits in France; Joyce et al. (2004) look at changes in means-tested programs across 24 American states. [1] On the other hand, realizing that policy shifts are rarely available and do not occur in all countries where we observe notable changes in childbearing behavior, a second strand of the literature has focused on describing relevant associations between cross-national differences in

[1]Gauthier (2007) provides a good review of this literature.

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fertility, policies and economic conditions through country specific time series, cross-sections of countries or cross-country panel analysis.

Following the second empirical strategy, this article contributes to our understanding about fertility behavior by first pointing to sharply different labor market dynamics across European countries during the 1980s and 1990s (e.g. long-term unemployment rates ranged from around 15 percent in some Nordic countries to over 60 percent in Southern Europe) and then investigating the degree to which the disparity in fertility levels is associated to differences in labor market dynamics and institutions with data of women from thirteen European countries. The current paper adds to the existing literature since, to date, cross-country analyses have been mostly panel estimates of aggregate data or have focused on the study of the relationship between fertility and family cash-benefits (Gauthier and Haztius 1997) and child-care availability (Gustafsson and Stafford 1994, Del Boca et al. 2005). The relationship between economic conditions and fertility has been addressed with country-specific studies of the US (Butz and Ward 1979, 1980), Britain (Ermisch 1988), Spain (Ahn and Mira 2001), Sweden (Hoem and Hoem 1989; Andersson 1999; Andersson et al. 2006 a) and Norway (Kravdal 2002, 2007), to name a few. Another set of papers has looked at labor market behavior and economic well-being of mothers after childbirth to assess the impact of institutions on fertility decisions in each country (Aassve et al. 2006; Gustafsson et al. 1996; Gutierrez-Domenech 2005; Rønsen and Sundstrom 1996; Rønsen and Sundstrom 2002).

In this paper, I first estimate proportional hazard models of the transitions to the first three births with a sample of close to 50,000 women and employ time varying measures of aggregate market conditions in each woman s country, such as unemployment rates, shares of public sector and part time employment, as covariates of interest to investigate the association between labor market dynamics and fertility decisions. Second, I add micro-measures of each woman s labor market history, such as whether they are unemployed, inactive or employed and what type of job they hold, to the initial set of country-level covariates to models of second and third births.

The article shows that high and persistent unemployment in the country of residence is associated with delays in childbearing and, as a result, a likely lower number of children. For a given unemployment level, a wide supply of public sector employment (mostly tenured-positions in Europe) is coupled with faster transitions to all births. Second births occur sooner in countries with easy access to part-time. Women with temporary contracts, mostly prevalent in Southern Europe, are the least likely to give birth to a second child.

The remainder of this paper is organized as follows. Section 2 includes a description of the cross-country differences in fertility and labor market characteristics and discusses, in light of the existing literature, the potential associations between them. Section 3 lays out the research design and describes the data. Section 4 discusses the estimated associations of the timing of childbearing and country-aggregate conditions. Section 5 presents the proportional hazard models to second and third birth that include individual labor market information in addition to the covariates already included in Section 4. Section 6 concludes.

2 Labor Markets and Fertility

Table 1 illustrates the extent of variation and changes over time in fertility patterns in Europe. The first two columns show period total fertility rate (TFR) for 1985 and 1995 to portray the dramatic change Europe underwent in only one decade. [2] By the mid 1990s,

[2] The total fertility rate (TFR) is an age-period fertility rate for a synthetic cohort of women. It measures the average number of children a group of women would bear by the end of their lifetime if they were to give birth at the current age-specific fertility rates.

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none of the European countries had a TFR close to the replacement rate and countries such as Germany, Spain and Italy had "lowest-low" fertility rates well under 1.3. 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, the next two columns present total fertility rates for the cohort of women (TCFR) born in either 1955 or 1965 across European countries (Council of Europe 2005). As expected, cohort numbers are slightly larger than the prevailing fertility rates in the country. Still with the exception of Ireland, France and Nordic countries, the average number of children for the 1965 cohort is well below the replacement rate of 2.1. Among countries with TFRs under 1.3, TCFR for the 1965 cohort is 1.53 in Germany (down from 1.67 for the 1955 cohort), 1.61 in Spain (down from 1.92) and 1.49 in Italy (down from 1.8). Frejka and Sardon (2007) show that the proportion of childless women and of one-child families has been increasing among recent cohorts though cross-country differences prevail and that of families with four and more children already decreased to 5 percent or under among cohorts in the late 1950s and the 1960s across Europe.

Overall, 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). The extent of maternity postponement has not been uniform across Europe. The last four columns in Table 1 present the First Birth Cumulated Cohort Fertility Rates (CCFR) up to the 27th birthday for the cohorts of 1960, 1965, 1970 and 1975 (or latest available) in selected European countries from Frejka and Sardon (2006). In some countries the decline has been moderate. In Sweden it has moved down from 49 percent for the 1960 birth cohort to 42 percent for women ten years younger. In the UK the change from the 1960 to the 1970 cohorts has been from 50 percent to 43 percent. In Italy and Spain the proportion of mothers at age 27 has gone down by more than 20 percentage points between these two cohorts from about 51 and 55 percent, respectively, to fewer than 30 percent in both countries. For the 1975 cohort in Spain, it is only 19 percent. These country differences persist in the transitions to higher parities and result in the observed variation in fertility rates (Frejka 2008)

The fertility decline in developed countries has been traced to changes in the preferences of couples toward smaller families, larger investments per child and dual-careers (Becker 1981; Bongaarts 2002). As female labor force participation rates increased in Europe, women traded-off children for less time-demanding alternatives to reduce forgone wages (Butz and Ward 1979; Becker 1981;, Galor and Weil 1996).[3] Improvement in access to family planning in these countries made this move to smaller families (and motherhood postponement) possible (Goldin and Katz 2002). However, these factors cannot explain the wide differences in fertility across countries shown in Table 1, especially in light of the relative similarity in the preferred number of children for women 20–34 across the fifteen European Union (Goldstein et al. 2003).

As the literature has long argued, fertility behavior is the result of forward-looking and sequential decisions that individuals (or households) make in an uncertain environment under multiple institutional and economic constraints.[4] Economic events not only alter couples current demand but also their forecasts of future constraints and hence future demands (Butz and Ward 1980; Ermisch 1988). A large set of country-specific studies has unveiled significant relationships between the economic environment, fertility and its timing in many Western nations such as the US (Butz and Ward 1979, 1980; Macunovich 1996),

[3] The purchase of childcare services in the market may lessen the substitution effect. As a result the net impact of broader market opportunities on fertility may conceivably turn positive for women with high potential wages (Ermisch 1989). In that regard, Del Boca et al. (2005) show that Italian regions with bad child care provision have experienced larger fertility decreases.

[4] Arroyo and Zhang (1997) and Hotz et al. (1997) provide a good review of these dynamic fertility models.

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Britain (De Cooman et al. 1987; Ermisch 1988; Murphy 1992), Spain (Ahn and Mira 2001), Sweden (Hoem and Hoem 1989; Hoem 2000) and Norway (Kravdal 2002).

The sharp (but distinct) increases in unemployment and economic uncertainty across European countries during the 1980s and the 1990s combined with broad differences in their labor market arrangements[5] offer an exceptional scenario to revisit these associations and probably understand some of the observed variation in postponement of first births and overall fertility. European unemployment went up from less than 3 percent before 1975 to about 10 percent in the 1990s hitting women particularly hard. In the European Union the average female unemployment rate rose from 2.5 percent in 1970 to 6.5 percent in 1980 and then to around 11 percent from the mid 1980s to the late 1990s. In countries with high female unemployment, the gender gap in unemployment rates was wide and particularly large for young, married women and for those with young children (Azmat et al. 2006). In Southern Europe, female unemployment rates climbed beyond 15 percent in Greece and Italy and 20 percent in Spain by the mid 1990s, 7 to 12 points higher than their male counterparts (Table 2, columns 1 to 4). The rapid feminization of the labor force in these countries with traditionally low female participation collided with rigid labor market institutions geared toward prime aged male workers and resulted in relatively higher female unemployment rates (Bertola et al. 2002). In 1996, the total fertility rate was the lowest where the gap between female and male unemployment rates was the largest (Adsera 2005). In addition, European unemployment during this period was very persistent. By 1990, around 50 percent of those unemployed in the European Union had been out of work for more than 12 months (Table 2, column 5).

The standard microeconomic model of fertility predicts that an associated fall in opportunity costs makes a temporary unemployment spell for a woman a good time for childbearing (Willis 1973; Becker 1981; Butz and Ward 1979; Galor and Weil 1996). However, if unemployment shocks happen at a point in women s life-cycle (i.e. early in their careers) when human capital accumulation is crucial, women may postpone childbearing to acquire experience and/or education and guarantee better life-time wage-growth, benefits and employment. In addition, women may fear that time spent in childbearing (including any maternity leave period) may impair their ability to get a good job again and, as a result, increase the risk of future unemployment. Furthermore, a persistent unemployment spell may have a large negative impact on household permanent income. This may render childbearing unattractive not only for those directly affected by unemployment but also for those to which it constitutes a threat and who want to secure future employment. This behavior has been documented for the interwar period and the 1930s depression (Becker 1981; Tzannatos and Symons 1989; Murphy 1992).[6] Likewise in a rough labor market, parents may limit their offspring to invest more per child and improve their future outlook (Becker et al. 1990). Finally, long term unemployment may deter or delay household formation (and with it, childbearing) (Aassve et al. 2001).

The threat that persistent unemployment imposes on a woman s ability to combine childbearing and work can be eased if her current employer secures her return to her position after childbirth (and maternal leave). Most government employment in Europe offers such guarantee in addition to generous parental leave, flexible work schedules and possibly subsidized child-care (Rosen 1996; Gustafsson and Stafford 1994; Gustafsson et al. 1996;

[5] See Gustafsson and Stafford 1994; Esping-Andersen 1999; Pampel 2001; Gutierrez-Domenech 2005.

[6] Murphy (1992) cites from a report of the Royal Commission on Population in 1949: “The heavy unemployment of the inter-war period must have affected the attitude to parenthood not only for the workers who at any one moment were out of work but also of the far larger number for whom it was an ever-present threat”. Other analyses have also found a negative relationship between different measures of unemployment and first births (De Cooman et al. 1987; Ermisch 1988; Macunovich 1996; Ahn and Mira 2001; Kravdal 2002).

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Rønsen and Sundstrom 1996). Public sectors employ around 30 percent of workers in Nordic countries (and close to 25 percent in France) but only half that size in most of the others (Table 2, column 6). Conversely, short-term contracts with meager provisions and high turnover that expanded rapidly during the 1990s, particularly in Southern Europe, do not offer any of those guarantees (Dolado et al. 2002).

3 Research Design and Data

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 fifteen European Union member states at the time.[7] The dataset provides information on both the year and month of birth for each individual in the household. With this information, it is possible to reconstruct backwards the childbearing history of women in the household. To minimize excluding children who have already left the household, the sample includes only women who were 40 years old or younger at the time of their first interview.[8] In this paper, time is measured by monthly intervals from the moment women turn 16. Because the survey does not include exact month of birth for children in Germany and Denmark, these countries are not included in the analysis. The thirteen countries in the sample are Austria, Belgium, Finland, France, Greece, Ireland, Italy, Luxembourg, Netherlands, Portugal, Spain, Sweden and United Kingdom.

When we include everyone starting with those who were 40 years old when first observed in the panel and who had turned 16 on 1969 or 1970 up to those who just turned 16 in the last year of the panel 2001, the largest available sample includes observations on 50,789 women, and 24,994 first births between 1969 and 2001. However, since some country-level covariates of interest are only available starting in 1980, the sample is limited to the period 1980–2001 unless noted and it includes information on 47,352 women who have 23,811 first births, 16,088 second births and 4,952 third births.

The first part of the paper sets out to estimate the associations between country-level unemployment, labor market institutions and fertility and to determine whether these associations capture a significant portion of the declines in fertility observed in Europe. To accomplish these objectives, I estimate Cox proportional hazard models of the timing of births. The dependent variable in all models is months to a birth from either the previous birth or from age 16 in the case of the first birth.

For each woman *i*, in country *c* and month *y* who enters a state (e.g. first birth) at time t=0, the (instantaneous) hazard ratio function at t>0 is assumed to take the proportional hazards form:

$$\lambda_{icyt}=\lambda_0(t)\exp(x_{icyt}\beta+m_{c(y-12)}\delta+C+T+M) \quad (1)$$

where $\lambda_0(t)$ is the baseline hazard function; exp (.) is the exponential function; x_{icyt} is a vector of covariates summarizing observed differences between individuals, $m_{c(y-12)}$ is a vector of 12-month lagged aggregate economic conditions in country *c*. Given that economic conditions within each country offer substantial variation over time, I include a vector of country fixed effects, C, to analyze within-country changes in the timing of fertility as a response to changing economic conditions. I also include a vector of year dummies, T, and a

[7] 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. Some of the interviews were conducted in 1993 and in 2001.

[8] Results are robust to restricting the sample to women 38 and younger. Further, in the data less than 0.7 percent of children live with their father and not their mother, so this is not likely to bias the results in any important manner.

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vector of month dummies, M. I use a grouped robust variance as estimated by Lin and Wei (1989) and cluster the errors by country and year to account for potential correlations in the errors among women in a country in each year.

All estimates include basic demographic controls: women s education, birthplace and, in models of second and third births, information on previous fertility history (age at first birth, time intervals between births and gender of previous children). The education categories include less than upper secondary, upper secondary (omitted) and tertiary education.[9]

The first set of estimations, presented in section 4, focuses on the time varying labor market conditions of the country where each woman lives. I link each woman-monthly observation to the aggregate conditions prevailing in her country of residence one year ago starting from the moment she turns 16. Time-varying economic conditions are lagged one year since fertility decisions are obviously taken some months prior to actual birth. Country level covariates include different measures of unemployment rates, shares of public sector, part time and self-employment, female labor force participation, and maternity benefits, among others.

In the analysis, I use two sources of variation in labor market characteristics to obtain the correlations of interest: cross-country and within-country. The cross-country variation in labor market characteristics is greater than the within-country, so using it is likely to result in more precise estimates. However, because there may be omitted country-specific factors that are correlated with labor market characteristics and fertility, estimates using cross-country variation may be confounded.[10] The use of within-country variation addresses this source of confounding, but at the expense of losing some variation (precision). The tables include within-country estimates and I comment on the other results in the text.

A second set of estimations, reported in section 5, adds (to the covariates employed in section 4) longitudinal individual information on labor market status of each woman (and her spouse if present) such as whether they are unemployed, inactive or employed and what type of job they hold. These variables enter the model with a seven-month lag, $x_{ic(y-7)t}$. As explained later, the period of estimation for these models only starts in January 1992 when this information becomes available.

Given that labor supply and fertility are jointly determined, coefficients on aggregate labor market conditions and on the women s labor market status cannot be given a direct causal interpretation. Women who are unemployed and seeking work, for example, are likely to have lower hazards to birth than economically inactive women for two reasons. First, women who self-select to participate in the market instead of remaining economically inactive may be less inclined to trade off work for further offspring. Second, as argued in the analytical section, active women who experience a negative unemployment shock in the context of persistent unemployment may fear that having a child at this point will reduce their chances of landing a job again. Despite this limitation, estimates in the paper still show what positions are associated with the earliest births.

[9] Kravdal (2007) has shown the estimated impact of education to be sensitive to whether the variable is entered as a fixed covariate or not. In the first estimates of the paper in section 4 only the highest educational attainment is used since we lack information to trace back the time at which each degree was achieved from age 16. However, in section 5, education is time-varying since we limit the analysis to the years when the individual is interviewed.

[10] The absence of large within-country variation constitutes a problem for some of the covariates of interest such as government and part-time employment, but not as much for measures of unemployment. For the decades of the 1980s and 1990s, country dummies alone explain close to 90% of the variance of government and part-time shares in the panel of European nations, but only around 64% of unemployment differences – and less than 40% when the sample extends to the late 1960s.

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4 Fertility Transitions and Country-level Labor Market Characteristics

4.1 Data on Country Conditions

To characterize the labor market opportunities women face, I use twelve-month lag female unemployment rates as well as long-term unemployment rates in their country of residence, after controlling for female participation rates. Unemployment rates are annual until 1982 and monthly thereafter. To measure the existing diversity of contractual arrangements I include the shares of public sector, self-employment and part time employment. In turn, the share of part-time employment is interacted with female labor force participation to reflect its particular relevance for women employment in each country. I experiment both with linear and nonlinear specifications of the variables of interest in an attempt to find the most parsimonious model with the best fit. In the estimates presented in the paper the share of government employment enters in a quadratic form. Linear estimates are available from the author but the square of public employment entered significantly in all estimates.

Additionally all estimates include the country s GDP per capita in purchasing power parity (real 1995 dollars) and maternity benefits. To measure the generosity of maternity benefits I create an index, similar to what is generally done to calculate unemployment benefits, by multiplying the number of weeks of maternity leave with the percentage of her previous earnings (replacement rate) that are paid to the woman while on leave. Appendix 1 includes data sources and cross-country descriptive statistics of the data. Most series are available for 1968–2001, but since part-time employment and long-term unemployment are only available for 1979–2001 the estimates presented in the paper are restricted to this period unless otherwise noted. In addition all models include year dummies to account for any cycle changes that affect all countries, month dummies to account for possible seasonality in births as well as country dummies to account for any other omitted cross-country differences.

4.2 Results on Unemployment

As discussed in section 2, the expected association of unemployment and fertility is ambiguous. It depends on the relative strength of, on one end, the lower opportunity cost (in terms of current forgone wages) that prevails during any unemployment shock with respect to more prosperous times and, on the other, the negative income effect that may accompany a particularly persistent unemployment period.

Columns 1, 2 and 3 in Table 3 present the basic estimates for the model of transition into the first three births for the period 1980–2001. The estimated coefficient for female unemployment is negative in all columns. It decreases in size with parity and it is only significant for the first and second births. Thus maternity postponement is more acute in countries with high female unemployment and that negative association, though more moderate, persists into the second birth.[11] This confirms previous findings that responses to changes in the economic variables are different by birth order (Ermisch 1988; Kravdal 2002).

4.3 Public Employment

To measure the availability of contractual arrangements that may ease mothers transition back into the market, I include country-level public sector (and its square) employment in all

[11] Postponement of first birth brings risks that women will not have all the children they intend (Morgan 2003). In the 1999 Spanish Fertility Survey, among women who report a gap between their preferred family size and their actual fertility, economic constraints appear at the top of reasons for restricting fertility. Necessity to work outside of the home and unemployment of either the woman or her spouse are also ranked high (Adsera 2006).

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estimates. In Table 3 the coefficient for the share of government employment is negative but that of its square is positive. The t-statistics are larger in columns 1 to 3 than in columns 4 to 6, when additional governmental policy controls are included. For third births, the coefficients on government employment in column 6 are only significant in a joint test with the coefficient of family benefits. This is not surprising given that the share of GDP devoted to cash and in kind family benefits is highly correlated with the scope of government employment. Women in countries with government sectors much larger than the average transit somewhat faster to motherhood and, particularly, to second and third births than those with moderate opportunities of public employment. The quadratic estimates imply that the association between public employment and the timing of childbearing is relatively flat (or slightly negative) for government sectors of 15–18 percent where the majority of countries cluster. But a generous availability of public employment is associated with faster births, particularly second and third, in places where the massive expansion of the public sector, such as in Nordic countries, has been a deliberate policy choice to encourage simultaneously fertility and female labor force participation, among other things (Rosen 1996).

Simulations of these estimates in Table 4 show how the variation of female unemployment and of the provision of public sector jobs combined approximates the cross-national differences in the timing of births (and ultimately fertility) in Europe. In the last two rows I combine the simulated proportion of mothers by age 40 (or age 35) jointly with the proportion of women who have already had a second or third birth eight years after the previous child to obtain a raw estimate of total fertility under different labor market conditions.

With country fixed-effects, the simulated differences in speed to first births between countries with average government sizes (around 18 percent) and those with large public sectors (around 30 percent) are fairly small. For the second and third births, however, those differences are sizable. Nevertheless, simulations in Table 4 uncover that, 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. Around 60 percent of women are mothers at age 30 and the simulated fertility rate is around 1.8 in countries with low unemployment, around 5 percent, and large public sectors, 30 percent of employment (such as in Nordic countries). By contrast, in countries with a 20 percent unemployment rate and an 18 percent share of government employment, only half of the women are mothers at age 30 and the simulated fertility rate is 1.41. [12] As a matter of fact, these values correspond very closely to the behavior of recent cohorts and to the underlying conditions in Southern Europe, as shown in Tables 1 and 2. The gaps in the simulated proportion of women having a second (and a third) child eight years after their previous one for public sectors of different dimensions are large, even in settings where female unemployment is only around 5 percent: from 73.5 percent (and 31 percent) in countries with modest public sectors (18 percent of employment) to 86.3 percent (and 38.5 percent) in those with large governments (30 percent of employment). A potential interpretation of the finding that public sector matters most for high parities is that, even if women are planning to use the advantages of a tenured-public sector job to ease the trade off of family and work, they may still need to postpone motherhood until after they land that job. However, once they have secured it, the benefits attached to that position may enable them to transit to higher parities faster than women in more temporary or less accommodating forms of employment.

[12] If country dummies are excluded the simulated percentage of mothers at age 30 in the two scenarios above moves to 71 and 53 respectively and the simulated fertility rates fluctuate considerably from 1.98 to 1.42. Results are available from the author.

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4.4 Controls

The share of part-time employment, female participation rates and the interaction of both are included in all estimates in Tables 3 & 5. As expected by the standard microanalysis of fertility, within-country increases in female participation are coupled with delays in childbearing in all columns.[13] The main effect of part-time employment is positive and significant in the model of transitions to a second child (columns 2 and 5 in Table 3). Its interaction with female participation is negative, and either significant in column 2 or jointly significant in column 5, denoting a particular relevance of part-time in those economies with fewer active women. Simulations from column 2 (not presented in tables) indicate that eight years after the first birth there is almost a 5-point difference, from 76.9 percent to 81.6 percent, in the proportion of second-time mothers in countries with either 7 percent or 20 percent of their work force in part-time and with 50 percent female activity rates (the mean for the period). These findings suggest that women may initially aim for full-time positions and later balance their career-family demands by reducing the hours of work.[14] Part-time employment is scarce in Southern Europe (Table 2, columns 8 and 9) where legislation long penalized it by either reducing entitlements or by not adjusting social security contributions and payroll taxes to work-hours (OECD 1995). There women may 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).

Among other results in Table 3, first births occur faster in periods when countries have more generous maternity benefits.[15] Also, as GDP per capita grows in European countries, second births happen later. Nonetheless, the coefficient for GDP per capita turns significant in models of first births in Table 5 when alternative measures of joblessness are included. The most educated women postpone motherhood the longest but tend to squeeze the first two births in a short period. The estimated relation between a third child and a woman s education is U-shaped. This finding has previously been partly attributed to selection in the European literature (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 (or second) birth, the less likely they are to have a subsequent child. The gender of the first child does not matter for second births but having two previous children of the same gender boosts third births (Pollard and Morgan 2002; Andersson et al. 2006 b). Finally, foreign-born women transit faster to motherhood but, among them, only those born outside of the European Union transit faster to third births than others.[16]

4.5 Robustness Tests

I undertake a set of additional exercises to test the robustness of the association of unemployment and delayed fertility (particularly for the first birth). First, in columns 4 to 6 of Table 3 I add controls for family-friendly governmental policies that are expected to boost births and that were, arguably, more generous in countries with moderate

[13] However in cross-country estimates, transitions to first births are, on average faster, where female participation is higher. This is consistent with the positive cross-country correlation between fertility and female participation found since the mid eighties in the OECD (Adsera 2004).

[14] Bianchi (2000) shows that, even as they (re)enter the labor force, mother s time with children in the US is fairly constant and women use part-time or temporary exits from the labor force to accommodate those needs. The ability to remain, at least, partially attached to the labor market may minimize the depreciation of women s skills (and its negative income effects-but some low-wage unstable part-time jobs may be similar in their effects to the short-term contracts mentioned above (Ariza et al. 2005).

[15] When country dummies are excluded, larger maternity benefits are associated with faster second births.

[16] In separate estimates I have interacted foreign birth with all the covariates in the model to analyze whether either unemployment, the availability of certain types of employment or demographic characteristics are associated with transition to maternity in a distinct way among those born abroad. Only the coefficient for low educational achievement is significant indicating that low educated migrants are those who become mothers the earliest.

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unemployment during the last decades. In particular, the models include: (1) the number of children who are enrolled in pre-primary, regardless of age, expressed as a percentage of those of eligible age; (2) the extent of family cash and in kind benefits provided by the government as a share of GDP; and (3) as a measure of the tax benefits available to families, an index of disposable income that calculates the ”additional disposable income (after taxes and cash transfers) of a one-earner-two-parent-two-child family as compared to the disposable income of a childless single earner, expressed as a percentage of the disposable income of the childless single earner” (Gauthier 2003). (See Appendix 1 for sources and descriptive statistics of each of these controls.) I posit that the three measures are likely to be positively associated with transitions to births. The value and significance of the female unemployment coefficients are almost identical to those in columns 1 to 3. Thus, even after controlling for the generosity of government policies toward families, the degree of female joblessness continues to be associated with later maternity. Interestingly, in the within-country estimations in Table 3 only the percentage of GDP a country allocates to family benefits is strongly associated with the transitions to the first three parities and, in particular, generous benefits seem to encourage families to move beyond the two-child norm. The coefficients of both pre-primary enrollment and the disposable income index are not significant.[17]

Second, in Table 5 I substitute the one-year lagged female unemployment rates for a set of alternatives measures of joblessness.[18] In column 1, to further explore the link of long-term unemployment and childbearing postponement, I use the percentage of all unemployed that have been out of work for a period of 12 months or more as a measure of aggregate persistence. The estimated coefficient is negative and significant in the transition to motherhood. In column 2 I include female unemployment, long term unemployment and their interaction – this interaction provides an indicator of the percentage of active females that have been unemployed for more than a year.[19] Thus, in a country with a 20 percent female unemployment rate and a 60 percent long-term unemployment rate, 12 percent of women in the labor market are long-term unemployed. The estimated coefficients are all negative and jointly significant. Simulations of these estimates presented in Table 6 indicate that persistence clearly matters more as the underlying female unemployment rate increases. Almost two-thirds of women (64 percent) have become mothers by age 30 in countries where female unemployment is low (around 5 percent) and only 30 percent of the unemployed are jobless for over 12 months. The proportion decreases to 60.5 percent as the prevalence of long-term unemployment increases to 55 percent. Only 58 and 52 percent of women are mothers by age 30 in countries where unemployment affects 20 percent of active females and either 30 or 55 percent of the unemployed have been out of work more than one year. By age 35, the rate of motherhood in countries with low and short-lived female unemployment reaches 80 percent, but only 69 percent in those with high (around 20 percent) and persistent (55 percent long term) unemployment.

Column 3 in Table 5 includes the rate of female youth unemployment (women under 25 years) instead of the overall female unemployment rate. The coefficient is negative and

[17] When country dummies are excluded, the index of disposable income is positively associated with transitions to first and second birth and pre-primary enrolment with second and third births. Overall, findings in Tables 3 are robust to excluding one country at a time. Estimates are available upon request.

[18] I estimated additional models of first births that included an interaction between female unemployment and a dummy for either Southern countries or those with a particularly persistent female unemployment such as Belgium and/or France, in addition to Southern nations. The coefficient on these interactions is in general negative but its size and whether it is significant hinge on the particular countries included in the group. The main coefficient on female unemployment remains significant in the range of −0.011 and −0.014, close to estimates in column 1, Table 3. Results are available upon request.

[19] 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 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.

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highly significant. Columns 4 and 5 include the second lag of female unemployment rates (without and with the first lag) to test whether the association with unemployment is long-lived. In column 4 the coefficient of the second unemployment lag is significant, negative and of a similar size to that of the first lag in Table 3. When the first lag is added in column 5, however, the coefficient of the second lag turns positive while the coefficient of the first lag increases to −0.017 and is highly significant, possibly indicating some fertility rebound after a temporary delay.

As an additional exercise to explore the relationship of adverse market conditions and late motherhood, I estimate a model that excludes all the measures of labor market performance (i.e., unemployment and shares of public and part-time employment) and only includes time, month and country dummies, basic individual demographic characteristics and the employment protection legislation index (EPL) from the OECD combined with information from the International Organization of Employers to extend the series to the early 1980s. To what extent a more restrictive regulation has been a main factor driving the increase in unemployment in some European countries is still a question under debate (see Addison and Teixeira 2003 for a literature review on the subject). Nonetheless there is some evidence that highly regulated markets were hostile environments for young workers. Bertola et al. (2002) note that countries with high employment protection have lower unemployment rates of prime-aged individuals compared to younger workers and that union wage-setting institutions “lower the male unemployment rate relative to the female unemployment rate by 4.4 to 6.2 percentage points”(p.29). Strict regulation led to the expansion of temporary employment, particularly among the youth in Southern Europe (Dolado et al. 2002 in a special issue of *Economic Journal* on the topic) and this in turn hampered long-run family planning.

The EPL index increases with the strictness of the labor regulation (firing, hiring, work-time, benefits) and in the sample it goes from 0.5 in the UK to 4.1 in the late 1980s and early 1990s in Portugal and Italy (see Table 2, column 7 for 1995 data). The estimated coefficient for EPL is −0.039 with a t-statistic of 1.99 (the corresponding values for a model without country dummies are −0.059 and 8.61). This indicates that the transition to motherhood occurs early in more flexible labor markets and, within countries, in periods when regulations are lessened. Results are available upon request. The simulated proportion of woman who have at least one child by age 40 with an EPL of 4.1 (the level of Italy in the late 80 s early 90s) is 80%. For countries with an EPL of 2.5 (Sweden, France during the late 80s and early 90s) it is close to 82%. For and EPL of 0.5 (the UK throughout the period) it is 84%. Excluding the country dummies from the model, this variance expands from 79% to 85.5%.

Finally, to study whether the estimated association of unemployment and the timing of childbearing has been stable during recent decades I extend the data till 1969 (when women, who were already 40 in the first ECHP interview, would had turned 16). I find fertility to be procyclical only since the early/mid eighties, when persistence of unemployment rose. Estimates are available upon request.

5 Fertility Transition adding Individual Labor Market Status

5.1 Individual-level Labor Market Status

The second set of estimations in the paper includes information on the labor market status of each woman (and her spouse, if present) in addition to the demographic characteristics and aggregate labor market covariates of Table 3. The ECHP contains information on the labor market situation of the individual for both the year of the interview and the previous year, unemployment episodes during the five years previous to each interview, the first job the

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individual ever had as well as the dates when the current job started and the last job ended. Since interviews for the first year of the panel were conducted either in 1993 or in 1994, the earliest year for which there is any complete individual labor market information is 1992. The short time period for which this information is available poses two challenges to estimating the timing of first births in a meaningful way. First, currently childless women who turned 16 (and entered the risk pool for motherhood) before 1992, when no individual employment information is still available (left truncation), are likely different from those in their cohorts who are not longer in the sample because they had a first child before that date (selection bias). Second, even if we restrict our sample to those who turned 16 on January 1992 and thereafter to circumvent these problems, the length of exposure that we observe may be too brief to obtain significant insights on the dynamics to first births in countries where maternity has been widely delayed into the late twenties and early thirties. As a result, in this section I only estimate models of second and third births.

On the basis of the available labor market information, I restrict the sample to women who had either their first or second child on January 1992 and thereafter. The sample employed to estimate second births contains data on 6,920 women with 2,842 observed births, and that for third births 5,356 women with 921 observed births by 2001. The size of the sample per country across years is fairly stable. Around six percent of the individuals are lost in each interview but a similar proportion is added from the new mothers and the new survey. For those who are lost before a new birth occurs, the observation is censored at the date of the last available interview. The sample appears resilient to potential biases from its panel nature and attrition.[20]

The cross-country differences in fertility patterns observed in the sample mimic the major trends found in Table 1. The proportion of women in the sample with a second child eight years after their first birth ranges from 84 percent and 81 percent in the Netherlands and Finland to 52 percent and 63 percent in Portugal and Italy. Country variation is even larger for those with a third child eight years after the second birth: from over 50 percent of Irish women to less than 20 percent in all Southern European countries.

The model specification includes covariates on the employment status of both the woman and her spouse, when present (employed, unemployed and inactive, the omitted category) as well as annual work earnings (in thousands).[21] The following job characteristics are considered: full or part time (30 hours and less), self-employed and sector of employment (public or private). In addition, some specifications include information on the existence of an unemployment spell longer than one year during the past five years; the length of the woman s contract if employed as well as the receipt of government family allowances.

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 reverse causality problem. Nonetheless this problem is lesser for second and third births since most employment reallocation occurs around the first birth (Browning 1992). Results are robust for seven to twelve month lags and seven are chosen to maximize the sample size.

5.2 Results

Table 7 presents the estimated duration models to second and third births. It only displays the coefficients on the individual labor market history and on the country-level female

[20] Several works conclude that attrition biases in the ECHP are relatively mild and low for individuals living in couples as the great majority in this sample (Nicoletti and Peracchi 2002; Ehling and Rendtel 2004). Longitudinal individual labor market information is limited for Sweden and this country is excluded from this sample.

[21] Income is converted to Euros and adjusted for differences in purchasing power with the index provided in the ECHP dataset.

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unemployment rate. Coefficients for the other covariates are available from the author and conform to results in Table 3 discussed in section 4.

Columns 1 and 6 present the basic model for second and third births, respectively, without income controls. Information on the earnings of a woman and her spouse (if present) is missing for some observations; thus, the sample size shrinks somewhat when these covariates are included in all other columns in Table 7. As expected, a fat paycheck from the spouse is associated with faster transitions to second births, while women with high earnings are less likely to become mothers for a second time. As noted, the interpretation of these coefficients is not causal. For third births, only the woman s income enters negatively and significantly in column 7.

Active mothers, on average, experience substantially slower transitions to both second and third births than those who remain inactive, consistent with the standard expectation that working women trade off children in favor of less time-demanding alternatives (Becker 1960, 1981; Willis 1973; Butz and Ward 1979). Still there are large differences among those who are active depending on the sector and the intensity of employment. Women working full time in the private sector have the lowest estimated hazard to a second child (over 20 percent lower than inactive women) followed by those who are unemployed. The coefficient on a women s unemployment is only marginally significant in column 1 but significant at 5 percent when income is included. Working in the public sector, as opposed to the private sector, or working part-time, as opposed to full time, are positively associated with second births. Overall the hazard to a second birth among those employed full-time in public sector is close to that of stay-at-home mothers, while that of part-timers in the public sector is around 18 percent higher. Simulations of estimates from Table 7, column 2, presented in Table 8 indicate that, five years after becoming mothers, 66 percent of mothers working part-time in the public sector would already have a second child. Among those working full time in either the private or the public sectors the percentages are only 51.7 and 62 respectively. Around 60.5 percent of those inactive, 56.3 percent of those working part-time in the private sector and 55.6 percent of those unemployed would also have become mothers for a second time. Similarly, in simulations from column 7, five years after the birth of their second child, 24.5 percent of mothers working part-time in the public sector would already have another child, as compared to only 15.5 percent or 23 percent of those working full time in either the private or the public sectors. The share is around 20.5 percent among those inactive, 16.5 percent of those working part-time in the private sector and 15 percent of those unemployed.

The estimated coefficient of public employment, both for second and third births estimations, is significantly larger when I include income measures while that of part-time work is halved (and even becomes insignificant in third birth models). Thus, among similarly paid jobs, public sector jobs may carry stability and generous benefits that are valued characteristics in the attempt to balance work and family. These results are consistent with those in section 4, where larger public sectors are associated with faster transitions to second and third births but part-time employment only with second births.

Columns 3 to 5 in Table 7 include additional individual information in models of second births. After controlling for their current employment status, women who experienced a long-term unemployment spell (longer than one year) during the previous five years (in column 3) transit significantly more slowly to a second birth than others. Understandably current unemployment status fails to be significant in this column as it is highly correlated with this dummy.

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In column 4 second births among women without permanent jobs happen significantly later than for others. Permanent contracts were the norm in European countries well into the early 1980s, when, after a short trial period, workers were protected by high firing costs imposed to the firms and entitled to receive generous severance benefits. However, 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.[22] These positions are characterized by lack of tenure, reduced benefits or stable earnings which set hurdles to long-run financial planning. Simulations of column 4 estimates indicate that women with non-permanent contracts in the private sector have the slowest transitions to second births among all women. Five years after the first birth there is more than a 10 point difference in the simulated proportions of second-time mothers among those working in the private sector and holding either permanent (53.5 percent) or non-permanent contracts (42.5 percent), ceteris paribus. The simulated difference is even larger when the sample is restricted to Southern Europe. This association would likely be even more apparent in a model of the transition to maternity. All these simulations are available from the author.

Finally, in column 5 women who were receiving some type of family allowance from the government seven months ago are more likely to have a second (or third) child earlier than the rest. Family allowances in the ECHP include child, maternity, birth, unmarried mother and invalid dependent allowances. Gauthier and Hatzius (1997) and Milligan (2005) find a similar impact of family allowances on fertility (particularly on high parities). Again the coefficient cannot be interpreted causally as women who are receiving some benefit are much more likely to have infants or toddlers than older children. The strength of this association may also depend on the design of family policies themselves. In Austria for example legislation was passed in the 1990s where maternity leave was extended automatically if a second child was born close enough to the first (Lalive and Zweimuller 2009).[23]

With regard to spouse s employment, self-employment is positively associated with births and significant in all estimates in Table 6. 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. Women with a spouse working part-time do not display any differential childbearing behavior. Yet second births are faster among women with a spouse working in the public sector.[24]

Finally, the estimated association with the country-level unemployment rate is similar to that in Table 3, negative in all columns in Table 6 and again only significant for second births.

6 Conclusions

Fertility rates across Europe have plunged since the late 1960s to levels below replacement level. Delayed childbearing has contributed to the lower completed fertility, as late starters

[22] In 1984 Spain allowed non-permanent contracts with temporary subsidies for new hires. The percentage of female workers holding temporary contracts increased from around 5 percent in 1984 to over 35 percent in less than 10 years. Temporary employment also rose in Italy during the late 1980s and the 1990s as employers were searching for means to reduce non-wage costs.

[23] This legislation was developed after the Swedish model. When Swedish mothers have a child before their first-born is 30 months-old, their earnings (prior to maternity) continue to be the basis for the cash benefits they receive (Gustafsson et al. 1996) for the second child. This provides a financial incentive for “speeding up” births without reentering work.

[24] Estimated coefficients also suggest a positive income effect from a spouse s college education. In country specific estimates available from the author, women whose spouses were highly educated and/or employed in the public sector transited relatively fast to second and third births in Southern Europe where families still relied more heavily on spouse’s employment and faced higher job uncertainty than elsewhere in Europe (Ahn and Mira 2001).

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tend to have fewer children. Nevertheless there are substantial differences in both the degree of postponement and actual fertility across countries, as seen in Table 1. This paper has taken advantage of the sharp (but distinct) fluctuations in unemployment rates across European countries during the 1980s and the 1990s combined with broad differences in the latter s labor market arrangements to analyze the associations between fertility timing and the changing economic environment in a sample of close to 50,000 women from thirteen countries.

Estimates show that, since the mid 1980s, first (and second) births occur later in countries with both high and lasting unemployment. The association is robust to alternative measures of unemployment (i.e. youth unemployment) and to the inclusion of controls for family-friendly governmental policies (i.e. family cash and in kind benefits, maternity leave) that were probably more generous in countries with moderate unemployment during this period.

Besides moderate unemployment, wide access to part-time employment is only associated with faster transitions to second births and a public sector above the average of the sample is also significantly associated with earlier transitions, particularly to high parities. Using the estimates for the first three births, the simulated fertility rate, in Table 4, ranges from a high of 1.8 in countries with low unemployment and large public sectors to a low of 1.41 in countries with high unemployment and moderate public employment. As a matter of fact, these two values correspond very closely to the actual fertility presented in Table 1 (and underlying institutional arrangements in Table 2) of Northern and Southern Europe respectively.

A second set of estimates adds detailed information of each woman s labor market status and type of job to models of second and third births. Results are consistent with those above. Women employed by the public sector have second and third births earlier than those who work in the private sector or are unemployed, but those in part-time employment only transit relatively fast to second births. Women with temporary contracts, mostly prevalent in Southern Europe, are the least likely to give birth to a second child.

As women continue to enter the labor force and participation rates across Europe slowly converge to high levels, work and family will be compatible only in those countries where labor market institutions reduce the uncertainties connected with childbearing and allow couples to better plan ahead. Policies geared towards full-employment, labor reforms that do not relegate the youngest to volatile contracts and laws that do not penalize part-time employment emerge as the most appropriate strategies to achieve this.

During recent years and, in part, as a result of shrinking recent cohorts in the labor market, most European countries have witnessed a massive inflow of immigrants from very diverse backgrounds. As immigrant fertility rates, in many countries, are higher than those of native born, the fertility adjustment of immigrants plays a role in assessing their contribution to demographics and is relevant in the planning of fiscal policy and sustainability of generous welfare states. However, as Sobotka (2008) notes, even if immigrants contribute substantially to the total number of births across European countries, their net effect on the period total fertility remains relatively small, typically between 0.05 and 0.10 in absolute terms.

Of course, smaller future cohorts could result, absent a continuation of massive migration flows, in improved economic conditions due to lower pressure in labor and housing markets. This would potentially boost fertility rates. However, given the dim economic prospects for young cohorts during the current economic downturn and since these aggregate changes would only take place in the very long run, fertility rates are not likely to rebound to the replacement level in the near future. In the meantime, fertility preferences in some countries,

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such as Germany and Austria, have clearly tumbled under replacement level (Goldstein et al. 2003) and they can become entrenched never to rebound again.

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APPENDIX 1. Descriptive Statistics and Data Sources

Variable	Mean	Std. Dev.	Min	Max
1980–2001				
Log GDP per capita (1995 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
% 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 Participation	54.7	11.9	31.9	80.6
Gross Enrollment Pre-Primary	76.2	25.3	20.2	118
Disposable Income Index (two-kids)	18.6	8.1	3	39.4
Tot Family Benefits as % GDP	2	1.1	0,15	4.9

Labor market and income per capita covariates (1968–2001): OECD *Labour Force Statistics,* OECD *Economic Outlook* and national official statistics. Part-time employment and long-term unemployment are only available for 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. Unemployment rates are annual for 1969–1982 and monthly starting in 1983.

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).

Gross Enrollment Rates in pre-Primary School (1971–2001): Gauthier (2003) and *UNESCO* Statistics. Note that this indicator can exceed 100% due to the inclusion of over-aged and under-aged pupils/students, therefore causing a discrepancy between the numerator and denominator of this index.

Total Family Benefits (1980–2001) as percentage of GDP from *OECD Social Expenditures Database* and index of *Disposable Income* (1972–1999) is available from Gauthier (2003).

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Table 1

Period Total Fertility Rate (TFR), Total Cohort Fertility Rate (TCFR) and First Birth Cumulated Cohort Fertility Rates (CCFR) up to 27th birthday for selected cohorts and European countries

	TFR		TCFR		First Birth CCFR up to 27 years			
	1985	1995	1955	1965	1960	1965	1970	1975[c]
Austria	1.47	1.42	1.77	1.64	..	..	0.471	0.407
Belgium	1.51	1.56	1.83	..	..	..	..	..
Denmark	1.45	1.80	1.84	1.94	0.539	0.451	0.421	0.35
Finland	1.64	1.81	1.90	1.91	..	0.425	0.393	0.348
France	1.81	1.71	2.13	2.02	..	..	..	..
Germany	1.37	1.25	1.67	1.53	..	..	..	..
Greece	1.67	1.31	2.01	1.75	0.661	0.537	0.397	0.311
Ireland	2.48	1.84	2.67	2.18	..	..	..	..
Italy	1.42	1.19	1.80	1.49	0.514	0.391	0.298	0.298[a]
Luxembourg	1.38	1.70	1.69	1.82	..	..	..	..
Netherlands	1.51	1.53	1.87	1.77	0.395	0.324	0.268	0.268
Norway	1.68	1.87	2.05	2.06	..	..	0.493	0.419
Portugal	1.72	1.41	2.04	1.82	..	0.638	0.528	0.445
Spain	1.64	1.17	1.92	1.61	0.548	0.419	0.278	0.192
Sweden	1.74	1.73	2.03	1.98	0.493	0.493	0.427	0.319
UK	1.79	1.71	2.03	1.90	0.497	0.455	0.433	0.392[b]

Source: Eurostat (2010), Council of Europe (2005), Frejka and Sardon (2006).

Note:

[a]1970,

[b]1974,

[c]1975 or latest available

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Table 2

Gender Gap in Unemployment Rates, Youth Unemployment, Long-Term Unemployment, Prevalence of Public Employment and Part Time Employment and Employment Protection Legislation (EPL) across European Countries in the 1990s

	Unemployment					Public Sector[c]	EPL[b]	Part Time[b]	
	% Male (25–54)[a]	% Female (25–54)[a]	Difference[a]	% Female under 25 yrs[b]	% out work >12 month out of all unemployed[b]	% total employed	Index	% of total employed	% of female employed
Spain	9.2	21.0	11.8	49.1	56.9	15.5	3.1	7.5	16.6
Greece	6.2	15.2	9.0	37.7	51.2	12.2	3.6	4.8	8.4
Italy	6.6	12.7	6.1	37.6	63.6	17.9	3.3	6.4	12.7
France	9.0	12.6	3.6	32.2	42.3	24.6	2.7	15.6	28.9
Belgium	6.1	9.0	2.9	23.7	62.4	19.0	2.1	13.6	29.8
Netherlands	2.1	3.8	1.7	12.7	46.8	12.0	2.1	37.4	67.2
Luxembourg	1.4	2.9	1.5	7.8	23.2	10.8	2.5	7.9	20.3
Germany	7.2	8.5	1.3	8.0	48.3	15.5	2.5	16.3	33.8
Portugal	3.4	4.6	1.2	17.6	50.9	18.4	3.7	7.5	11.6
Denmark	3.7	4.9	1.2	12.3	28.1	30.2	1.2	21.6	35.4
Finland	7.9	9.0	1.1	28.1	37.0	23.3	2.0	8.2	11.1
Sweden	5.2	5.9	0.7	14.0	15.8	32.1	2.2	24.3	40.3
Austria	3.4	3.6	0.2	6.2	27.5	22.5	2.2	13.9	26.9
Norway	2.6	2.2	−0.4	11.8	26.5	31.2	N/A	26.5	46.5
Ireland	5.7	4.8	−0.9	17.4	61.4	13.3	0.9	12.1	23.1
United Kingdom	5.4	4.3	−1.1	12.2	43.6	14.2	0.5	24.0	44.3

Source: *OECD Employment Outlook* OECD (Paris) various issues.

[a] Azmat et al. (2006) from OECD Labour Market Statistics, 1999

[b] 1995

[c] 1994

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Table 3

Transition to First, Second and Third Births and Aggregate Labor-Market Conditions. 1980–2001 (T-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)
Parity	**First**	**Second**	**Third**	**First**	**Second**	**Third**
Individual level variables						
Tertiary Education	−0.358 (16.13)**	0.099 (4.08)**	0.211 (5.35)**	−0.361 (16.01)**	0.096 (3.89)**	0.205 (5.09)**
Less Upper Secondary Education	0.407 (18.36)**	−0.006 (0.28)	0.141 (3.87)**	0.422 (19.02)**	0.004 (0.17)	0.143 (3.91)**
Born Abroad	0.165 (4.63)**	−0.055 (1.45)	0.000 (0.08)	0.163 (4.55)**	−0.064 (1.69)+	−0.004 (0.06)
Born out EU (if Abroad=1)	−0.048 (1.02)	0.020 (0.38)	0.268 (3.09)**	−0.052 (1.08)	0.026 (0.49)	0.284 (2.96)**
Age First Birth		−0.004 (1.76)+	−0.070 (12.36)**		−0.003 (1.34)	−0.069 (12.14)**
First Boy		−0.010 (0.60)			−0.013 (0.79)	
Two Boys			0.204 (6.00)**			0.202 (5.95)**
Two Girls			0.197 (5.24)**			0.201 (5.31)**
Months 1st to 2nd			−0.009 (11.03)**			−0.009 (10.83)**
Country level variables (t-12)						
Female Unemployment rate	−0.014 (2.79)**	−0.011 (1.88)+	−0.002 (0.26)	−0.014 (2.83)**	−0.010 (1.66)+	−0.002 (0.29)
Gross Enrollment Pre-Primary				−0.002 (1.00)	−0.000 (0.06)	0.001 (0.27)
Disposable Income				−0.003 (0.90)	−0.000 (0.09)	0.005 (0.71)
Family Benefits % GDP				0.131 (3.55)**	0.125 (3.58)**	0.179 (3.26)**
Maternity Leave	0.010 (1.69)+	−0.006 (0.88)	−0.011 (1.34)	0.010 (1.96)*	−0.004 (0.74)	−0.006 (0.85)
% Government Employment	−0.114 (2.57)*	−0.144 (3.30)**	−0.115 (1.86)+	−0.063 (1.76)+	−0.088 (2.44)*	−0.071 (1.42)
Sq. % Government Employment	0.002 (2.00)*	0.004 (3.54)**	0.003 (1.65)+	0.001 (1.30)	0.003 (2.68)**	0.002 (1.05)
% Part time	0.001 (0.05)	0.041 (2.12)*	0.008 (0.21)	0.003 (0.12)	0.038 (2.10)*	−0.010 (0.27)
% Part time x Female Participation	0.000 (0.72)	−0.001 (2.06)*	0.000 (0.18)	0.000 (0.90)	−0.001 (1.53)	0.001 (0.83)
Female Participation Rate	−0.032 (3.55)**	0.009 (1.04)	−0.012 (0.88)	−0.030 (3.37)**	0.005 (0.65)	−0.020 (1.46)
Log GDP per capita	−0.420 (1.42)	−1.048 (3.45)**	−0.068 (0.19)	−0.335 (1.39)	−0.845 (3.39)**	0.286 (0.78)
% Self-employed	−0.011 (1.09)	0.004 (0.39)	−0.033 (1.99)*	0.006 (0.54)	0.020 (2.27)*	−0.010 (0.58)
Women	47,352	23,811	16,088	47,157	23,251	15,727

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	(1)	(2)	(3)	(4)	(5)	(6)
Parity	**First**	**Second**	**Third**	**First**	**Second**	**Third**
Events	21,557	15,493	4,952	21,016	15,149	4,854
Person-months	4,622,607	1,198,428	1,194,785	4,496,807	1,159,371	1,153,064

Note: Coefficients from Cox Proportional Hazard Models that include *year, month and country dummies*. For first births, exposure starts at age 16 and, for second and third, it starts at the time of the previous birth. Each model is estimated separately. Robust z statistics from errors clustered by country-year:

$^{+}$ significant at 10%;

* significant at 5%;

** significant at 1%. All country variables are lagged one year.

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Table 4

Predicted proportions of women transiting to births of different order according to country s female unemployment rate and share of government employment

Female Unemployment	**5%**		**20%**	
Government Employment	**18%**	**30%**	**18%**	**30%**
First Birth				
By Age 30	0.594	0.596	0.516	0.520
By Age 35	0.765	0.766	0.688	0.690
By Age 40	0.816	0.818	0.741	0.750
Second Birth				
8 years after 1st	0.734	0.863	0.689	0.827
Third Birth				
8 years after 2nd	0.309	0.385	0.301	0.376
TFR1	1.570	1.797	1.413	1.596
TFR2	1.469	1.682	1.306	1.476

Note: Simulations are based on Table 3, columns 1, 2 and 3. 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.

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Table 5

Transition to First Birth, Unemployment Persistence and Youth Unemployment in the country, 1980–2001 (T-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)
Individual level variables					
Tertiary Education	−0.355 (15.97)**	−0.356 (16.02)**	−0.336 (15.26)**	−0.358 (16.12)**	−0.358 (16.13)**
Less Upper Secondary Education	0.403 (18.08)**	0.404 (18.17)**	0.421 (18.80)**	0.407 (18.34)	0.407 (18.35)**
Born Abroad	0.175 (4.99)**	0.175 (4.98)**	0.190 (5.36)**	0.165 (4.63)**	0.165 (4.63)**
Born out EU (if Abroad=1)	−0.057 (1.22)	−0.057 (1.22)	−0.061 (1.26)	−0.048 (1.02)	−0.048 (1.02)
Country level variables (t-12)					
Female Unemployment rate		−0.006 (0.63)			−0.017 (1.80)+
Long Term Unemployment rate	−0.004 (2.78)**	−0.003 (1.18)			
Female Unemp. rate*Long Term Unemployment rate		−0.012 (0.63)			
Youth (under 25yrs) Female Unemp. rate			−0.011 (3.01)**		
Female Unemployment rate (t-24)				−0.011 (2.37)**	0.003 (0.35)
Maternity Leave	0.008 (1.43)	0.008 (1.43)	0.007 (1.15)	0.010 (1.64)	0.010 (1.69)+
% Gov Employment	−0.092 (2.02)**	−0.096 (2.14)**	−0.133 (2.74)**	−0.112 (2.52)*	−0.114 (2.57)**
Sq. % Government Employment	0.002 (1.49)	0.002 (1.57)	0.003 (2.30)*	0.002 (1.90)+	0.002 (2.02)*
% Part time	0.006 (0.29)	0.015 (0.72)	0.014 (0.63)	−0.001 (0.05)	0.001 (0.03)
% Part time x Female Participation	0.000 (0.42)	−0.000 (0.03)	−0.000 (0.17)	0.000 (0.89)	0.000 (0.71)
Female Participation Rate	−0.027 (3.01)**	−0.025 (2.65)**	−0.021 (1.80)+	−0.033 (3.71)**	−0.031 (3.51)**
Log GDP per capita	−0.372 (1.94)+	−0.555 (1.85)+	−0.716 (2.18)*	−0.318 (1.34)	−0.429 (1.44)
% Self-employed	−0.010 (1.27)	−0.009 (1.24)	−0.007 (0.64)	−0.014 (1.34)	−0.011 (1.00)
Joint Test Chi [a] Prob > chi2		14.12 (0.0027)			
Women	47,167	47,167	45,976	47,352	47,352
Events	21,372	21,372	20,167	21,557	21,557
Person-months	4,601,042	4,601,042	4,370,777	4,622,607	4,622,607

Note: Coefficients from Cox Proportional Hazard Models that include *year, month and country dummies*. Robust z statistics from errors clustered by country-year:

+ significant at 10%;

[*] significant at 5%;

[**] significant at 1%. All country variables are lagged one year.

[a] Joint test of the variables Female Unemployment, Long-Term Unemployment and their interaction

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Table 6

Predicted proportion of women who are mothers by age 30 and 35 according to country s female unemployment rate and long-term unemployment rate

Female Unemployment	**5%**		**20%**	
Long-Term Unemployment	**30%**	**55%**	**30%**	**55%**
First Birth				
By Age 30	0.640	0.605	0.580	0.520
By Age 35	0.803	0.775	0.750	0.694

Note: Simulations are based on estimates in Table 5, column 2. All other variables set at the mean.

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Table 7

Transition to Second (or Third) Births from First (or Second) Births occurred on January 1992 or after (T-statistics in parentheses)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Parity	**Second**	**Second**	**Second**	**Second**	**Second**	**Third**	**Third**
Individual level variables							
Woman Employment (re: Inactive)							
Work (t-7)	−0.396 (7.16) **	−0.241 (3.34) **	−0.228 (3.12) **	−0.191 (2.55) **	−0.251 (3.50) **	−0.379 (3.80) **	−0.147 (1.23)
Unemployed (t-7)	−0.109 (2.08) *	−0.131 (2.37) *	−0.068 (1.16)	−0.134 (2.42) *	−0.137 (2.46) *	−0.209 (2.39) *	−0.186 (1.86) +
Public Sector (if work (t-7)=1)	0.254 (3.93) **	0.289 (4.51) **	0.292 (4.56) **	0.299 (4.62) **	0.285 (4.43) **	0.413 (4.97) **	0.446 (4.61) **
Part-time (if work (t-7)=1)	0.235 (3.35) **	0.120 (1.64)	0.125 (1.70) +	0.124 (1.66) +	0.122 (1.65) +	0.186 (1.65) +	0.084 (0.72)
Self-employed (if work (t-7)=1)	0.147 (1.52)	0.002 (0.01)	−0.006 (0.06)	0.016 (0.07) (0.15)	0.008 (0.07)	0.239 (1.401	0.058 (0.34)
Long-term unemployment spell in 5 past yrs.			−0.177 (3.16) **				
No Permanent contract (t-7)				−0.184 (3.19) *			
Woman Family Allowances (t-7)					0.363 (4.87) **		
Spouse Employment (re: Inactive)							
Work (t-7)	0.100 (1.59)	0.061 (0.79)	0.067 (0.80)	0.053 (0.64)	0.074 (0.87)	0.043 (0.39)	−0.025 (0.18)
Unemployed (t-7)	−0.043 (0.53)	0.043 (0.41)	0.055 (0.53)	0.037 (0.36)	0.051 (0.48)	0.189 (1.24)	0.110 (0.63)
Public Sector (if work (t-7)=1)	0.117 (1.77) +	0.120 (1.74) +	0.118 (1.70) +	0.118 (1.71) +	0.130 (1.87) +	0.042 (0.43)	0.034 (0.35)
Part-time (if work (t-7)=1)	0.109 (0.72)	0.146 (0.92)	0.142 (0.91)	0.143 (0.91)	0.153 (0.99)	−0.219 (0.89)	−0.210 (0.84)
Self-employed (if work (t-7)=1)	0.224 (4.14) **	0.301 (5.17) **	0.294 (5.00) **	0.300 (5.17) **	0.303 (5.22) **	0.310 (2.82) **	0.227 (1.96) *
Work Income							
Woman (t-7)		−0.015 (3.58) **	−0.0016 (3.71) **	−0.017 (3.76) **	−0.016 (3.67) **		−0.023 (2.63) *
Spouse (t-7)		0.007 (4.04) **	0.007 (4.02) **	0.007 (4.06) **	0.007 (4.06) **		−0.004 (0.65)
Country level variables							
Female Unemployment rate (t-12)	−0.038 (1.88) +	−0.041 (2.08) *	−0.039 (1.96) *	−0.041 (2.06) *	−0.041 (1.97) *	−0.027 (0.68)	−0.030 (0.71)
Women	6,920	6,112	6,112	6,112	6,112	5,356	5,001
Events	2,842	2,493	2,493	2,493	2,493	921	827
Person-months	199,804	160,451	160,451	160,451	160,451	207,645	180,595

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Note: Coefficients from Cox Proportional Hazard models. All columns include demographic characteristics (presence of a spouse, marital status, education of the woman and her spouse, place of birth, gender of previous children, age at first birth and time elapsed between births), country level variables in Table 3 (government, self and part-time employment, maternity leave) as well as *year, month and country dummies*. Annual work income is expressed in thousands of euros.

Exposure to second (third) birth starts at the time of the first (second) birth. Robust z statistics from errors clustered by country-year:

$^{+}$ significant at 10%;

* significant at 5%;

** significant at 1%. All country variables are lagged one year and individual variables are lagged seven-months.

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Table 8

Predicted proportions of women transiting to second and third births according to their labor market status

Woman labor market status	Inactive	Unemploy	FT Public Sector	PT Public Sector	FT Private Sector	PT Private Sector
Second Birth						
5 years after 1st	0.605	0.556	0.620	0.660	0.517	0.563
Third Birth						
5 years after 2nd	0.205	0.150	0.230	0.245	0.155	0.165

Note: Simulations are based on Table 6, columns 2, and 7 assuming continuous permanence on each particular labor market status for the full five years after the previous birth. All other variables set at the mean. FT corresponds to Full-time jobs and PT to Part-time jobs.

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