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Employment and Second Childbirths in Europe

Even though the recent economic crisis has led to fewer births across Europe, fertility levels still vary widely. While fertility rates fell between the 1960s and the 1990s throughout Europe, they have since levelled off at below replacement level in some countries, while in others they have recovered significantly.

The decline and recovery of fertility in Europe has often been seen as a logical consequence of the process of childbearing postponement (Bongaarts and Sobotka, 2012; Goldstein et al. 2009).(1) However, the fact that fertility recovered in some European countries but not in others raises questions about factors that lead individuals and couples in low-fertility countries to postpone or forego a second child. Recent research suggests that fertility differentials between European countries cannot be fully explained by the process of postponement. Structural and cultural changes that go hand in hand with economic development are likely to affect fertility behaviours in terms of both timing and quantum (Goldstein et al., 2009; Lesthaeghe, 2010; Myrskylä et al., 2009). Moreover, several studies have shown that the fertility differences across European countries are largely attributable to fewer second births in low fertility countries (Breton and Prioux, 2009; Frejka and Sardon, 2007; Frejka and Sobotka, 2008).

This article aims to explore the reasons behind low fertility levels in several European countries by combining individual and institutional determinants of fertility behaviour and by focusing on second births. On the aggregate level, female employment has recently been identified as a key parameter for explaining

(1) Fertility levels initially fall because births at young ages are postponed; they recover after a certain lapse of time due to the "recuperation" of births taking place at older ages.

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 DOI: 10.3917/pope.1704.0625

fertility differentials in Europe. Luci-Greulich and Thévenon (2013, 2014), for example, show that the upturn in total fertility rates has occurred mostly in highly developed countries where economic development has occurred in parallel with increases in female employment, and in countries with strong public support for parents' work-life balance, in the form of preschool childcare services for example. Low fertility countries are identified as those where parents find it difficult to reconcile work and family life. The extent to which the evidence of a positive link between fertility and female employment on the macroeconomic level reflects individual behaviour in contemporary Europe is still an open question, however.

Recent studies suggest that female labour force entry goes hand in hand with the birth of a first child in developed countries where a strong institutional setting supports the work-life balance (d'Albis et al., 2017; Rendall et al. 2014; Schmitt 2012; Wood et al. 2015). Adsera (2011) shows that the effect of working status on transitions to higher-order births in European countries differs significantly between sectors and depends on the length of the working contract. Matysiak and Vignoli (2008, 2013) also find large variations in the effect of female employment and first and second childbirth across institutional settings; they show that women's employment conflicts with childbearing in Italy, while in Poland women tend to combine the two activities. However, there is still no systematic analysis of the impact of women's employment status on childbirth which covers most European countries and which comprehensively takes account of important factors such as partner and institutional characteristics.

Besides, research on the specific determinants of second childbirths is relatively scarce, even though fertility differentials between European countries emerge mainly due to lower progression to second childbirth in low fertility countries. By covering the majority of European countries, d'Albis et al. (2017) find that the shortfall of second births in low fertility countries contributes to nearly half of the fertility gap between high- and low-fertility countries in Europe, whereas the other birth orders are less influential. Against the background of rather homogenous preferences for a two-child family in European countries (Sobotka and Beaujouan, 2014; Testa, 2012), this suggests that parents in low-fertility countries face barriers to having a second child.

This article analyses both individual and institutional determinants of the transition to second childbirth and the barriers to this transition. We first identify the extent to which employment is associated with the probability of second childbirth for women, whatever the country context. We then analyse whether this association is modified by education and partner characteristics. Finally, we examine whether the link between women's employment and second childbirth is dependent upon the family policy setting.

We use data from the European Statistics on Income and Living Conditions (EU-SILC, waves 2003 to 2011) and the OECD Family Database. As EU-SILC provides information on all household members, we can control for partner

characteristics. In addition, the large sample size enables us to differentiate the impact of women's employment status on fertility by education and by partner's employment status. As EU-SILC covers the large majority of European countries, we are also able to consider interactions with institutional settings (multi-level modelling). Here we focus on three core family policy instruments: childcare coverage, length of parental leave and cash transfers. Potential endogeneity between fertility behaviour and parents' employment status is taken into account by exploiting the longitudinal components of the data (we observe labour market status before potential conception) and by applying an instrumental-variable approach (bi-probit modelling).

I. Theoretical background: an economic and institutional approach

In classic economic theory (Becker 1960, Mincer 1958), decreasing fertility is explained as an overall result of women's increasing level of education which strengthens their labour market attachment and career aspirations. When combining work and family life is impossible and traditional gender roles remain strong, women tend to give priority to paid employment over childbearing in order to take advantage of increasing career and income options (negative substitution effect due to the increasing opportunity costs of staying at home). For men, on the other hand, increasing career and income options tend to favour fertility behaviour (positive income effect). In principle, this positive income effect also exists for women, as their increased income lowers the household's budget constraints. However, when the substitution effect dominates the income effect, the net effect of increasing female income on fertility is negative.

In turn, growing opportunities for combining work and family life, often accompanied by weakening normative gender roles (McDonald, 2000; Neyer et al., 2013), may result in the positive income effect dominating the negative substitution effect for women; in countries where parents can combine work and family life, women's labour market participation is likely to facilitate the decision to start or enlarge a family. Women no longer have to choose between work and childbearing (the negative substitution effect of female employment on fertility becomes weaker) and their participation in the labour market generates (additional) household income which facilitates starting and enlarging a family (the positive income effect of female employment on fertility becomes stronger and tends to dominate the substitution effect). In this scenario, a woman's and her partner's career and income options no longer have opposite impacts on fertility, as they both generate an income effect that is stronger than the substitution effect. Both partners might first want to benefit from their educational investments and begin a career before starting a family. The labour market integration of both partners, along with increased household

income, is then likely to facilitate family formation as well as family enlargement. The sequence of behaviour changes as a consequence; in this situation, labour market entry precedes family formation and childbearing is postponed with respect to a situation with a more traditional division of work (Bernhardt, 1993; Thévenon, 2006).

In line with these arguments and the macroeconomic empirical evidence of a positive link between fertility and female employment, in countries with high fertility and high female employment rates, women seem to be more successful in combining work and family. In low-fertility countries, on the other hand, parents – women in particular – face barriers to combining work and family life, so must choose between labour market integration or childbearing.

Women's labour market integration has become a key variable in fertility decisions for many reasons. First, the steep increase in female educational attainment has made it very costly for women and their households to interrupt employment for reasons of childbearing and/or child-raising. Women's labour force participation not only provides additional income, but also safeguards household income at times of growing uncertainty when partners are at risk of becoming unemployed. Women's labour market participation thus not only reflects women's desire for self-fulfilment, but is also, increasingly, a response to economic necessity (OECD 2012). In addition, faced with the growing risk of divorce and/or union dissolution, women need to work in order to gain economic independence. In these circumstances, it has become increasingly important for women not only to work before starting a family, but to secure their labour market situation after childbirth and during the years of family formation (Blossfeld, 1995). Following the economic argument that children are relatively costly and female employment represents an important contribution to family income, it is all the more important for the mother to have a secure job before having another child. In other words, the possibility of family enlargement is likely to depend increasingly on women's ability to contribute continuously to household income.

As this ability also depends on a country's degree of support for the work-family balance, the relation between female employment and fertility is likely to differ across countries. In countries that provide institutional support in the form of public childcare, dual-earner couples may be more likely to decide in favour of family enlargement than those in which at least one partner is inactive or unemployed: the couple's joint income creates a secure economic environment for having an additional child. Income can be maintained after the birth of children thanks to institutional support in the form of childcare. In low-fertility countries, however, the impact of parents' labour market integration might be ambiguous, due to the absence of childcare options: a childbirth would imply a reduction in family income as at least one partner has to stop or reduce his or her labour market activity in order to care for the

child. In countries with low access to formal childcare, couples depending on both partners' incomes to make ends meet cannot afford to have a child due to the resulting drop in income. This is particularly the case for higher order births, as the couple already has to finance one or more children. Consequently, with low institutional support for the work-life balance, dual-earner couples might be more likely to decide against family enlargement than couples with one partner already inactive. Besides access to formal childcare, other family policy instruments – such as parental leave schemes and cash transfers to families – may also influence the impact of women's labour market integration on childbearing behaviour. These policies also have the potential to reduce the costs of fertility, either in monetary terms or in terms of opportunity costs. While cash benefits support families' standard of living, parental leave schemes are intended to secure women's position in the labour market (by allowing for a baby-pause while keeping their job) (McDonald 2006; Rindfuss et al. 2010; Thévenon and Gauthier, 2011). However, long periods of parental leave are known to hamper career prospects, and generous lump-sum benefits may also encourage women – especially low-educated women – to reduce their working hours or withdraw from the labour market (Thévenon and Solaz, 2014). Their influence on the employment and fertility nexus is therefore potentially ambiguous.

II. Data and methods

The data we use in this article come, at the micro level, from the EU-SILC database (European Union Statistics on Income and Living Conditions) and, at the macro level, from the OECD Family Database.

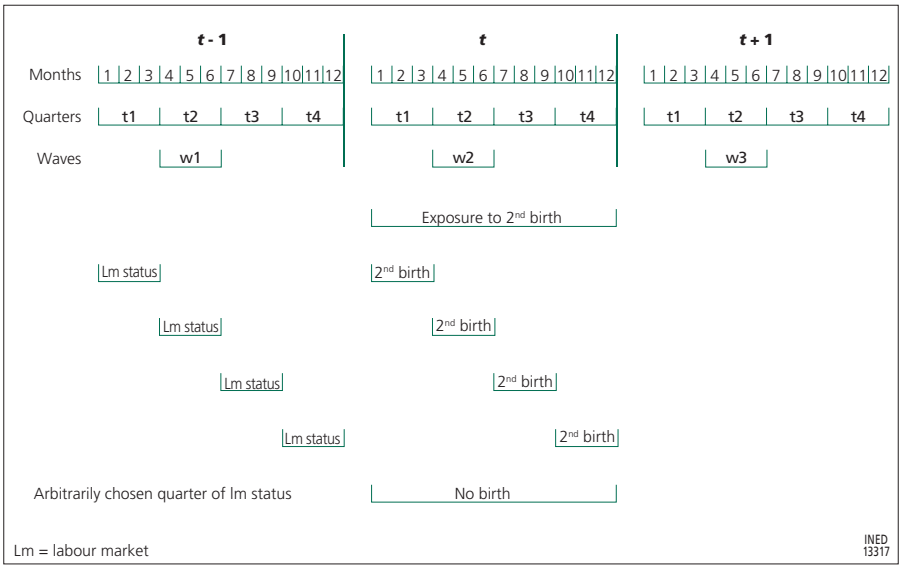
The EU-SILC is a harmonized survey covering the large majority of European countries. It captures individual and household situations by providing a large number of economic and social variables that may be considered as determinants in the decision to have children. It includes information on age and educational level as well as variables on labour market status. Household members can be linked to each other, making it possible to observe not only women's characteristics but also those of their partner.

To analyse the impact of women's labour market status on the probability of having a second child, we mobilize the longitudinal sample of EU-SILC. The dataset covers 25 European countries[(2)] and the waves 2003 to 2011. Within this period, individuals are followed up for a maximum period of four years in the majority of countries (rotational panel).

(2) The 25 countries are: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Spain, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia and Sweden. The UK and Romania are excluded due to serious errors in measures of childbirth and employment status. Longitudinal data are not available for Germany and Switzerland.

Our sample is restricted to women aged 17-45 who already have a first child at the start of the observed period. As EU-SILC contains monthly information on labour market status and quarterly information on the birth of children, we can identify labour market status before potential conception. Figure 1 illustrates our identification strategy.

Figure 1. Strategy for identifying labour market status before a potential birth



To obtain the information needed for our analysis, individuals have to be observed over a period of at least three years (years *t*–1, *t* and *t*+1). Children born in the third and the fourth quarters of each year are generally declared the following year, as interviews usually take place during the first half of each year. Births at the end of the year are therefore not detectable immediately. Three consecutive waves of interviews are thus needed. Based on wave 3 (interview in year *t*+1), we identify all second births that occurred during the calendar year *t*. Year *t*–1 serves to observe the mothers' and their partner's labour market characteristics over a certain period before potential conception.(3)

For women who have a second child in year *t* (the treatment group), we observe their labour market status in the three months before conception, assuming that the pregnancy lasted nine months. More precisely, for women with a second child born in quarter one of year *t*, we observe their labour market status in January, February and March of year *t*–1. For these women who are observed for three years only and who have had a second child in the first quarter of year *t*, three months is the maximum time period we can observe

(3) This is possible at the survey interview in year *t* (wave 2); individuals give information about their month-by-month employment status of year *t*–1.

in terms of labour market status before potential conception. In order to obtain the largest possible number of observations and a homogenous measure of labour market status for all individuals, we limit the observed time period to three months for all individuals. For women with a second child born in quarter two of year *t*, we observe their labour market status in April, May and June of year *t*–1. For those with a second child born in quarter three, we observe July, August and September, and for those with a second child born in quarter four, we observe October, November and December. For women without a second birth in *t* (the control group), we chose an arbitrary three month period during the year *t*–1. Women observed for four years who did not have a second child in year *t* are included twice in our database (two calendar years of potential childbirth). We thus obtain a homogenous dataset in which labour market status is observed for a period of three months before potential conception for all individuals. This allows us to run a simple probit model, controlling for the number of person-years, with a dummy that indicates whether individuals are observed twice.

Covering three months rather than using information given at a certain point in time helps to smooth out short-term periodical fluctuations in employment. We consider an individual as "employed" only if he or she is employed during each of the three months, while those who change employment status during the observed time period figure separately. Note, however, that three months is too short to interpret our measure of employment as an indicator of employment stability.(4)

Overall, we obtain 35,401 observations (person-years) for women aged 17-45 with one child at the beginning of the observed period, who are thus "at risk" of having a second child in the following year. All countries combined, the event "birth of a second child" concerns 9% of observations in our sample. This proportion varies from 4% (Lithuania) to 18% (Netherlands).

Besides women's employment status, we include a series of control variables in the estimation equation in order to isolate other potential determinants from the impact of women's employment on second childbirth. Demographic controls include women's age as well as the age and sex of the first child. We also control for women's education, observed at the time of the survey in *t*–1 (using the UNESCO ISCED classification(5) to distinguish between three categories). Most importantly, SILC enables us to include partner information in our models. We control for the presence of a partner and the couple's marital

(4) See Rendall and Greulich (2016) for employment-stability measures in SILC. By applying multiple imputation for left-censored predictor variables, they find that in Poland increasing the length of the observed period in terms of labour market status increases the significance of the empirical findings. Being in full-time employment for two or more years is found to be strongly predictive of a first birth in Poland, while being in full-time employment for only one year is not.

(5) "Low education" for pre-primary, primary and lower secondary education (ISCED 0-2); "medium education" for upper secondary and post-secondary non-tertiary education (ISCED 3-4); and "high education" (ISCED 5+) for tertiary education.

status (married, unmarried), and we observe the partner's employment status during three months before potential conception of a second child.

Table 1 shows descriptive statistics of the distribution of women over categories and the proportions by category of women who had a second child during the observed period. On average, the majority of women surveyed in the 25 observed countries are in employment during the three months before potential conception of a second child. However, the distribution between part-time and full-time employment is quite heterogeneous across European countries, as discussed in more detail in Greulich et al. (2016). The second group is inactive, and the third group is unemployed. Women and men on maternity and paternity leave are coded as employed, while those on parental leave are coded as inactive in the EU-SILC. Table 1 also shows that on average in the EU, the large majority of partners are in employment. Interaction terms allow us to distinguish the impact of women's employment status on the probability of having a second child by education and partner employment status.

By observing determinants of second childbirth before the event potentially occurs, we can reduce the risk of obtaining biased estimation results due to endogeneity. However, using time lags cannot completely rule out inverse causality; women may take account of future childbearing plans when choosing their labour market situation. To increase the control for endogeneity, we apply an instrumental variable (IV) approach[6] implemented with a bivariate probit model estimated using full information maximum likelihood. Regional unemployment rates (matched with our individuals using NUTS-2 codes)[7] are used as instruments for women's employment status, as they are found to be much more closely associated with women's labour market situations than with their fertility behaviour (Greulich et al., 2016).

All models are run with year and country fixed effects. This allows us to capture the effects of country-specific unobserved characteristics and focus solely on within-country variations. The country fixed effects are then randomized and the impacts of some selected country-specific variables are specified in multi-level models.[8] We analyse how the probability of having a second child is correlated with different family policies and how the correlation between second birth probabilities and family policies differs with the mother's labour market status.

(6) More technical details about the IV approach used in this study can be found in Greulich et al. (2016).

(7) NUTS-2 codes are taken from the Classification of Territorial Units for Statistics, a geocode standard developed by the European Union for referencing the subdivisions of countries. In January 2015, the NUTS classification listed 276 regions at NUTS 2.

(8) More details about the multi-level modelling technique can be found in Greulich et al. (2016).

Table 1. Descriptive statistics: distribution of women and proportions of second childbirth

	Distribution of women (%)	Proportion of second childbirth per category (%)
Overall		9
Woman's employment status before (potential) conception of a second child		
Full-time employment	54	8
Part-time employment	15	10
Unemployment	9	7
Inactivity	18	9
Student	1	6
Military service	<1	13
Retirement	<1	4
Change: found job	1	12
Change: lost job	1	12
Change: full-time to part-time	<1	22
Change: part-time to full-time	<1	12
Other change in employment status	1	45
Partner information		
Partner's employment status before (potential) conception of a second child		
Partner in employment	72,5	10
Partner not in employment	7,5	8
Presence of partner and marital status		
No partner	20	4
Partner and married	62	9
Partner and not married	18	12
Both partners in employment	51	10
Woman's educational attainment		
Low education (ISCED 0-2)	23	6
Medium education (ISCED 3-4)	48	8
High education (ISCED 5+)	29	12
Woman's age		
17-24	6	10
25-34	44	15
35-45	50	3
Age of first child (years)		
0	11	4
1-2	21	20
3-6	24	13
7+	44	2
First child is female	49	8

Note: Weighted averages for 25 European countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Slovakia, Spain and Sweden.
Source: EU-SILC longitudinal sample, waves 2003 to 2011, women aged 17-45 who already have one child at the beginning of the observed period.

Three aggregated indicators drawn from the OECD Family Database (2011)[9] are used as macro institutional variables in the multilevel analysis. They represent the three main options for public policies to support families, namely leave schemes, childcare coverage and cash transfers to families (Thévenon, 2011; Thévenon and Gauthier, 2011). Table 2 gives a descriptive overview of these three variables by country.

Leave schemes are quantified by the maximum duration for which a mother can be on leave with employment protection. Childcare coverage is measured by the proportion of children under age 3 who are enrolled in formal care services, either home- or centre-based, and refers not only to public and publicly subsidized care but also to private formal childcare.[10] Cash benefits represent the transfers received by a couple with 2 children over a period of 3 years after

Table 2. Country-level policy variables used in multilevel models

	Childcare coverage (%)	Maximum length of leave (weeks)	Total cash transfers (conditioned earnings percentage)
Austria	10.94	112	34.62
Belgium	45.03	27	20.81
Bulgaria	14.63	63	–
Czech Republic	2.63	164	40.51
Denmark	65.66	50	21.94
Estonia	17.02	180	44.59
Finland	24.99	156	37.71
France	42.00	159	30.82
Greece	14.16	28	5.33
Hungary	9.03	108	65.49
Iceland	56.33	26	12.54
Ireland	29.03	62	17.46
Italy	25.76	47	22.92
Latvia	15.64	19	–
Lithuania	26.87	125	–
Luxembourg	38.39	40	34.04
Netherlands	54.94	29	11.50
Norway	47.33	57	30.81
Poland	9.06	174	16.00
Portugal	32.52	29	14.43
Slovakia	3.00	156	30.32
Slovenia	35.88	52	31.77
Spain	39.31	162	16.69
Sweden	46.66	84	24.86

Source: OECD Family Database (2011), variables observed for the year 2007.

(9) The multi-level models are only based on 24 (or sometimes 21 countries), as the OECD Family Database provides no information on policy measures for Cyprus or on cash transfers for Bulgaria, Latvia and Lithuania.

(10) Since there is no comparative data available on childcare supply, we use this indicator as a global measure of the total cross-national differences in formal childcare capacities.

the birth of a second child. This total is estimated as the sum of leave payments and family benefits, plus the household's tax savings in comparison to the tax burden of a childless household with the same earnings. Each partner is assumed to receive the average earnings. This indicator is expressed as a percentage of the net income for a childless family.

III. An overall positive effect of women's employment on the transition to second childbirth, reinforced by the level of childcare coverage

In the following, we present the core results of our regression analysis. Our models estimate the impact of labour market status on transition to second childbirth of women aged 17-45 who already have one child at the start of the observed period. Additional specifications and robustness checks are presented in Greulich et al (2016). They include a differentiation between full-time and part-time working, controls for wage income, analyses by region and fertility regime (high versus low) as well as IV-2SLS and IV-probit models.[11] The results in Table 3 are based on survey data only, while the models presented in Table 4 integrate aggregate-level information by country from the OECD Family Database.

Model 1 of Table 3 (column 1) analyses the effect of employment against all other possible situations, while Model 2 distinguishes between all possible alternative employment situations. Model 1 shows a significantly positive effect of employment on transition to second childbirth, after controlling for the existence of a partner, marital status, mother's age, age and sex of the first child, country and year fixed effects, and the number of person years.[12] This implies that within European countries, women in employment are more likely to have a second childbirth than women not in employment. The model further shows that partnered women who are not married are less likely to have a second child than married women. The sex of the first child has no significant effect on the probability of having a second child in any of the models.

Model 2 shows that unemployed women and students are significantly less likely to have a second child than women in employment. For the very small minority of women with a change in employment status during the observed

(11) For the IV-2SLS and IV-probit models, the first-stage equation assumes a linear function with an OLS estimation, which is guaranteed to produce first-stage residuals that are uncorrelated with fitted values and covariates. In these models, the error terms of the two equations appear to be uncorrelated, which suggests first, that employment status can be considered with limited risk as an exogenous factor, and second, that results from the simple probit estimation are valid.

(12) Converting the estimated probit coefficients into probabilities leads to the following quantification of estimation results (for women whose characteristics correspond to the reference category: partnered and married, aged 25-34 and having a first child that is male and aged one or two, Austria, year 2003): women without employment have a 26.7% probability of having a second child, versus 28.6% for employed women.

Table 3. Estimated coefficients of second childbirth for women aged 15-45 with one child. Probit regressions with robust standard errors, country fixed effects

	Model 1 Basic probit model		Model 2 Distinction between different labour market statuses		Model 3 Interaction with partner's employment status		Model 4 Interaction with education and control for partner's labour market status	
	estim. coeff.	t-stat.	estim. coeff.	t-stat.	estim. coeff.	t-stat.	estim. coeff.	t-stat.
Woman's employment status before (potential) conception of a second child								
Employed (full-time and part-time employment and self-employed)	0.06*	2.41	*Ref.*		– 0.04	– 0.76	– 0.01	– 0.38
Not employed	*Ref.*				*Ref.*		*Ref.*	
Unemployed			– 0.11*	– 2.47				
Inactive			– 0.04	– 1.51				
Student			– 0.29***	– 3.86				
Retired			– 0.15	– 0.67				
Military service			0.06	0.24				
Change: found job			0.18+	1.86				
Change: lost job			0.20+	1.82				
Change: from full-time to part-time			0.09	0.25				
Change: from part-time to full time			– 0.05	– 0.16				
Other change in employment status			0.13	0.84				
Woman's education								
Low education							0.016	0.36
Medium education (upper and post secondary)							*Ref.*	
Higher education (tertiary)							0.09+	1.77
Partner information								
No partner	– 0.48***	– 13.07	– 0.47***	– 12.87	– 0.34***	– 6.32	– 0.35***	– 6.52
Partnered and not married	– 0.06*	– 2.19	– 0.06*	– 2.15	– 0.06*	– 2.03	– 0.05*	– 1.72
Partner employed before (potential) conception of second child					0.08	1.50	0.12**	2.97
Interaction terms								
Employed with employed partner					0.11*	1.98		
Employed and low educated							– 0.05	– 0.78
Employed and high educated							0.15**	2.73

Table 3 (cont'd). Estimated coefficients of second childbirth for women aged 15-45 with one child. Probit regressions with robust standard errors, country fixed effects

	Model 1 Basic probit model		Model 2 Distinction between different labour market statuses		Model 3 Interaction with partner's employment status		Model 4 Interaction with education and control for partner's labour market status	
	estim. coeff.	t-stat.	estim. coeff.	t-stat.	estim. coeff.	t-stat.	estim. coeff.	t-stat.
Woman's age								
17-24	0.03	0.79	0.05	1.17	0.03	0.81	0.09**	2.23
25-34	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
35-45	– 0.57***	– 19.20	– 0.57***	– 19.23	– 0.57***	– 19.17	– 0.59***	– 19.81
Age of first child (years)								
0	– 0.86***	– 20.75	– 0.87***	– 20.66	– 0.87***	– 20.77	– 0.88***	– 20.92
1-2	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
3-6	– 0.16***	– 5.89	– 0.15***	– 5.78	– 0.16***	– 5.86	– 0.13***	– 4.78
7+	– 0.78***	– 22.27	– 0.78***	– 22.19	– 0.78***	– 22.13	– 0.72***	– 20.00
First child is female	– 0.003	– 0.15	– 0.003	– 0.13	– 0.002	– 0.13	– 0.004	– 0.18
Intercept		– 6.00	– 0.58***	– 5.60	– 0.70***	– 6.21	– 0.76***	– 6.77
Year fixed effects	Yes		Yes		Yes		Yes	
Country fixed effects	Yes		Yes		Yes		Yes	
Test of joint significance								
p (employed if partner employed)(a)						0.005		
p (partner employed if employed)						0.0001		
p (employed if low educated)								0.25
p (employed if high educated)								0.003
Pseudo R^2		0.17		0.17		0.17		0.18
Number of observations	35,401							
Number of events	2,972							

(a) test H0: β_1(employed) + β_2(interaction) = 0.
Significance levels: + p < 0.1, * p < 0.05, ** p < 0.01, *** p < 0.001.
Note: 25 European countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Slovakia, Spain and Sweden.
Source: EU-SILC longitudinal sample (covering years 2003 to 2011).

Table 4. Estimated coefficients of second childbirth for women aged 15-45 with one child. Bi-probit and multi-level regressions

	Model 5 Bi-probit model with regional unemployment rates as instrument for women's labour market status				Model 6 Multi-level model with control for family policies		Model 7 Multi-level model -interaction with childcare coverage	
	Dep. var.: 2nd childbirth		Dep. var.: employment					
	estim. coeff.	*t*-stat.	estim. coeff.	*t*-stat.	estim. coeff.	*t*-stat.	estim. coeff.	*t*-stat.
Woman's employment status before (potential) conception of a second child								
Employed	0.65***	0.09			0.09+	0.05	0.10+	0.06
Woman's education								
Low education			– 0.52***	– 0.02				
Medium education (upper and post secondary)			*Ref.*					
High education (tertiary)			0.46***	0.02				
Partner information								
No partner	– 0.45***	– 0.04	0.05*	0.02	– 0.73***	– 0.11	– 0.79***	– 0.09
Partner and not married	– 0.07*	– 0.03	0.06**	0.02	– 0.15**	– 0.05	– 0.14***	– 0.03
Partner is employed before (potential) conception of a second child					0.34***	0.09	0.25**	0.08
Contextual variables								
Regional unemployment rate			– 0.04***	– 0.003				
Childcare coverage (children aged 0-2)					0.02**	0.005	0.02***	0.003
Maximum length of leave					0.001	0.002		
Total cash (3 years)					0.001	0.006		
Interaction terms:								
Stable employment * childcare coverage (ages 0-2)							0.007*	0.003

Table 4 (cont'd). Estimated coefficients of second childbirth for women aged 15-45 with one child. Bi-probit and multi-level regressions

	Model 5 Bi-probit model with regional unemployment rates as instrument for women's labour market status				Model 6 Multi-level model with control for family policies		Model 7 Multi-level model -interaction with childcare coverage	
	Dep. var.: 2nd childbirth		Dep. var.: employment					
	estim. coeff.	*t*-stat.	estim. coeff.	*t*-stat.	estim. coeff.	*t*-stat.	estim. coeff.	*t*-stat.
Woman's age:								
17-24	0.22***	0.05	– 0.60***	– 0.03	0.07	0.07	0.07	0.07
25-34	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
35-45	– 0.58***	– 0.03	0.10***	0.02	– 1.09***	– 0.06	– 1.10***	– 0.08
Age of first child:								
0	– 0.91***	– 0.04	0.34***	0.03	– 1.69***	– 0.08	– 1.67***	– 0.11
1-2	*Ref.*		*Ref.*		*Ref.*		*Ref.*	
3-6	– 0.22***	– 0.03	0.45***	0.02	– 0.24***	– 0.05	– 0.24*	– 0.11
7+	– 0.86***	– 0.04	0.75***	0.02	– 1.66***	– 0.07	– 1.58***	– 0.15
First child is female	– 0.002	– 0.02	– 0.0166	– 0.02	0.005	0.04	0.003	0.03
Intercept	– 0.91***	– 0.11	0.13	0.08	– 2.83***	– 0.08	– 2.94***	– 0.07
Year fixed effects	Yes		Yes		Yes		Yes	
Country fixed effects	Yes		Yes		No		No	
Random effects:								
Variance of the intercept					0.10***		0.13***	
Variance of 'Employed'							0.04*	
Pseudo R^2					0.17		0.18	
Athrho	– 0.40***							
Number of observations	35,401				31,300		34,691	
Number of countries	25				21		24	

Significance levels: + p<0.1, * p<0.05, ** p<0.01, *** p<0.001.
Note: 25 European countries: Austria, Belgium, Bulgaria, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, the Netherlands, Norway, Poland, Portugal, Slovenia, Slovakia, Spain and Sweden.
Source: EU-SILC longitudinal sample (covering years 2003 to 2011); OECD Family Database, 2007.

three-month period, we see that women finding a job during this period are more likely to have a second child in the following year than those who are in employment over the whole three months-period. Even though women in unemployment over the observed period have a lower probability of having a second child, we find that job loss actually has a positive impact. This paradox might be partly explained by the fact that within this very small group of women who lost their jobs during the three observed months, some may have already anticipated the conception of a second child, whereas others may take the opportunity to conceive a second child.

Model 3 takes the partner's employment status into account, as well as its interaction with women's employment status. For women with a partner who is not in employment, being in employment themselves is insignificant for having a second child (estimated coefficient: –0.04). However, the effect of being in employment is significantly positive for women who have an employed partner. For this group, the estimated coefficient of employment is positive (–0.04 + 0.08 + 0.11 = +0.15), with a joint confidence level of 99% (*p*-value of 0.005 presented in the last rows of the table). The effect of having a partner in employment is important for second childbirth, and even more so for women who are themselves in employment (0.08 + 0.11= 0.19).

Dual employment thus seems to favour the transition to a second child more strongly than when the partners have different labour market statuses (except for the very small group of women mentioned before who lost their jobs during the three observed months). For women, having a partner who is employed is a fundamental determinant for having a second child, but at the same time their own labour market integration after first childbirth also favours second childbirth. Women's labour market status is less important for a second childbirth if the partner is not in employment. Having a partner in employment thus appears to be the main determinant for having a second child. Once this condition is fulfilled, employment for women increases the chance of family enlargement. Dual-earner couples are more likely to have a second child than couples in which only the man is in employment; they may have a more secure economic situation that facilitates family enlargement.

Model 4 tests how the impact of women's employment on second childbirth differs across education groups. The difference in the probability of second childbirth between employed and non-employed women is not significant among low-educated and medium-educated women (estimated coefficient for the impact of employment on the probability of second childbirth: –0.01 for medium-educated and –0.06 for low-educated women, (–0.01 – 0.05 = –0.06). The impact of employment is found to be significantly positive for high-educated women, however (–0.01 + 0.15 = 0.14). It seems that for highly educated women, receiving a return on their educational investment after the birth of a first child is important for family enlargement. At the same time, being high educated relative to being medium educated has a significantly positive effect on second

childbirth, especially for those women who are in employment (0.09 + 0.15 = 0.24), which most likely reflects a positive income effect.

In all four models, we include all women with a first child, while controlling for the age of the first child observed for the year preceding the potential year of second childbirth. All estimated models show that women whose first child is aged one or two are significantly more likely to have a second child than all other women. Women whose first child is aged below 1 in the year preceding the year of potential second childbirth have the lowest probability of second childbirth.

Table 4 shows the results of the models containing contextual variables. First of all, Model 5 shows the results of a bi-probit model which reduces endogeneity between labour market participation and fertility behaviour using regional unemployment rates as instruments. Model 5 shows results for fertility (column 1) and employment (column 2), estimated simultaneously. This robustness check confirms the main results of the simple probit models, namely an average positive effect of employment on the probability of having a second child for all women, all education levels combined.(13)

Models 6 and 7 present the results of the multi-level analysis including family-policy indicators. Model 6 shows that women's employment is confirmed to have a positive impact on the probability of having a second child when controlled for childcare coverage, length of parental leave and cash transfers. The policy variable that displays a significant and positive effect on second childbirth is childcare coverage, while no significant effect is found for length of leave schemes and total cash transfers.

The positive effect of childcare and the relative inefficiency of leave duration and cash transfers for encouraging second childbirth show that reconciliation issues play a crucial role for family enlargement. The possibility of combining work and family life appears as a key determinant for the decision in favour of a second child, whereas the opportunity to stop working for a relatively long period does not seem to have such a positive effect.

Model 7 tests for a differentiated effect of childcare coverage on the probability of second childbirth according to women being in employment or not. This model also tells us how the positive individual effect on fertility of being in employment may be strengthened or weakened by the country's level of childcare coverage. The interaction term between the individual variable *employment* and the macro-level variable *childcare coverage* displays a positive and significant coefficient, showing that the positive effect of employment on the probability of having a second child is reinforced by childcare development. This positive interaction also means that the positive effect of childcare development on second childbirth is stronger for women who are in employment

(13) This effect becomes smaller and non-significant when education is added among the regressors (Greulich et al., 2016). Education is omitted in the core specifications presented in this paper due to its strong correlation with employment.

than for those who do not work. Thus, being in employment (at the individual level) and the development of formal childcare (at the macro level) both have a positive impact on the probability of having a second child and this is even more true when these two features are combined.

Conclusion

This article studies the links between women's employment and second births in contemporary Europe. By covering the majority of European countries, observing partner characteristics and controlling for family policy settings, the paper provides an important piece of comparative research in this field. So far, to our knowledge, there have been no comprehensive analyses of fertility determinants at the microeconomic level which focus on employment status in a large-scale comparative perspective.

By mobilizing the longitudinal sample of the European Union's Statistics of Income and Living Conditions (EU-SILC, covering waves 2003 to 2011), we find evidence of a positive association between women's employment and second childbirth within European countries. The magnitude of the effect differs, however, among individuals. The positive association is stronger for highly educated women and for women with partners who are themselves in employment. For women without a partner or with a partner who is not working, their own employment status seems to be less important for having a second child, as having a partner in employment is found to be crucial for the decision to have another child. Once this condition is fulfilled, women who are themselves in employment are more likely to have a second child than women not in employment. Multilevel models reveal, in addition, that the positive effect of employment on the transition to second childbirth is reinforced in countries with high childcare coverage. The development of childcare at the country level seems to increase the individual probability for women of having a second child, whereas other types of institutional support such as leave schemes or lump-sum cash transfers have a lesser effect.

The positive interaction between childcare development at the country level and employment at the individual level suggests that reconciliation issues are at the core of fertility choices. Being integrated into the job market after the birth of a first child emerges as a crucial determinant for family enlargement. This concerns the woman as well as her partner. Dual-earner couples are found to be more likely to have a second child than couples with other employment configurations. Our results suggest that these couples are most successful in generating the financial security needed to have an additional child. Following this logic, policies which succeed in encouraging both parental employment and fertility are not only those which invest in childcare facilities but also those which secure employment and wage income.

Finally, it is important to mention that even though the use of EU-SILC carries several advantages in comparison to more demographic surveys (large country coverage, control for partner characteristics, detailed employment information), our study also has several limitations. As EU-SILC is not designed for demographic analysis, measures of fertility behaviour are liable to be biased, mainly because fertility is linked to attrition in the longitudinal sample. In addition, important individual determinants of fertility, besides socio-economic characteristics, such as health, quality of the partner relationship, norms and values, are not observed. However, our focus on second childbirth allows us to circumvent some of these issues, at least to a certain extent; as the women in our sample already have one child, we implicitly control for general sterility and a "dislike" of children. We are also less exposed to attrition, as couples with children are more likely to be followed up in SILC than singles and childless couples. Greulich and Dasré (2017) find that for the majority of countries covered by EU-SILC, under-reporting of second childbirth is negligible in comparison to unbiased measures from the Human Fertility Database. They also find no evidence for significant socioeconomic differences in attrition.(14)

We acknowledge, however, that the focus on second childbirth carries the risk of obtaining transition rates that are biased by selection effects, as we only look at individuals that already displayed some family orientation in the past (as they already have a first child). However, if this was the case, one may expect women's employment to no longer have a significant effect on the likelihood of having a second child. Our results suggest the opposite: on average, being in employment remains an important criterion for deciding to have an additional child, even among women who, by the previous decision to have a first child, have demonstrated a certain family affinity.

Nevertheless, including other child parities in the analysis may be a fruitful research avenue, as it would allow us to substantiate conclusions about the impact of female employment on aggregate levels of fertility. The macro-economic framework also deserves to be expanded, for example by considering labour market institutions and their interplay with economic fluctuations. This seems particularly important in view of the recent economic crisis. Finally, and in connection with this point, further research is needed to accurately trace individual long-term employment stability.

(14) Greulich and Dasré (2017) show that SILC underestimates the probability of first childbirth for women aged 20-30 due to attrition, but higher order births are well reported for all ages in SILC. First childbirth may coincide with a household split, i.e., women moving away from their parents' household to set up their own household. As these women are not likely to be the principal survey respondents, they may drop out of the survey once they have moved. SILC is more successful in following up moving households if the whole household moves, which is why the attrition problem is much lower for a higher order birth.

Acknowledgements: This research was funded by the World Bank as a background paper for the "What's Next in Aging Europe? Aging with Growth in Central Europe and the Baltics" and "Golden Aging: Prospects for Healthy, Active and Prosperous Aging in Europe and Central Asia" reports. The paper has benefited greatly from comments by Emily Sinnot, Ana Maria Munoz Boudet, Aurélien Dasré, Letizia Mencarini, Francesco Billari, Josh Goldstein, Trude Lappegard, Zsolt Spéder, Michael Rendall, Hippolyte d'Albis, Uwe Sunde, Elena Stancanelli, Benoît Rappoport, David Margolis and three anonymous referees.

Data used: European Commission, Eurostat, cross-section 2011 and longitudinal EU-SILC for the years 2003-2011 and OECD Family Database 2011. The World Bank Group, Eurostat and OECD have no responsibility for the authors' results and conclusions. The views expressed in this paper are the sole responsibility of the authors and do not represent the views of the World Bank Group, Eurostat, the OECD or its member countries.

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Angela Greulich, Mathilde Guergoat-Larivière, Olivier Thévenon • **Employment and Second Childbirths in Europe**

This article studies the effects of women's employment on second births in contemporary Europe. By mobilizing longitudinal data from the European Union's Statistics of Income and Living conditions (EU-SILC) and aggregated data from the OECD Family Database, we find evidence that being in employment significantly increases women's probability of second childbirth. The magnitude of the effect differs, however, among individuals. The positive impact is stronger for highly educated women and for women with partners who are themselves in employment. Dual employment thus favours family enlargement from one to two children more strongly than other employment configurations within the couple. Multilevel models also reveal that the positive effect of employment on the transition to second childbirth is reinforced in countries with high childcare coverage. The development of childcare at the country level – the most effective family policy to secure women's employment – increases the individual probability for women of having a second child, whereas other types of institutional support such as leave schemes or lump-sum cash transfers do not have such a positive effect.

Angela Greulich, Mathilde Guergoat-Larivière, Olivier Thévenon • **Emploi et deuxième naissance en Europe**

Cet article étudie les effets de l'emploi des femmes sur les deuxièmes naissances dans l'Europe contemporaine. En utilisant des données longitudinales issues des Statistiques communautaires sur le revenu et les conditions de vie (EU-SILC) de 2003 à 2011, et des données agrégées provenant de la base de données de l'OCDE sur la famille, nous identifions des éléments démontrant que l'exercice d'un emploi augmente significativement la probabilité d'une deuxième naissance chez les femmes. L'ampleur de l'effet diffère toutefois selon les individus. L'effet positif est plus marqué chez les femmes les plus instruites et celles dont le conjoint occupe lui-même un emploi. Le fait que les deux conjoints travaillent favorise donc davantage l'agrandissement de la famille d'un à deux enfants que d'autres configurations. Les modèles multiniveaux révèlent en outre que l'effet positif de l'emploi sur la transition vers une deuxième naissance est plus net dans les pays où l'offre de services de garde d'enfants est importante. L'essor de ces services à l'échelle d'un pays, qui constitue la mesure de politique familiale la plus efficace pour garantir la participation des femmes à la vie active, augmente la probabilité individuelle qu'une femme ait un deuxième enfant, ce qui est moins vrai pour d'autres types d'aides institutionnelles (systèmes de congés parentaux, allocations forfaitaires, etc.).

Angela Greulich, Mathilde Guergoat-Larivière, Olivier Thévenon • **Empleo y segundos nacimientos en Europa**

Este artículo estudia los efectos del empleo femenino sobre los segundos nacimientos en la Europa contemporánea. Se utilizan datos longitudinales procedentes de las Estadísticas comunitarias sobre la renta y las condiciones de vida (EU-SILC) de 2003 a 2011, y datos agregados procedentes de la base de datos de l'OCDE sobre la familia, para mostrar que el ejercicio de un empleo aumenta significativamente la probabilidad de un segundo nacimiento. Sin embargo, la magnitud del efecto difiere según las características individuales y de la pareja. El efecto es más fuerte en las mujeres más instruidas y en aquellas cuyo cónyuge tiene también un empleo. El hecho de que los dos cónyuges trabajen favorece pues la llegada de un segundo hijo más que cualquier otra configuración. Los modelos multi-nivel muestran además que el efecto positivo del empleo es más elevado en los países donde la oferta de servicios de guardería y cuidado de niños es importante. El desarrollo de dichos servicios a la escala de un país – la medida de política familiar más eficaz para garantizar la participación de las mujeres a la vida activa – aumenta pues la probabilidad individual de que una mujer tenga un segundo hijo, lo cual es menos cierto para otro tipo de medidas institucionales (sistemas de permisos, de subsidios…)

Keywords: low fertility, female employment, work-life balance, Europe, family enlargement