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Economic and Institutional Context and Second Births in Seven European Countries

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Abstract

The extent to which mothers progress to a second child varies greatly between European countries. Although both institutional and economic context are believed to be partly responsible for these differences, available research on economic conditions and fertility mostly focuses on first births and studies on family policy and fertility have hitherto insufficiently addressed population heterogeneity. Combining longitudinal microdata from the Harmonized Histories with contextual data on labour market uncertainty and family policy, this paper uses discrete-time hazard models to analyse the impact of economic and institutional context on second birth hazards of 22298 women in 7 European countries between 1970 and 2002. Particular attention is paid to variation in the contextual effects by level of education. We find that aggregate-level unemployment and temporary employment reduce second birth hazards, particularly for low and medium level educated women. Family policies are positively related to second birth hazards. Whereas family allowances stimulate second births particularly among low educated mothers, the positive effect of childcare is invariant by level of education.

1. Introduction

Fertility levels are considered too low by the majority of governments in developed countries (UNPD 2011). The emergence of low fertility in Europe has been mainly driven by declining cohort fertility at higher parities rather than increasing levels of childlessness (Germany being an exception) ([Billari and Kohler 2004](#); [Sobotka 2008](#)). Fertility differences between countries in the 2000s are largely determined by differences in second births (Van Bavel and Rozanska-Putek 2010) with lowest-low fertility countries, mostly in Southern and Central and Eastern Europe, showing low second birth rates (Human Fertility Database 2012). Although some indications have been found for sub-replacement fertility ideals in Europe ([Goldstein et al. 2003](#)), most research finds that the two-child norm persists ([Sobotka and Beaujouan 2014](#)). However, actual and intended fertility levels mostly fall short of ideal fertility ([Testa 2007](#)). This fertility gap is potentially related to unfavourable economic and institutional conditions.

Throughout the 20th century economic recessions have raised interest in the effect of economic context on fertility. The Great Depression of the 1930s, the oil shocks of the 1970s and the economic recessions in Central and Eastern Europe following the turn to a market economy have all entailed research on economic determinants of childbearing. The recent economic recession starting in 2008 adds to this long-standing interest ([Sobotka et al. 2011](#); [Kreyenfeld et al. 2012](#); [Goldstein et al. 2013](#)). A large body of research has addressed the relation between economic context and first births and mostly reveals pro-cyclical fertility patterns ([Neels et al. 2013](#); [Neels and Wood 2013](#); [Mills et al. 2011](#); [Sobotka et al. 2011](#); [Wood et al. 2015](#); [Kamran and Goldstein 2010](#)). Although some research also shows a negative association between adverse economic conditions and second births, this body of literature is more limited ([Sobotka et al. 2011](#); [Adsera 2011](#)). As a result, this article assesses the effect of aggregate-level labour market uncertainty on second births in seven European countries. In addition, we consider variation of this effect by level of education.

Whereas economic uncertainty is frequently identified as one of the factors driving postponement of first births ([Sobotka et al. 2011](#); [Mills et al. 2011](#)), entry into parenthood at older ages and subsequent childbearing is increasingly associated with supportive policy for

parents ([Gauthier 2002](#); [Neels and Wood 2013](#)). Literature reviews by [Gauthier \(2007\)](#), Neyer and Andersson (2008), and Luci and Thévenon (2012), however, find that the (positive) correlation between the availability of various family policies and fertility outcomes is small which may be due to the fact that available research has hitherto failed to address population heterogeneity in assessing family policy effects. This study considers the effects of the availability of childcare and family allowances on second births in seven European countries, and investigates whether policy effects are differentiated by level of education.

2. Theoretical background

In order to provide a coherent theoretical framework regarding the economic constraints to second births on the one hand, and stimulating effects of family policies on the other, this section first considers classic economic theories of fertility ([Becker and Lewis 1973](#); [Becker 1991](#); [Cigno 1991](#)). These theories conceptualize children as costly but desired goods and consider childbearing decisions as rational actions based on costs and benefits within the household production model. Economic theory distinguishes between an *income* effect on the one hand and the effect of *opportunity costs* on the other ([Becker 1991](#)). As income rises, the demand for children grows. However, higher income can also be used to improve the quality of children rather than having another child ([Becker and Lewis, 1973](#)). As child-related (opportunity) costs rise, the demand for children declines. Both labour market uncertainty and family policy are expected to impact second births through income and opportunity costs. In addition to the impact of contextual factors on income and opportunity costs, we also expect effects on second births non-economic factors such as social anomie related to labour market uncertainty and perceived societal support as a result of family policies.

2.1 Labour markets

Labour market uncertainty can affect second births in several ways. First, uncertain labour markets may cause *deprivation of both income and human capital*. Whereas persistently low income does not necessarily hamper fertility as low income groups may be less inclined to

invest in quality of children, changes or threats to income are more likely to affect fertility behaviour ([Kravdal 2002](#)). Various labour market characteristics potentially entail deprivation of income or human capital which in turn may impact second births. Job-loss entails forgone earnings and labour force experience, but also increases the risk of future unemployment ([Adsera 2004](#)). Especially long-term unemployment causes considerable income and skill deprivation (Bell and Blanchflower 2009; [Özcan et al. 2010](#); [Adsera 2011](#)). Temporary employment may also reduce second birth hazards as temporarily hired workers earn less than their permanently hired peers ([Adsera 2011](#); [Polavieja 2005](#)) and receive less formal training and other benefits (paid vacation, paid sick leaves, unemployment insurance, pension schemes,...). Hence high unemployment, long-term unemployment, and large shares of temporary contracts may hamper second births as a result of income and human capital deprivation of women and their partners.

Second, labour market conditions may influence second births by altering *opportunity costs*. High unemployment may cause increased job demands and workloads which decrease the time available outside the labour force. This elevates the opportunity cost of non-market activities like child-rearing. For mothers who become unemployed, however, opportunity costs may decline, entailing counter-cyclical fertility ([Vikat 2004](#)). [Adsera \(2004\)](#) claims that – although an unemployment spell may be regarded as a cheap time for childbearing – an extended withdrawal from employment may also result in fewer future labour market opportunities. A prerequisite for counter-cyclical second births is furthermore that the household income can deal with additional child-related costs, which depends on the financial position of the household members, financial reserves, but also on the availability and level of benefits received. Although unfavourable labour market positions may thus affect opportunity costs in different ways, the persistence of high unemployment levels in Europe since the 1980s for both men and women suggests that the long-term negative consequences of withdrawal from the labour force should not be neglected ([Adsera 2004](#)).

In addition to the impact of labour market conditions on income and opportunity costs, unfavourable labour market conditions may increase perceived *uncertainty* (Anderson and

Pontusson, 2007), which in turn potentially delays childbearing decisions (Kohler et al. 2002; Kravdal 2002; Blossfeld et al. 2005; Kreyenfeld 2009; Sobotka et al. 2011). As a result, mothers may postpone births, even when individual labour market positions are not affected (Ermisch 1988; Neels 2010; Sobotka et al. 2011). Kravdal (2002) - investigating the effects of unemployment at the individual- and aggregate-level - finds that negative aggregate-level unemployment effects persist after controlling for individual-level employment status. This may reflect a sense of uncertainty about future income and labour market opportunities, or the expectation that penalties in terms of forgone earnings and opportunities for a temporary exit from the labour market for child-rearing intensify in uncertain labour markets (Adsera 2004). However, the concept of uncertainty is not limited to future income and opportunities as economic downturns have been shown to induce anomie, social pathology, social isolation and (mental) health problems (Durkheim 1960; Tausig and Fenwick 1999). Hence, labour market uncertainty may also entail lower second births hazards through non-economic pathways.

2.2 Family policy

We identify three mechanisms through which family policies can relate to second births. First, family policies (e.g. family allowances) can reduce the *direct monetary costs* of raising children through financial stimuli (Cigno 1986; Adsera 2004; Luci and Thévenon 2012). This may stimulate progression to a second birth.

Second, whereas family allowances in the first place are financial stimuli, family policies such as childcare provisions can lower *opportunity costs* by facilitating the work-family combination (Rindfuss and Brewster 1996; Andersson et al. 2003; Rindfuss et al. 2007). The degree to which mothers use childcare depends on whether childcare is available, affordable, of sufficient quality, and culturally accepted (Fagnani 2002; Andersson et al. 2003; Mills et al. 2011). In contexts without sufficient or sufficiently flexible day care (e.g. Germany (Kreyenfeld and Hank 2000)), affordable day care (e.g. UK (Viitanen 2005)) or contexts in which the use of day care is not culturally accepted (e.g. Southern Europe (Del Boca 2002; Baizan 2009), Eastern Europe (Neels and Theunynck 2012a; Neels and Theunynck 2012b)) mothers may

1 have to rely on informal care arrangements (e.g. grandparents) or exit the labour market.
2
3 Opting out of the labour market may jeopardize future labour market opportunities and the
4
5 household income ([Adsera 2011](#)).
6

7 Third, extended family policy provisions create a sense of societal support toward families
8
9 (Neyer and Andersson 2008). If mothers feel that society provides little support to them,
10
11 continued childbearing may be postponed until they have reached sufficient certainty by
12
13 themselves.
14

15 16 17 2.3 Education

18
19 Women's education is an important determinant of fertility ([Becker 1991](#); Liefbroer and Corijn
20
21 1999; Lappegård and Ronsen 2005; Neels and De Wachter 2010; Wood et al. 2014). High
22
23 education generally leads to higher earnings, entailing a positive income effect. However,
24
25 extensive labour market opportunities for highly educated women increase opportunity costs
26
27 of engaging in nonmarket activities, in turn negatively affecting fertility (Neels and De Wachter
28
29 2010). Given that the aforementioned effects of labour market uncertainty and family policies
30
31 on second birth hazards largely operate through income and opportunity costs, the effects of
32
33 such contextual factors are expected to vary by educational group.
34
35

36
37 We distinguish two key differences between educational groups with respect to the
38
39 influence of labour market uncertainty and family policy on second birth hazards. First, women
40
41 with different levels of education search for jobs in different *segments of the labour market*
42
43 (Adsera 2011) and particularly low educated individuals and their partners are affected by
44
45 economic downturns ([Verick 2009](#)). Highly educated women witness more labour market
46
47 opportunities, strongly emphasise their role in the labour force as a means for self-realisation
48
49 (Friedman et al. 1994), and tend to invest in long-term career tracks which pay off later in life
50
51 through higher earnings and a relatively stable labour market position (Liefbroer and Corijn
52
53 1999; Lappegård 2002; [Kravdal 2007](#)). This career-path encourages highly educated women
54
55 to postpone motherhood until a stable labour market position is attained (Kreyenfeld and
56
57 Andersson 2013). As highly educated women are likely to postpone parenthood until a stable
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labour market position is attained, highly educated women and their partners may have become less vulnerable to economic downturns by the time they consider having a second child (Lappegård 2002; [Adsera 2011](#); [Neels et al. 2013](#)).

Second, the association between family policies and second births may also vary between educational groups, depending on the type of family policy considered. Given that low educated households have lower earnings and display lower child-related spending, extra *financial stimuli* through family allowances may impact second birth hazards more strongly in this group (Gauthier and Hatzius 1997). In case of means-tested family allowances (e.g. Spain from 1999 (Gauthier and Tézli 2010)) highly educated households are less likely to benefit from these allowances in the first place (UNECE 2012). The reverse situation is found for family policies that aim to facilitate the combination of work and family. Highly educated women show more positive attitudes towards childcare and return to work more often and more swiftly after the entry into motherhood (Dex et al. 1998; Gutiérrez-Domènech 2005; Köppen 2006; Neyer and Andersson 2008; De Wachter and Neels 2011; Neels and Theunynck 2012a; Neels and Theunynck 2012b). Available literature indicates that uptake of childcare is higher among highly educated households (Ghysels and Van Lancker 2009) and stronger effects of childcare on second births are found for this group (Van Bavel and Rozanska-Putek 2010).

2.4 Selection effects

Women who have entered the risk set for second births may be a non-random selection of women ([Adsera 2011](#)). Assuming that the decision to progress to a second birth depends on the strength of childbearing intentions on the one hand, and income and opportunity costs of childbearing on the other, the group of women who have had a first child are expected to be selective. First, we expect that women with one child have stronger childbearing intentions compared to women who have not (yet) had a first child. Second, the fact that a first child is born signals that the preconditions (e.g. in terms of income or opportunity costs) for having a first child were fulfilled. To the extent that these preconditions also positively affect the progression to second births the risk set for second births is selective.

This selection into the risk set may occur differently across educational groups. First, available literature indicates that opportunity costs of childbearing are highest for highly educated women. Particularly in contexts where childrearing and continued labour force participation are difficult to combine, this may result in the selection of family prone women into motherhood (Kreyenfeld 2002). Second, as a stable labour market position and work-family compatibility are important preconditions to parenthood among highly educated women, the first birth is likely to signal a stable labour market and income position (Liefbroer and Corijn 1999). In contrast, due to fewer labour market opportunities, low educated mothers may be more likely to have a child as an alternative to labour force participation (Friedman et al. 1994). As low educated mothers exit the labour market more often, the probability of having second child may depend on the financial feasibility of supporting a second child while remaining out of the labour market, or on labour market re-entry (Köppen 2006; Neyer and Andersson 2008; Neels and Theunynck 2012a).

3. Research questions

Based on the theoretical considerations just described, we formulate two research questions. The first research question considers the effect of labour market uncertainty on second birth hazards and whether this effect varies by level of education. In line with the majority of previous studies, we expect that the negative effect of unemployment on second births through lower income, fewer labour market opportunities, and higher perceived uncertainty outweighs the positive effect of time spent out of the labour force becoming cheaper (hypothesis 1). We also expect that second birth hazards are lower in contexts where long-term unemployment is more prevalent as longer unemployment spells lead to greater human capital deprivation and higher future unemployment risks (hypothesis 2). In addition, we expect that contexts with a high share of temporary contracts are characterized by lower second birth hazards due to lower income, fewer labour market opportunities, and higher uncertainty (hypothesis 3). With respect to differences by level of education, negative effects of labour market uncertainty are assumed

to be strongest for low educated mothers as this group is typically situated in less stable labour market positions ([Verick 2009](#); [Adsera 2011](#)) (hypothesis 4).

The second research question considers the effect of family policies on second birth hazards, and whether the effects of family policy vary by level of education. We expect family allowances to have a positive effect on second birth hazards due to the financial stimulus they provide. Similarly, childcare is expected to have a positive effect due to an easier combination of work and family life. In addition both policies are expected to yield a sense of societal support for families with children (hypothesis 5). With respect to differences by level of education, we expect the effect of family allowances to be stronger for low educated mothers since the relative importance of a fixed amount of money is higher in this group and low educated mothers are more likely to be eligible to means-tested benefits (hypothesis 6). Conversely, we expect the effect of childcare to be stronger for highly educated mothers as they are more likely to use childcare (Ghysels and Van Lancker 2009) (hypothesis 7).

4. Data and Methods

4.1 Individual-level data

This study uses microdata from the Harmonized Histories provided by the non-marital childbearing network ([Perelli-Harris et al. 2010](#)). The non-marital childbearing network has cleaned and standardized surveys for 20 countries. In addition to cross-sectional characteristics, the Harmonized Histories include retrospective information on family formation which enables cross-national analyses of fertility over time. We use the Harmonized Histories for seven European countries. For Belgium, Germanyⁱ, France, and Norway Generations and Gender Survey (GGS) data are included. The Harmonized Histories also include Dutch Fertility and Family Survey data, Spanish Fertility Survey data and British Household Panel Survey data. Hence the data result from different surveys conducted at different points in time (Belgium: 2008-2010, Germany: 2005, France: 2005, Norway: 2007-2008, Netherlands: 2003,

Spain: 2006, UK: 2005-2006). The selection of countries is based on the availability of longitudinal aggregate-level data on labour market uncertainty and family policy.

Vergauwen and colleagues (2015) – comparing fertility indicators calculated using GGS fertility histories to population statistics – indicate that GGS-based period indicators are fairly accurate from the 1970s onwards. However, total fertility rates for Germany fail to approximate population statistics. In a contribution dealing with the validity of fertility data in the German GGS, Kreyenfeld and colleagues (2013) find that the misrepresentation of the number of children is mainly due to an overestimation of childlessness for older cohorts and an underestimation of childlessness for younger cohorts. In contrast to trends in childlessness, progression ratios to a second birth based on the GGS provide a better approximation of the German micro census (Kreyenfeld et al. 2013). We used GGS design weights for France and Germany since available literature shows that fertility data from the GGS in France and Germany more closely approximate population or census statistics when weighted (Kreyenfeld et al. 2013; [Vergauwen et al. 2015](#)). To our knowledge fertility histories for the Dutch Fertility and Family Survey, the Spanish Fertility Survey and the British Household Panel Survey data have not been compared to vital statistics or census data.

After selecting women aged 15 to 49 who were at risk of a second child between 1970 and 2002, the sample size was reduced from 74,561 respondents to 22,298 one-child mothersⁱⁱ. The mean age at first birth (which is entry in the risk set for second births) is 25.6. About 70 per cent of the sample has a second birth in the observation period.

4.2 Macro-level data

This study combines the longitudinal microdata from the Harmonized Histories with contextual information on *labour markets* from the Organization for Economic Co-operation and Development (OECD, 2010). First, we included unemployment rate, calculated as the number of unemployed persons as a percentage of the civilian labour force. Available literature shows that the pathways through which economic cycles affect fertility are better identified using unemployment than more general economic indicators like GDP ([Sobotka et al. 2011](#)).

Second, using OECD data on unemployment by duration, we included the share of unemployment lasting one year or longer as a measure of long-term unemployment. Third, using OECD data on permanent versus temporary employment, we included the share of temporary contracts in total employment as a measure for precarious employment. Since we expect economic conditions to affect second birth hazards for both men and women, the measures for unemployment, long-term unemployment, and temporary employment all refer to the total active population. Results for corresponding gender-specific indicators yield similar results (results not shown).

Time series on *family policies* were provided by the Comparative Family Policy Database (Gauthier 2010) and by Luci and Thévenon (2012). First, we included the amount of the monthly family allowance for a second child. Since allowances tend to depend on household composition, these series are based on the assumption of a three-child family. Time series of family allowances for other household types are not available. We used monthly family allowances for a second child as a per cent of monthly earnings by dividing family allowances by monthly earnings of a production worker, as recommended in the Comparative Family Policy Database documentation (Gauthier 2010; Gauthier and Tézli 2010). Second, we included enrolment of children younger than 3 in formal childcare as a per cent of the population aged under 3. These data series were collected by Luci and Thévenon (2012) from various sources and linear/proximal interpolation was applied in case of missing data (Luci and Thévenon 2012). Whereas previous studies have linked longitudinal micro-data on family formation to cross-sectional data on family policies (e.g. Van Bavel and Rozanska-Putek 2010), this study includes longitudinal policy indicators which reduces measurement error as second birth hazards are linked to the economic and institutional circumstances effectively prevailing at the time.

4.3 Method

All the aforementioned aggregate-level indicators were included as predictors of second birth hazards in a discrete-time event history model. A one-yearⁱⁱⁱ time lag was used since conception

typically occurs nine months before childbirth. An additional lag of 3 months is justified as there is a lag between birth decisions and conceptions, but also because it takes some time for people to adjust their behaviour to contextual changes. We used a complementary log-log link function which means that the exponentiated coefficients can be interpreted as hazard ratios. Person-year data were generated so that women become at risk of a second birth after having a first birth. Censoring occurs when women reach age 50 or at the time of the survey. This analyses uses 146,600 person-years on 22,298 women. Whereas the analyses on the effects of unemployment consider second births between 1970 and 2002, models including long-term unemployment (1984-2002), temporary contracts (1984-2002)^{iv}, family allowances (1973-2002), and childcare enrolment (1990-2002) consider shorter timeframes due to limited data availability. Aggregate-level indicators of labour market uncertainty and family policy were included in the event history models as follows. First, we estimated the effect of unemployment rates on second birth hazards (1970-2002). Subsequently, we assessed the effect of long-term unemployment and temporary contracts (1984-2002) controlling for variation in unemployment rates. In order to assess the effect of family policy, we first included family allowances (1970-2002), and subsequently estimated the effect of childcare enrolment controlling for family allowances (1990-2002).

Apart from considering the effects of contextual factors on second birth hazards (model a), this article focusses on varying effects by education (model b). Subsequently, sensitivity analyses assessing variation in the contextual effects by duration since first birth (model c), and by education and duration since first birth (model d) were performed. Education-specific, duration-specific, or education- and duration-specific effects were included into the models as main effects. Hence these group-specific effects are absolute effects (not deviations from a main effect) and significance tests show whether the exponentiated group-specific effects differ significantly from unity (i.e. no effect).

Apart from the aforementioned aggregate-level indicators, we included following covariates (equation 1): (i) country, (ii) year, (iii) duration since first birth, (iv) education, (v) age at first birth, and (vi) duration since entry into the current union.

We allow for differences between the seven *countries* by including dummy variables (CNTRY_{li}). In addition, the models include a linear *calendar time* variable (YEAR_i) to control for long-term trends in second birth hazards. This effect is allowed to vary across the seven countries (YEAR_i*CNTRY_{li}). *Duration since first birth* is modelled using dummies (first year, second year, third year, fourth year, fifth year) (DUR_{ki}) in addition to a linear duration parameter (DUR_i). This allows for a closer approximation of observed second birth schedules compared to polynomial specifications. Baseline hazard functions are allowed to vary across countries (DUR_{ki}*CNTRY_{li} and DUR_i*CNTRY_{li}). The *educational* variable (EDU_{ki}) distinguishes three levels of education based on the international standard classification of education (ISCED): i) low (ISCED levels 0 to 2), ii) medium (ISCED levels 3 and 4) and iii) high (ISCED levels 5 and 6). The analyses include education at the time of the survey as a time-constant variable as the Harmonized Histories do not provide complete educational histories^v. The models allow the effect of education to vary across countries (EDU_{ki}*CNTRY_{li}). *Age at first birth* (AGEATFIRST_i) is included as a quadratic effect and differential effects are allowed by education (AGEATFIRST_i*EDU_{ki} interaction). We included *duration since entry into the current union* (UNION_{ki}) in five categories: i) not in a union or less than one year, and subsequently ii) 1-5 years, iii) 6-10 years, iv) 11-15 years, v) 16 years or more since the start of the current union.

Equation (1)

$$\begin{aligned} \ln[-\ln(1-h_{2nd})] = & \beta_0 + \sum_{k=1}^5 \beta_{ki} DUR_{ki} + \beta_i DUR_i + \sum_{l=1}^7 \beta_{li} CNTRY_{li} + \sum_{k=1}^5 \sum_{l=1}^7 \beta_{kli} DUR_{ki} * CNTRY_{li} + \sum_{l=1}^7 \beta_{li} CNTRY_{li} * DUR_i \\ & + \sum_{k=1}^3 \beta_{ki} EDU_{ki} + \sum_{k=1}^3 \sum_{l=1}^7 \beta_{kli} EDU_{ki} * CNTRY_{li} + \beta_i AGEATFIRST_i + \beta_i AGEATFIRST_i^2 + \\ & + \sum_{k=1}^3 \beta_{ki} EDU_{ki} AGEATFIRST_i + \sum_{k=1}^3 \beta_{ki} EDU_{ki} * AGEATFIRST_i^2 + \sum_{k=1}^5 \beta_{ki} UNION_{ki} + \beta_i YEAR_i \\ & + \sum_{l=1}^7 \beta_{li} YEAR_i * CNTRY_{li} \end{aligned}$$

NOTE: Subscripts 'k' and 'l' refer to dummy variables representing a categorical indicator. Subscript 'i' refers to the unit of analysis (person-years).

Since the sample of women at risk of having a second birth is likely to be selective in several respects (see section 2) we performed additional robustness checks. First, we estimated shared-frailty models to assess whether the effects of labour market uncertainty and family policy on second births change when controlling for selection into the risk set (Kravdal 2001;

Wienke 2003; 2010). As the results of these models are approximately identical (results available on request), we present the simpler discrete-time hazard models. Second, we estimated all models excluding Germany as the quality of retrospective fertility histories in the German GGS has been suggested to be poor (Kreyenfeld et al. 2013; [Vergauwen et al. 2015](#)). Also these models did not alter the main findings of the paper (results are available upon request).

5. Results

5.1 Variation in second birth hazards, labour market uncertainty, and family policy

The first panel of figure 1 illustrates *second birth hazards* for the European countries considered. We show three-year moving averages (average second birth hazards in years $t-1$, t , and $t+1$) to smoothen the series. The Netherlands, Norway, and the UK consistently show high second birth hazards compared to the other countries, whereas Germany is consistently characterised by low second birth hazards. Belgium and France show intermediate second birth hazards. Finally, Spain displays higher than average second birth hazards in the early 1970s, which decline to resemble second birth hazards in Belgium and France during the 1980s, and approximate low German second birth hazards in the 1990s and 2000s.

Spain witnessed the highest *unemployment* from the 1980s onward, whereas Norway generally shows the lowest unemployment levels throughout the observation period (figure 1, panel 2). Unemployment in Europe was particularly high in the mid-1980s and mid-1990s, but towards the beginning of the 21st century unemployment declined in all countries. The share of *long-term unemployment* (figure 1, panel 3) varies greatly between the different countries. Whereas short durations of unemployment (e.g. Norway) may signal frictional unemployment, longer durations (Belgium, Spain, France) may indicate structural unemployment. Belgium displays the highest proportion of unemployment lasting for at least one year. Spain holds a remarkable position with respect to the *temporary character of employment* (figure 1, panel 4) with the share of temporary contracts being much higher than is the case in the other countries where the share of temporary contracts is typically limited between 5 to 10 per cent. For Spain

the sharp rise in temporary contracts reflects the fact that the labour market was made more flexible as an attempt to control unemployment (McDonald 2006; [Adsera 2011](#); [Polavieja 2005](#)).

While Spain displays unfavourable labour market conditions, it is also characterized by relatively limited family policies. Belgium, France, and Norway in more recent time periods, show the highest amount of *family allowances* relative to wages whereas Spain by far shows the lowest amount (figure 1, panel 5). Great Britain and Germany on the other hand show low *childcare* enrolment, whereas France, Belgium, and Norway consistently show high enrolment rates (figure 1, panel 6). Spain and the Netherlands witnessed rather low childcare enrolment up to the mid-1990s, but enrolment increased sharply during the late 1990s.

FIGURE 1 ABOUT HERE

5.2 Effects of economic and institutional context on second births

In order to provide a succinct discussion of the findings, two tables are presented. Table 1 displays the effects of i) duration since first birth, ii) age at first birth, iii) duration since entry into the current union and iv) year. Subsequently, Table 2 shows the effects the aggregate-level unemployment rate, labour market uncertainty and family policy on second birth hazards, controlling for all covariates discussed in section 4.3.

The effect of duration since first birth on second birth hazards in table 1 reflects the effect for Norway. Due to space limitations, differential effects of duration since first birth by country are not shown. The significantly negative quadratic effect of age at first birth indicates that second birth hazards are lower among women who had a first birth at a relatively young or old age. The effects of union duration indicate that women who have entered a union one to five years earlier are most likely to experience a second birth. Varying effects of calendar time by country indicate that Spain is the only country displaying a negative effect of calendar time whereas other countries show positive effects or no effect (UK).

Table 2 presents the effects of interest. The column “Unemployment” summarizes the results concerning the impact of unemployment on second birth hazards. The effect of unemployment (model a) is significantly negative, lowering second birth hazards by $((1-.985)*100)$ 1.5 per cent for every per cent increase in unemployment rate. A ten per cent difference in unemployment rate – which is routinely observed in the countries considered – entails a $((1-.985^{10})*100)$ 14 per cent decrease in second birth hazards. Allowing the effect of unemployment to vary by education (model b) indicates that lower educated women are more sensitive to unemployment, and yields a significant model improvement (Δ -2LL: 6.3, Δ df: 2, p: .04). For highly educated women no significant effect of unemployment is found. The inclusion of varying effects by duration since first birth (model c) also yields a significant model improvement (Δ -2LL: 44.88, Δ df: 2, p: .00). The strong negative effect of unemployment on second birth hazards for short durations since first birth indicates that high unemployment hampers short birth spells. Finally, allowing the duration-specific effects of unemployment to vary between educational levels (model d) also results in a significant improvement in model fit (Δ -2LL: 21.88, Δ df: 6, p: .00). All three educational groups exhibit lower second birth hazards within the first three years since first birth in response to higher unemployment rates. However, the effect is strongest for low educated mothers and this group also seems to be affected by unemployment during the fourth and fifth year since first birth.

Subsequently we assessed the effect of long-term unemployment controlling for unemployment rates. No significant effect is found (model a). Also the interactions between long-term unemployment and education (model b) (Δ -2LL: 0.84, Δ df: 2, p: .83) or duration since first birth (model c) (Δ -2LL: 0.64, Δ df: 2, p: .63) do not yield a significant model improvement. Allowing duration-specific effects to vary by education (model d) does significantly improve the model (Δ -2LL: 12.58, Δ df: 6, p: .05), but no significant effects on second birth hazards are found.

Besides (long-term) unemployment we also investigated the relation between second births and temporary employment. Controlling for unemployment rates, the share of temporary contracts in total employment seems negatively related to second birth hazards (model a),

although the effect is not significant. The interaction between temporary employment and education does not significantly improve model fit (model b) (Δ -2LL: 4.5, Δ df: 2, p : .10). However, temporary employment only seems to affect second birth hazards negatively among women with medium levels of education whereas low and especially highly educated women show no significant relation. The inclusion of duration-specific effects (model c) significantly improves the model (Δ -2LL: 11.76, Δ df: 2, p : .00) and shows that second birth hazards in the first five years after the first birth are negatively associated with the share of temporary employment. This negative effect is only significant for the fourth and fifth year since first birth. Finally, allowing these duration-specific effects to vary by level of education (model d) significantly improves the model (Δ -2LL: 15.12, Δ df: 6, p : .01) and indicates that the negative effects of precarious employment on second birth hazards within the first 5 years after the first birth only hold for low and medium level educated mothers.

Second birth hazards seem positively related to family allowances (model a). A 10 per cent increase in the ratio of family allowances to earnings is associated with a 45.2 per cent increase in second birth hazards. Allowing variation in the effect by education (model 1b) significantly improves the model (Δ -2LL: 5.2 Δ df: 2, p : .07) and indicates that low educated mothers are most sensitive to family allowances for the second child. The effect of family allowances is not significant for highly educated women. Including interactions between family allowances and duration since first birth (model c) does not improve the model fit (Δ -2LL: 2.88 Δ df: 2, p : .23). Education- and duration- specific effects of family allowances on second birth hazards indicate positive associations for all groups. However this relation is strongest for low educated women (Δ -2LL: 20.4 Δ df: 6, p : .00), whereas other educational groups exhibit less convincing positive effects of family allowances.

Childcare enrolment is also positively related to second birth hazards (model a). However the effect is not significant. The inclusion of the interaction between childcare and education does not significantly improve the model (Δ -2LL: .36 Δ df: 2, p : .83) and all educational groups show insignificant positive effects of childcare on second birth hazards (model b). Interacting the effect of childcare with the duration since first birth reveals a positive effect of childcare on

second birth hazards in the first three years after the birth of the first child. This inclusion yields a significant model improvement (Δ -2LL: 7.6 Δ df: 2, p: .02). Allowing these duration-specific effects of childcare to vary by level of education indicates that the positive effect of childcare on short birth spells is weakest among medium level educated women (Δ -2LL: 12.8 Δ df: 6, p: .04).

TABLES 1-2 ABOUT HERE

6. Conclusions

The extent to which mothers progress to a second child varies greatly between European countries (Human Fertility Database 2012). This paper relates these differences to labour market uncertainty and family policy. Although periods of labour market uncertainty (high unemployment, high long-term unemployment, high shares of temporary employment) may yield a cheap time for childbearing as opportunity costs are low, this paper indicates that the negative effects of labour market uncertainty on fertility through lower income, fewer career advancements, and higher insecurity outweigh the lower cost of time ([Adsera 2011](#); [Macunovich 1996](#)). We find a negative relation between aggregate-level unemployment and second birth hazards (hypothesis 1). This conclusion of pro-cyclical birth hazards is in line with previous findings ([Adsera 2011](#); [Neels et al. 2013](#); [Sobotka et al. 2011](#)). Unexpectedly, only weak relations between long-term unemployment or temporary employment and second birth hazards are found (hypotheses 2-3) ([Adsera 2011](#)). In addition, this paper focuses on two very different family policies: family allowances and childcare. Results indicate that family allowances relate positively to second births, and that childcare elevates second birth hazards in the first three years after the first birth (hypothesis 5). These positive effects suggest positive impacts through financial stimuli (e.g. family allowances), lower opportunity costs (childcare), and a sense of societal support towards continued childbearing ([Luci and Thévenon 2012](#); [Andersson et al. 2003](#)).

The foremost contribution of this study is the assessment of educational differences in the relation between economic and institutional context and second births. Widespread economic theories of fertility assign an important role to women's level of education ([Becker 1991](#); [Cigno 1991](#); [Neels and De Wachter 2010](#); [Liefbroer and Corijn 1999](#); [Lappegård and Ronsen 2005](#)). The impact of education on fertility is assumed to be channelled through higher income on the one hand and higher opportunity costs on the other, which are in turn factors depending on the aggregate-level economic and institutional context. Available literature, assessing the relation between female education and fertility cross-nationally, concludes that the effect of education on second births is context-dependent (e.g. [Wood et al. 2014](#)). However, research has hitherto not sufficiently addressed population heterogeneity in assessing the effects of labour market uncertainty and family policy on second births ([Gauthier 2007](#); [Neyer and Andersson 2008](#); [Sobotka et al. 2011](#)).

Results show that especially low educated women postpone second births in response to high unemployment rates (hypothesis 4). Low educated women are more likely to witness financial difficulties connected to second children in contexts with high unemployment and are positioned in less favourable segments of the labour market ([Verick 2009](#)). Similarly, the negative effect of temporary employment on second birth hazards is greatest for low and medium level educated mothers. In line with our hypotheses (hypothesis 6) the positive effect of family allowances on second births is stronger for low educated women. This finding suggests that insufficient resources to manage the progression to a second child can be overcome by family allowances for this educational group. In contrast to the educational gradient in the effect of cash benefits, this study assumed that childcare provisions matter most for highly educated mothers as they are more likely to combine work and childrearing ([Dex et al. 1998](#); [Ghysels and Van Lancker 2009](#); [Gutiérrez-Domènech 2005](#)) (hypothesis 7). However, this article finds that enrolment in childcare is equally positively related to second birth hazards for low and highly educated mothers.

In sum, this study finds that second births are hampered by unfavourable labour market conditions while extensive family policy facilitates the transition to second births. Hence

differences in second births between Belgium, Germany, Spain, France, the UK, the Netherlands, and Norway are associated with cross-national differences in the economic and institutional setup. High labour market uncertainties in Spain, combined with ill-developed family policies hamper the progression to a second child, whereas lower labour market uncertainty as witnessed in Norway or Germany, and better developed family policies for instance in Norway, Belgium, and France stimulate the progression to a second child. Hence we identify labour market policies and family policies as important pathways to facilitate parity progression in Western European countries, which in turn constitutes an important determinant of future welfare state sustainability. In addition, this study has shown that the link between contextual factors and individual-level fertility behaviour is likely to depend on the educational group considered. Hence we encourage further research to acknowledge population heterogeneity in the contextual effects on fertility as this pathway may enhance our understanding of cross-national variation in the educational gradient of fertility (e.g. [Wood et al. 2014](#)).

The foremost limitation of this study is that the microdata does not include individual-level indicators of labour market uncertainty. Similarly, no information is provided on previous receipt of family allowances or use of childcare for the first birth. Hence inferences on the impact of individual-level economic conditions or use of family policy lies beyond the scope of this contribution. Second, due to the lack of partner information in the microdata, conclusions on how labour market uncertainty and family policy influence fertility through household dynamics cannot be made. We identify both limitations as fruitful avenues for future research.

7. Endnotes

- i. For Germany only individuals living in West Germany at the time of the survey are used in the analyses. Aggregate-level indicators refer to West Germany before 1990, and to reunified Germany thereafter.
- ii. 1,947 Belgian, 2,387 German, 4,229 Spanish, 2,933 French, 3,843 British, 2,755 Dutch, and 4,204 Norwegian women are included in the sample.

- iii. Analyses using two- and three-year time lags entail similar results, whereas analyses using longer time lags show weakening relations between contextual indicators and second birth hazards.
- iv. For Norway, data on temporary employment is not available prior to 1996.
- v. For example, the GGS questions “What is the highest level of education you have successfully completed?” and “In what month and year did you reach that level?” do not provide sufficient information to determine whether an individual was continuously enrolled in education up to the date of the highest educational attainment.

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Figure 1: 2nd birth hazards, Economic and institutional factors, 7 European countries

Sources: HH, OECD (2010), Comparative Family Policy Database(2010), Luci and Thévenon (2012), calculations by authors

Table 1: Exponentiated coefficients (hazard ratios) from complementary log-log models of second births, women aged 15-49, EU7, 1970-2002

	Model a		Model b		Model c		Model d	
	<i>e(b)</i>	<i>sig.</i>	<i>e(b)</i>	<i>sig.</i>	<i>e(b)</i>	<i>sig.</i>	<i>e(b)</i>	<i>sig.</i>
<i>Individual-level covariates</i>								
Duration since first birth by country ¹								
. <i>linear</i>	.808	***	.808	***	.808	***	.808	***
. <i>1st year</i>	.014	***	.014	***	.016	***	.016	***
. <i>2nd year</i>	.100	***	.100	***	.111	***	.110	***
. <i>3rd year</i>	.559	***	.559	***	.620	***	.615	***
. <i>4th year</i>	.919		.919		.947		.936	
. <i>5th year</i>	1.058		1.058		1.091		1.079	
Age at previous birth								
. <i>linear</i>	1.037		1.035		1.038		1.037	
. <i>square</i>	.998	***	.998	***	.998	***	.998	***
Age at previous birth by education								
. <i>linear mid</i>	1.167	***	1.168	***	1.167	***	1.168	***
. <i>linear high</i>	1.339	***	1.328	***	1.338	***	1.332	***
. <i>square mid</i>	.997	***	.997	***	.997	***	.997	***
. <i>square high</i>	.995	***	.995	***	.995	***	.995	***
Duration since current union (<i>never/less than 1 year is reference</i>)								
. <i>1-5 years</i>	2.257	***	2.268	***	2.254	***	2.276	***
. <i>6-10 years</i>	2.166	***	2.158	***	2.174	***	2.159	***
. <i>11-15 years</i>	1.415	***	1.394	***	1.412	***	1.393	***
. <i>≥16 years</i>	.794	***	.817	***	.791	***	.819	***
<i>Macro-level covariates</i>								
Year by country								
. <i>year BE</i>	1.007	**	1.006	**	1.007	**	1.008	**
. <i>year FR</i>	1.013	***	1.013	***	1.013	***	1.005	***
. <i>year DE</i>	1.017	***	1.016	***	1.017	***	1.016	***
. <i>year NL</i>	1.010	***	1.010	***	1.010	***	1.007	***
. <i>year NO</i>	1.008	***	1.008	***	1.008	***	1.007	***
. <i>year ES</i>	.989	***	.990	***	.988	***	.996	***
. <i>year UK</i>	.999		.999		1.000		.997	
Unemployment	See table 2		.		.		.	
Unemployment by education	.		See table 2		.		.	
Unemployment by duration since first birth	.		.		See table 2		.	
Unemployment by education and duration	.		.		.		See table 2	
<i>Model fit</i>								
Person-periods	146600		146600		146600		146600	
-2LL	80550.66		80544.36		80505.78		80483.90	
Df.	81		83		83		89	

Controlling for country, education, education*country

¹: The baseline hazard function for Norway is shown, differential effects for other countries are not shown

Source: HH & OECD (2010), calculations by authors

Significance levels: $p < .100$ (*), $p < .050$ (**), $p < .010$ (***)

Indicator	Unemployment (1970-2002)		Long-term unemployment ¹ (1984-2002)		Temporary employment ¹ (1984-2002)		Family allowances (1973-2002)		Childcare enrolment ² (1990-2002)	
	e(b)	sig.	e(b)	sig.	e(b)	sig.	e(b)	sig.	e(b)	sig.
Main effect (model a)										
. main	.985	***	.999		.989		1.038	***	1.004	
	Model fit									
-2LL	80550.66		49403.36		42807.60		74220.56		34361.62	
Df.	81		82		82		81		82	
By education (model b)										
. low	.979	***	.996		.991		1.070	***	1.004	
. mid	.988	**	.999		.981	*	1.025	*	1.002	
. high	.993		1.000		1.001		1.023		1.004	
	Model fit									
-2LL	80544.36		49402.52		42803.10		74215.36		34361.26	
Df.	83		84		84		83		84	
By duration since first birth (model c)										
. year 1-3	.969	***	.999		.988		1.033	**	1.009	*
. year 4-5	.991	**	1.001		.977	**	1.025	*	1.000	
. year 6+	1.001		.997		1.003		1.063	***	1.000	
	Model fit									
-2LL	80505.78		49402.72		42795.84		74217.68		34354.02	
Df.	83		84		84		83		84	
By duration since first birth and education (model d)										
. year 1-3 low	.962	***	.996		.987		1.063	***	1.010	*
. year 4-5 low	.981	***	.997		.974	**	1.042	**	1.000	
. year 6+ low	.999		.996		1.007		1.105	***	1.004	
. year 1-3 mid	.972	***	.999		.979	*	1.016		1.008	
. year 4-5 mid	.996		1.001		.968	***	1.017		.999	
. year 6+ mid	1.006		.998		.997		1.048	**	.999	
. year 1-3 high	.979	***	1.000		1.003		1.027		1.011	**
. year 4-5 high	1.006		1.002		.996		1.017		1.001	
. year 6+ high	1.002		.996		1.010		1.025		.994	
	Model fit									
-2LL	80483.90		49390.14		42780.72		74197.28		34341.22	
Df.	89		90		90		89		90	

Controlling for country, education, education*country, duration since first birth, duration since first birth*country, age at first birth, age at first birth*education, duration since current union, year, year*country

1: Controlling for unemployment rate

2: Controlling for family allowances

Source: HH, OECD (2010), Comparative Family Policy Database (2010), Luci and Thévenon (2012), calculations by authors

Significance levels: $p < .100$ (*), $p < .050$ (**), $p < .010$ (***)