Educational differentials in having a second child in Europe before and after the Great Recession

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Background

In the past decades, there has been a considerable variation in fertility across European countries and subnational regions that has received scholarly attention (e.g. Frejka and Sobotka 2008). In low fertility context, focusing on differences in the progression to a second child is also a way to understand factors of cross-country variation of fertility. Educational attainment is widely used as an explanatory variable to analyse opportunities and constraints of childbearing (Vasireddy et al. 2023), to address the cost of staying away from labour market as predicted by microeconomic theory. Comparative studies have shown that the relationship between fertility and education in Europe is diverse and varies based on individual and contextual factors (e.g. Klesment et al. 2014; Sobotka et al. 2017; Nisén et al. 2021). Since the great recession of 2007–2008, there has been a decline in period fertility in countries that generally were associated with higher levels of fertility, while less educated have experienced more substantial decline in fertility (Hellstrand et al. 2021). Some studies have reported narrowing of educational differentials and growing homogeneity of family size (see in Vasireddy et al. 2023). Advancement in theories about low fertility has recently put more focus on the growing uncertainty (Vignoli et al. 2020), which may have a different influence on various socio-economic groups. It is, therefore, reasonable to ask whether the educational gradient in fertility has changed in the post-recession period as compared with what was observed prior to that.

Aims, questions, and hypotheses

In this paper, we expand upon and improve our previous analysis of 29 European countries that estimated cross-country and regional differences in the educational gradient of second birth up to year 2010 (Klesment et al. 2014). We address the following questions and issues:

1. Compared with the previous period, how has the educational gradient changed after the great recession? Given the more recent findings about narrowing educational differentials in fertility, we expect that there is a change from the U-shaped educational gradient in second births towards a flatter but positive gradient. This would be consistent with declining fertility rates among the lower educated. A more positive gradient would offer support to arguments about the growing economic uncertainty in the post-recession period, which, being negatively associated with educational attainment, positions more educated individuals in a less vulnerable situation.
2. In either of the periods under the study, are differences by educational attainment in transition rates of second birth more likely observed due to the difference in the timing of childbirth or due to the quantum? In the previous paper, we did not directly address

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this, although it was suggested that in some regions, the positive educational gradient was due to considerably shorter intervals also referred to as time-squeeze. Thus, higher rates do not necessarily mean higher proportion of women becoming a mother of two. As an improvement, in this paper we address the timing/quantum issue by applying a mixture cure model (Bremhorst et al. 2016). Similar to the previous point, we expect that higher educational attainment has become more positively related with the hazard of second birth, while lower education has a positive effect on the 'cured' proportion, i.e. increasing the proportion of those who are unlikely to experience the event at all.

3. Leaning on different theoretical frameworks of contemporary fertility such as microeconomic, SDT, and gender revolution theory, it is expected that cross-country fertility differentials can partly be explained by contextual factors. We ask whether international differences in educational disparities in the progression to a second child are correlated with various contextual variables. The latter include indices about the levels of economic uncertainty (CPI and consumer confidence), employment, gender inequality and childcare enrolment.

Data and methods

The data come from the European Survey of Income and Living Conditions – EU-SILC. The survey applies a standard questionnaire resulting in harmonised data across countries. However, it is not designed for event history analysis as the data include neither total number of children ever had nor fertility history. Nevertheless, several studies have demonstrated its applicability for fertility analysis before (Klesment et al. 2014; d'Albis et al. 2017). As previously, we apply the own-child technique that links co-resident children to their mothers in the same household. In order to minimise errors in the procedure, some assumptions and age limitations suggested by others are necessary (Bordone et al. 2009).

Based on the combined longitudinal EU-SILC data from 2014–2020, our study sample covers 27 countries. Considering only women who had their first child after year 1999, we analyse 71,368 women who had 44,695 second births between 2000 and 2019. Pre- and post-recession periods are differentiated by the time the mothers under observation had their first child (alternatively, we also experiment with a time-varying dummy variable). Respectively, there are 24,808 and 19,887 events in total during the two periods.

We apply different methods. First, in order to test overall educational gradient differences between the pre- and post-recession period, we fit a discrete-time event history model with fixed country effects. Alternatively, we also experiment with random effects model, but we are aware of its limitations when applied to a relatively small number of countries.

Second, to address the timing/quantum issue in hazard models, we apply a mixture cure model. This specifies two sub-models: one for the incidence of having a second child and the other for the hazard of birth. These results help understanding how educational levels are associated with the quantum and tempo dimensions that cannot be separated in the transition rate model.

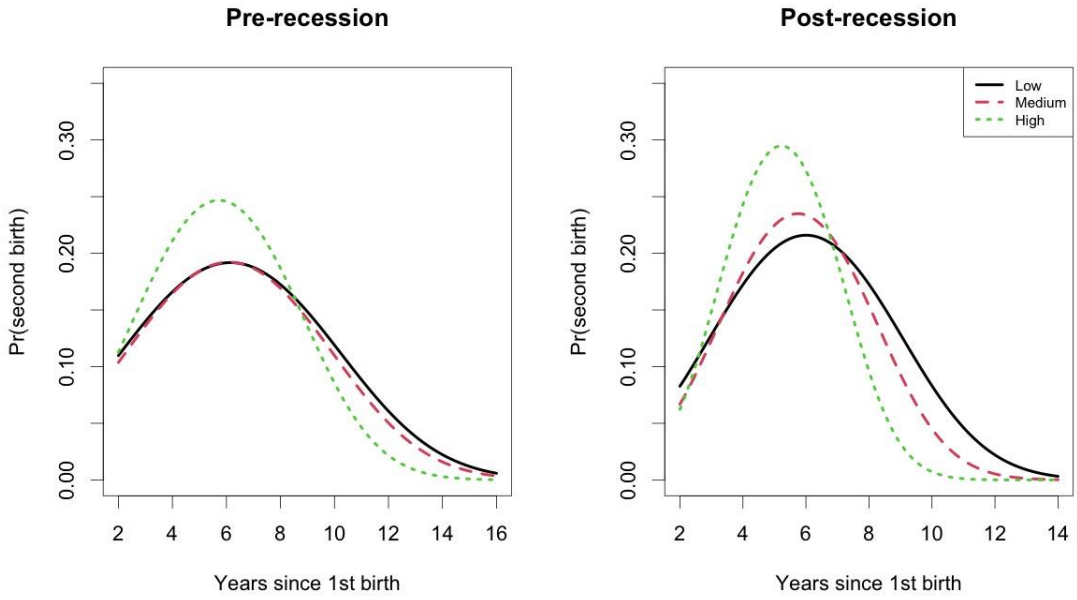
Finally, we want to incorporate contextual variables to understand how they associate with educational gradient of second birth. Assessing correlation with contextual variables is done using meta-regression techniques. In the first step, we fit a discrete-time event history model for each country in both time periods. The estimates for educational attainment are used to compute their average marginal effect (AME) in each country/period. In the second step, AME-

s are used in a meta-regression which includes contextual variables for each country/period combination as explanatory terms.

Preliminary results

Unlike in our previous paper, there is less evidence of a U-shaped pattern in the educational gradient of second births. In the model that is fitted for all countries simultaneously, highly educated women remain to have the highest risk of second birth, while the low educated are not distinguishable from the medium educated in neither pre- nor -post-recession period. An interaction with the duration variable indicates that in the post-recession period the low educated have a lower likelihood of having a second child (or it takes more time for them) even when compared with the medium educated (Figure 1).

Figure 1 Model predicted probability of second birth by education and time period



We apply the mixture cure model separately to the two periods being compared. The results (Table 1) indicate that there is a positive educational gradient for the incidence of second birth in both periods (highly educated are less 'immune' to second birth, while the low educated are more likely to remain with one child). The second sub-model indicates that the hazard of birth is relatively higher (i.e. the time to event is relatively shorter) for the low and highly educated in the pre-recession period compared with the medium educated. In the post-recession period, these timing differences do not any more appear as statistically significant. This suggests that there are relatively more women among the lower and medium educated, who will remain with one child, and this is not offset by them not having to account for the time-squeeze like the highly educated.

Table 1 Mixture cure model of transition to second birth by time period

	Pre-recession		Post-recession	
Cure fraction				
Low education	0.202***	(3.47)	0.367**	(3.12)
Higher education	-0.544***	(-7.72)	-0.889***	(-6.83)
Scale				
Low education	0.0516**	(2.86)	0.0271	(1.29)
Higher education	0.0405*	(2.21)	0.0348	(1.85)
Shape	0.260***	(39.45)	0.323***	(45.85)
N	26,601		29,419	
t statistics in parentheses				

Note: Control variables not shown but included in both the incidence and timing models are partner's educational level, age at first birth, mother's birth cohort, country, and year.
* p<0.05 ** p<0.01 *** p<0.001

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