

The changing relationship of employment and women's fertility in the post-recession years

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The aim of this paper is to investigate whether the relationship between fertility and women's employment has changed over time, and especially so during the post-recession years in Norway. The point of departure is a puzzling decline in fertility since 2010 where the fertility level has dropped from 1.9 to 1.40 in 2023 in Norway. Although the fertility drop began in the years following the Great recession in 2008, it is not given that this economic crisis is the only or main cause for the decline in fertility. The economy and the labor market has remained comparatively stable in Norway throughout the following decade. Additionally, the generous family policies for families with young children in Norway were maintained or even expanded. At the same time, at the individual level, employment and income are fundamental to people's lives and the changing role of women's employment on fertility could be a key factor in understanding the downward trend in fertility level in Norway.

Economic uncertainty has been suggested as one reason for the fertility decline, although difficult to empirically confirm (OECD, 2023). People may experience economic uncertainty in different ways, linking it to their own situation or their perceptions of the economic situation they are embedded in either locally or globally. If people's perceptions of economic uncertainty are growing more negative, their employment situation could be a stronger predictor of fertility.

To test this, we will explore the effect of full-time employment, part-time employment or not being employed on fertility, and see whether this effect has changed over time. More specifically, we ask whether full-time employment has become more important for the transition to motherhood and higher parities in Norway. Furthermore, we will investigate whether the effect of full-time employment varies between women with different educational attainment. We will achieve this by using high-quality register data with information about fertility, employment, and educational attainment spanning across almost three decades (1993-2020). To account for the possibility that the birth process and the employment process could be jointly determined, we apply joint modelling of hazard models for different birth transitions and employment.

Theoretical considerations

The relationship between employment and fertility is interrelated and complex. This implies that one should account for unobserved characteristics that both affect employment and fertility, such as unobserved preferences for work and family. We apply statistical methods allowing for controls of unobserved time-constant characteristics.

The employment – fertility argument. Traditionally, increased female employment was associated with lower fertility. The negative effect of women's employment on fertility is, according to microeconomic theory, a result of increasing opportunity costs of a childbirth for women (Becker, 1991). The assumption is that childbearing is subject to a rational decision based on calculating the costs and benefits of children, income constraints of the family as well as individual preferences. The utility of having a child is weighed against the costs, which include both direct costs and indirect costs, or so-called opportunity costs, related to the time needed to take care of the child. The birth of a child entails a withdrawal from the labor market, which varies strongly between countries, as the availability of childcare and parental leave policies differ, but in all countries the opportunity costs are related to such withdrawal.

First, forgone income during the period in question suggests that women in employment have larger opportunity costs than women outside the labor market. Second, lost, or reduced accumulation of skills and knowledge (human capital) during a period out of the labor market may reduce future earnings. Third, as it requires time to become a productive worker, there is a positive association between wages and work experience. This implies that the opportunity costs of a periodical withdrawal from the labor market vary over time in a woman's occupational career. Following the microeconomic theory, the opportunity costs (the price effect) pool in the direction of women's employment hampering childbearing, and thus predict lower birth intensities among employed women than among non-employed women.

However, new research indicates that opportunity cost varies across institutional settings (Matysiak & Vignoli, 2008). In Norway, parents receive generous income compensation when taking parental leave after birth (Ellingsæter, 2007), which implies that the opportunity costs of employment is lower in this context than in others. That said, other aspects of opportunity costs such as loss of human capital and labor market experience, and a potential reduction of future earnings, may still be present. The opportunity costs do not only vary across institutional settings, but also between different socioeconomic groups. Traditionally, there has been a notion that highly educated women have higher opportunity costs than lower educated women (Esping-Andersen & Billari, 2015). This builds on an assumption that mothers are the sole caregivers of children, and that motherhood and paid employment are incompatible (Jalovaara et al., 2019). Nowadays, this is not always the case. As several aspects may modify the opportunity costs such as the value of available childcare, parental leave regulations and partner's engagement in childcare, highly educated women may have lower opportunity costs than less educated (Kravdal & Rindfuss, 2008). New insights from the Nordic countries showing lower levels of childlessness among the highly educated supports such a view (Jalovaara et al., 2019).

Fertility — employment arguments. It should be noted that in the same way as employment may influence childbearing, childbearing might influence a woman's employment status. Arguments for this relationship revolve around the fact that having a child might reduce the

benefits of having a job, for example because motherhood might lead to a penalty in wage rates (Aassve et al., 2006).

First, we hypothesize that full-time employment has become a stronger determinant over time for the transition to motherhood and higher parities.

The argument for this is twofold. Firstly, following the increase in gender equality there has been an overall increase in the proportion of women in the labor market and an increasing number of women are now economic breadwinners, similar to men. If women nowadays feel stronger responsibility for economic breadwinning than they did in the past, full-time employment may have a stronger effect on childbearing. Secondly, in the post-recession years and due to increased globalization, people are increasingly influenced by what is happening elsewhere. If there is more economic uncertainty in the world and women have stronger expectations about an uncertain economic future, full-time employment may become more important before having children.

Second, we hypothesize that the increasingly positive effect of full-time employment on childbearing over time to be more pronounced among lower educated women than among highly educated women. The argument for this is that in a setting of a strong welfare state providing comparatively generous wage compensations to parents during the parental leave and subsidized public childcare thereafter, lower educated women has equally high or even higher opportunity costs than higher educated women. In addition, lower educated women are comparatively more exposed to increases in economic uncertainty than highly educated women.

Analytical framework

The data cover all women living in Norway during the period 1993-2020. Information from Norwegian administrative registers give us complete fertility and employment histories for all women. We have a sample of women 20 years old and above born in 1973-1992 and follow them over time – from year to year – observing their transitions to first, second, third and fourth birth and their employment histories up to age 44.

We apply joint modelling of hazard models for births and employment to account for the possibility that the birth process and the employment process might be jointly determined. We specify separate hazard functions for first, second and third/fourth birth, respectively, for transitions into full-time and part-time employment and for transitions out of employment. To capture the simultaneity in the determination of labor market participation and births, employment is included in the specifications of birth transitions and the number of children is included in the specifications of hazards for employment. In the model specifications, we also included are time dummies, dummies for employment and interaction effects between these variables.

We will use the estimated model to simulate the effects of the different time periods on the probability of first, second and third/fourth birth. Here, we assume that all women, independent of their birth cohort, face the same parameter estimates related to the effects of working full-time, part-time or not employed and the pure period effects. This gives a cleaner estimate of the effect of the time periods. The idea is that we estimate the effect of a counterfactual situation where all women, independent of their birth cohort, go from one situation given by the parameter estimates to another situation.

Preliminary results

Preliminary results show that overall, both *full-time* and *part-time employment* have grown to be increasingly stronger determinants than *not working* for entering motherhood and for having a second child. For first births, the impact of *full-time employment* is stronger, than the impact of *part-time employment*. For higher parities, the impact of *full-time* and *part-time employment* is more similar. Over time, especially the effect of working full-time increases stronger for both entering motherhood and for higher parities. The estimates by educational remains to be calculated.

Research contribution

This study contributes to the research field in several ways. It provides new insights into how the relationship between women's employment and fertility has changed across three decades. It can create a better understanding of the relationship between employment and fertility for women with different educational attainment. Lastly, it sheds new light on why fertility in Norway has dropped dramatically over the last decade.

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