Timing of Parenthood, Earnings trajectories, and Earnings Accumulation in Sweden

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In this study, we analyze the effects of the age at becoming a parent on earnings trajectories and cumulative earnings over the life course in Sweden. The vast literature of motherhood earnings penalties and fatherhood premia has primarily focused on estimating these effects from a static perspective, as effects on hourly wages or monthly/annual earnings. We contribute to this literature by analyzing how the timing of becoming a parent affects earnings trajectories and accumulated earnings over the life course. If parenthood and its timing affect accumulated earnings over the life course, these events will additionally affect future pension levels and gender inequalities therein. Because the timing of parenthood is affected by socioeconomic resources and socioeconomic background (Andersson 2000; Dahlberg 2015), it can furthermore shape inequalities in them and in their intersections with gender.

Previous studies from the Nordic countries have reported cross-nationally small motherhood earnings penalties (Petersen et al. 2010; Harkness & Waldfogel 2003) and fatherhood premia, which are mainly tied to marriage premia (Petersen et al. 2011). We add to this literature by analyzing whether parenthood is a life course event that can affect earnings trajectories and whether its timing can consequently affect earnings accumulation over the life course. Theoretically, such an effect can be expected if early childbearing hampers the accumulation of work experience and human capital at early stages of the life course, when the returns to it are the highest. Furthermore, to the extent that motherhood penalties or fatherhood premia show persistence beyond the early years after childbirth, these effects can accumulate to major differences over the life course. Empirically, such an effect is suggested by findings by Abendroth and colleagues (2014), who reported that the motherhood penalty on occupational status increases over the life course.

Our analysis focuses on Sweden, which is well-known for its extensive parental leave and childcare policies, which are built to hamper negative consequences of childbearing on female careers and promote combining work and family life. We use population register based data between ages 18 and 40 to estimate earnings growth trajectories as well as cumulative effects of childbearing on earnings. We assess the effects of age at childbirth by using predicted values from our models.

Data and methods

We use data from the Swedish population registers, which include income, demographic, and labor market data on all residents in Sweden. We focus only on individuals born in Sweden for whom there is information for at least one biological or adoptive parent. We selected the cohorts born between 1972 and 1981, which we

followed until 2012. After excluding foreign-born individuals as well as those for whom we lack information for the observation period (usually due to stays abroad or due to mortality), the final analytical sample includes 941,031 individuals and 17,132,602 person-years.

The main dependent variable is the natural log of yearly income from work and self-employment, adjusted for inflation with year 2000 as the baseline. As a robustness check, we also use the yearly income from work, self-employment and other benefits arising from unemployment, sick leaves, etc. Our main independent variables measure the time since one has become a parent, starting from pregnancy. These are entered as dummy variables, one for the time during pregnancy, and yearly dummies until the sixth year and from the nineteenth to the twenty-first year after the birth of a child, whereas from the seventh to the eighteenth year since parenthood we use 3-yrs dummies. To capture the basic age pattern of earnings growth, we control for age using splines, which enable flexible specification of non-linear age patterns. Additionally, we control for period effects to account for macro-economic trends, educational attainment, educational enrolment and region.

Our main research method is growth curve analysis. Mathematically, growth curve models are the same as individual-level panel regressions, but theoretically, they are distinguished from them by the explicit attention on the time variables. We estimate fixed effect panel regression models separately for men and women, which control for unobserved heterogeneity, eliminating potential biases arising from omitted and time-invariant factors which can affect earnings. In forthcoming analyses, we complement the fixed effects estimation with individual-slopes fixed effects regression, which in addition to controlling for time-invariant unobserved factors, also controls for unobserved individual-specific growth patterns in earnings (Wooldridge 2002).

Preliminary results

Below, we present preliminary results from our fixed effects models for women. We present the results as predicted logged earning scores based on the estimated parameters. The estimated models capture the earnings growth trajectories and how they are affected after having the first child. In the examples below, we use hypothetical scenarios in which the first child born either when she is 24 or 34 years old. The predicted trajectories correspond to women with a secondary level (high school) education.

Figure 1 presents the earnings growth trajectories predicted from the fixed effects regressions in hypothetical scenarios in which the woman has her first child at age 24 compared to age 34. These are compared to women who remained childless. The results show a slight increase in earnings during pregnancy (which probably reflects selection to timing of motherhood when earnings have increased, which affects the level of parental benefits) and a sharp drop immediately after becoming a parent. This drop reflects the reduced labor supply of mothers of small children. Earnings recover partly after this drop, but remain lower than for childless women. At

age 40, women who became mothers at age 34 have lower earnings than comparable women who became mothers ten years prior.

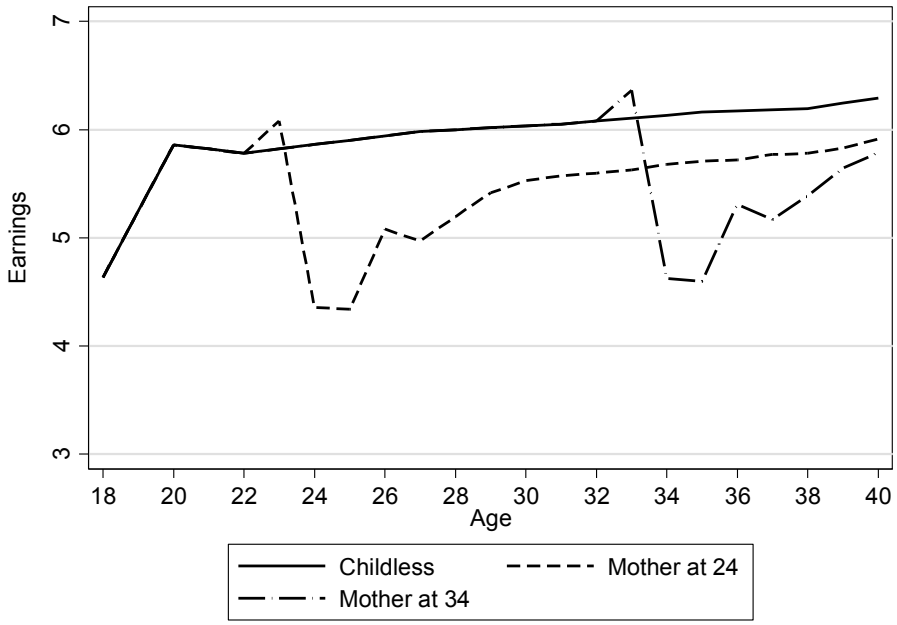

Figure 1. Logged earnings trajectories of childless women, mothers at age 24 and mothers at age 34, predicted values from fixed effects regression.

These findings suggest that motherhood has a long-term negative effect on earnings. They also suggest that, because women who became mothers at a later age experience these penalties for a shorter time, postponing parenthood has positive effects on cumulative earnings.

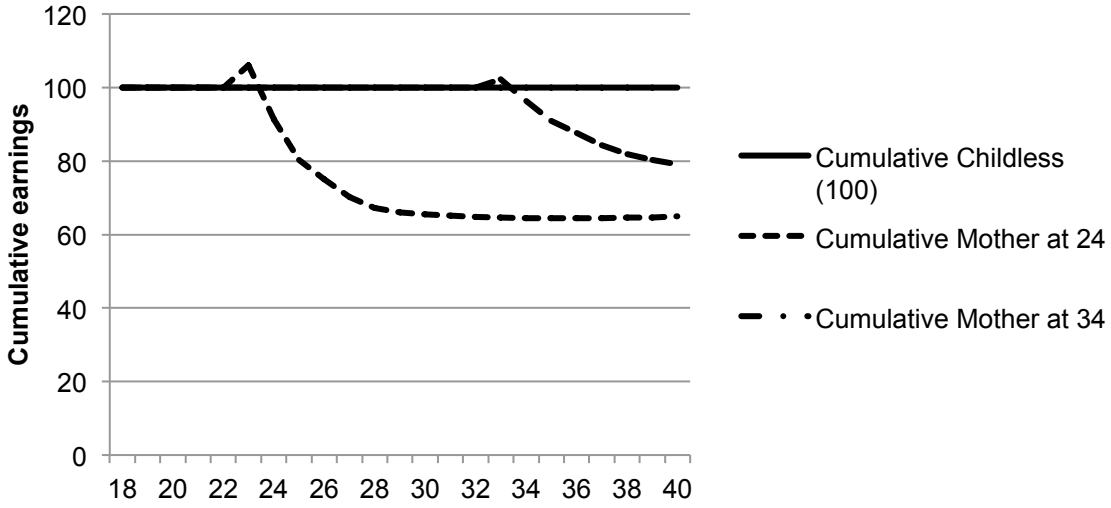

Figure 2. Cumulative earnings of mothers at 24 and mothers at 34, compared to childless women (100), predicted values from fixed effects regression on log earnings.

We consider this possibility more closely in Figure 2, which plots the predicted accumulated earnings in these hypothetical scenarios, with childless women as the baseline (set at 100). The results suggest major cumulative earnings penalties of motherhood, which are considerably smaller for women who became mothers at a later age. Women who became mothers at age 24 have accumulated 35 % less earnings by age 40 than childless women, whereas women who had their first child at age 35 have 20 % less in accumulated earnings than childless women.

Conclusions

Our analyses show that motherhood has a long-term effect on earnings trajectories, which accumulate into substantial earnings penalties over the life course. In results not presented here, we also find small fatherhood premia, which accumulate into minor premia at age 40.

These findings point to major long-term gender earnings inequalities over the life course even in a country like Sweden, which is known for its family-friendly social policies aimed at encouraging women's careers. Because life-course earnings (partly) determine pensions, these inequalities persist late into the life course. The findings also suggest that postponement of motherhood helps to alleviate cumulative earnings penalties. Finally, because the timing of parenthood is related socioeconomic resources (Andersson 2000) and social background (Dahlberg 2015), timing of motherhood can affect inequalities by these factors and their intersections with gender.

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