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Parenthood and productivity of highly skilled labor: Evidence from the groves of academe☆

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ABSTRACT

We examine the effect of parenthood on the research productivity of academic economists. Combining the survey responses of nearly 10,000 economists with their publication records as documented in their RePEc accounts, we do not find that motherhood is associated with low research productivity. Nor do we find a statistically significant unconditional effect of a first child on research productivity. Conditional difference-in-differences estimates, however, suggest that the effect of parenthood on research productivity is negative for unmarried women and positive for untenured men. Moreover, becoming a mother before 30 years of age appears to have a detrimental effect on research productivity.

1. Introduction

Over the past 50 years the gender wage gap has substantially narrowed, mainly because women are now better educated and their labor market participation has become more continuous (Goldin, 1989; Weichselbaumer and Winter-Ebmer, 2005). However, in terms of achieving leading positions, women still lag behind, indicating that women still have a disadvantage in pursuing challenging professional careers.

In this paper, we explore the intricate relationship between parenthood and the productivity of highly skilled labor by investigating the effect of pregnancy and parenthood on the productivity of academic economists. Scientists provide an eminently suitable profession for our purposes because well-established and generally accepted measures of research productivity are available, whereas for most other highly skilled professionals, such as managers, engineers, surgeons, top

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officials, and so on, comparable productivity measures are either not available or not recorded.[1] Our focus is on female academic economists, but we also investigate how male economists are affected by fatherhood.

Our data are from a survey sent to all economists who have an account with the research platform RePEc (Research Papers in Economics). This platform records the research output of some 30,000 economists from 75 countries. About 10,000 economists answered our anonymous survey. Matching the survey answers with the responders' publication records yields a panel dataset of more than 150,000 annual observations of career and family situation details.

Since parenthood of professionals is usually planned, the identification of the effects of parenthood on research productivity is not simple. We therefore begin our analysis by simply documenting career patterns while making no attempt to derive causal relationships. The descriptive statistics do, however, immediately suggest that reverse causality is indeed likely to be an issue: Our data suggest that economists with two or more children are more productive than economists with only one child or no children, although the difference is not statistically significant. Apart from the obvious effects of parenthood on labor productivity, we thus need to contend with a possible reverse causality effect running from productivity to family structure. If the decrease in productivity resulting from the additional burden of parenthood is as strong as the increase that may result from responsible parents with a stronger commitment to work, parenthood does not decrease labor productivity simply because family planning is selective in the sense that only parents who know that they will be able to cope with the additional burden decide to have children.

The study unfolds as follows. In the next section we provide a brief survey of the related literature. In Section 3, we present our survey-generated data and explain how we measure our dependent variable, i.e. research productivity. Descriptive statistics on the number of children and career age at first birth are reported in Section 4.1. In Section 4.2 we then report estimates of career cycles in research productivity for men and women. These estimates are based on the full sample of observations. In Section 4.3 we report our first estimates of career cycles that are conditioned on parenthood. In these estimates, we only use observations of individuals who are, because of their age, unlikely to have in the (unobserved) future a first child or, if they are already a parent, another child. To estimate the effect of the number of children and the children's age, we then go on to report Poisson estimates with individual fixed effects. Since estimating family gaps in research productivity with simple regressions do not necessarily describe causal effects, we investigate in Section 5 the effect of a first child by using a more convincing identification strategy, i.e. a semiparametric difference-in-differences estimation method that exploits propensity scores to account for endogenous parenthood. Since the data for calculating these propensity scores is only available for the more recent cohorts, we can only include those respondents to our questionnaire survey whose first child was born between 2004 and 2007 and respondents who had no children when the survey was taken but could have had a child in the 2004–07 period, given their age. We readily admit that this identification strategy may not completely dismiss any concerns about the endogenous timing of parenthood. We believe, however, that our empirical strategy makes substantial headway towards a clean identification of the parenthood effect on labor productivity, and any progress in that direction will, given the importance and topicality of the issue, surely provide valuable new insights even if the final word in this matter may not have been spoken yet.

2. Related literature

A substantial part of the literature on gender gaps in the academic labor market emphasizes that women are more likely than men to take non-ladder teaching positions or to leave academia when they have children (Joecks et al., 2014; Mason et al., 2013). The empirical evidence, however, provides far from a uniform picture. Hunt (2016), for example, finds that family-related constraints play at best a minor role in women's decision to leave science and engineering. Our analysis does not investigate this effect of parenthood. We only observe "survivors,"—that is, those with PhDs in economics who stayed in academia—and investigate the extent to which their productivity is affected by parenthood. Of course, evaluating the total effect of childbirth and parenthood on academic career paths requires consideration of both channels of influence.

The literature investigating the academic careers of survivors has paid special attention to the gender gaps in wages, promotion, and research productivity. The gender wage gap in academia has narrowed over time but still persists (Kahn, 1995; Faggian and Della Giusta, 2008). Controlling, however, for the prestige of the PhD-granting institution, experience, seniority, and especially for research productivity, substantially reduces the net wage gap (Ward, 2001) and may even close it altogether (Gibson et al., 2014). This finding is well in line with the results of similar studies on nonacademic groups of highly educated workers such as college graduates (Black et al., 2008) and MBAs (Bertrand et al., 2010). Waldfogel (1998) investigates the family wage gap (i.e., the wage differential between women with and without children). While the gender wage gap has substantially narrowed, the family wage gap has widened in the United States: Women with children face a wage penalty of around 10% to 15% compared with women without children. Waldfogel (1998) especially highlighted the importance of maternity leave coverage in explaining cross-country differences in the family wage gap: The family wage gap was smaller in countries that provide maternity leave coverage.

Perhaps more troublesome than the gender wage gap are the effects of gender and family formation on academic promotion (Kahn, 1993). At the beginning of their academic careers, women are not disadvantaged because they are women;

[1] To be sure, jobs in the research sector provide more flexibility than jobs in other professions. Also, economics may be an outlier when it comes to promotion of women compared to other scientific disciplines (Ceci et al., 2014).