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The timing of childbearing: The role of human capital and personal preferences

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ABSTRACT

As significant as the shift from quantity to quality in fertility decisions, a rise in the median age at first birth has been commonly observed in the more developed world. This paper attempts to understand the latter demographic trend from the empirical perspective. We first construct a conditional hazard model that incorporates determinants of birth spacing, with a primary emphasis on human capital and personal preference factors. We then examine the importance of these factors, using a rich data set comprised of a selected sample of women from various cohorts reported in the 1980 Taiwan Census. Our results show that, in addition to the age at marriage, human capital factors such as the woman's education, job security and occupation are all significant in influencing the first spacing. The roles played by these human capital factors become even more important for the second spacing. In the third spacing, the relative importance of education and occupation still persists, while gender preferences become much stronger. Overall, while job security shortens the timing of childbearing, better education and occupation as well as more girls from previous births all lead to delays in births. As for preference factors, we find that elementary school teachers have a shorter birth-spacing compared to junior high school teachers, indicating possible personal preferences for children that are consistent with women's job selection.

1. Introduction

Since two centuries ago, major industrialized countries have enjoyed long-run sustained growth in per capita real income. Yet, not until the turn of the 20th century have they completed demographic transition, with falling fertility accompanied by rising quality of children. Over the past two decades, demographic transition has been one of the central issues in the broad field of growth theory and development economics. This is not only because of academic curiosity for understanding the causes of such a significant socioeconomic change, but also because of its strong implications for the speed of economic development and the misery of poverty traps.

To study demographic transition, however, one must recognize that fertility choice includes three distinct decisions: the number of children, the quality of children, and the timing and spacing of births. A vast literature has been devoted to

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studying the first two of these aspects of fertility by documenting the decline in the total fertility rate over the past century and the associated rise in the quality of children. Much less discussed is the timing of fertility, which has undergone changes of the same order of magnitude as those observed in the quantity and quality dimensions. In the present paper, we endeavor to examine this much less-explored dimension of fertility choice, hoping to better understand the determinants of the timing and spacing of births. As such, our findings would help generate useful implications for the interplays between demographic transition and economic development.

Over the past five decades, the rise in the childless rate and the median age at first birth has been commonly observed in many developed countries in Western Europe and North America as well as in fast growing countries in Asia. Such a positive trend is not only quantitatively large, but robust across regions and ethnic groups (given some noticeable disparities). For example, by the year 1990, almost half (49%) of Swedish women in the 25–29 age group were still childless (The comparable figures for the U.S., Germany and the Netherlands were 42%, 57% and 61%, respectively). Despite the empirical significance and important implications, a systematic analysis of the joint decisions of birth timing and other fertility and individual choices remains relatively under-investigated.

This focus of the literature on the quantity-quality trade-off is not surprising, because the quantity and quality aspects of children can be handled by standard demand and supply analysis without the need for a full dynamic model over a woman's course of life. By contrast, the childbearing age requires a fully specified dynamic process of demographic and labor decisions over an individual female's entire life course, which complicates the analysis greatly. Once a woman is married, her decision on birth timing is influenced by the allocation of time to work, childrearing, human capital accumulation, as well as the allocation of her own and her husband's earnings to her own consumption and childrearing. Therefore, even though women sharing the same number of desired children, their timing of having births could vary substantially with respect to the types of jobs they were holding, the extent of job security, or their specific preferences for children.

Led by labor economists, there has been some empirical work examining birth timing and spacing in OECD countries. From the economic development view point, the patterns and the underlying economic trade-offs in a developing economy before reaching a matured state of mass consumption seem more prominent to investigate, especially because the policy implications obtained would be more important as they may affect the developing economy's entire path of growth. We thus echo previous empirical studies of birth timing and spacing in advanced economies, by focusing on a newly industrialized economy, Taiwan. The case of Taiwan is of particular interest to explore, because it has experienced one of the fastest demographic transitions from high fertility to a below-replacement level as noted by Freedman et al. (1994).[1] Moreover, the 1980 Taiwan Census Data, on which our empirical analysis is based, have excellent features suitable for the study of women's fertility decisions.

More specifically, our data record the detailed job characteristics of the employed women, inclusive of a woman's working industry, occupation and job security (public vs. private employers), which enable us to explore the impact of job characteristics on a woman's fertility decision. Moreover, the information on the sex composition of the available children and the analysis of a restricted sample of elementary and high school teachers whose salaries are fixed for a given cohort enable us to detect pure personal preference factors in determining fertility choice. Furthermore, our data offer detailed residence information of married women that enables us to capture the unobserved traits of locational factors. Finally, the large sample size of approximately 17 million enables us to make careful sample selection, by focusing particularly on women cohabiting with their husbands, those aged between 35 and 40 (since the vast majority of them had completed their fertility behavior before the interview), those with more than 9 years schooling (because their fertility behavior is likely to be affected by career choices), and those who had got married before completing their highest education (to alleviate the concern that their education and fertility decisions are jointly determined). Even after the selection, we still have a sample of between 9000 and 14,000 women for each of the six cohorts.

Based on these key factors that drive a woman's birth timing decision, we extend the childbearing hazard model developed by Heckman and Walker (1990a) to study the determinants of the birth spacing of our selected sample of women from various cohorts. We estimate both a baseline hazard model that exploits the residence information in the data and a more flexible model to account for unobserved heterogeneity. In both models, we consider controls such as a woman's age cohort, the number and gender of children she had at the start of a particular spell, and an array of job characteristics (possibly time-varying) at the start of a particular spell, including years of education, her own employment status, her husband's earnings, along with her own wage, occupation, working industry and job security if employed.

By comparing the coefficient estimates within each birth spacing, our empirical results indicate that, in addition to the expected role played by the age at marriage, human capital factors such as a woman's education, job security and occupation are all significant in determining the first spacing: while job security shortens the timing of childbearing, a better education and occupation both lead to delays in births. For the second spacing, these human capital factors become even more important. While the relative importance of education and occupation still persists in the third spacing, gender preferences begin to matter a lot: a woman with two girls shortens the birth spacing whereas one with two boys lengthens it, suggesting son preferences in making fertility decisions. The main empirical findings are robust to restrictions in the employed sample and to the adoption of a flexible hazard model. In addition, by using a restricted sample of elementary and high school teachers with identical years of education and approximately fixed salaries for a given cohort, we find that elementary school teach-

[1] The total fertility rate has fallen sharply from 6.6% in 1952 to 0.9% in 2010.