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How to Evaluate the Effect of Two-Child Effect on Fertility

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Abstract

This paper discusses how to evaluate the effect of two-child policy in China on fertility. We consider issues both of data and of thestatistical methods that were applied to those data. Then, we review and discuss the development of the empirical studies. At last, we make concludes.

Keywords

Fertility; Two-Child Policy; Household Surveys.

1. Introduction

In response to the continued decline in fertility, China began implementing the universaltwo-child policy on January 1, 2016, which allows all couples to have two children. Theaggregate data from the National Bureau of Statistics show that China's population birth rate increased significantly in 2016 and 2017, reaching 13.57 per thousand and 12.64 per thousand, respectively; however, by 2018, 2019, and 2020, the birth rate dropped sharply, to 10.86 per thousand, 10.41 per thousand and 8.52 per thousand; in terms of the number of births by sub-children, after the universaltwo-child policy, the number of two-child births each year from 2016 to 2019 remained above 7 million, while the number of one-child births fell sharply, from 9.73 million in 2016 to 593.3 million in 2019 (Chen 2023).However,the analysis using the macro-level data cannot control for factors that may distortthe outcome of fertility, and the effect of the two-child policy on fertility is unclear.

In this paper, we discuss survey data requirements for fertility evaluation and review the estimation methods that have been used to examine the effect of policy on fertility when using household surveys. Then we review empirical studies on China'stwo-child policy. Finally, we present the discussion and provide the conclusion.

2. Data Requirements

What are the data requirements necessary for evaluating the effect of the two-child policy on fertility? We discuss data requirements concerningfourcriteria.

(1) Measures of completed fertility. Fertility is required to be completed, not pregnant or an ideal number of children.In particular, responses to questions about the ideal number ofchildren tend to cluster around the two-child norm, and very few people tend toreport having zero or one child as the ideal.The measure should be the number of children, first birth, second birth, or third birth.

(2) Number of sibling of parents. The birth restriction from population policy is associated with the number of sibling of parents. The one-child policy which restricted a couple to have only one child had been enforcedin China since 1979. Due to the pressure of enforcement of this policy in rural areas, a one-and-a-half-child policy was proposed in themid-1980s. Some

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couples in rural areas were allowed to have a second child if the first child is a girl. Birth restrictions for couples that both partners are the only childwere gradually relaxed in late 1980s and early 1990s for most provinces. It was until December 2013that the policy that allows couples with one partnerbeing the only child to have a second child was proposed. The universal relaxation policy that allows all couples to have two children was proposed in December 2015. This policy became effective in January 2016. As a result, the data should supply the information on the number of sibling of parents to distinguish between the control group and treatment group.

(3) Large and representative samples. The China's population policy is diverse, varying with province, hukou, family size and ethics. Only large and national samples can cover all kinds of groups belonged to different population policy. In addition, large and representative samples are significant to estimate the treatment effect. In particular, the smaller the sample, the more likely that estimates are more prone to sampling variability and hence less reliable. Non-representative samples potentially limit the extent to which findings can be generalized.

(4) Other important measures. If one wishes to control for factors influencing fertility decisions, then surveyed data have to include information aboutparents' age, education, health, housing conditions, family structure,employment situation, and neighbourhoodcharacteristics, etc.

3. Method Requirements

Heckman, LaLonde and Smith (1999) examined the evidence on the effectiveness of active labour market policies. They introduce the evaluation problem andassess conditionsunder which social experiments solve the evaluation problem and the econometric models used to evaluate the impact of welfare programs in nonexperimental settings.Their methodological discussion of alternative approaches to evaluating welfare programs has more general interest. As to the evaluation ofthe effect of family policies on fertility, the outcome of interest is different and focus on a range of measures on fertility.

Gauthier (2007) reviews the empirical evidence of the effect of policies on fertility and discuss the evaluation problem using macro-level or micro-level data.Studies based on macro-level dataexploit crossnational and/or historical variations in family policies in order to assess their impacton fertility, andtypically use a globalmeasure of fertility, such as the total period fertility rate, as the dependent variableand various independent variables including specific policy indicators, male andfemale wages, etc. In contrast, studies based on micro-level data focus on probability of birth. The methods of analysis are alwayshazardmodel, logit model, etc. The only exception is the work of Bjorklund (2006), which employs difference-in-difference (DID) design.

Since 2010, causal inference has been the dominant method in policy evaluation, such as DID (Bauerns chuster et al. 2015; Cygan-Rehm 2016; Riphahn & Wiynck 2017; Raute 2019; Rossi& Godard 2021),regress discontinuity (RD) (Cygan-Rehm 2016;Farré& González, 2019),and synthetic control (Lichtman-Sadot 2014).

To sum up, most studies in the socialsciences aim to answer causal rather than associative questions. As a result, statistical tools for causal inference are significantly important and more and more popular in empirical research on fertility.

4. Literature Review

A few scholars evaluate the effects of two-child policy on fertility in China using individual-level data from the survey or census data. Zeng & Hesketh (2016) predict the total fertility rate will rise from the current 2.01 in rural areas and 1.24 in urban areas, to 2.15 and 1.67, respectively, in the next decade. The combined rural–urban total fertility rate is estimated to be 1.88 in 2017, and 1.81 in 2030. Li et al. (2019) estimate the number of additional births attributable to the

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new policy between July 2016 and December 2017 was 5.40 million. Using a panel data from the 2011, 2013, 2015, and 2017 China Household Finance Survey (CHFS), Wu (2022) estimates the impact of the new two-child policies (the relaxation policies in 2010s) on fertility level and find that one more year after a couple being eligible to have a second child would increase the number of children by 0.122, and the new two-child polices increases the probability to have a first child by 6 percentage points for those who had no child, increases the probability to have a second child by 7.7 percentage points for those who already had one child, and have no impact on the probability to have a third birth and above for those who already had two children.

The above literatures predict the effect of two-child policy in early implementation of the universal two-child policy. As we know, fertility decision is complex and susceptible to social-economic situation. It will take a long time for couples to swich from intent to have a child to preparation for pregnancy.Using the data in the above research, the policy effect is not fully realized because the universal two-child policy became effective in January 2016. The work of Ge & Shi (2023) is an exception. Using data from the Chinese family panel studies (CFPS) from 2010 to 2018, theyperform DID design and estimate the effect of universal two-child policy on fertility. They find that this policy significantly increased the possibility of having children and the effect was not attenuated from 2016 to 2018.This policy can explain 14.8% of average number of the newborns in 2016-2018.Their calculation suggests that the universal three-child policy implemented in 2021will bring additionally 283.2thousand newborns each year.However, there is limitations in their empirical strategy. First, the dependent variable is the number of childrenof every woman. It is not suitable for statistical sense in that we do not know the true value of number of childrenuntil women lose the ability to have children. As a result, the data is censored. Survival analysis is more suitable in this case. Second, they misuse the DID design. Because universal two-child policy is universal, the couples that either partner is one child as the control group qualified to selective two-child policy and universal two-child policyare always treated. As a result, the usual DID, there is a control group that is never treated and a treatment group that is treated at some time point, is not available. A more appropriate approach is differenceindifference in reverse (DIDR), where the control group is always treated (instead of always untreated).That could be applied to the cases from selective policy to universal policy. Rossi & Godard (2021) perform DIDR and exploit the effect of the Extension of Social Pensions in Namibia on fertility.

5. Conclusion

China has experienced a fertility decline since 1970s and the decline has been more dramatic in the last ten years, even the implement of two-child policy. What contributes to fertility decline? To exploit the factors influencing fertility, we must evaluate the effects of two-child policy on fertility decision. Due to limitation of data, existing research could not precisely estimate the effects of two-child policy and identify the core factors influencing fertility.In addition, the diversified two-child policy pose difficulties for evaluating problem. Exceptassociation analysis, we should introduce more suitable method of analysis, especially a range of variation of the usual DID.

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