

The Effect of Paternal Retirement Age on Offspring's Fertility Decision : An analysis based on the intergenerational transfer perspective

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Abstract. Recently, the conflicts between work and family are becoming more and more serious for the younger generation. The family intergenerational transfer is regarded as an effective balancing agent to ease conflicts and improve fertility, but it is affected by the retirement age of parents. Therefore, it is of great economic and policy significance to identify the relationship between paternal retirement age and offspring's fertility decisions. In this paper, a regression discontinuity model is established based on the China Family Panel Studies (CFPS) database. The results show that: (1) the parents beyond the retirement age have a positive influence on the offspring's fertility; (2) When the number of children is more than one, it has a significant negative effect on offspring's fertility decisions; (3) The income level of different families will also affect the influence of parents' retirement age on offspring's fertility decisions.

Keywords: Intergenerational transfer, Work-family Conflict, Fertility Decision.

1. Introduction

Today, the employment pressure caused by the global economic fluctuations is increasing, further intensifying the work-family conflict faced by adult children, especially adult females, in the environment of public social childcare services shortages. With an inevitable aging trend, the problem of work-family conflict will undoubtedly have a negative impact on women's fertility, hence accelerating the aging process in society. Previous studies showed that intergenerational transfers provided by the older generation could effectively alleviate work-family conflict of offspring and increase subsequent fertility [1]. However, studies also found that intergenerational transfers were strongly associated with parents' retirement. Therefore, by studying the effect of parents' retirement age on offspring's fertility decision, this paper can not only find ways to mitigate work-family conflict at micro-level but also provide a reference for the formulation and implementation of delayed retirement policy in China.

This paper focuses on the perspective of intergenerational transfer, using China Family Panel Studies (CFPS) for empirical analysis. The analysis shows evidence that parents over the legal retirement age play a positive role in offspring's fertility decision. It means the intergenerational transfer provided by retired parents can help offspring reconcile work with family life, lightening their burden of raising children in terms of economy and time. Based on the results, this paper argues that when making a deferred retirement policy, in addition to paying attention to the substitution of labor quantity by longer work hours, taking the inhibitory effect of delayed retirement on fertility into account is also crucial, so as to avoid postponement or abandonment of the younger generation's fertility decision caused by the deferred retirement policy.

2. Literature Review

Under tremendous social pressure, adult children often face serious work-family conflict due to their childcare responsibilities, especially adult women[2]. Studying how to solve this problem has become a significant work.

A large number of studies showed that the intergenerational support provided by grandparents, as a complement and substitute to paid childcare services, can alleviate offspring's work-family conflict and increase fertility rates[3-4]. Although the purpose of intergenerational support is similar to that of formal nursing and childcare services provided by the government, it plays a different role in providing emotional support to offspring and building strong family ties[5]. Moreover, intergenerational support is the main tool for balancing offspring's work-family conflict[1], which can alleviate offspring's pressures and benefit fertility growth[6]. As Jendrek noted, more than 60 percent of parents and grandparents provided care to their grandchildren, which helped their offspring balance work and family [7]. Research on ten European countries also supported the point that the higher proportion of grandparents participating in childcare, the higher the fertility rate[8]. Some researchers analyzed the survey data about health, aging, and retirement from 11 European countries and found that the accessibility of grandparents significantly affected the labor force participation rate and fertility rate[9].

The mechanism of the effect of parents' retirement age on offspring's fertility decisions is mainly realized through intergenerational transfers. Effective intergenerational transfers between parents and offspring include both time transfers and financial transfers[10], and these two pathways have substitution effects on each other. With retired parents decreasing financial transfers and increasing time transfers, it will reduce the fertility pressure of adult children, thus influencing offspring's fertility decisions [11]. Battistin's analysis of the Italian survey data also showed that retirement would increase the time spent by parents caring for grandchildren and improve the fertility of their offspring[12].

At present, there is a lack of research on how parents' retirement age affects offspring's fertility decisions in China. Most of the studies analyzed the changes in the work-family conflict extent of women from the perspective of intergenerational transfer and adult children's labor participation rate after parents' retirement [13]. Some Chinese scholars concluded that offspring would choose early childbearing, late childbearing, or infertility according to the parents' retirement age using three years of China Family Panel Studies (CFPS) data. On this basis, this paper will use more data to further identify the relationship between parents' retirement age and offspring's fertility decisions from the perspective of intergenerational transmission, trying to find ways to alleviate work-family conflict.

3. Data

3.1 Data and Sample

The interest of this study is about the effect of the retirement age of parents on offspring's fertility decision. The China Family Panel Studies (CFPS) database provides a series of comprehensive data, which can meet the research needs of the study. Thus, this paper takes the data from CFPS in 2012, 2014, 2016, and 2018 to match the relevant information of parents, children, and families. Data cleansing is utilized to yield a sample of about 147112 individuals for analysis.

3.2 Descriptive Statistical Analysis

The basic characteristics of the parent sample are presented in Table.1. Parents of non-agricultural household registration account for a relatively high proportion, mainly in the range of 55% to 87%, which indicates that individuals with agricultural households are less covered by the urban workers' pension insurance system. Meanwhile, some of the parents who don't reach the legal retirement age also deal with retirement procedures, among which the proportion of men is significantly higher than that of women.

Table.1. Basic characteristics of parent

	Father		Mother		Spouse's father		Spouse's mother	
	Age≥60	Age<60	Age≥50	Age<50	Age≥60	Age<60	Age≥50	Age<50
Age	62.97	55.34	56.02	48.71	64.79	56.21	56.37	48.68
Education (junior college or above)	0.036	0.075	0.021	0.083	0.053	0.056	0.016	0.000
Non-agricultural Household	0.627	0.609	0.605	0.553	0.870	0.835	0.848	0.579
Self-reported (health)	0.069	0.088	0.026	0.129	0.031	0.055	0.037	0.053
Retired	0.894	0.483	0.852	0.349	0.979	0.467	0.905	0.421

Note: Table 1 shows the statistics of at least one of the offspring's parents and spouse's parents who is covered by the endowment insurance for urban employees and is not more than 10 years old from the legal retirement age.

The descriptive statistics for the offspring sample and family information can be found in Table.2. The mean value of the offspring's age is 29.956 years, while the mean value of the spouse's age is 32.361 years. In particular, the birth year of the offspring's child is used to assess whether the offspring gave birth in the last year, and the variable "whether the offspring gave birth in the last year" is generated.

Table.2. Basic characteristics of offspring individual and family

	Obs	Mean	Std.Dev	Min	Max
Personal characteristics					
Age	1171	29.956	3.652	21	41
Junior high school or below	336	2.664	0.797	0	3
High school or above	812	5.005	0.950	4	8
Household registration	1151	0.624	0.485	0	1
Employ	1024	0.887	0.317	0	1
Salary of the previous year	701	10.070	0.913	6.908	11.920
Spouse characteristics					
Age	803	32.020	4.581	23	59
Junior high school or below	266	2.857	0.462	0	3
High school or above	547	4.985	0.945	4	8
Household registration	930	0.654	0.476	0	1
Family characteristics					
Family income	1140	11.250	0.914	7.824	15.220
Number of siblings	767	0.960	1.042	-2	7
Number of children	1171	0.940	0.610	0	3
Whether the offspring gave birth in the last year	1171	0.051	0.221	0	1

Note: The number of siblings was obtained by matching with CFPS 2010.

4. Empirical Analysis

4.1 Model Building

The legal retirement age, as an exogenous policy, can be used as a breakpoint to impute the impact of parents' retirement age on offspring's fertility decision. The baseline regression model of the study is shown in equation (1), where $birth_rec_i$ is the outcome variable that indicates whether offspring gave birth in the past year. $retire_whether_i$ is the dummy treatment variable that signifies whether parents reach the legal retirement age, taking value one if parents' age exceeds the legal retirement

age. $retire_i$ is a grouping variable that refers to the difference between parents' retirement age and legal retirement age; $retire_whether_i * retire_i$ is the interaction term that controls the effect of parent's age. C_i is the covariate includes personal characteristics such as offspring's household registration and education. Since offspring's fertility decision can be affected by age, C_i also includes offspring's age in the control range.

$$birth_rec_i = \beta_0 + \beta_1 retire_whether_i + \beta_2 retire_i + \beta_3 retire_i * retire_whether_i + \beta_4 C_i + \delta_i \quad (1)$$

In addition to using the interaction term to control the influence of parents' age, this paper also includes the quadratic term of the difference between parents' age and the legal retirement age to control the impact of parents' age. Besides, other covariates that may affect the child-bearing choices of the offspring are added, such as number of children the offspring already have, offspring's work status, number of siblings, spouse's age, spouse's education, parent's household registration, parent's self-reported health, household income, and other characteristics of individuals.

4.2 Analysis of Baseline Results

Table.3. shows the results of the baseline regression. Columns (1) and (4) report results of regression using the interaction term to control for parents' age effects. The results in columns (2) and (5) are about the regression controlling parents' age effects with the quadratic term of the difference between parents' retirement age and legal retirement age. Furthermore, columns (3) and (6) offer results of the regression adding more covariates that may affect offspring's fertility decision.

Table.3. Basic characteristics of offspring individual and family

	Parents - Offspring			Parents and spouse's parents - Offspring		
	(1) Interaction term	(2) Quadratic term	(3) Other terms	(4) Interaction term	(5) Quadratic term	(6) Other terms
Parents over retirement age	0.1072*** (0.0323)	-0.0497 (0.0448)	0.4998*** (0.1162)	0.0735*** (0.0250)	-0.0738* (0.0250)	0.6308*** (0.2327)
Obs	740	740	740	1171	1171	1171
Z-statistic	3.31	-1.11	4.30	2.94	-1.72	2.71

Note: The covariates in Columns (1), (2), (4) and (5) are offspring's age, offspring's education, offspring's household registration and year. Columns (3) and (6) on the basis of the former, control number of children, offspring 's work, number of siblings, spouse's age, spouse's education, offspring's age square/100, parents' household registration, parents' self-reported health status, and family income. *p<0.1, **p<0.05, ***p<0.001.

The results show that parents over retirement age have a strong positive and significant effect on offspring's fertility decision. When using the interaction term to measure parents' retirement age, offspring's fertility rate in the past year will increase by 7%-10% after parents retire. The positive impact is becoming more significant with the addition of more covariates, and the fertility rate increases by 50%-63%. However, exploring the effect of parents' retirement age through the quadratic term, negative effects of parents' retirement age on offspring's fertility decision appears in this case.

4.3 Robustness Check

4.3.1 Fuzzy Regression Discontinuity (FRD)

From the descriptive statistics, it can be seen that some parents who don't reach the legal retirement age deal with retirement formality, so judging whether the parents retire or not only by whether they reach the legal retirement age may lead to biased estimation. Therefore, this paper takes "whether parents reach the legal retirement age" as a proxy for "whether parents deal with retirement formality" to find out more about how parents' retirement affects offspring's fertility decision.

$$retire_do_i = \alpha_0 + \alpha_1 retire_whether_i + \alpha_2 retire_i + \alpha_3 retire_i * retire_whether_i + \alpha_4 C_i + \varepsilon_i \quad (2)$$

$$birth_rec_i = \beta_0 + \beta_1 \widehat{retire_do}_i + \beta_2 retire_i + \beta_3 retire_i * retire_whether_i + \beta_4 C_i + \delta_i \quad (3)$$

Equations (2) and (3) are Two-Stage Least Squares(2SLS) regression equations, where $retire_do_i$ is the indicator of whether parents deal with retirement formality, which equals to 1 if parents retire, 0 otherwise. $\widehat{retire_do}_i$ is the estimation result of equation (2). The definition of covariate C_i is the same as in equation (1).

Table.4. Fuzzy Regression Discontinuity results

	Parents - Offspring		Parents and spouse's parents - Offspring	
	The first stage	The second stage	The first stage	The second stage
	Whether parents deal with the retirement procedure	Whether the offspring gave birth in the last year	Whether parents deal with the retirement procedure	Whether the offspring gave birth in the last year
Whether parents reach the legal retirement age	-0.6687*** (0.1424)		-0.9066*** (0.1911)	
Whether parents deal with the retirement procedure		-0.0852* (0.0453)		-0.2007* (0.1058)
Obs	732	732	1149	1149
Z-statistic	-4.70	-1.88	-4.74	-1.90

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

The first stage regression results show that whether parents reach the retirement age represents a negative and significant impact on the handling of retirement formality, which may be due to the rising cost of childcare, leading parents to give up retirement and continue working to earn income, thereby provides financial support for bringing up grandchildren. The results of the second stage regression are approximately consistent with the results using the quadratic term in the baseline regression. The possible reasons are that parents reach the legal retirement age but choose not to retire, and the offspring give up child-bearing to reduce the family's economic burden and time cost.

4.3.2 Change Bandwidth

The baseline regression sets the bandwidth as 10 years before and after the legal retirement age. Unlike the above, Table.5. reports the regression results for bandwidths narrowed to 9, 8, and 7 years. According to the regression results, parents' reaching the legal retirement age positively impacts offspring's fertility decision when the bandwidth is 9 and 8. In contrast, a significant negative impact appears in the case of bandwidth of 7.

Table.5. Change bandwidth regression results

	Parents - Offspring			Parents and spouse's parents - Offspring		
	[-9,9]	[-8,8]	[-7,7]	[-9,9]	[-8,8]	[-7,7]
Whether parents reach the legal retirement age	0.4998*** (0.1162)	0.0794* (0.0449)	-0.4964** (0.2313)	0.5248*** (0.1044)	0.3663*** (0.1217)	-0.4540* (0.2711)
Obs	606	661	606	1101	1051	969
Z-statistic	4.30	1.78	-2.15	5.03	3.01	-1.67

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.001$.

4.3.3 Change The Measure of Fertility Time

The outcome variable in the baseline regression is "whether the offspring gave birth to children in the last year". Accordingly, robustness tests are carried out using two proxy variables: "whether the offspring gave birth to children in the last six months" and "whether the offspring gave birth to in

the last eighteen months”. Results are presented in Table.6. In either case, the finding shows that parents’ reaching the retirement age is positively associated with offspring’s fertility decision. Notably, while the outcome variable is “whether the offspring have borne children in the last eighteen months”, at least one of the offspring’s parents over the retirement age or at least one of the four parents over the retirement age both have a significant and positive impact on offspring’s fertility decision.

Table.6. Regression results of second generation fertility time change

	Parents - Offspring		Parents and spouse's parents - Offspring	
	Six months	Eighteen months	Six months	Eighteen months
Whether parents reach the legal retirement age	0.0228 (0.0141)	0.4998*** (0.1162)	0.0026 (0.0134)	0.5268*** (0.1044)
Obs	616	740	1047	1171
Z-statistic	1.62	4.30	0.20	5.05

Note: *p<0.1, **p<0.05, ***p<0.001.

4.4 Heterogeneity Analysis

4.4.1 Additional Analysis of Family Structure

Table.7. reports the heterogeneous effect of parents’ reaching the legal retirement age on offspring’s fertility decision across households that differ in the numbers of children. When there is no more than one child, parents’ retirement has a facilitating effect on offspring’s fertility decision. If one of the parents is over the legal retirement age and retires, with adequate childcare provided by the retired parent, the offspring are more willing to have children. However, when the number of children is more than one, the cost and difficulty of childcare increase substantially. As a result, the offspring will be less likely to choose to have children even with the availability of retired parents for childcare.

Table.7. Regression results of different family structure

	Parents - Offspring		Parents and spouse's parents - Offspring	
	No more than one child	No less than two children	No more than one child	No less than two children
Whether parents reach the legal retirement age	0.0420 (0.0398)	-2.1594*** (0.4283)	0.3107*** (0.1072)	-2.2264*** (0.4865)
Obs	642	98	1004	167
Z-statistic	1.06	-5.04	2.90	-4.58
Difference between groups	2.062***		2.407***	

Note: *p<0.1, **p<0.05, ***p<0.001.

4.4.2 Additional Analysis of Family Income

This paper considers family income for further discussion as the fertility decisions of the offspring may be affected by family income. Divide the sample into four types: low-income, middle and low-income, middle and high-income, and high-income, according to the quartile of family income and estimate equation (1). Results are presented in Table.8. If only the offspring’s parents are beyond the legal retirement age, the offspring’s fertility decisions decline as family income rises. But if at least one of the offspring’s parents or spouse’s parents reaches the retirement age, it implies that more care and support can be supplied for grandchildren. Therefore, with the increase in family income, childcare cost gradually decreases, leading to fertility growth.

Table.8. Regression results of different income structure

	Parents - Offspring				Parents and spouse's parents - Offspring			
	Low	Middle and low	Middle and high	High	Low	Middle and low	Middle and high	High
Whether parents reach the legal retirement age	0.7375* ** (0.1299)	4.9731* (2.5682)	- 0.7057* ** (0.2171)	- 0.3880 (0.0386)	- 0.4518* ** (0.1055)	7.0947* ** (2.7435)	2.2307* ** (0.0796)	0.1227* ** (0.0434)
Obs	149	155	187	207	227	261	290	346
Z-statistic	5.68	1.94	-3.25	-1.00	-4.28	2.59	28.04	2.83
Difference between groups	0.378***		0.019		1.278***		0.092***	

Note: *p<0.1, **p<0.05, ***p<0.001.

5. Conclusion and Enlightenment

5.1 Conclusions

Aiming at the question of whether intergenerational care can improve offspring fertility decisions, this paper conducts regression discontinuity analysis through the data of China Family Panel Studies (CFPS) 2012, 2014, 2016, and 2018, reaching the following conclusions.

First, parents' retirement age can affect the fertility decisions of the offspring. When the parents reach the legal retirement age, the offspring will increase fertility decisions. But there are also some cases where the parents continue to work beyond the statutory retirement age, causing the children to give up childbearing in order to reduce the pressure of family life.

Second, the number of children in a family affects the choice of offspring. When the number of children is more than one, even if the parents reach the legal retirement age and can provide the child with intergenerational care, the offspring still suffer from the time and money cost, reducing their fertility decisions.

Third, the income level of different families can also affect the influence of paternal retirement age on the fertility decisions of offspring. When there are fewer parents over the official retirement age, the increase in family income does not increase the choice of offspring; When there are more parents in the household beyond the legal retirement age and adequate intergenerational care is provided, the fertility of children will increase with family income.

5.2 Policy Enlightenment

It can be concluded that although the delayed retirement policy can alleviate the pressure of population aging by prolonging the working time of parents, it can also lead to the suppression of offspring's fertility decisions and the further decrease of the fertility rate, thus aggravating the negative impact of population aging. The delayed retirement policy, therefore, need to take fertility into account.

Firstly, when putting the delayed retirement policy into place, it is feasible to provide financial support to families by postponing only the legal retirement age without delaying the state pension age, to minimize the negative impact of the reduction of intergenerational care that leads to the declining fertility rate.

Secondly, all sectors of society need to establish a formal and complete social childcare service system. Childcare services that help children share the time cost of childbirth can make up for the lack of intergenerational care and have a positive effect on increasing the fertility rate.

Finally, the delayed retirement policy can be carried out in parallel with a large number of maternity subsidies. At the same time, implementing a flexible mechanism can allow parents to balance the needs of social work and family care, creating more opportunities for parents to provide childcare. In this way, the time and financial costs of childbirth can be reduced, and a new situation in which the alleviation of population aging and the improvement of social fertility go hand in hand is forming.

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