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Research Article

Keywords: Paid maternity leave, Fertility, Child human capital

Posted Date: October 16th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-10743699/v1>

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Additional Declarations: No competing interests reported.

Time versus Money: How Maternity Leave Shapes Fertility Decisions and Child Development in China

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Funding Declaration:

National Social Science Fund of China, 22ZDA049

Abstract: This study develops an overlapping generations (OLG) model with endogenous fertility and paid maternity leave, and provides empirical evidence on how maternity leave affects fertility and children's human capital. The results reveal an inverted U-shaped relationship between maternity leave duration and fertility, with a turning point of 24.54 weeks. Fertility responses are stronger among women in central and western regions, those employed in the private sector, and women with weaker intrinsic fertility preferences. Mechanism analysis shows that moderate extension of leave promote fertility by increasing childcare time, whereas the negative income effect becomes dominant as longer leave. Moreover, maternity leave also improves children's human capital by strengthening parent-child interactions, although the reduction in household income during the leave period may constrain household investment in children's education. Overall, these findings highlight the importance of balancing childcare time support and income protection in the design of maternity leave policies.

Key words: Paid maternity leave; Fertility; Child human capital

1 Introduction

In the context of accelerating population aging and persistently low fertility rates, how to design effective policies to alleviate childbearing constraints and achieve long-term demographic sustainability has become a global challenge. As one of the time-based family policies, maternity leave was introduced

to protect the rights of women during childbirth by facilitating their return to work and reducing earnings losses associated with fertility (Baker & Milligan, 2008).

Given the relatively high female labor force participation in China, households face a pronounced trade-off between labor market participation and childrearing when making fertility decisions. The potential adverse effects of childbirth on women's careers may discourage childbearing and delay fertility, thereby contributing to declining birth rates and population aging. In this context, China's extension of paid maternity leave, which combines time support with income compensation, provides a valuable setting for discussing how family policies affect childbearing decisions. Specifically, the maternity leave enables mothers to allocate more time to childcare and reduces the opportunity cost of childbirth through continued wage payments during work interruptions. However, extended maternity leave may also generate adverse income effects, as prolonged labor market absence can reduce earnings of mothers. Moreover, adjustments in maternity leave duration may alter the allocation of parental time between the childcare and the labor market, which may affect early parental investments in childcare and children's human capital. Given that early childhood education plays a crucial role in children's long-term educational outcomes, evaluating maternity leave policies solely in terms of fertility quantity may fail to fully capture their long-term intergenerational effects.

This study examines the impact of extended maternity leave on fertility behavior and children's human capital. The effect is ambiguous: while longer leave may increase fertility through time support, it may simultaneously crowd out parental investment in children. Such trade-offs may arise from prolonged female detachment from the labor market or inefficient household resource allocation. Alternatively, even if the fertility effect is limited, maternity leave may still generate substantial welfare gains if it improves children's human capital. In this study, we analyze both the quantity and quality of fertility to provide a more comprehensive assessment of the mechanisms and overall effects of maternity leave policies.

According to the existing literature, maternity leave policies can reduce the opportunity cost of childbearing through two main channels. First, income during maternity leave can compensate women for earnings losses caused by childbirth-related work interruption (Lee et al., 2009). Second, statutory job protection enables women to return to their pre-birth jobs. It also lowers the risk of involuntary unemployment after childbirth (Lalive & Zweimüller, 2009). Paid maternity leave thus serves as an important family policy that helps women reconcile childbearing with career development (Olivetti & Petrongolo, 2017). However, the literature has not reached a consensus on the effects of maternity leave policies on fertility behavior. Some studies find that longer paid maternity leave reduces work-family conflict and increases fertility (Lalive & Zweimüller, 2009; Bassford & Fisher, 2020; Girsberger et al., 2023). Other studies highlight unintended negative effects. Longer leave reserved for mothers may reinforce a traditional division of labor. In this pattern, mothers are viewed as primary caregivers. This

may intensify the motherhood penalty and weaken women's incentives to have children (Buligescu et al., 2009). Generous maternity benefits may also alter women's career planning. For example, low-skilled women may choose to secure stable employment before having children, which can delay fertility (Erosa et al., 2010). Women may also reduce their labor supply or move into informal employment, while fertility does not increase significantly (Liu et al., 2024). In addition, longer paternity leave may make fathers more aware of the costs of childrearing. This may reduce fertility intentions and lengthen birth intervals (Farré & González, 2019).

While the effects of maternity leave on fertility decisions have received considerable attention, the policy may also affect children's human capital by shaping parental time allocation and early childhood investments. High-quality parental care in early childhood is crucial for the development of both cognitive and non-cognitive skills (Del Bono et al., 2016; Drange & Havnes, 2019; Bigoni et al., 2025). Longer maternity leave allows mothers to devote more time to childcare, which may improve children's sense of security, language development, and cognitive outcomes (Plotka & Busch-Rossnagel, 2018; Fabel, 2021). Cross-country evidence also shows that maternity leave is positively associated with adolescents' long-term educational attainment, with stronger effects among families with more educated mothers (Tugrul et al., 2024).

However, the effects of extended maternity leave on children's human capital are not necessarily positive. By increasing mothers' time away from the labor market, longer leave may also generate potential costs for child development. One channel operates through household budget constraints. According to the quantity-quality trade-off theory, limited household resources require parents to allocate investments between the number of children and the quality of each child (Becker & Lewis, 1973). When income constraints are relaxed, this trade-off becomes weaker, allowing families to increase investment in children's human capital without reducing fertility (Shea, 2000; Wang & Zhang, 2018). This suggests that family policies that relax household budget constraints may mitigate the quantity-quality trade-off and affect the joint determination of fertility and child investment. Another channel operates through mothers' career trajectories.

Prolonged employment interruptions may lead to short-term income losses and persistent wage penalties for mothers (Lai & Masters, 2005; Lebedinski et al., 2023), thereby reducing household disposable income and potentially limiting educational investment in children (Gruber, 1994). Longer periods of maternal care may also delay children's entry into kindergarten, which could adversely affect child development when home-based care is of lower quality than formal childcare services (Bičáková & Kališková, 2024). In addition, extended absence from the labor market may weaken mothers' skills and social networks, making labor market reentry more difficult (Schönberg & Ludsteck, 2014; Timpe, 2024). Career disruptions may further increase maternal psychological stress, indirectly affecting the

family environment and the quality of childrearing (Baum, 2003; Chuard, 2023). Moreover, existing studies confirm substantial heterogeneity across regions, women's job characteristics, family backgrounds, and child-specific traits (Girsberger et al., 2023; Liu et al., 2024; Rojas-Ampuero, 2026).

However, previous literature has several limitations. First, existing studies pay limited attention to the role of childcare time in shaping the effects of maternity leave policies. Although maternity leave directly affects parental time allocation, few studies incorporate childcare time and household income constraints into a unified framework to analyze their relative importance in fertility and child development. Second, in the context of rapidly developing countries such as China, most studies focus on the labor market effects of maternity leave policies. However, little is known about how maternity leave affects the quantity-quality trade-off between fertility and child investment. Third, existing empirical analyses typically adopt a single perspective, making it difficult to identify how the competing effects of childcare time and household income jointly determine the overall welfare implications of maternity leave policies. To address these gaps, we develop an endogenous fertility model with paid maternity leave, building on the literature on childcare and family decision-making (Hirazawa & Yakita, 2009; Day, 2016; Bar et al., 2018). The model highlights two channels through which maternity leave affects fertility and children's human capital: childcare time and household income. We then test the hypotheses of models using micro-level data from the China Household Finance Survey (CHFS).

This paper makes three main contributions. First, it develops a three-period overlapping generations (OLG) model with endogenous childcare time and fertility choices. By considering the quantity-quality trade off into the model, we find that the effects of maternity leave are determined by the relative strength of childcare time and income effects. It further predicts a nonlinear relationship between maternity leave duration and both fertility and children's human capital accumulation. Second, we provide empirical evidence that supports the theoretical predictions and identifies the mechanisms through which extended maternity leave affects fertility and human capital accumulation. The findings show that longer maternity leave is not necessarily more effective in promoting fertility; instead, moderate extensions can increase fertility, while excessive extensions may generate adverse effects as income losses become dominant. Third, the study highlights the dual role of maternity leave as both a time-support and income-support policy. By revealing the trade-offs between increased childcare time and reduced household income, this study provides new insights into how family policies can be designed to simultaneously alleviate childbearing constraints and promote long-term human capital accumulation.

2 Policy Background and Theoretical Analysis

2.1 The Maternity Leave Policy of China

The maternity leave policy of China has evolved through a combination of national legislation and local policy adjustments. At the national level, statutory paid maternity leave was extended from 56 days

in 1951 to 90 days in 1988, and further to 98 days in 2012, establishing a nationwide legal minimum. In response to persistent fertility decline, maternity leave policies have been further expanded in recent years. By 2025, most provinces had extended statutory maternity leave to at least 158 days. In addition, local governments have introduced supplementary maternity leave, paternity leave (approximately 15 days), and parental leave (5-20 days), accompanied by improvements in benefit coverage. The evolution of maternity leave policies at both the national and local levels is summarized in Table 1. These staggered policy adjustments across regions and over time create substantial variation in maternity leave duration, providing valuable policy variation for examining its effects on fertility and children’s human capital.

Table 1 The evolution of maternity leave policies in China

Policy	Year	Context
Labor Insurance Regulations of the People’s Republic of China	1951	Female employees have 56 days of paid maternity leave, including pre- and postnatal periods; an additional 14 days is granted for multiple births or difficult deliveries.
Regulations on Labor Protection for Female Employees	1988	Female employees have 90 days of paid maternity leave, including 15 days of prenatal leave; an additional 15 days is granted for multiple births or difficult deliveries.
Population and Family Planning Law of the People’s Republic of China	2002	Couples who practice late marriage and late childbearing may be entitled to extended marriage leave, maternity leave, or other benefits
Special Provisions on Labor Protection for Female Employees	2012	Female employees have 98 days of paid maternity leave, including 15 days of prenatal leave; an additional 15 days is granted for multiple births or difficult deliveries.
Population and Family Planning Law of the People’s Republic of China (2015 Revision)	2016	Couples who give birth in accordance with laws and regulations are entitled to extended leave or other benefits.
Population and Family Planning Law of the People’s Republic of China (2021 Revision)	2021	The state encourages local governments in introducing parental leave policies.
Several Measures for Accelerating the Improvement of the Fertility Support Policy System and Promoting the Construction of a Fertility Friendly Society	2024	Improve the maternity leave system and promote the implementation of maternity leave, paternity leave, and parental leave.

Note: Data are compiled from the Labor Insurance Regulations of the People's Republic of China, the Regulations on Labor Protection for Female Employees, the Special Regulations on Labor Protection for Female Employees, and the Population and Family Planning Law of the People’s Republic of China.

2.2. Theoretical Analysis

We consider an overlapping generations (OLG) model that incorporates childcare time, endogenous fertility, and paid maternity leave policies. It examines how extensions of paid maternity leave affect household fertility decisions and the human capital development of children through changes in childcare time allocation and household income.

2.2.1 The Model

In our model, individuals live through three periods: childhood, adulthood, and retirement. Individuals

are endowed with one unit of time during both childhood and adulthood, and no time endowment in old age. During childhood, individuals rely on their parents for consumption as well as educational expenditures.

Family

In our study, childcare time is an important input factor in "giving birth" to children. It can be provided by family members or by purchasing formal childcare services in the market (Day, 2016). The childcare time production function is specified as:

$$n_t = bz_t^\alpha x_t^{1-\alpha} \quad (1)$$

Where b denotes the technological parameter in the production of childcare time. Raising each child requires parents to devote z_t units of childcare time, and to purchase x_t units of childcare services from the market. Parameters α and $1 - \alpha$ represent the output elasticities of parental childcare time and market-based childcare services, respectively, capturing their relative contributions to fertility. Considering that childcare provided by family members and market-based childcare services are asymmetric substitutes, formal childcare services available in the market cannot fully replace parental care, such as parent-child interaction, emotional support, and interpersonal communication (Reijnders, 2018; Plotka and Busch-Rossnagel, 2018). Accordingly, both α and $1 - \alpha$ are assumed to be positive.

Let v_t denote the minimum childcare cost required to raise one child. The total childcare time cost of raising n_t children is thus given by $TC(n_t) = n_t v_t$. Accordingly, the total cost of childcare is

$$TC(n_t) = \min_{z_t, x_t} \{ (1 - t_p)(1 - \tau)w_t h_t z_t + p_t x_t \} \quad (2)$$

Where t_p denotes the share of paid leave in total household childcare time. Given that all existing paid parental leave policies in China provide basic wage replacement during the leave, $t_p w_t h_t z_t$ captures income compensation during paid leave. The opportunity cost of providing family-based care is $(1 - t_p)w_t h_t z_t$. The cost of using childcare services is $p_t x_t$. Households minimize the total cost of childcare by allocating time between parental care and market childcare services. The optimal parental childcare time and purchased childcare services that minimize the total childcare time cost are given as

$$z_t^* = \hat{z}_t n_t = \left[\frac{p_t}{(1 - t_p)(1 - \tau)w_t h_t} \cdot \frac{\alpha}{1 - \alpha} \right]^{1-\alpha} \cdot \frac{n_t}{b} \quad (3)$$

$$x_t^* = \hat{x}_t n_t = \left[\frac{(1 - t_p)(1 - \tau)w_t h_t}{p_t} \cdot \frac{1 - \alpha}{\alpha} \right]^\alpha \frac{n_t}{b} \quad (4)$$

$$v_t = \frac{[(1 - t_p)(1 - \tau)w_t h_t]^\alpha p_t^{1-\alpha} D}{b} \quad (5)$$

Where $D = \frac{1}{\alpha^\alpha (1 - \alpha)^{1-\alpha}}$, and v_t refers to the minimized childcare cost for each child.

Each household derives utility directly from family consumption and children, with child quantity and quality jointly affecting household utility. The utility function is given as

$$U_t = \ln c_{1,t} + \beta \ln c_{2,t+1} + \gamma \ln n_t h_{t+1} \quad (6)$$

Where $c_{1,t}$, $c_{2,t+1}$, n_t denote the working-age consumption, old-age consumption, and pairs of children,

respectively. h_{t+1} is the human capital of child at time t . $\beta \in (0,1)$ and $\gamma \in (0,1)$ capture the relative weights given to old-age consumption and children.

The budget constraint can be written as

$$c_{1,t} = (1 - \tau)w_t h_t (1 - z_t) + t_p (1 - \tau)w_t h_t z_t - s_t - e_t n_t - p_t x_t \quad (7)$$

$$c_{2,t+1} = R_{t+1} s_t \quad (8)$$

We assume that the child's human capital is determined by parental human capital, household financial investment in child's education and parental childcare time. The human capital production function is specified as follows:

$$h_{t+1} = E(\hat{z}_t e_t)^\varepsilon h_t^{1-\varepsilon}, 0 < \varepsilon < 1 \quad (9)$$

Here, child human capital is denoted by h_{t+1} . e_t and $\hat{z}_t$ denote the household financial investment in child's education, and parental childcare time per child, respectively. ε captures the contribution of parental monetary and time investments to child's education, with a higher value indicating a larger contribution to human capital accumulation. $E > 0$ denotes the technological parameter in the human capital production function, which also reflects the effect of purchased childcare on child human capital formation.

Government

The government provides income compensation $t_p w_t h_t$ to individuals on parental leave, financed by a proportional tax τ on young individuals. The government budget constraint is specified as follows:

$$\tau w_t h_t N_t = t_p w_t h_t z_t N_t \quad (10)$$

This simplifies to:

$$\tau = t_p z_t \quad (11)$$

Production Department

The production sector consists of a final goods sector and a childcare services sector. Given that adults at time t devote z_t units of time to childcare, effective labor supply at time t is given by $H_t = (1 - z_t)N_t h_t$, where N_t denotes the adult population at time t .

Final goods sector. A representative firm operating under perfect competition employs effective labor and capital as production inputs. We assume that the production function follows a Cobb–Douglas form:

$$Y_t = A K_t^\rho (H_{yt})^{1-\rho} \quad (12)$$

Where Y_t is total output, $A > 0$ is the technology parameter. ρ and $1 - \rho$ are the output elasticities of capital and effective labor ($0 < \rho < 1$), respectively. K_t is capital, and H_{yt} denotes effective labor

($H_{yt} = L_{yt}h_t$, L_{yt} denotes labor employed in the final goods sector, and the superscript y refers to the final goods sector). Assuming full capital depreciation within one period, firms choose capital and effective labor to maximize profits. The equilibrium wage and interest rates are given by:

$$w_t = (1 - \rho)A \left(\frac{K_t}{H_{yt}} \right)^\rho \quad (13)$$

$$R_{t+1} = \rho A \left(\frac{K_t}{H_{yt}} \right)^{\rho-1} \quad (14)$$

Let k_t denote capital per effective worker, where $k_t = \frac{K_t}{L_{yt}}$. Accordingly, the equilibrium wage rate and interest rate can be rewritten as:

$$w_t = (1 - \rho)A\eta_t^\rho \quad (13)'$$

$$R_{t+1} = \rho A\eta_t^{\rho-1} \quad (14)'$$

Here, the ratio of physical capital to human capital per worker is determined by $\eta_t = \frac{K_t}{H_{yt}} = \frac{K_t/L_{yt}}{H_{yt}/L_{yt}} = \frac{k_t}{h_t}$.

Childcare Services Sector. We assume the childcare service is labor-intensive, with identical labor costs across sectors. The production function of the childcare services sector is given by:

$$Y_{ct} = \sigma H_{ct} \quad (15)$$

Where σ is the technological parameter ($0 < \sigma < 1$), and H_{ct} denotes effective labor input in the childcare services sector. The total output of the childcare services sector in period t is Y_{ct} . Assuming that the wages in the childcare services sector are equal to those in the final goods sector (w_t), the equilibrium price of childcare services is given by:

$$p_t = \frac{w_t h_t}{\sigma} \quad (16)$$

The details of the household optimization are reported in Appendix A.

2.2.2 Dynamic System

In equilibrium, all markets clear in every period. Labor market clearing implies the effective labor supplied by households equals the total effective labor employed by the final goods sector and the childcare services sector, that is: $L_t = (1 - z_t - x_t)N_t$. The dynamics of the economy are governed by the law of motion for capital per working-age household. Goods market clearing implies $K_{t+1} = s_t N_t$. In equilibrium, next-period capital stock equals aggregate savings of working-age households in the current period. The number of working-age households at time $t+1$ satisfies $N_{t+1} = n_t N_t$.

Thus, an equation of motion k_{t+1} can be written as

$$k_{t+1} = \frac{s_t N_t}{L_{t+1}} = \frac{s_t N_t}{(1 - z_{t+1} - x_{t+1})N_{t+1}} = \frac{s_t}{(1 - z_{t+1} - x_{t+1})n_t} \quad (17)$$

The steady state for this model satisfies $z^* = z_t = z_{t+1}$, $x^* = x_t = x_{t+1}$. Substituting the factor price from Eq.(13)'-(14)' into Eq.(A1)-(A4)^①, we can derive the equilibrium for parental childcare, market

^① Details of the household optimization results can be found in the Appendix.

childcare, fertility, and human capital investment:

$$z^* = \frac{\gamma\alpha(1-\varepsilon)}{1+\beta+\gamma} \cdot \frac{1}{1-t_p} \quad (18)$$

$$x^* = \frac{\gamma(1-\alpha)(1-\varepsilon)}{1+\beta+\gamma} \cdot (1-\tau)\sigma \quad (19)$$

$$n^* = \frac{b}{D} \cdot \frac{\gamma(1-\varepsilon)}{1+\beta+\gamma} \cdot \left(\frac{1}{1-t_p}\right)^\alpha \cdot [(1-\tau)\sigma]^{1-\alpha} \quad (20)$$

$$e^* = \frac{\varepsilon}{1-\varepsilon} \cdot \frac{D[(1-t_p)(1-\tau)]^\alpha \sigma^{1-\alpha}}{b} \quad (21)$$

By substituting Eq.(18), (20), and (21) into Eq.(9), we obtain the equilibrium human capital accumulation equation as

$$h_{t+1} = E \left\{ \frac{\varepsilon\alpha}{1-\varepsilon} \cdot \left(\frac{D}{b}\right)^2 \cdot \sigma^{(2\alpha-2)} [(1-t_p)(1-\tau)]^{2\alpha-1} \right\}^\varepsilon \cdot w_t^\varepsilon h_t \quad (22)$$

Substituting Eq.(13)'-(14)' and Eq.(22) into Eq.(17), and normalizing both sides by h_{t+1} , yields the law of motion for:

$$\eta_{t+1} = \frac{k_{t+1}}{h_{t+1}} = \frac{\beta D(1-t_p)(1-\tau)(1-\rho)A\eta_t^\rho h_t}{b\gamma(1-\varepsilon)[(1-t_p)(1-\tau)\sigma]^{1-\alpha} \left\{ 1 - \frac{\gamma(1-\varepsilon)}{1+\beta+\gamma} \left[\frac{\alpha}{1-t_p} + (1-\alpha)(1-\tau)\sigma \right] \right\}} \quad (23)$$

In the steady state, the ratio of physical to human capital per worker is given by $\eta_{t+1} = \eta_t = \eta^*$, and η^* satisfies

$$\eta^* = \left\{ \frac{\beta}{\gamma E} \cdot \left(\frac{D}{b}\right)^{1-2\varepsilon} \cdot \frac{[(1-t_p)(1-\tau)]^{\alpha+(1-2\alpha)\varepsilon} \cdot [(1-\rho)A]^{1-\varepsilon}}{(\varepsilon\alpha)^\varepsilon \cdot (1-\varepsilon)^{1-\varepsilon} \cdot \sigma^{(1-\alpha)(1-2\varepsilon)}} \right\}^{\frac{1}{1-\rho(1-\varepsilon)}} \quad (24)$$

In our model, wage compensation during paid maternity leave is financed through income taxes levied on workers by the government. Combining the government budget constraint Eq.(11) with the optimal household childcare condition Eq.(18), we obtain

$$\tau = \frac{\gamma\alpha(1-\varepsilon)}{1+\beta+\gamma} \cdot \frac{t_p}{1-t_p} \quad (25)$$

The derivative of τ in Eq.(25) is given as

$$\frac{\partial \tau}{\partial t_p} = \frac{\gamma\alpha(1-\varepsilon)}{1+\beta+\gamma} \cdot \frac{1}{(1-t_p)^2} \quad (26)$$

According to Eq.(26), $\frac{\partial \tau}{\partial t_p} > 0$, implying that under general equilibrium conditions, extending paid maternity leave requires the government to increase the income tax rate to finance additional wage compensation during leave. The higher tax burden may reduce households' disposable income, thereby tightening their budget constraints.

2.2.3 Paid Maternity Leave and Fertility: t_p and n^*

Take the derivative of t_p in the steady-state fertility n , we obtain

$$\frac{\partial n^*}{\partial t_p} = \frac{b}{D} \cdot \frac{\gamma(1-\varepsilon)}{1+\beta+\gamma} \cdot \frac{\alpha\sigma^{1-\alpha}}{(1-t_p)^{1+\alpha} \left[1 - \frac{\gamma\alpha(1-\varepsilon)}{1+\beta+\gamma} \frac{t_p}{1-t_p}\right]^\alpha} \cdot \left[1 - \frac{\gamma\alpha(1-\varepsilon)(1+t_p-\alpha)}{(1+\beta+\gamma)(1-t_p)}\right] \quad (27)$$

As shown in Eq.(27), the sign of $\frac{\partial n^*}{\partial t_p}$ depends on the relationship between t_p and the threshold value $\bar{t}_p$.^① When $t_p < \bar{t}_p$, $\frac{\partial n^*}{\partial t_p} > 0$, implying that the optimal child number increases with the duration of paid maternity leave. In contrast, when $t_p > \bar{t}_p$, $\frac{\partial n^*}{\partial t_p} < 0$, indicating that further extensions generate a negative effect on fertility. We therefore obtain the following proposition:

Proposition 1 *Given the factor prices, the relationship between paid maternity leave and fertility is inverted U-shaped.*

Proof Refer to the Appendix A.

2.2.4 Paid Maternity Leave and Children's Human Capital: t_p and h_{t+1}

Take the derivative of t_p in the human capital production function h_{t+1} , we obtain

$$\frac{\partial h_{t+1}}{\partial t_p} = \varepsilon \hat{z}_t^{\varepsilon-1} e_t^{\varepsilon-1} h_t^{1-\varepsilon} E \left(e_t \frac{\partial \hat{z}_t}{\partial t_p} + \hat{z}_t \frac{\partial e_t}{\partial t_p} \right) \quad (28)$$

As shown in Eq. (28), the sign of $\frac{\partial h_{t+1}}{\partial t_p}$ depends on the sign of $\left(e_t \frac{\partial \hat{z}_t}{\partial t_p} + \hat{z}_t \frac{\partial e_t}{\partial t_p} \right)$. Since $\frac{\partial \hat{z}_t}{\partial t_p} > 0$ and $\frac{\partial e_t}{\partial t_p} < 0$, the sign of $\partial h_{t+1} / \partial t_p$ is ambiguous. We therefore obtain the following proposition:

Proposition 2 *In the general equilibrium, the effect of extending paid maternity leave on children's human capital is ambiguous. The overall impact depends on the relative strength of the positive effect arising from increased parental childcare time and the crowding-out effect caused by the reduction in disposable household income.*

Proof Refer to the Appendix A.

3 Empirical Strategy

3.1 Model for Fertility Behavior

We employ a Poisson regression model to examine the effect of paid maternity leave on fertility behavior. Since the number of children is a count variable, we adopt the Poisson model to capture the distributional characteristics of fertility outcomes.

Let $child_i$ denote the number of children born to individual i , and c_i is the observed realization of $child_i$. Assuming that $child_i$ follows a Poisson distribution with conditional mean μ_i , the conditional probability function is given by

$$P(child_i = c_i | \mu_i) = \frac{e^{-\mu_i} \mu_i^{c_i}}{c_i!} \quad c_i = 1, 2, 3, 4, 5, 6 \quad (29)$$

^①We obtain that $sign \frac{\partial n}{\partial t_p} = sign \left\{ 1 - \frac{\gamma\alpha(1-\varepsilon)(1+t_p-\alpha)}{(1+\beta+\gamma)(1-t_p)} \right\}$. When this condition holds, we have the threshold $\bar{t}_p =$

$\frac{1+\beta+\gamma-\gamma\alpha(1-\varepsilon)(1-\alpha)}{1+\beta+\gamma+\gamma\alpha(1-\varepsilon)}$.

Where $\mu_i = E(c_i | Mare_i, Z_i)$ is the expected number of children conditional on the explanatory variables. The basic model is defined as follows:

$$\mu_i = \exp\{a_0 + a_1 Mare_i + a_2 Mare_i^2 + Z_i \delta + \varepsilon_{1,i}\} \quad (30)$$

Where $Mare_i$ denotes the length of paid maternity leave, $Mare_i^2$ is the squared term of paid maternity leave; Z_i is a vector of control variables that includes individual characteristics associated with fertility decisions and a set of macroeconomic variables. a_1 and a_2 capture the marginal effect of paid maternity leave on fertility behavior; $\varepsilon_{1,i}$ is a random error term.

3.2 Model for Children's Human Capital

Since children's human capital is measured as a continuous variable, we estimate the following OLS model:

$$hum_i = d_0 + d_1 lea_i + d_2 lea_i^2 + d_3 Plea_i + X_i \alpha + \varepsilon_{2,i} \quad (31)$$

Where lea_i denotes the length of maternity leave, and lea_i^2 is the squared term of it; $Plea_i$ represents the paternity leave taken by the father following the most recent birth; hum_i denotes the educational attainment of the child born from the most recent childbirth; X_i is a vector of control variables. The coefficients d_1 and d_2 capture the effects of paid maternity leave and paternity leave on children's human capital, respectively. $\varepsilon_{2,i}$ is the error term.

4 Data and Variables

4.1 Data

We use the 2013, 2015, and 2017 waves of the China Household Finance Survey (CHFS) for the empirical analysis. The CHFS conducted five rounds of nationally representative household surveys between 2011 and 2019. In China, paid maternity leave policies were adjusted in 1955, 1988, 2012, and 2016, with each reform primarily extending the duration of leave. Consistent with the theoretical framework developed above, the empirical analysis focuses on the fertility and child-quality effects of changes in maternity leave duration. We use the sample of urban employed women aged 50 or below who had given birth. Rural residents, self-employed urban workers, and other groups not explicitly covered by maternity leave regulations are excluded. After further removing observations with missing values, the final sample consists of 5,221 individuals.

4.2 Variables

Dependent Variables

We construct two sets of dependent variables to capture household fertility and children's human capital, namely fertility quantity and child educational attainment. When analyzing the effect of paid maternity leave on fertility, the dependent variable is the total number of children born to the respondent. This variable ranges from 1 to 5 and is directly constructed from the survey data. When examining

children's human capital, we use children's relative years of schooling.^① This variable is constructed by standardizing individual years of schooling relative to provincial averages^②, which are computed using age-specific education data from the National Bureau of Statistics of China. This approach ensures that educational attainment is comparable across children of different ages.

Key Explanatory Variables

The key explanatory variable is maternity leave duration, measured in two alternative ways: statutory maternity leave length and women's actual leave taken. In the analysis of fertility outcomes, we use provincial statutory maternity leave days, compiled from national and provincial labor protection and family planning regulations^③. Because statutory leave is set by policy and varies exogenously across provinces and over time, whereas actual leave is self-selected and may be correlated with unobserved individual and household characteristics (Danzer & Lavy, 2018), we use statutory leave length to identify the causal effect on fertility. When examining children's human capital, we use the actual maternity leave duration of mothers, as it better captures the realized time allocated to childcare and the household income changes around childbirth. The CHFS 2013 provides detailed information on whether women aged 52 and below took maternity leave, the number of leave days, their income status during leave and spousal paternity leave, which we use to construct actual leave duration. Besides, we exclude respondents with no income during leave, as they do not meet the definition of paid leave.

Control Variables

For the fertility analysis, we include women's age, education, political affiliation, household income, housing assets; province fixed effects absorb time-invariant regional heterogeneity. We additionally construct a policy-reform indicator from each respondent's year of childbirth to capture the 1988 and 2012 national maternity leave adjustments. For the human capital analysis, we include maternal characteristics (age, ethnicity, political affiliation, education), child characteristics (gender and number of children), household socioeconomic status, and paternity leave duration, with province and cohort (birth year of the most recent child) fixed effects.

^① We use relative rather than absolute educational attainment for the following reasons. The expansion of paid maternity leave in 1988 (from 56 to 90 days), together with the 1986 Compulsory Education Law and the subsequent nationwide expansion of compulsory education, may inflate absolute educational outcomes and confound the estimated policy effects. To address this issue, we construct children's years of schooling relative to the average in their province of residence, thereby standardizing educational attainment across regions and cohorts. A positive effect on relative educational attainment indicates that children's schooling increases faster than the provincial trend under longer maternity leave policies, mitigating concerns driven by nationwide education reforms.

^② The provincial average years of schooling is computed as a population-weighted mean of educational attainment levels: the year 0 to no schooling, 6 to primary school, 9 to junior secondary, 12 to senior secondary, and 16 to tertiary education (college and above), where the weights are the population shares of each level among residents aged 6 and above.

^③ In line with the coverage of the micro survey data and the timing of maternity leave policy reforms in China, this study primarily focuses on maternity leave policies implemented before 2016.

4.3 Descriptive Statistics

Using the Regulations on Labor Protection for Female Employees and provincial Population and Family Planning Regulations, we compile statutory maternity leave data for 31 Chinese provinces as of 2015 (see Table B1 in Appendix B). Statutory maternity leave was extended from 90 days in 1988 to 98 days (14 weeks) in 2012, consistent with the International Labour Organization standard. Provincial additional leave ranges from 10 days (e.g., Gansu) to 90 days (e.g., Heilongjiang, Fujian, and Henan), so total statutory leave varies by up to 80 days across provinces.

Table 2 reports descriptive statistics for the main variables. Statutory maternity leave duration is measured in weeks and entered in logarithmic form. The mean of the logged actual leave is 1.395 (approximately 10.03 weeks or 70.21 days), indicating that actual leave falls below the statutory entitlement of 14 weeks. With a standard deviation of 1.485, the coefficient of variation exceeds 1, indicating substantial heterogeneity in actual leave duration across individuals. The mean log of men's paternity leave is 0.339 (approximately 0.75 weeks, or 5.35 days), while the average expected maternity leave is 16.52 weeks (115.64 days). For individual characteristics, the mean age of women is 39.34, and senior high school is the most common education level. Nearly 70% of individuals are employed in the private sector. The mean relative income during maternity leave is 7.150, which is lower than the income before childbirth. For children's human capital, the average years of schooling are 11.86 for all adult children and 12.79 for the most recently born child.

Table 3 reports the distribution of actual maternity leave duration by subgroup. On average, women in eastern China take longer maternity leave than those in central and western regions, and more than half of them take fewer than 98 days. On average, individuals of public-sector employees take about one additional week of maternity leave than private-sector. More than half of private-sector employees still take less than 98 days of leave. Paternity leave exhibits a similar pattern, with public-sector employees taking slightly longer leave than their private-sector counterparts. Actual leave duration varies with mothers' education. Women with a college degree or above tend to take longer leave, followed by those with senior high school education or below. For the most recently born child, families with better-educated children tend to have longer maternity and paternity leave and smaller family size.

Table 2 Descriptive Statistics

Variable	Obs.	Mean	SD	Min	Max
<i>Panel A: Key Explanatory Variables</i>					
Statutory maternity leave (Log)	5,221	2.850	0.210	2.079	3.291
Actual maternity leave (Log)	1,341	1.395	1.485	0	4.643
Actual paternity leave (Log)	681	0.339	0.570	0	2.461
Expected maternity leave (Log)	5,221	2.770	0.172	2.024	3.182
<i>Panel B: Individual-level Variables</i>					
Age	5,221	39.340	6.498	21	50

Han Ethnicity (Yes = 1)	1,418	0.927	0.260	0	1
CPC member (Yes = 1)	5,221	1.876	0.329	1	2
Education level	5,221	3.774	1.117	1	5
Public sector employment	3,594	1.690	0.462	1	2
Fertility motivation: old-age support	5,221	0.920	0.753	0	2
Fertility motivation: enjoys parenting	2,967	0.496	0.500	0	1
Household per capita annual income (Log)	5,221	9.963	1.811	0	14.708
Number of housing units owned	5,221	1.273	0.568	0	5
Grandparent support (Yes = 1)	1,418	0.765	0.424	0	1
Breastfeeding duration (Log)	1,343	2.143	0.900	0	4.511
Relative income during maternity leave	1,694	7.150	1.364	0	11.812
Frequency of parent-child interaction	1,347	4.471	0.986	1	5
Number of children	5,221	1.283	0.534	1	5
Average years of schooling (adult children)	1,418	11.864	3.048	1	22
Relative educational attainment (adult children)	808	3.640	0.980	0.234	6.317
<i>Panel C: Recently Born Child</i>					
Male (Yes=1)	1,418	0.599	0.490	0	1
First-born (Yes=1)	1,418	0.802	0.399	0	1
Years of schooling	791	12.794	2.508	1	19
Relative educational attainment	791	1.398	0.302	0.111	2.231
<i>Panel D: Macro-level Variables</i>					
Provincial per capita GDP (Log)	5,221	10.857	0.394	10.050	11.768
Maternity leave policy reform	5,221	1.083	0.345	0	2

Note: Sample sizes vary across specifications due to differential missing values in key explanatory, control, and mechanism variables. Observations with missing values are dropped in each regression.

Table 3 Distribution of Actual Maternity Leave

Group	Actual Maternity Leave (weeks)	< 98 days (%)	98-127 days (%)	128-157 days (%)	≥ 158 days (%)	Paternity Leave (weeks)	Children Number
<i>Region</i>							
Eastern	14.99	50.57	18.10	11.21	20.12	0.731	1.252
Others	14.30	60.62	14.26	6.65	18.47	0.780	1.323
<i>Employer type</i>							
Public sector	15.73	49.81	18.20	10.15	21.84	0.767	1.095
Private sector	14.54	55.39	17.39	9.82	17.40	0.738	1.208
<i>Mother's education</i>							
Junior high or below	11.06	73.56	11.49	1.15	13.80	0.447	1.492
Senior high school	13.35	65.20	13.48	6.58	14.74	0.863	1.206
College and above	15.94	47.56	19.27	11.95	21.22	0.798	1.082
<i>Child's education</i>							
Junior high or below	17.80	87.68	2.17	2.17	7.97	0.545	1.179
Senior high or above	20.20	73.23	7.73	4.16	14.88	0.767	1.162

Note: The above sample includes only individuals who reported taking maternity leave after childbirth.

5 Empirical Results

5.1 Baseline Results

5.1.1 Effect of Maternity Leave Duration on Fertility

Table 4 reports the estimated effects of maternity leave extension on household fertility, with columns (1) and (2) presenting Poisson and OLS results, respectively. Consistent with the theoretical analysis, the results reveal a significant inverted U-shaped relationship between maternity leave duration and fertility. Fertility increases with leave duration but declines beyond a threshold level. According to column (1), the turning point is approximately 24.54 weeks, suggesting that extending leave by around 10 weeks above the current 14-week national floor—suggesting that extending statutory leave toward roughly 24 weeks could promote fertility, but further extension would reverse the effect. Among the controls, fertility rises with age and political affiliation, and falls monotonically with educational attainment (from primary through college) and with household income, consistent with a quantity-quality trade-off. Housing assets show a positive and highly significant association with fertility in both columns.

Table 4 Effect of Maternity Leave on Household Fertility

Variable	(1) Poisson	(2) OLS
Statutory maternity leave	3.946** (1.774)	5.219** (2.280)
Statutory maternity leave (squared)	-0.617* (0.318)	-0.823** (0.408)
Age	0.007*** (0.001)	0.009*** (0.002)
Primary school	-0.162*** (0.041)	-0.308*** (0.082)
Junior high school	-0.314*** (0.041)	-0.542*** (0.083)
Senior high school	-0.443*** (0.041)	-0.708*** (0.083)
College and above	-0.541*** (0.043)	-0.817*** (0.085)
Political affiliation	0.036*** (0.014)	0.041** (0.016)
Household income	-0.025*** (0.003)	-0.036*** (0.005)
Housing assets	0.040*** (0.009)	0.051*** (0.012)
Other control variables	Yes	Yes
Maternity leave policy reform	Yes	Yes
Province FE	Yes	Yes

Observations

5,221

5,221

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors clustered at the city level are reported in parentheses.

5.1.2 Effect of Maternity Leave Duration on Children's Human Capital

Table 5 reports the effects of maternity leave on children's human capital. Column (1) includes actual maternity leave, its squared term, and paternity leave. Column (2) adds full control variables, and column (3) restricts the sample to households whose target child is aged 18 or above. The results reveal a U-shaped relationship between actual maternity leave duration and children's educational attainment. Children's educational attainment initially decreases with longer maternity leave but increases after a threshold level. The estimated turning point is approximately 0.143 in logarithmic terms (less than one week), which is substantially below the sample mean 1.395 (approximately 10 weeks). This indicates that, for most observations in the sample, longer maternity leave is associated with improved children's human capital. Column (4) uses the average relative educational attainment of all adult children in the household as the dependent variable. The U-shaped pattern remains, although the effect is weaker than that for the most recently born child, indicating that maternity leave has a more pronounced impact on the educational outcomes of the target child.

Besides, fathers' actual paternity leave, child gender, birth order, and the total number of children in the household are not significantly associated with children's human capital. Parental education exerts a significant positive effect on children's human capital, consistent with the intergenerational transmission of human capital.

Table 5 Effect of Paid Maternity Leave on Children's Human Capital

Variable	(1)	(2)	(3)	(4)
	Target child	Target child	Target child (age ≥ 18)	Average adult children's education
Actual maternity leave	-0.210** (-2.550)	-0.178*** (-2.849)	-0.178*** (-2.858)	-0.122* (-1.704)
Actual maternity leave (squared)	0.728** (2.528)	0.622*** (2.894)	0.590*** (2.759)	0.429* (1.811)
Paternity leave	-0.024 (-0.946)	-0.016 (-0.630)	-0.000 (-0.004)	-0.002 (-0.062)
Gender of child (Male = 1)		-0.015 (-0.275)	-0.072 (-1.248)	
First child (Yes = 1)		0.028 (0.524)	-0.029 (-0.449)	
Number of children		-0.020 (-0.782)	-0.017 (-0.578)	
Age		0.001 (0.248)	0.002 (0.504)	-0.001 (-0.123)
Junior high school		0.258***	0.346***	0.358***

		(2.983)	(5.307)	(5.250)
Senior high school		0.361***	0.449***	0.402***
		(4.038)	(6.560)	(5.729)
College and above		0.429***	0.521***	0.494***
		(4.845)	(7.651)	(7.243)
Province FE	Yes	Yes	Yes	Yes
Observations	369	343	278	326

Note: Given that children under 18 may not have completed formal schooling, this paper constructs a relative educational attainment variable (child's years of schooling divided by the provincial average) and restricts the sample to target children aged 18 and above in columns (3) and (4). Regressions with and without the squared term are both estimated; the coefficient on the leave variable is insignificant when the squared term is excluded, confirming a nonlinear relationship. Results without the squared term are not reported. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors clustered at the city level are reported in parentheses.

5.1.3 Robustness Checks

The potential endogeneity in this study may arise for two reasons. First, sample selection bias may occur because the analysis is restricted to employed women, excluding those outside the labor market whose fertility outcomes are unobserved. To address this issue, we employ a Heckman selection model as a robustness check for both fertility quantity and children's human capital outcomes. Specifically, we estimate the selection equation using the provincial female employment rate as the exclusion restriction and include the inverse Mills ratio in the outcome equations.^① Second, omitted variable bias may arise from unobserved factors that affect both access to paid maternity leave benefits and fertility decisions.^② Although the baseline specification controls for respondents' work unit type at the time of the survey, data limitations prevent us from observing employment status at the time of childbirth. Consequently, controlling for current work unit type may not fully eliminate this source of endogeneity. To address this issue, we construct an instrumental variable, namely expected maternity leave. The IV is defined as the maternity leave a woman would expect to receive at the time of childbirth given her age and the policy environment. It is constructed by combining the national statutory baseline with province specific bonus leave policies and their implementation timing, matched to each respondent's year of childbirth.^③ Expected maternity leave is thus computed as follows:

^① This variable is constructed as the ratio of employed women to the female population aged 16 and above in each province over the sample period. The female employment rate is expected to affect women's labor market participation but is unlikely to directly influence fertility decisions, thereby satisfying the exclusion restriction requirement.

^② Women employed in government, public institutions, or large enterprises are more likely to receive paid maternity leave and may experience smaller income losses or lower job instability around childbirth. As a result, the effect of maternity leave on fertility may be confounded by differences in employment characteristics.

^③ For example, Shanghai introduced an additional 15 day maternity leave in 1990, implying a total entitlement of 105 days (90 national days plus 15 additional days) for women giving birth in that year. This study extends Jia and Yang (2019) by incorporating the national reforms in 1988 (from 56 to 90 days) and 2012 (from 90 to 98 days) as

$$Expleave_i = \frac{Basleave_i*(23-18+1)+Totleave_i*(Womage_i-24+1)}{Womage_i-18+1} \quad (30)$$

Where $Expleave_i$ is the expected maternity leave days for respondent i given her age $Womage_i$ at the survey period, and $Totleave_i$ is the total statutory leave entitlement (national + provincial bonus) applicable when the woman is aged a in the corresponding year.^① The expected maternity leave variable satisfies the requirements for a valid instrument. Expected maternity leave is constructed based on the national statutory leave schedule and each province's bonus leave implementation year, and is closely linked to the actual leave women can take, ensuring strong correlation. The instrument is based on macro-level policy rules and is not determined by individual fertility behavior, supporting its exogeneity.

We also address the potential confounding effects of fertility policy changes. The study period coincides with major shifts in family planning policy, including the one-child policy introduced in 1979, as well as the “selective two-child” and “universal two-child” policies implemented in 2013 and 2015, respectively. For each respondent, we construct the cumulative duration of exposure to each policy from age 20 to the survey year and include it as a control to capture shifts in fertility intentions and norms induced by these policy changes.^②

Table 6 reports robustness checks for the effect of maternity leave extension on household fertility. The inverted U-shaped relationship between statutory maternity leave and fertility remains robust to instrumental variable estimation, Heckman selection correction, and controls for fertility policy exposure. These results corroborate the baseline findings. Table 7 presents robustness checks for the estimated effect of maternity leave extension on children's human capital. The results are consistent with the baseline estimates, supporting the robustness of the main conclusions.

Table 6 Robustness Checks: Effect of Maternity Leave Extension on Fertility

Variable	(1) IV	(2) Heckman	(3) Fertility Policy
Statutory maternity leave	12.708** (5.839)	4.163** (1.775)	3.907** (1.768)
Statutory maternity leave (squared)	-2.154** (1.058)	-0.656** (0.318)	-0.610* (0.317)
Inverse Mills ratio		3.361	

time varying policy changes.

^① For women in provinces that have implemented the bonus and whose childbirth has not yet occurred, it is assumed that they give birth after 2012. If aged 18-23, the statutory leave is 98 days; if aged 24 or above (late childbearing under family planning regulations), the applicable leave is 98 days plus the provincial bonus. For women who gave birth before 1988, the national leave was 56 days. Leave days are converted to weeks for consistency with earlier specifications.

^② Given that the sample covers cohorts born between 1964 and 1991, the youngest women are already above age 20 by 2013. As a result, all individuals have identical exposure duration during their reproductive years to the “selective two-child” and “universal two-child” policies, and thus this variation is not informative. We therefore focus on exposure to the 1979 one-child policy when constructing fertility policy exposure. Although the one-child policy underwent gradual adjustments over time, it remained a binding constraint for most of the study period. Hence, this measure still captures, to some extent, the influence of fertility policy constraints and helps control for potential confounding effects of policy changes on fertility behavior.

		(4.041)	
Other controls	Yes	Yes	Yes
Maternity leave policy reform	Yes	Yes	Yes
Province FE	Yes	Yes	Yes
Observations	5,221	5,221	5,221

Note: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors clustered at the city level are reported in parentheses.

Table 7 Robustness Checks: Effect of Maternity Leave on Children's Human Capital

Variable	Children's Education
Actual maternity leave	-0.178*** (-2.849)
Actual maternity leave (squared)	0.622*** (2.894)
Paternity leave	-0.016 (-0.630)
Inverse Mills ratio	6.736*** (3.582)
Other controls	Yes
Birth cohort FE	Yes
Province FE	Yes
Observations	343

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors clustered at the city level are reported in parentheses.

5.2 Heterogeneity Analysis

5.2.1 Heterogeneity in the Fertility Effect

Region

Regional disparities in economic development, childcare availability, and women's labor market opportunities may lead to heterogeneous fertility responses to maternity leave policies. Compared with central and western China, eastern China has higher living costs and stronger female labor market attachment, which may alter the effectiveness of maternity leave in reducing childbearing constraints. We therefore divide the sample into eastern and central-western China to examine regional heterogeneity in fertility responses.

As shown in Table 8, the fertility effects of maternity leave extension differ significantly across regions. In eastern China, neither the linear nor quadratic coefficients of statutory paid maternity leave is statistically insignificant, whereas the central and western subsample reveal a significant inverted U-shaped relationship. The estimated turning point is approximately 20.14 weeks of maternity leave. The weaker fertility response in eastern China may be because households in these regions face higher childrearing costs and greater opportunity costs associated with women's career interruptions.

Consequently, the time and income support provided by maternity leave may be insufficient to offset the overall costs associated with childbearing.

Table 8 Effect of Maternity Leave on Fertility by Region

Variable	(1)	(2)
	Eastern	Central & Western
Statutory maternity leave	-2.240 (2.942)	10.010*** (3.217)
Statutory maternity leave (squared)	0.525 (0.537)	-1.666*** (0.567)
Other controls	Yes	Yes
Maternity leave policy reform	Yes	Yes
Province FE	Yes	Yes
Observations	2,943	2,278

Notes: *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively. Standard errors clustered at the city level are reported in parentheses.

Employment Sector

Labor market conditions and employment protection differ substantially across sectors, potentially generating heterogeneous fertility effects of maternity leave extension. Women employed in the public sector (government agencies and public institutions) typically enjoy more stable work conditions and stronger childbirth-related benefits, which may reduce career concerns associated with fertility decisions. However, private-sector women often face greater uncertainty following childbirth. We therefore divide the sample into public- and private-sector subgroups.

Table 9 shows substantial heterogeneity in the fertility effects of maternity leave by employment sector. For public-sector women, neither the linear nor the squared coefficient is statistically significant. For private-sector women, the linear coefficient and the squared coefficient are significantly negative at the 5% level, revealing a significant inverted U-shaped relationship. The turning point is approximately 19.77 weeks of maternity leave. This suggests that, for women employed in the public sector, childbirth-related risks have already been partially absorbed by existing institutional arrangements, leaving limited room for additional maternity leave to further stimulate fertility. In contrast, private-sector women face greater employment and income risks associated with childbirth, making maternity leave policies more effective in relaxing their fertility constraints.

Table 9 Effect of Paid Maternity Leave on Fertility by Employment Sector

Variable	(1)	(2)
	Public	Private
Statutory maternity leave	-0.012 (2.505)	7.210** (2.864)
Statutory maternity leave (squared)	0.058	-1.209**

	(0.445)	(0.518)
Other controls	Yes	Yes
Maternity leave policy reform	Yes	Yes
Province FE	Yes	Yes
Observations	1,113	2,481

Note: *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively. Standard errors clustered at the city level are in parentheses.

Fertility Motivations

Fertility motivations may shape women's childbearing decisions and their responses to maternity leave policy. We therefore examine whether the effects of maternity leave extensions differ between women who report liking children as a motivation for childbearing and those who do not. Table 10 shows that the fertility effects of maternity leave extension differ by preferences for children. A significant inverted U-shaped relationship is observed only among women who do not report liking children as a motivation for childbearing. This suggests that maternity leave policies may have larger marginal effects among women whose fertility decisions are less strongly determined by their preferences for children.

Table 10 Effect of Paid Maternity Leave Extension on Fertility by Fertility Motivation

Variable	(1)	(2)
	Like children: Yes	Like children: No
Statutory maternity leave	6.130 (4.492)	11.830*** (3.331)
Statutory maternity leave (squared)	-0.964 (0.818)	-2.002*** (0.591)
Other controls	Yes	Yes
Maternity leave policy reform	Yes	Yes
Province FE	Yes	Yes
Observations	1,472	1,495

Note: The fertility motivation indicator equals one if respondents report "liking children" as a reason for having children and zero otherwise, based on responses to the survey question "What are the main reasons for having children?". *, **, and *** denote significance at the 10%, 5%, and 1% levels. Standard errors clustered at the city level in parentheses.

5.2.2 Heterogeneity in the Human Capital Effect

Parental Education

Parental human capital, particularly mother's education, may shape children's human capital formation through differences in early childcare investment. Mothers with different educational backgrounds may vary in the quality of childcare time provided during maternity leave, leading to heterogeneous effects of maternity leave on children's human capital accumulation. We therefore examine whether the effects of maternity leave differ by the education level of mothers and parents.

As shown in Table 11, the significant U-shaped relationship between actual leave duration and

children's educational attainment is consistent across all education subgroups. Since the estimated turning points are close to zero in all cases, longer maternity leave is associated with improved educational outcomes of children regardless of parental educational background. Comparing columns (1) and (2), the positive effect of maternity leave is more pronounced among children whose mothers have lower educational attainment. This may be because childcare time is relatively more constrained among less-educated mothers. According to the China Time Use Survey, college-educated women spend substantially more time on childcare and children's education than less-educated women. Therefore, extending maternity leave may provide greater marginal benefits for less-educated mothers by increasing their childcare time and partially mitigating disadvantages in early parental investment.

Table 11 Heterogeneity in the Effect on Children's Education: Parental Education

Variable	(1)	(2)	(3)	(4)
	Mother: low education	Mother: high education	Family avg: low education	Family avg: high education
Actual maternity leave	-0.281*** (-2.728)	-0.125* (-1.761)	-0.189* (-1.800)	-0.153** (-2.227)
Actual maternity leave (squared)	1.035*** (3.429)	0.369* (0.209)	0.777** (3.123)	0.392* (1.910)
Paternity leave	-0.060 (-1.109)	-0.027 (-0.709)	-0.065 (-1.238)	-0.003 (-0.078)
Other controls	Yes	Yes	Yes	Yes
Birth cohort FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Observations	200	143	160	183

Note: The sample is divided according to the mother's education and average parental education. The education indicator equals 1 for college degree or above and 0 for senior high school or below. *, **, and *** denote significance at the 10%, 5%, and 1% levels. Standard errors clustered at the city level in parentheses. Joint tests of cross-group differences reject the null hypothesis of equality (see Appendix Table B2).

Birth Order and Child Gender

Children's birth order and gender may shape parental investment patterns and the allocation of household resources, potentially leading to heterogeneous effects of maternity leave on children's human capital. We therefore examine whether the effects of maternity leave on children's educational attainment vary by birth order and child gender. Table 12 shows that maternity leave extensions significantly improves children's educational outcomes across all birth-order groups. Given that the turning points are near zero, the overall effect of extended leave on children's educational outcomes is positive. Heterogeneity by child gender reveals a significant positive effect of maternity leave on girls' educational attainment, while the effect for boys is statistically insignificant. This suggests that moderately extending maternity leave can partially counteract the gender discrimination that girls may face in early human

capital formation.

Table 12 Heterogeneity in the Effect on Children's Education: Child Characteristics

Variable	(1)	(2)	(3)	(4)	(5)
	First-born	Last-born	Only child	Boy	Girl
Actual maternity leave	-0.197** (-2.145)	-0.169* (-1.900)	-0.174* (-1.933)	-0.134 (-1.129)	-0.366** (-2.476)
Actual maternity leave (squared)	0.693** (2.120)	0.645** (2.073)	0.642** (2.036)	0.537 (1.338)	1.275** (2.509)
Paternity leave	-0.015 (-0.501)	-0.028 (-1.097)	-0.021 (-0.749)	-0.018 (-0.570)	0.011 (0.251)
Other controls	Yes	Yes	Yes	Yes	Yes
Birth cohort FE	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes
Observations	320	341	321	194	149

Notes: The sample is divided by the birth order (first-born, last-born, and only child) and gender of the target child, defined as the child born during the mother's most recent maternity leave. *, **, and *** denote significance at the 10%, 5%, and 1% levels. Standard errors clustered at the city level in parentheses.

5.3 Mechanism Analysis

5.3.1 Mechanisms of Fertility Responses to Maternity Leave

The theoretical model highlights two channels through which maternity leave affects fertility: maternal childcare time and household income. On the one hand, longer paid maternity leave increases the time available for maternal care during early childhood and reduces the time constraints associated with childbearing, thereby encouraging fertility. On the other hand, paid leave provides income protection during the childbirth period, which may relax household budget constraints and increase fertility incentives. However, extended maternity leave may also generate offsetting effects by reducing women's labor supply. In the general equilibrium framework, longer maternity leave reduces taxable labor income, requiring a higher tax rate to finance maternity leave benefits. The resulting increase in the tax burden may lower household disposable income and weaken fertility incentives. To examine these mechanisms, we use women's actual maternity leave duration as a proxy for maternal childcare time and relative income during leave (defined as the ratio of leave-period income to pre-leave income) as a measure of the income channel.

Table 13 provides evidence for the two mechanisms. The coefficient of statutory maternity leave on actual leave is significantly positive at the 5% level, indicating that longer statutory leave increases the actual time women spend away from work and available for childcare. Meanwhile, statutory maternity leave has a significantly negative effect on relative income during leave, suggesting that longer leave durations reduce income support during the leave period and strengthen the negative income effect on

fertility. Overall, these findings suggest that maternity leave extensions generate opposing effects on fertility: increased childcare time promotes fertility, whereas reduced relative income weakens fertility incentives. The inverted U-shaped fertility response reflects the changing dominance of these two effects as leave duration increases.

Table 13 Mechanism Analysis: Effect of Maternity Leave on Fertility

Variable	(1)	(2)
	Actual leave	Relative income
Statutory maternity leave duration	0.150** (0.070)	-0.479* (0.257)
Other controls	Yes	Yes
Maternity leave policy reform	Yes	Yes
Province FE	Yes	Yes
Observations	2,977	1,694

Note: *, **, and *** denote significance at the 10%, 5%, and 1% levels. Standard errors clustered at the city level in parentheses.

5.3.2 Mechanisms of Human Capital Effects of Maternity Leave

The theoretical framework suggests that maternity leave may affect children's human capital through two channels: parental childcare time and household income. On the one hand, extended maternity leave increases maternal time investment during early childhood, which may strengthen parent-child interactions and provide greater emotional and developmental support for children (Drange & Havnes, 2019; Lu et al., 2019). On the other hand, maternity leave extensions may tighten household budget constraints through higher tax burdens, thereby reducing resources available for children's education. In addition, fertility responses to increasing leave may generate a quantity-quality trade-off by spreading educational resources across a larger number of children.

To examine these mechanisms, we use parent-child interaction and relative income during leave as mechanism variables. Table 14 shows that paid maternity leave has a significantly positive effect on parent-child emotional interaction at the 10% level, indicating that extending maternity leave enhances parental engagement during early childhood. The coefficient on paternity leave is also significantly positive at the 1% level, suggesting that fathers may play an important complementary role in parent-child interactions. Since greater parent-child interaction can promote children's cognitive development and educational attainment (Del Bono et al., 2016; Drange & Havnes, 2019), these results provide evidence that parental childcare time is an important channel through which maternity leave affects children's educational outcomes. We also find that actual maternity leave duration has a significantly negative effect on relative income during leave, indicating that longer leave duration may tighten household budget constraints. These income constraints may crowd out parental investment in children's education, thereby potentially weakening children's human capital accumulation.

Table 14 Mechanism Analysis: Effect of Maternity Leave on Children's Human Capital

Variable	(1) Parent-child interaction	(2) Relative income
Actual maternity leave	0.139* (1.714)	-0.088*** (-2.638)
Paternity leave	0.316*** (2.646)	0.004 (0.174)
Other controls	Yes	Yes
Birth cohort FE	Yes	Yes
Province FE	Yes	Yes
Observations	619	619

Note: *, **, and *** denote significance at the 10%, 5%, and 1% levels. Standard errors clustered at the city level in parentheses.

6 Conclusions

In this paper, we revisit the classic question of how family support policies shape demographic outcomes and intergenerational human capital accumulation. Using China's gradual extension of statutory paid maternity leave as a policy setting, we develop a theoretical framework that incorporates endogenous childcare time, fertility choices, and parental investment in children. Our findings reveal that maternity leave extension generates nonlinear effects on fertility, while its impact on children's human capital depends on the trade-off between increased parental childcare time and constrained household income. The empirical evidence shows an inverted U-shaped relationship between statutory maternity leave and fertility, with an estimated turning point of approximately 24.54 weeks. For children's human capital, maternity leave extension generally improves educational outcomes, suggesting that the benefits from increased parental time investment outweigh the potential costs associated with constrained household income.

Further analysis highlights that maternity leave is an important family support policy that shapes how families allocate time and resources between fertility decisions and long-term child development. Extending maternity leave increases parental childcare involvement during early childhood and strengthens parent-child interactions, thereby promoting children's human capital accumulation. However, longer leave may also weaken income support during the leave period and tighten household budget constraints, partially offsetting the positive effects of increased parental childcare time.

Our heterogeneity analysis further demonstrates that the effects of maternity leave vary across household characteristics and institutional environments, highlighting the importance of targeted policy design. Fertility-promoting effects of maternity leave are stronger among women in central and western China and those employed in the private sector, suggesting that leave policies provide greater support for households facing childcare and employment constraints. In terms of child development, maternity leave generates larger human capital benefits for children of less-educated mothers and significantly improves girls' educational outcomes. These findings suggest that maternity leave policies may contribute not only to fertility support, but also as a means of improving equity in early human capital formation.

More broadly, effective maternity leave policies should balance childcare support and household resource constraints. A moderate extension of statutory paid maternity leave (approximately 10 weeks

beyond the current 14-week entitlement) may help increase fertility rate. However, longer leave durations should be accompanied by adequate income protection to prevent financial pressures from offsetting the benefits of increased parental childcare time. Such income support may further alleviate the quantity-quality trade-off by easing household budget constraints. Moreover, greater attention should be paid to groups that may benefit more from maternity leave support, such as less-educated mothers and girls. Ensuring equitable access to maternity leave benefits can help those families provide more childcare time and improve children's educational outcomes. Therefore, the design of maternity leave policies requires balancing time support and income protection rather than simply extending leave duration.

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Appendix A

A1. Household Optimization

Given the wage rate and interest rate, individuals solve the lifetime utility maximization problem. The first-order conditions with respect to savings, fertility, household educational investment, and childcare costs are given by:

$$\{s_t\} \quad \frac{1}{c_{1,t}} = \frac{\beta R_{t+1}}{c_{2,t+1}} \quad (A1)$$

$$\{z_t\} \quad \frac{(1-t_p)(1-\tau)w_t h_t}{\gamma c_{1t} - e_t n_t} = \frac{\alpha}{z_t} \quad (A2)$$

$$\{x_t\} \quad \frac{p_t}{\gamma c_{1t} - e_t n_t} = \frac{1-\alpha}{x_t} \quad (A3)$$

$$\{e_t\} \quad \frac{n_t}{c_{1,t}} = \frac{\gamma \epsilon}{e_t} \quad (A4)$$

Here, Eq.(A1) provides the relationship between the marginal cost and marginal benefit of savings. An increase in savings during adulthood reduces current consumption and utility, but the higher return

on savings raises old-age consumption and thereby increases lifetime utility. Eq.(A2) captures the trade-off between adult consumption and parental childcare time. Providing childcare reduces labor income, leading to lower consumption and utility during adulthood. However, the resulting increase in the number of children raises parental utility. Eq.(A3) captures the trade-off between adult consumption and the purchase of market-based childcare services. Greater expenditure on childcare services reduces current consumption and utility. At the same time, the increase in fertility associated with purchased childcare services enhances parental utility. In addition, purchased childcare services substitute for parental childcare time, thereby increasing labor income and consumption. Eq.(A4) captures the trade-off between child quantity and child quality, where child quality is reflected in human capital investment per child. An increase in the number of children raises the marginal cost of human capital investment, leading households to reduce financial investment in each child, holding other factors constant. Conversely, greater human capital investment per child increases the marginal cost of fertility and therefore discourages childbearing. This implies that individuals face a quantity-quality trade-off in fertility decisions.

Maximizing Eq. (6) with respect to Eq. (7)-Eq.(9), it follows that the savings, consumption, the number of children, and the household investment in child human capital are:

$$s_t^* = \frac{\beta}{1+\beta+\gamma} \cdot (1-\tau)w_t h_t \quad (\text{A5})$$

$$c_{1,t}^* = \frac{1}{1+\beta+\gamma} \cdot (1-\tau)w_t h_t \quad (\text{A6})$$

$$n_t^* = \frac{b}{D} \cdot \frac{\gamma(1-\varepsilon)}{1+\beta+\gamma} \left(\frac{1}{1-t_p} \right)^\alpha \left[\frac{(1-\tau)w_t h_t}{p_t} \right]^{1-\alpha} \quad (\text{A7})$$

$$e_t^* = \frac{\varepsilon}{1-\varepsilon} \frac{D[(1-t_p)(1-\tau)w_t h_t]^\alpha p_t^{1-\alpha}}{b} \quad (\text{A8})$$

According to Eqs. (A5) - (A8), an extension of paid maternity leave reduces the cost of child rearing, enabling households to raise more children and thereby increasing fertility. However, longer paid parental leave also reduces household investment in child human capital, implying the existence of a quantity-quality trade-off under partial equilibrium conditions. In addition, extending paid parental leave has no direct effect on adult consumption or savings, suggesting that a general equilibrium analysis is required.

A2. Proofs of Propositions

Proof of Proposition 1

Under the steady state, we first derive the relationship between the government tax rate and the length of paid maternity leave, as shown in Eq. (25). Furthermore, substituting Eq. (25) into Eq. (20), we obtain

the optimal fertility rate in the steady state.

$$n^* = \frac{b}{D} \cdot \frac{\gamma(1-\varepsilon)\sigma^{1-\alpha}}{1+\beta+\gamma} \cdot \left(\frac{1}{1-t_p}\right)^\alpha \cdot \left[1 - \frac{\gamma\alpha(1-\varepsilon)}{1+\beta+\gamma} \cdot \frac{t_p}{1-t_p}\right]^{1-\alpha} \quad (B1)$$

The derivative of n^* in Eq.(B1) is given as Eq.(27).

Proof of Proposition 2

From the human capital function Eq.(9), children's human capital depends on parental childcare time $\hat{z}_t$, educational investment per child e_t , and parental human capital h_t . Using the Eq.(25) and substituting it into the optimal parental childcare time Eq.(18) and educational investment per child Eq.(21) in the steady state, we obtain the following relationships between $\hat{z}_t$ and t_p , and between e^* and t_p

$$\hat{z}_t = \frac{\alpha D}{b} \left[\frac{1}{\left(1-t_p - \frac{\gamma\alpha(1-\varepsilon)}{1+\beta+\gamma} t_p\right)^\sigma} \right]^{1-\alpha} \quad (B2)$$

$$e^* = \frac{\varepsilon}{1-\varepsilon} \cdot \frac{D}{b} \cdot \left[1 - t_p - \frac{\gamma\alpha(1-\varepsilon)}{1+\beta+\gamma} t_p\right]^\alpha \cdot \sigma^{\alpha-1} \quad (B3)$$

According to Eq. (9), $\text{sign} \frac{\partial h_{t+1}}{\partial t_p} = \text{sign} \left\{ e_t \frac{\partial \hat{z}_t}{\partial t_p} + \hat{z}_t \frac{\partial e_t}{\partial t_p} \right\}$. Taking the partial derivatives of Eq.(B2) and Eq.(B3) with respect to t_p , yields $\frac{\partial \hat{z}_t}{\partial t_p} > 0$ and $\frac{\partial e_t}{\partial t_p} < 0$. The results indicate that an extension of paid maternity leave increases parental childcare time, which promotes children's early human capital formation through greater parental involvement ($\frac{\partial \hat{z}_t}{\partial t_p} > 0$). However, it may also reduce labor supply and household income, tightening budget constraints and crowding out educational investment in children. Moreover, if maternity leave extensions increase fertility, the resulting larger family size may dilute educational resources allocated to each child. Thus, the effect of increased maternity leave on children's educational investment is negative ($\frac{\partial e_t}{\partial t_p} < 0$). Therefore, the overall effect of paid maternity leave extension on children's human capital is ambiguous.

Appendix B

Table B1 Distribution of statutory Maternity leave by province in China

Province	Total Leave (days)	Statutory Leave (days)	Bonus Days	Year Bonus Implemented
Gansu	100/108	90/98	10	1990
Ningxia	104/112	90/98	14	1991
Guangxi	104/112	90/98	14	1989
Guangdong	105/113	90/98	15	1992
Hainan	105/113	90/98	15	1989

Shaanxi	105/113	90/98	15	1991
Beijing	120/128	90/98	30	1991
Tianjin	120/128	90/98	30	1989
Jilin	120/128	90/98	30	1988
Shanghai	120/128	90/98	30	2003
Jiangsu	120/128	90/98	30	1990
Zhejiang	120/128	90/98	30	1988
Anhui	120/128	90/98	30	1988
Jiangxi	120/128	90/98	30	1990
Hubei	120/128	90/98	30	1988
Hunan	120/128	90/98	30	1990
Chongqing	120/128	90/98	30	1987
Sichuan	120/128	90/98	30	1987
Guizhou	120/128	90/98	30	1998
Yunnan	120/128	90/98	30	2002
Shanxi	120/128	90/98	30	1999
Qinghai	120/128	90/98	30	1992
Xinjiang	120/128	90/98	30	2003
Inner Mongolia	120/128	90/98	30	1995
Hebei	135/143	90/98	45	1989
Shandong	150/158	90/98	60	1988
Liaoning	150/158	90/98	60	1988
Heilongjiang	180/188	90/98	90	1990
Fujian	180/188	90/98	90	1988
Henan	180/188	90/98	90	1990
Tibet	365	90/98	—	—

Table B2 Tests of differences across education groups

Variable	Mother education	Family education
High-education	0.629*** (3.02)	0.566** (2.42)
Maternity leave	-0.263*** (-2.73)	-0.179* (-1.77)
Maternity leave (squared)	0.995*** (3.01)	0.791** (2.25)
High-education × Maternity leave	0.174 (1.55)	0.02 (0.16)
High-education × Maternity leave (squared)	-0.772** (-2.04)	-0.393 (-0.91)
Paternity leave	-0.018	-0.02

	(-0.64)	(-0.79)
Other controls	Yes	Yes
Birth cohort FE	Yes	Yes
Province FE	Yes	Yes
Observations	343	343
P-value for joint test of intergroup differences	0.032	0.004

Note: The p-value for the joint test of intergroup differences is obtained from a Wald test of the joint significance of the interaction terms between the high-education group and paid maternity leave, as well as its squared term. Robust t-values clustered at the city level are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% levels, respectively.