Discussion Paper Series – CRC TR 224

Discussion Paper No. 760
Project A 03

The Dynamics of Fertility, Bargaining, and Human Capital Accumulation

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July 2026
(First Version: June 2026)

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Support by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) through CRC TR 224 is gratefully acknowledged.

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June 26, 2026

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Abstract

This paper studies the role of intrahousehold bargaining in shaping women's fertility decisions over the life cycle. I develop and estimate a quantitative life-cycle model featuring a dynamic feedback loop between fertility and bargaining power: childbirth lowers women's wages and outside options, weakening their bargaining position within the household and further constraining their autonomy over future fertility decisions. These bargaining concerns are quantitatively important in depressing marriage incentives, generating inefficient divorce, and consequently lower fertility at the household level. Exploiting the relaxation of the One-Child Policy in China, I show that couples with misaligned fertility preferences exhibit smaller fertility responses and higher divorce rates than couples with aligned preferences. The estimated model further indicates that such couples are less likely to form marriages and tend to marry at later ages. Removing bargaining frictions encourages earlier childbearing, increases completed fertility, and strengthens fertility response to family policies.

Keywords: fertility, intrahousehold bargaining, marriage and divorce, female labor supply, human capital accumulation

JEL Codes: D15, J12, J13, J16

*I am grateful to my advisors, Ning Zhang, Naijia Guo, and Yifan Zhang, for their outstanding guidance and support. I would also like to thank Effrosyni Adamopoulou, Philipp Ager, Miren Azkarate-Askasua, Mary Ann Bronson, Yaming Cao, Kwok Yan Chiu, Lidia Cruces, Husnu C. Dalgic, Christian Dustmann, Hanming Fang, Ying Feng, Christian Hellwig, Anne Hannusch, Marina Hoch, Thomas H. Jørgensen, Jeanne Lafortune, Andrej Mijakovic, Takahiro Moriya, Kanato Nakakuni, Leanne Nam, Michelle Petersen Rendall, Lukas Riedel, Zhentao Shi, Michèle Tertilt, Camille Urvoy, Hanna Wang, Philipp Wangner, Yutao Wang, and Anson Zhou for their valuable comments and suggestions. I also thank seminar participants at the University of Mannheim, Families in Macroeconomics (Edesheim, Germany), ROCKWOOL Foundation Berlin, and 2026 CEPR Women in Economics: WE_ARE Series. Financial support from the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) through CRC TR 224 (Project A3) and the Gottfried Wilhelm Leibniz-Prize (TE 966/2-1) is gratefully acknowledged. All errors are my own.

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1 Introduction

Total fertility rates have declined sharply across advanced and emerging economies (United Nations, 2024). Persistently low fertility has raised concerns regarding population aging, the sustainability of pension and social insurance systems, and long-term economic growth (Aksoy et al., 2019, Hopenhayn et al., 2022, Jones, 2022, Maestas et al., 2023). In response, governments around the world have implemented a wide range of pronatal policies, such as child allowances, parental leave, public childcare, and tax incentives (Doepke et al., 2023, Olivetti and Petrongolo, 2017, Zhou, 2025). Most of these policies implicitly treat households as unitary decision makers, overlooking the fact that fertility is the outcome of negotiation between partners with potentially conflicting interests. When partners disagree about desired family size, career investments, or the division of childcare responsibilities, bargaining power determines whose preferences prevail and how the costs of childbearing are shared.

Understanding household bargaining is particularly important because the balance of power within households has changed substantially over recent decades. Women have achieved greater economic, political, labor-market, and reproductive rights (Tertilt et al., 2022). However, in many countries, expansions in women's rights and autonomy regarding marriage and childbearing have preceded declines in fertility (Goldin, 2025).

How is women's bargaining power associated with lower birth rates? This paper offers a new perspective: having children can reduce women's bargaining power within the household, which in turn constrains their autonomy over subsequent fertility decisions and intrahousehold resource allocations. I build and estimate a quantitative life-cycle model in which fertility is jointly determined by female labor supply and women's bargaining power within the household, with endogenous marriage and divorce. Anticipation of a future decline in bargaining position can diminish incentives for childbearing, particularly given the prevalence of limited commitment within couples.[1] Beyond this direct mechanism, concerns about bargaining power further reduce incentives to enter marriage, increase the incidence of divorce, and consequently lower fertility at the household level. The effectiveness of family policies aimed at increasing fertility thus depends on the degree of commitment within households.

A central innovation of the paper is to study the two-way interaction between bargaining and fertility — in which bargaining shapes fertility and fertility shapes bargaining — within a unified framework. Previous literature usually focuses on a single direction: bargaining power shapes fertility outcomes. Couples often have different fertility preferences (Doepke and Kindermann, 2019, Doepke and Tertilt, 2018), and women with stronger bargaining positions can shift fertility decisions in their favor. However, what the existing literature overlooks is that

[1] Previous studies provide evidence supporting the existence of limited commitment within couples, indicating that couples are unable to fully commit to ex ante agreements on behavior within marriage (Mazzocco, 2007, Rasul, 2008, Theloudis et al., 2025). This inability to commit to post-divorce allocations constrains household specialization and leads to inefficient outcomes (Gobbi, 2018, Gonzalez and Zoabi, 2026, Lafortune and Low, 2023, Mazzocco et al., 2014, Reynoso, 2024).

women's bargaining position is affected by fertility.[2] After the birth of a first child, women experience substantial and persistent declines in employment, wages, and earnings potential (Adda et al., 2017, Kleven et al., 2025, Melentyeva and Riedel, 2025).[3] Because wages are a key determinant of outside options in marriage (Lise and Yamada, 2019), these earnings losses weaken women's outside options and shift bargaining power toward husbands. A woman whose bargaining power declines after the first birth may be required to bear a greater share of childcare responsibilities or may have less ability to prevent additional births she does not desire. Therefore, women must balance the utility of childbearing against the long-term cost of a diminished bargaining position within the household.

If bargaining and fertility are jointly determined, identifying the effect of bargaining empirically becomes challenging. To provide direct evidence on how couples negotiate fertility decisions, I exploit the 2016 relaxation of China's One-Child Policy. China's 2016 reform provides a rare setting where fertility constraints changed exogenously while couples' pre-existing fertility preferences are observed before the reform. The analysis is based on the China Family Panel Studies (CFPS, 2010–2020). Using an event-study approach, I find that, after the policy, couples with misaligned fertility preferences had 0.13 fewer children and divorce rates that were 1.6 percentage points higher than those of couples with aligned fertility preferences. This difference of 0.13 children is economically meaningful, equivalent to approximately 15% of the average fertility level in the pre-reform year 2014. Furthermore, the divorce effect is primarily driven by households in which husbands hold stronger fertility preferences and wives hold stronger outside options, as proxied by women's educational attainment, pre-reform average wages, and her pre-reform income ratio relative to the husband. The increase in divorce indicates that disagreement over fertility can lead not only to fewer births but also to the breakdown of the household when couples cannot renegotiate efficiently.

Building on the empirical findings, I develop and estimate a quantitative life-cycle model with endogenous marriage, divorce, fertility, and labor supply within a limited commitment framework (Mazzocco, 2007, Voena, 2015). Women's bargaining power, also referred to as the Pareto weight, is defined as their degree of influence over cooperative household decision-making (Jayachandran and Voena, 2025). Couples jointly determine both the number of children and the timing of births, with possible misalignment in fertility preferences. Women experience human capital depreciation due to career interruptions after childbirth, which leads to lower future wages and earnings potential. A woman's bargaining power depends on her outside option relative to her husband. Stronger outside options raise the value women require to enter marriage and make it easier for them to renegotiate household allocations or leave the

[2] Guo and Xie (2026) find that women's bargaining power declines relative to the husband's after the first birth, identified from the drop in women's private consumption and leisure relative to the husband's after childbirth. The present paper further investigates the underlying mechanisms through labor market outcomes.

[3] Appendix C.4 examines the labor market consequences of the first birth for both women and men in China. Women experience substantially larger declines in employment, wages, working hours, and earnings following childbirth than men in the study sample. Furthermore, women's employment declines again following the birth of a second child, as shown in Appendix Figure C.5.

relationship if decisions conflict with their interests.

The model is estimated using the method of simulated moments (McFadden, 1989), targeting moments from the pre-reform period in China (2010–2014). The model successfully replicates the fertility and divorce responses to the policy shock, with magnitudes that are quantitatively consistent with the reduced-form estimates. Furthermore, it closely matches the observed decline in female labor supply around the first birth, so that it captures the trade-off between market work and childcare in the presence of children.

I use the quantitative model to study the long-run effects of a permanent relaxation of fertility constraints imposed on women at the beginning of reproductive age. The long-run fertility response exceeds the short-run response, in which the policy shock occurs at a specific age, because women can optimally front-load births to earlier periods when fecundity is high. For women with higher educational attainment and greater earnings potential, the long-run amplification is strongly positive (13.59%) when she has a higher fertility preference than her husband, but negative (-0.34%) when she has a lower fertility preference. This outcome is attributable to a stronger bargaining position within the household, which enables these women to enforce their fertility preferences more than their less educated counterparts. The value of marriage also changes depending on the fertility preferences of the partner. Positive assortative matching on fertility preferences strengthens in the long run. Couples with conflicting fertility preferences are less likely to form marriages, and, even when they do marry, both marriage timing and first birth timing are delayed.

Next, I quantify the role of bargaining frictions on fertility and marriage trajectories over the life cycle. First, I eliminate bargaining frictions by assuming that couples can make a full commitment within marriage. Bargaining power is determined at the time of marriage and remains fixed thereafter. Credible commitment to future allocations among couples leads to earlier birth timing, higher average completed fertility, and an increased marriage rate over the life cycle. At the other extreme, I amplify the bargaining frictions by raising the probability of child custody assigned to mothers following divorce by 50%. This adjustment increases mothers' financial and childcare burdens and lowers their outside options. As a result, completed fertility decreases by 1.97% and women become more reluctant to enter marriage.

Finally, I evaluate three family policies commonly implemented by governments. A pronatalist cash transfer and an in-work benefit each improve either fertility or women's bargaining power, whereas public childcare raises both simultaneously by relaxing the time constraint between market work and child-rearing. Specifically, completed fertility increased by 1.09% and women's working hours rose by 7.8%, thereby enhancing women's bargaining positions. These policies generate both qualitatively and quantitatively distinct effects under full commitment. When couples are able to fully compensate each other, fertility responses are positive across all family policies, ranging from 0.42% to 2.69%. In such cases, couples capture the gains from policies without concern that future renegotiation will diminish those benefits. Consequently, the effectiveness of family policies depends not only on their direct financial incentives but also

on the extent to which couples can credibly commit to sharing the resulting benefits.

This paper contributes to the growing literature on fertility decisions under limited commitment. Doepke and Kindermann (2019) demonstrate that fertility decisions of the married couples can be blocked when mothers bear a fixed disproportionate share of childcare responsibilities in the outside option compared to the fathers. Doepke and Kindermann (2024) find that women with high wages can reduce the marginal child penalty by purchasing market childcare, thereby increasing fertility. Building on existing studies, I explicitly allow women's bargaining power, and their outside options are endogenously shaped by labor supply and fertility choices, which intensifies limited-commitment frictions, leading to delayed birth timing and lower completed fertility. This paper hence highlights the importance of strengthening women's outside options in policy design to increase birth rates.

The methodology of this paper builds on the literature on collective household models developed by Chiappori (1988, 1992). In the dynamic collective settings, intertemporal choices are often modeled with fertility treated as exogenous (Bronson, 2019, Bronson et al., 2024, Foerster, 2025, Low et al., 2025). My contribution is to consider that fertility decisions are endogenously determined by spousal bargaining power. Furthermore, the present model incorporates decisions on marriage and divorce to analyze the comprehensive effect of intrahousehold bargaining on fertility.

Previous research on life-cycle models has examined the joint decisions of fertility and female labor supply, analyzing how women consider the evolution of human capital and the labor market consequences of childbirth (Bang, 2022, Bick, 2016, Cruces and Rodrıguez-Roman, 2025, Eckstein et al., 2019, Francesconi, 2002, Guner et al., 2024, Jakobsen et al., 2025, Wang, 2026, Yamaguchi, 2019). This paper extends the literature by incorporating the dynamic implications of intrahousehold bargaining into the feedback mechanisms between fertility and labor supply. I show that spouses' relative labor-market performance influences the evolution of women's bargaining positions over time, which, in turn, shapes how couples negotiate future fertility decisions. Consequently, the career costs of children extend beyond monetary losses in labor-market performance: childbirth fundamentally reshapes the dynamics of marriage by altering women's bargaining power.

Many empirical studies have evaluated China's family planning policies (Chen and Fang, 2021, Fang and Liu, 2026, Giorgi and Raiber, 2025, Huang et al., 2021, 2023, Li, 2024, Lin et al., 2025, Wu, 2022). In this study, I use a structural approach to analyze the underlying bargaining mechanisms and the long-term effects of these policies on fertility and marriage. The present model demonstrates that the divorce response is triggered by women's dual pressures from unwanted births and the deterioration of both labor market outcomes and intrahousehold bargaining power. Furthermore, the permanent policy relaxation alters the gains from marriage when individuals match with partners with different fertility preferences, leading to long-run adjustments in marriage rates and timing.

2 Empirical Evidence

In this section, I provide empirical evidence on how couples negotiate birth decisions based on their fertility preferences and bargaining positions within the household.

To address the endogeneity concern that women with stronger fertility preferences may self-select into weaker bargaining positions, I exploit the abolition of China's One-Child Policy as an exogenous shock that relaxes fertility constraints for married couples. The One-Child Policy was one of the largest family planning policies in China, restricting households to only one child (Zhang, 2017). It was fully abolished starting in January 2016, allowing all married couples to have a second child. This policy, referred to as the "Two-Child Policy", is universal and affects a substantial share of married couples in China. The birth quota remained capped at two children throughout the sample period (2010-2020); the further relaxation of birth restrictions in 2022 falls outside the scope of this paper. The institutional background and policy details are provided in Appendix A.1.

The data are from the China Family Panel Studies (CFPS, 2010–2020), which provides rich information on individuals' marriage and fertility histories, labor market outcomes, and stated fertility preferences. What makes the dataset unique is that both spouses report their fertility preferences before the policy shock, enabling me to analyze whether misaligned fertility preferences translate into different policy responses. Specifically, I focus on couples already formed prior to the reform, so that matching on fertility preferences is predetermined. Furthermore, heterogeneity in women's labor market outcomes generates variation in pre-existing bargaining positions within marriage. Details about the variable construction are provided in Appendix B.1.

Sample Selection The main study sample is constructed according to the following criteria. First, I restrict the sample to married couples directly affected by the 2016 reform, excluding those already eligible for a second child before 2016.[4] Second, the sample is restricted to women born between 1972 and 1992, who were of prime reproductive age in 2016. Third, the sample includes couples with zero or one child in 2014, as both groups were potentially eligible for the Two-Child Policy. Finally, to ensure reliable estimates of within-household changes attributable to the reform, only couples observed for at least one wave prior to 2016 and at least one wave thereafter are retained. Appendix Table B.1 reports summary statistics for the main variables. The average woman is 34 years old, and her husband is 36. The employment rate is 75% for wives and 93% for husbands.

Fertility preferences In the pre-reform wave (2014), respondents are asked: *"Without considering any policy restrictions, how many children do you consider ideal?"* I use responses

[4]Specifically, the sample is restricted to individuals of Han ethnicity, the main population targeted by the One-Child Policy (Huang et al., 2021). Rural households whose first child is a daughter are excluded, as such households were permitted to have a second child beginning in the mid-1980s (Guo et al., 2025). Furthermore, households in which either spouse is an only child are excluded, as these households were already eligible for a second child under policies implemented in 2011 or 2014 (Fang and Liu, 2026).

to this question to measure fertility preferences.[5] In the study sample, approximately 26% of women report an ideal of one child, about 71% express a preference for two children, and around 2% report an ideal number greater than two (Appendix Figure B.1). Given that few individuals report an ideal of zero children or higher than two children, I focus on the two dominant preference categories, one versus two children, in the event-study analysis.

Furthermore, both wives and husbands answer this question, allowing me to assess whether fertility preferences are aligned within couples. Most couples have aligned preferences: 57% report that both spouses ideally want two children. However, misalignment is nonetheless common: in 13% of households, the husband wants two children while the wife prefers one; in 12%, the reverse holds (Appendix Figure B.3).[6]

Appendix Table B.2 compares household characteristics between preference-aligned and preference-misaligned couples in the pre-reform period (2010–2014). Overall, the two groups have comparable household characteristics across many dimensions based on t-tests, including wives' and husbands' home production hours, age at marriage, age at first birth, and labor market outcomes such as working hours, wages, and annual income. However, the two groups differ modestly along two dimensions, age and education, though the magnitudes are economically negligible.

Event Study Design Using the event-study approach, I compare households with misaligned preferences (treatment group, in which one partner reports one while the other reports two) to those with aligned fertility preferences (control group, in which both partners report either one or two). I estimate:

$$Y_{it} = \sum_{t \neq 2014} \eta_t \alpha_t + \sum_{t \neq 2014} \gamma_t (\alpha_t \times Treat_i) + \alpha_i + \alpha_A + \varepsilon_{it} \tag{1}$$

where Y_{it} denotes the outcome of interest for household i in year t, either the number of children or divorce status (equal to one if divorced, zero otherwise). α_t are year fixed effects, with 2014 serving as the reference period so that each η_t captures the mean outcome at time t relative to 2014. γ_t are time-varying treatment effects that capture how the outcomes of households with misaligned preferences evolve relative to those with aligned preferences following the reform. To account for potential heterogeneity associated with education and other time-invariant unobserved characteristics, I include household fixed effects α_i. In addition, I control for women's age-group fixed effects α_A to flexibly capture age-specific life-cycle patterns.[7]

Comparison with Prior Empirical Studies Appendix C.1 provides a summary of prior empirical studies on the effects of the Two-Child Policy. To assess the comparability of the current

[5] The actual number of children is positively associated with the stated fertility preference among individuals who had already obtained eligibility prior to 2016 (Appendix Figure B.2).

[6] In the 2018 wave, following the policy change, respondents once again reported their ideal number of children. In the full sample, over 80% of individuals reported the same fertility preference in both 2014 and 2018. Therefore, in the main analysis, I focus on their responses from 2014.

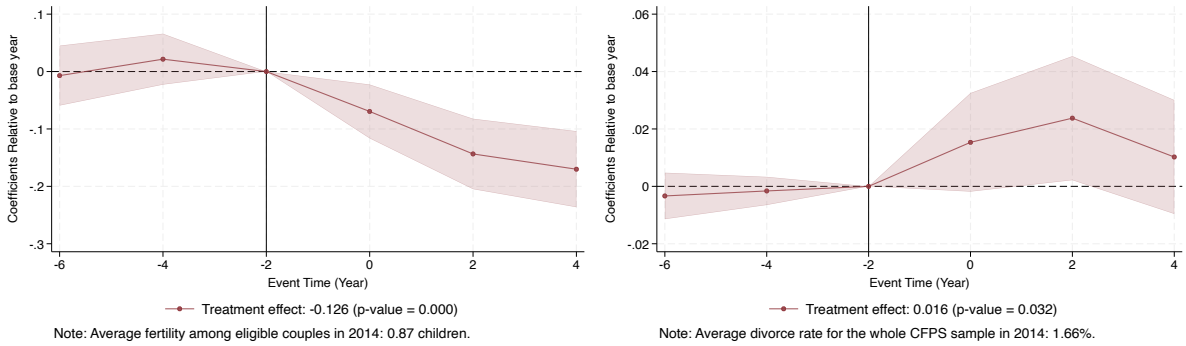
[7] Age groups are defined in five-year intervals: [18, 23], [24, 29], [30, 35], [36, 41], and [42, 47].

sample with those used in previous research, I use the identification strategy of Fang and Liu (2026) to estimate the policy's effect on the number of births. The analysis reveals a consistent and positive fertility response among eligible women, consistent with earlier findings. Unlike previous studies, the present empirical analysis does not aim to identify the overall causal effect of the Two-Child Policy. Instead, it examines heterogeneous policy responses among couples, differentiated by their fertility preferences and by women's bargaining positions, which are determined by labor market performance. The results indicate that fertility responses among eligible couples are inefficient and constrained by limited commitment within the household. These findings motivate the subsequent quantitative analysis.

2.1 Policy Effects on Fertility and Divorce

Figure 1 presents the main event-study results. Following the 2016 policy relaxation, households with misaligned fertility preferences exhibit smaller fertility responses: by the end of the sample period, they have, on average, 0.13 fewer children than households with aligned preferences. The difference of 0.13 children represents a large policy effect, equivalent to approximately 15% of the average fertility level among eligible couples in the pre-reform year 2014.[8]

Furthermore, divorce rates increase significantly by 1.6 percentage points in households with misaligned preferences. Given that the average divorce rate was 1.66 % among the whole sample in the pre-reform year 2014, this represents a quantitatively large effect. The coefficients in the pre-2014 period are statistically insignificant and fluctuate around zero. This suggests that couples with either aligned or misaligned fertility preferences did not systematically adjust their behavior prior to the reform.



(a) Number of Children (b) Divorce Status

Figure 1: Policy Effects on Fertility and Divorce

Next, I classify households into four groups according to each spouse's stated ideal number

[8]Relative to the 2014 baseline mean of 0.87 children, $0.13/0.87 \approx 0.149$. Alternatively, given that the two-child policy imposes an upper limit of two children, the maximum feasible increase in fertility available to any eligible couple following the reform is 1.13 children ($2-0.87 = 1.13$). Expressed relative to this feasible response space, the 0.13-child differential accounts for approximately 11.5 percent ($0.13/1.13 \approx 0.115$) of the entire range over which fertility could realistically adjust.

of children, in order to analyze whether policy responses vary depending on which spouse desires more children. Using the same event-study design outlined in equation (1), I treat households in which both partners desire a second child (*Both = 2*) as the control group, and estimate the differential policy effects for the remaining three household types:

$$Y_{it} = \sum_{t \neq 2014} \eta_t \alpha_t + \sum_{t \neq 2014} \sum_{g=1}^{3} \gamma_{t,g} \left(\alpha_t \times \mathbf{1}[G_i = g] \right) + \alpha_i + \alpha_A + \varepsilon_{it} \tag{2}$$

where $G_i \in \{1, 2, 3\}$ indexes the three treated household types: $G_i = 1$ indicates that only the husband desires a second child (*Wife = 1, Husband = 2*); $G_i = 2$ indicates that only the wife desires a second child (*Wife = 2, Husband = 1*); and $G_i = 3$ indicates that neither partner desires a second child (*Both = 1*). The coefficients $\gamma_{t,g}$ capture the differential year-specific effects for each treated group relative to the reference group.

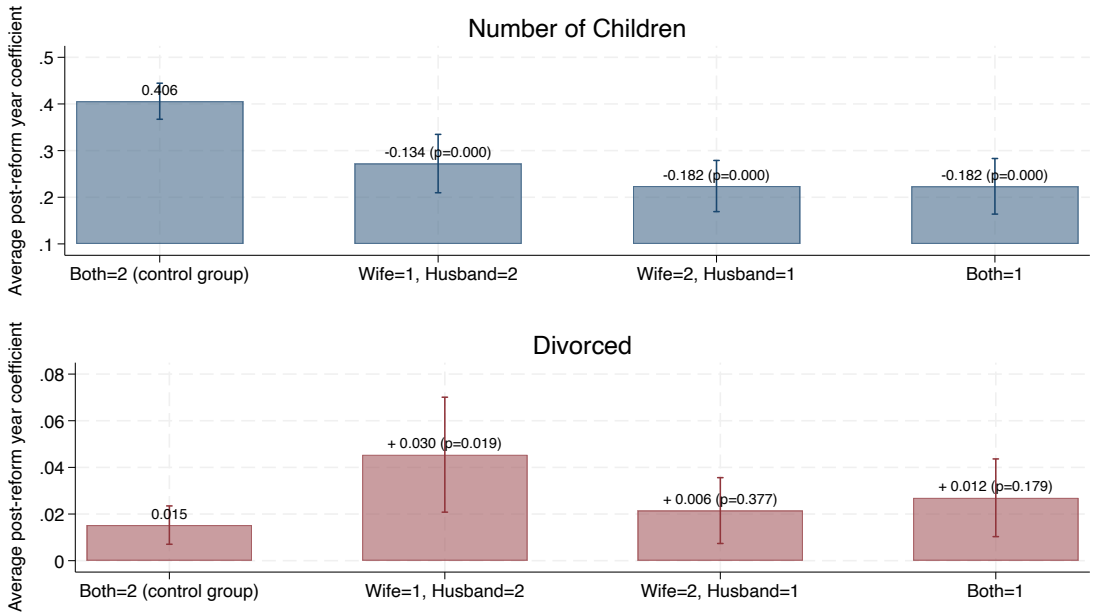
Figure 2 reports the weighted average of the post-policy coefficients for each household type. For the reference group (*Both = 2*), the post-policy coefficients η_t capture the year fixed effects. The estimated coefficients indicate that, after the policy, couples in this group have 0.41 more children and a divorce rate 1.5 percentage points higher relative to the baseline year 2014, reflecting the direct policy effect on this group with broader contemporaneous trends.

For the remaining three household types, the bars display the post-policy treatment effects relative to the baseline year 2014 ($\eta_t + \gamma_t$), with the associated difference-in-differences estimate relative to the control group (γ_t) and its significance level indicated above each bar. First, whenever at least one spouse does not want a second child, the fertility response is significantly smaller compared to households in which both spouses desire two children. Specifically, households where the husband desires more children (*Wife = 1, Husband = 2*) have 0.13 fewer children, and households where the wife desires more children (*Wife = 2, Husband = 1*) have 0.18 fewer children.[9] However, divorce responses display a strong asymmetry. Divorce rates rise significantly only in households where the husband wants a second child while the wife does not. Their divorce rate is 3.0 percentage points higher than that of the reference group. In contrast, when only the wife wants a second child, the divorce response is not statistically different from that of the control group. Consequently, the post-policy rise in divorce is primarily driven by households in which the husband's desired fertility exceeds the wife's.

The divorce outcomes account for the possibility of remarriage. As shown in Appendix C.2, remarriage rates do not differ significantly following the policy for couples with misaligned preferences compared to the control group. Moreover, fewer than 30% of divorced individuals in the sample remarry. I therefore abstract from remarriage in the subsequent analysis.

Finally, to examine how women's bargaining positions affect fertility and divorce responses in households where husbands have stronger fertility preferences, I consider three bargaining

[9]The fertility responses do not differ statistically between households where only the husband wants more children and households where only the wife wants more children (p-value=0.234).



Note: The average post-reform treatment effect (relative to the control group) is reported above the bars.

Figure 2: Heterogeneous Policy Effects by Couples' Fertility Preference Types

proxies. The first proxy is the wife's educational attainment, which captures persistent heterogeneity in women's earnings potential over the life cycle. Women are divided into two groups: those with a high school education or above, and those without. The second is the wife's pre-reform hourly wage, split at the sample mean, reflecting differences in outside options. The third proxy is the wife's pre-reform annual income relative to her husband's. Since bargaining power is determined not only by absolute wages but also by the share of household income contributed by each spouse, a higher income ratio indicates a stronger bargaining position for the wife (Basu, 2006). In what follows, I focus on average outcomes for households affected by the Two-Child Policy in the post-reform period (2016-2020).

Figure 3 shows that among households where the husband wants a second child but the wife does not, divorce rates are significantly higher for wives with stronger bargaining positions, as measured by educational attainment (p-value=0.04), pre-reform hourly wages (p-value=0.02), and pre-reform income ratio (p-value=0.00). The fact that higher wages are associated with higher divorce rates in precisely the households in which the husband has stronger fertility preferences points to a bargaining mechanism: higher wages strengthen women's outside options, enabling them to leave unsatisfactory marriages.

Women with weaker outside options, by contrast, are less able to resist unwanted fertility outcomes. Appendix C.3 further shows that households in which the wife has a weaker bargaining position exhibit a significantly higher number of children in the post-reform period. In particular, fertility is higher when the wife's pre-reform hourly wage is low (p-value=0.00) or when her pre-reform income share relative to her husband is low (p-value=0.04).

Summary of empirical patterns To summarize, I document three key empirical patterns:

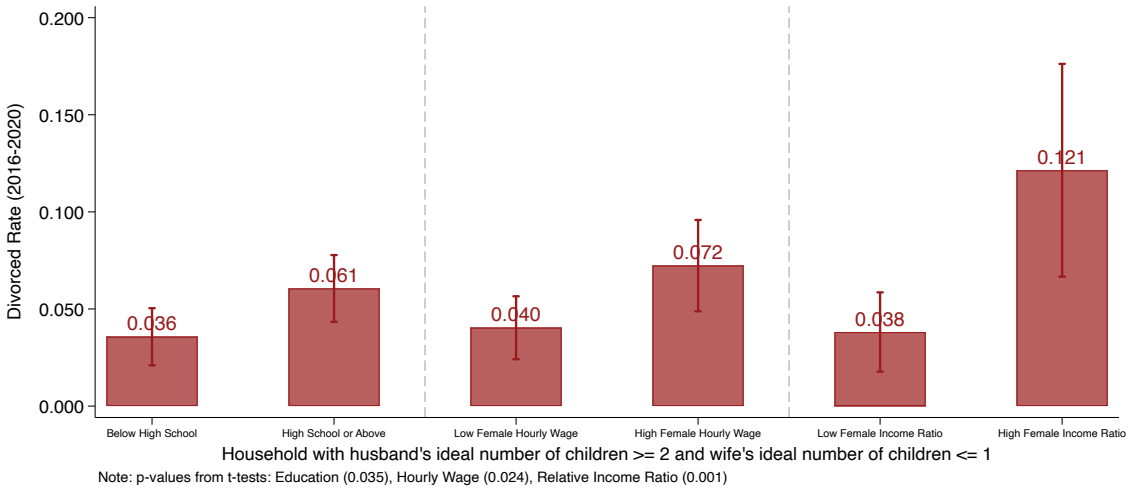


Figure 3: Policy Effects on Divorce by Women's Bargaining Positions

1. Couples with misaligned fertility preferences exhibit smaller fertility responses and higher divorce rates following the policy relaxation, relative to couples with aligned preferences.

2. The divorce response is asymmetric: it is driven entirely by households in which the husband wants a second child while the wife does not.

3. Among households where the husband's desired fertility exceeds the wife's, divorce is significantly more likely when the wife has stronger outside options.

The divorce response is an unintended consequence of the reform and reflects the nature of household decision-making. By relaxing the fertility constraint, the policy potentially expanded the Pareto frontier for households in which at least one partner desired an additional child. In principle, these couples could have remained together and reached a mutually beneficial agreement. However, some instead responded by divorcing. This pattern suggests that spouses are unable to fully compensate one another, even when there are potential gains from cooperation. The resulting fertility is therefore inefficient and provides direct evidence of limited-commitment frictions within households.

In the years immediately following the policy reform, a significant increase in divorce rates was observed. In the long run, if women are rational and can anticipate future fertility conflicts and negotiations, they will adjust their marriage timing and partner selection in a forward-looking way. Building on these empirical findings, the next section develops a life-cycle model to address two related questions. First, what mechanisms explain the asymmetric divorce response observed after the policy reform? Second, how do limited-commitment frictions systematically influence women's fertility choices over the life cycle, and what are the resulting long-term implications for marriage formation and dissolution?

3 Model

This section presents a life-cycle model that incorporates endogenous marriage and divorce, female labor supply, fertility choices, and home production. In the model, time is discrete, and the framework is a partial equilibrium. Individuals are heterogeneous in their types of gender, $j \in \{w, m\}$, education, $e_j \in \{low, high\}$, and ideal number of children $I_j \in \{1, 2\}$, all of which are fixed throughout the life cycle.[10] Fertility is an option only within marriage. Given that the ideal number of children I_j is capped at two, the maximum number of children in the model is also capped at two, so that $n_t \in \{0, 1, 2\}$. All individuals enter the model at age T_0 and retire at age T_R. Retirement occurs exogenously at T_R, and optimization during retirement is described in Appendix D.1.

At the beginning of each period t, individuals choose marital status among unmarried, married, or divorced. Unmarried individuals in each period t are randomly matched with a potential partner, observe their characteristics and marriage quality shocks, and decide whether to marry M_t. A marriage forms when both partners find it mutually beneficial to marry rather than remain single. If they marry, initial bargaining power is determined via Nash bargaining. Women, therefore, self-select into marriages with different initial bargaining weights, based on their returns to human capital and their preferences for children.

During marriage, married couples make cooperative decisions over fertility, consumption, and the allocation of time between market work, leisure, and home production activities, such as childcare and housework. They also decide whether to divorce D_t based on changes in their outside options and shocks to marital quality. Under limited commitment, Pareto weight μ_t is updated through negotiation, and divorce occurs only if reallocation cannot render marriage preferable to singlehood.

Therefore, a woman's bargaining power is determined by her outside option relative to her husband's, which evolves endogenously through two channels: (1) the characteristics of both partners at marriage formation, and (2) renegotiation arising from limited commitment.[11] A novel feature of the model is to capture the downstream bargaining consequences of childbirth for women. Parenthood reduces female labor supply, and career interruptions depreciate human capital and earning potential, causing women to forgo earnings growth during the early and mid-career stages. As wages and earning potential decline following childbirth, women's outside options deteriorate relative to those of their spouses, weakening their bargaining position within marriage.

[10] Fertility preferences exhibit little variation across age groups for both women and men, as shown in Figure B.4.

[11] The collective model in which the Pareto weight μ_t evolves under limited commitment is consistent with the repeated Nash bargaining framework (Ciscato, 2024). Changes in the Pareto weight reflect either shifts in the Nash bargaining parameter or changes in outside options.

3.1 Preferences and Technology

Preferences Individual j derives flow utility from consumption c_t, leisure ℓ_{jt}, public good Q_t and the number of children n_t:

$$u^j(c_t, \ell_{jt}, Q_t, n_t) = \frac{(c_t/\Lambda(n_t))^{1-\sigma_C}}{1-\sigma_C} + \alpha_\ell \cdot \frac{(\ell_{jt})^{1-\sigma_\ell}}{1-\sigma_\ell} + \alpha_Q^j(\kappa_t, D_t) \cdot log(Q_t) - \alpha_n \cdot (n_t - I_j)^2 \quad (3)$$

where α_ℓ denotes the preference weight on leisure. α_Q^j denotes the preference weight on the public good, and α_n governs the intensity of fertility preferences: it scales the dis-utility incurred when realized fertility n_t deviates from individual ideal number of children I_j (relative to consumption).

Specifically, individual's preference weight on the public good, α_Q^j, depends on the age of the youngest child κ_t, divorce status D_t, and gender j. The age of the youngest child is categorized into four groups, $\kappa_t \in \{\text{NC},\ 0\text{–}6,\ 7\text{–}12,\ 13+\}$, corresponding to no children, early childhood (ages 0–6), middle childhood (ages 7–12), and adolescence or older (ages 13 and above).[12] Since preferences over the public good affect each spouse's evaluation of the outside option, α_Q^j is allowed to vary by divorce status D_t and gender j. Specifically,

$$\alpha_Q^j(\kappa_t, D_t) = \left[\sum_{y \in \{\text{NC, 0–6, 7–12, 13+}\}} \kappa_y \cdot \mathbf{1}(\kappa_t = y) \right] \cdot \delta_j^{\mathbf{1}(D_t=1)}, \quad (4)$$

where $\kappa_y > 0$ denotes the baseline preference weight associated with having a youngest child in age group y, and δ_j captures the gender-specific multiplicative shift in preferences over the public good following divorce, allowing the magnitude of this adjustment to differ between mothers and fathers. To reduce the state space, children age probabilistically. Children can move out after the fertile period T_f ends, provided they are aged 13 or older. Further details regarding the how the age of youngest child is determined and the children moving out process are provided in Appendix D.2.

Home Production function The household public good Q_t of married couples is produced by the time allocated to home production by the wife and husband, q_{wt} and q_{mt}, respectively. This public good captures the welfare of children (Reynoso, 2024). Q_t is produced through a constant elasticity of substitution (CES) technology:

$$Q_t = \left(\pi_w q_{wt}^\rho + \pi_m q_{mt}^\rho\right)^{\frac{1}{\rho}}, \quad (5)$$

where π_w reflects the relative productivity of the wife in home production. I normalize the home productivity of both spouses such that $\pi_w + \pi_m = 1$. The parameter ρ determines the

[12] This setting is to account for two pieces of empirical evidence; first, many women withdraw from employment following childbirth; second, in the CFPS, women's time at home depends on the age of their children, as shown in Appendix Figure B.6.

degree of complementarity between spouses' time inputs.

The household public good Q_t of singles is produced by their own home hours q_{jt}:

$$Q_t = \pi_j q_{jt} \tag{6}$$

Time Constraint For women, labor supply choices are discrete: non-participation, part-time work, and full-time work, $h_{wt} \in \{h_{wt}^U, h_{wt}^P, h_{wt}^F\}$. Men always work full-time. The time constraint for individual $j \in \{w, m\}$ is:

$$\ell_{jt} + h_{jt} + q_{jt} = \bar{T} \tag{7}$$

Fertility Process and Children Let $p_t = 1$ denotes that the couple chooses to conceive a child in period t, and $p_t = 0$ else. The number of children evolves as

$$n_{t+1} = n_t + b_t(p_t, f_t) \tag{8}$$

where b_t denotes the birth of a child, which is a function of couple's conception effort p_t and the biological fecundity f_t, which declines with women's age. Unintended childbirths are not considered in the model, so that $b_t = 1$ is possible only when the couple actively chooses to conceive a child, $p_t = 1$, and fecundity is positive, $f_t > 0$. Fertility is feasible only within marriage: singles have no children, $n_{jt} = 0$, and divorced individuals have no further births, so that $n_{j,t+1} = n_{j,t}$.

To summarize, children enter utility through three channels. First, the number of children affects the household consumption levels through the household equivalence scale $\Lambda(n_t)$. Second, the age of the youngest child shapes couples' preferences for public goods α_Q^j and thus the time allocation. Third, individuals incur dis-utility α_n when the realized number of children n_t deviates from their intrinsic fertility preference I_j, with larger values implying stronger aversion to departures from desired fertility. Therefore, couples may desire children either because they value the time spent with them or because having children directly satisfies their fertility preferences. An individual who desires only one child may choose divorce to avoid potential future births and to prevent deviations from their fertility preference. Fertility therefore can be inefficient because couples cannot commit to future transfers.

3.2 Wages and Human Capital

Individual j's log wage, $\log w_{jt}^e$, is a function of the stock of human capital K_{jt} and the education level e_j:

$$\log w_{jt}^e = \eta_{j,1}^e + \eta_{j,2}^e K_{jt} + \eta_{j,3}^e K_{jt}^2 + \epsilon_{jt} \tag{9}$$

Individuals choose their labor supply while anticipating that future wages can be increased through work. Accumulating human capital serves as a form of self-insurance against potential divorce. Conditional on education and human capital, wages remain heterogeneous due to

idiosyncratic temporary labor market shocks, $\epsilon_{jt} \sim N(0, \sigma^2_{\epsilon j})$.

Female human capital $K_{jt} \in [\underline{K}, \bar{K}]$ is accumulated through learning by doing, which evolves according to

$$K_{j,t+1} = \begin{cases} K_{jt} + 1, & \text{if } h^F_{jt} = 1, \\ K_{jt}, & \text{if } h^P_{jt} = 1, \\ \delta^U K_{jt}, & \text{if } h^U_{jt} = 1. \end{cases} \tag{10}$$

where human capital in the next period $K_{j,t+1}$ increases by one unit for each year of full-time work and depreciates at δ^U if not working at t. Since men are assumed to work full time in every period, their human capital accumulates by one unit each period and increases monotonically with age.

3.3 Budget Constraint

For a married couple, the household budget constraint is given by:

$$c_t = \sum_{j \in \{w,m\}} w_{jt} h_{jt} + y_t(e_w, e_m) - CC_t(n_t, \kappa_t, e_w), \tag{11}$$

where $CC_t(n_t, \kappa_t, e_w)$ represents the fixed monetary cost of children, which depends on the number of children n_t, the age of the youngest child κ_t, and the wife's education level e_w.[13] For married couples, non-labor income is assumed to depend on the education levels of both the wife, e_w, and the husband, e_m.

For divorced or unmarried individuals, the budget constraint is:

$$c_{jt} = w_{jt} h_{jt} + y_{jt}(e_j) - CC_t(n_{jt}, \kappa_{jt}, e_j), \tag{12}$$

where household non-labor income y_t depends solely on own education level. Education captures urban-rural differences in income composition: less-educated individuals rely more heavily on agricultural or self-employment income, whereas higher-educated individuals derive a larger share of their income from wages.

The role of education in the model Educational attainment e_j influences several key dimensions of the model. First, it determines the returns to human capital in the wage process. Second, education shapes child-related monetary expenditures that households must incur. Third, it affects the level of non-labor income. Finally, it constrains the maximum number of children feasible over the life cycle, which will be discussed in Section 4 below.

[13] Market-based childcare services are excluded from the analysis, as such arrangements account for fewer than 1% of observations in the data, as documented in Appendix Figure B.8.

3.4 Problem of the Divorcee

At each period t, divorcee j chooses consumption c_t, time allocation on work h_{jt}, leisure ℓ_{jt} and home hours q_{jt}, and thus the choice vector is $C_t^d = \{c_t, \ell_{jt}, q_{jt}, h_{jt}\}$. The state variables of a divorced individual j at period t are $S_t^d = \{K_{jt}, n_{jt}, \kappa_{jt}, e_j, I_j, \epsilon_{jt}\}$. I consider the value of divorce as the outside option for individuals within a marriage. Divorce is an absorbing state.

The value of being divorced Let $V_{jt}^d(S_t^d)$ be the value function of an individual being divorced at period t, the recursive problem for divorced people can be formalized as:

$$V_{jt}^d(S_t^d) = \max_{C_t^d} u^j(c_{jt}, \ell_{jt}, Q_{jt}, n_t) + \beta \mathbb{E}_t[V_{j,t+1}^d(S_{t+1}^d)]$$

s.t. home production (6), time constraint (7), individual budget constraint (12), wage process (9), human capital evolution (10).

Child custody and alimony In the event of divorce, all children either remain with their mother with exogenous probability p_{cust_f}, or with their father with probability $1 - p_{\text{cust}_f}$.[14] Furthermore, alimony or spousal support is generally not granted, and only a small fraction of sole parents receive child maintenance (Appendix A.2). Given these institutional features in China, I do not model maintenance payments and therefore abstract from any strategic interactions between divorcees. Finally, I assume that the number of children realized does not depend on an individual's custody status. Hence, divorced mothers with custody bear the full cost of child-rearing unilaterally, both in terms of time and financial resources, relying solely on their own labor earnings and non-labor income. Furthermore, they determine their labor supply and consumption through individual optimization, without engaging in household bargaining.[15]

3.5 Problem of the Married Couple

Married couples cooperatively make household decisions subject to limited commitment. In each period t, Couples choose labor supply h_{wt}, h_{mt}, leisure ℓ_{wt}, ℓ_{mt}, and time spent in home production q_{wt}, q_{mt}, whether to have a child $p_t \in \{0, 1\}$, and the household consumption level c_t. They also receive a marriage-quality shock, ψ_t, and need to decide whether to continue their marriage or divorce $D_t \in \{0, 1\}$. Therefore, the choice vector $C_t^m = \{h_{wt}, h_{mt}, \ell_{wt}, \ell_{mt}, q_{wt}, q_{mt}, p_t, c_t, D_t\}$. The state variables of married couples are $S_t^m = (K_{wt}, K_{mt}, n_t, \kappa_t, e_w, e_m, I_w, I_m, \epsilon_{wt}, \epsilon_{mt}, \psi_t)$ and the bargaining power μ_{t-1} at the start of the period t. The bargaining updating process and the recursive formulation for a married couple are as follows, with the notation for value functions following Jorgensen et al. (2026).

[14] For tractability, I do not consider split custody arrangements in the case of multiple children.

[15] The existing literature typically assumes that assets are divided equally upon divorce (Berresheim and Koll, 2026, Jakobsen et al., 2025), under which asset levels enter the outside options of both spouses symmetrically. Given the limited information available in the CFPS on the actual distribution of assets at dissolution, including assets as a state variable may affect the estimated parameters but would not qualitatively alter the model's predictions. I therefore abstract from asset holdings and instead model non-labor income as a function of marital status and education.

The value of remaining a couple Given women's bargaining power μ_{t-1}, I define the value for individual j of entering period t as married and remaining married until period $t+1$ as $V_{jt}^{m\to m}$. Conditional on remaining married ($D_t = 0$), the couple solves a maximization problem that maximizes a weighted sum of individual utilities:

$$\max_{C_t^m} \quad \mu_{t-1} V_{wt}^{m\to m}(S_t^m, \mu_{t-1}) + (1-\mu_{t-1}) V_{mt}^{m\to m}(S_t^m, \mu_{t-1})$$

s.t. home production (5), time constraint (7), household budget constraint (11), children evolution (8), wage process (9), human capital evolution (10).

where individual j's value of marriage at t is

$$V_{jt}^{m\to m}(S_t^m, \mu_{t-1}) = u^j(c_t, \ell_{jt}, Q_t, n_t) + \psi_t + \beta \mathbb{E}_t[V_{j,t+1}^m(S_{t+1}^m, \mu_{t-1})]$$

The match quality ψ_t evolves as a random walk $\psi_t = \psi_{t-1} + \xi_t$ with $\xi_t \sim N(0, \sigma_\xi^2)$.

Renegotiation and bargaining process For each married individual j, the outside option is defined as the value of being divorced in period t, denoted by $V_{jt}^d(S_t^d)$. Comparing this outside option with individual j's value of marriage under the current bargaining power, $V_{jt}^{m\to m}(S_t^m, \mu_{t-1})$, determines whether the participation constraint is satisfied in period t. To formalize this comparison, I define the marital surplus of spouse j as

$$G_{jt}(S_t^m, \mu_{t-1}) \equiv V_{jt}^{m\to m}(S_t^m, \mu_{t-1}) - V_{jt}^d(S_t^d),$$

where the signs of $G_{jt}(S_t^m, \mu_{t-1})$ for both partners jointly determine whether the existing bargaining power must be renegotiated.

If both partners' marital surpluses are non-negative, the couple remains married and divorce does not occur, i.e., $D_t^* = 0$. At the other extreme, if both partners' marital surpluses are negative, divorce occurs immediately, $D_t^* = 1$. When only one spouse's participation constraint is violated, the household enters a renegotiation phase. Suppose spouse j (e.g., the wife) has a non-negative marital surplus, while the other spouse j' (e.g., the husband) has a negative surplus. To prevent divorce, the former transfers bargaining power to the latter. The updated bargaining weight, μ_t, is chosen so that the husband is exactly indifferent between remaining married and divorcing. As long as such a μ_t exists and yields non-negative surplus for both spouses, the couple remains married and $D_t^* = 0$. If no feasible reallocation of bargaining power can simultaneously satisfy both participation constraints, renegotiation fails and divorce occurs, $D_t^* = 1$. Therefore, the bargaining weight μ_t evolves according to

$$\mu_t = \mu_t^*(S_t^m, \mu_{t-1}). \tag{13}$$

Divorce can occur unilaterally: it is sufficient for one spouse's participation constraint to

bind if renegotiation cannot restore incentives to remain married. The institutional context in China conforms to a quasi-unilateral divorce framework. Appendix A.2 details the relevant provisions of Chinese divorce law, under which either spouse may initiate and obtain a divorce by asserting a lack of mutual affection after a two-year separation period.

The value of entering period t as married The value of entering period t as married for individual j is

$$V_{jt}^{m}(S_t^m, \mu_{t-1}) = D_t^* V_{jt}^{d}(S_t^d) + (1 - D_t^*) V_{jt}^{m \to m}(S_t^m, \mu_t^*),$$

where D_t^* denotes the optimal divorce decision in period t and therefore depends on the total marital surplus, both partners' outside options, the wife's bargaining power, and the realization of the match-quality shock.

3.6 Problem of the Unmarried

The choices of unmarried individuals are denoted by $C_t^s = \{c_t, \ell_{jt}, q_{jt}, h_{jt}\}$, which are identical to those of divorced individuals. The state variables of an unmarried individual are $S_t^s = \{K_{jt}, e_j, I_j, \epsilon_{jt}\}$. Since unmarried individuals have no children, the number of children is set to $n_{jt} = 0$ and the age of the youngest child is set to $\kappa_{jt} = NC$.

Unmarried individuals face a marriage decision. In period t, a single woman meets a potential partner with probability λ_t, which reflects the waiting time required to encounter potential partners. Each potential partner is characterized by his human capital K_{pt}, education level e_p, desired number of children I_p, and a temporary wage shock ϵ_{pt}, which is realized before the marriage decision. Thus, the state of a potential partner is $S_t^p = \{K_{pt}, e_p, I_p, \epsilon_{pt}\}$. Upon meeting, the pair draws an initial match quality ψ_0 and jointly decides whether to marry. In the model, the men's age is defined as $Age_H = Age_W + 2$, which aligns with the average age difference observed in the sample summary statistics (Appendix Table B.1). Details of the marriage process are described in Appendix D.3.

For newly married, the initial Pareto weight μ_t^0 is determined by the symmetric Nash bargaining game. The model assumes imperfectly transferable utility, which implies that the Pareto weight μ_t^0 affects both the size and the allocation of marital gains. A woman prioritizing her career can increase her future bargaining position, thereby increasing her share of marital surplus and providing an incentive to delay marriage. However, this incentive is moderated by search frictions on the marriage market and the curvature of the Pareto frontier: transferring utility between partners is increasingly costly, limiting the ability to shift bargaining power (Knowles, 2013). Thus, the decision to marry balances the immediate gains from marriage against the potential future benefits of remaining single.

The Gains to Marriage To summarize, individuals' incentives to enter marriage arise from several channels: (1) economies of scale in consumption, (2) the ability to share household public goods and gains from specialization, (3) the desire to achieve an ideal number of chil-

dren, (4) income pooling, (5) (partial) risk sharing in the face of negative wage shocks, and (6) match-specific love shocks.

4 Estimation and Validation

In the model, all individuals enter the model at age $T_0 = 22$, while women retire at age $T_R = 50$ and live for two additional periods, yielding a final period of $T_{max} = 52$.[16] Each model period t corresponds to two real-world years, resulting in a total of $T = 15$ periods. The initial fraction of married individuals at the beginning of T_0 is calibrated to match the CFPS data. Among low-educated women, 42% are married and 28% have one child, whereas among high-educated women, 9% are married and 4% have one child. At model entry, no individuals are divorced.

The estimation proceeds in two steps. First, a subset of parameters is fixed by adopting standard values from the literature or by direct calibration using CFPS data. Second, the remaining parameters are estimated using the method of simulated moments (MSM) to match moments from the model to those observed in the data.

The empirical moments are based on individuals aged 20 to 50 with no more than two children from the pre-reform period (CFPS 2010–2014). These ages correspond to the main fertile period relevant to the estimation.[17] I include moments for women who were eligible to have two children and had two children before the implementation of the Two-Child Policy. This serves two purposes: first, to recover women's wage profiles over the life cycle; and second, to identify the fertility-preference parameter α_n in the utility function (3) using couples who report misaligned fertility preferences and match their realized fertility outcomes.

4.1 Externally Calibrated Parameters

First, I assign several parameters standard values commonly used in the literature. The discount factor, β, is set to 0.96 following Adda et al. (2017). The coefficient of relative risk aversion for consumption, σ_C, is fixed at 1.5 in line with Blundell et al. (1994), while the curvature parameter governing leisure preferences, σ_L, is set to 1.826 based on the estimates reported in Gayle and Shephard (2019). The household equivalence scale $\Lambda(n_t) = 1 + 0.7 \cdot M_t + 0.5 \cdot n_t$ follows the OECD standard. Human capital is assumed to depreciate during periods of non-employment at an annual rate of $\delta^U = 0.1$ following Keane and Wasi (2016).

Hours, Wage Profiles, and Non-Labor Income Labor supply choices are discrete, and weekly work hours are restricted to three values: non-participation (0 hours), part-time work (30 hours), and full-time work (50 hours).[18] Given that a week comprises 168 hours, and after accounting for essential sleep and other basic needs, $\bar{T} = 100$ hours remain for allocation

[16] In China, the statutory retirement age is 50 for women during the sample period.

[17] I compute the empirical moments by weighting them according to the age-specific sample size following Foerster (2025).

[18] Appendix Figure B.5 shows that the average weekly hours for full-time and part-time female workers are 52 and 28 hours, respectively.

among work, leisure, and home production per week. Furthermore, for women, wage profiles are estimated internally within the model. For men, life-cycle wage profiles are estimated directly using CFPS data. Further details of the estimation procedures of male hourly wages are provided in Appendix E.1. Non-labor income is defined as total family income net of primary wage income. I compute the average non-labor income by marital status and educational attainment. The levels are reported in Appendix E.2.

Biological Fecundity, Childcare Costs, and Custody Biological fecundity, denoted f_t, is estimated based on medical evidence from Leridon (2004). The age-specific probability of conception is reported in Appendix E.3. Women are no longer fertile and cannot have more children after age $T_f = 45$. Moreover, in China, the largest component of monetary expenditures related to children is education-related costs (Hu et al., 2023). Accordingly, I use these costs as a proxy for the overall monetary cost of childcare. The detailed childcare costs used in the estimation are reported in Appendix E.4.

In China, there is no legal preference for awarding custody to mothers, as described in Appendix A.2. Single fathers residing with children is relatively prevalent due to patriarchal cultural norms (Zhang, 2020). In the event of divorce, women attain custody with probability $p^f_{cust} = 57.81\%$, based on statistics from Zhang et al. (2024). This implies that women are slightly more likely to retain custody of children.[19]

Education-Specific Fertility Constraints The model introduces heterogeneity in fertility constraints via education-specific upper bounds on the number of children. The goal is to match the observed shares of one-child and two-child households in the data before the end of the One-Child Policy in 2016, as discussed above. Specifically, I compute the distribution of the maximum number of children, $n_{\max} = \{1, 2\}$ based on educational attainment. This heterogeneity reflects the fact that rural women, who on average have lower educational attainment, faced less stringent fertility restrictions than their urban counterparts and were more likely to be eligible for a second child before 2016. To discipline the mapping from education to $n_{\max}$, I use completed fertility outcomes for women aged 40–49 in the data prior to 2016. The construction procedure is described in Appendix E.5.

The distribution of Characteristics of Single Men and Women In each period, a potential partner is randomly assigned based on the distributions of two key characteristics: educational attainment and the ideal number of children. The distributions of meeting a partner with a given characteristic are reported in Appendix Table E.6.

4.2 Internally Estimated Parameters

For the remaining model parameters, I employ the Method of Simulated Moments (MSM) (McFadden, 1989) for internal estimation. The parameter vector Θ comprises four sets of

[19] Assuming women automatically obtain full custody would further lower the wife's outside option, reinforcing the bargaining implications in this framework.

parameters: (1) the wage process for women by educational level ($\eta^e_{w,0}, \eta^e_{w,1}, \eta^e_{w,2}, \sigma_{\epsilon,w}$); (2) preferences of women and men over leisure, public goods, and deviations between actual and ideal fertility ($\alpha_\ell, \alpha^j_Q, \alpha_n$); (3) parameters governing home production technology (π, ρ); and (4) the variance of match quality (σ^2_ξ) and the probability of meeting a partner (λ). Appendix E.7 describes further details of the MSM procedure, including the objective function, weighting matrix, and standard error. Appendix Table E.7 reports the estimation results of the parameters.

Targeted Moments and Identification The target moments for estimation are classified into five sets, capturing key aspects of labor supply, fertility, marital outcomes, household production, and wages. In total, I have 78 empirical moments to identify 19 structural parameters. I provide a heuristic explanation for how these moments are more directly informative for identifying particular parameters below.

The first set of moments includes the life-cycle profile of women's employment probabilities and working hours (Figure 4, panel (a)). These moments primarily inform the parameter governing women's taste for leisure relative to consumption, α_ℓ. A higher α_ℓ leads to lower employment rates or fewer hours worked.

The second set of moments includes the life-cycle profile of women's hourly wages by educational attainment (Figure 4, panel (b)). These moments identify the parameters governing women's returns to human capital accumulation, $\eta^e_{w,0}, \eta^e_{w,1}, \eta^e_{w,2}$, by education level e. Higher wage levels and steeper wage growth over the life cycle indicate greater returns to experience.

The third set of moments targets fertility outcomes. I first use the life-cycle profile of the number of children women have (Figure 4, panel (c)), which is informative about the timing and cumulative realization of fertility over the life cycle. I then consider the number of children among couples with aligned versus misaligned fertility preferences (Figure 4, panel (d)), which captures the extent to which couples adjust fertility outcomes in response to preference misalignment. Together, these moments identify the dis-utility from deviations between the actual and ideal number of children α_n.

The fourth set of moments relates to the life-cycle profile of the probability of marriage (Figure 4, panel (c)). Marriage probabilities at early ages are informative about the meeting probability in the marriage market, λ. A higher λ implies a greater likelihood of encountering a potential partner, which is reflected in higher observed marriage rates among younger women. Marriage probabilities at older ages are informative about the standard deviation of match quality shocks, σ_ξ. A higher σ_ξ increases the probability of divorce by raising the likelihood of adverse shocks to marital quality.

The fifth set of moments captures married couples' time allocation to home production, conditional on the age of the youngest child and marital status (Figure 4, panels (e) and (f)). First, individual hours devoted to home production by age of the youngest child are informative about how the preference for the public good, α_Q, varies across child age groups κ_t. Furthermore, the spouses' home production hours help identify the substitutability of spousal inputs

in home production, ρ. The difference between women's and men's home production hours, conditional on their relative wages, identifies women's relative home productivity, π. Finally, the ratio of individual home production hours within marriage relative to divorce identifies how α_Q changes upon dissolution of the marriage.

Model Fit I evaluate the model's fit by comparing simulated moments to their empirical counterparts. Figure 4 shows that the model provides a good fit to the data. In particular, the model successfully captures (i) the dynamics of women's marriage, fertility choices, and labor market participation throughout the life cycle, (ii) patterns of household specialization and spousal home production hours by the age of the youngest child, and (iii) differences in fertility outcomes between couples with aligned versus misaligned fertility preferences, with aligned couples exhibiting higher fertility on average.

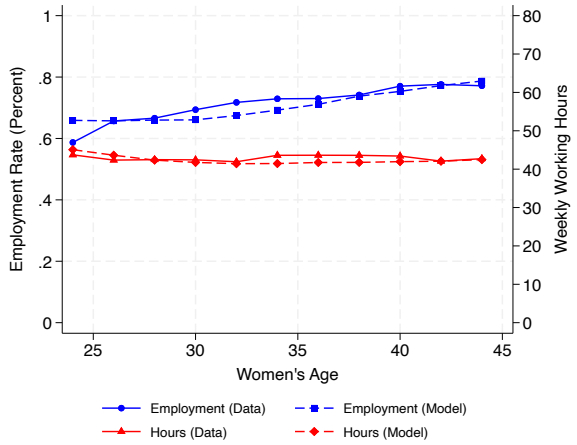
4.3 Validation

In this Section, I evaluate the external validity of the model by examining its ability to replicate key non-target moments. I consider two sets of non-target moments. The first set of moments concerns the dynamics of female labor supply surrounding the first birth. The second set consists of event-study estimates of the effects of the 2016 Two-Child Policy on fertility and divorce.

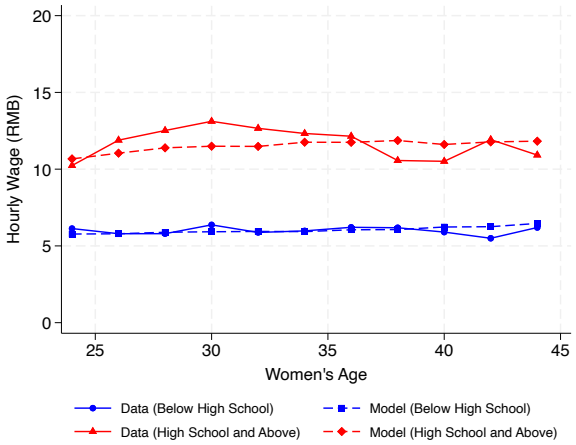
Women's Labor Supply Around the First Birth First, I examine female labor supply dynamics around the first birth and compare simulated working hours with those observed in the data. I focus on the period from six years before to eight years after the first birth, where period 0 denotes the year of childbirth. These moments provide insight into whether the model adequately captures women's trade-offs between market work and childcare in the presence of children. As shown in Figure 5, the model replicates both the magnitude and the dynamics of labor supply responses to childbirth. It captures the sharp decline in working hours at the time of birth as well as the gradual recovery in subsequent years.

Event-Study Estimates of Two-Child Policy Effects Next, I examine whether the model can reproduce the short-run policy effects of the Two-Child Policy estimated in reduced-form analyses. These moments are informative for evaluating whether the model captures the joint responses of fertility and divorce following the policy, which are governed by intrahousehold bargaining channels.

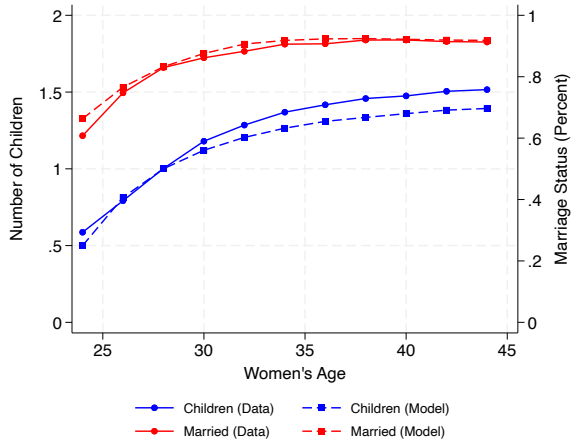
To align the model simulation with the identification strategy in Section 2, I proceed in three steps. First, I account for the fact that women were at different stages of their life cycle when the Two-Child Policy was introduced in 2016. Because fecundity declines with age, younger women had a greater probability of having an additional child following the reform, while older women faced a much lower probability. As a result, the empirical estimates reflect weighted averages of cross-sectional, age-specific responses rather than the full long-run adjustment (Cruces and Rodrıguez-Roman, 2025). To capture this heterogeneity, I compute



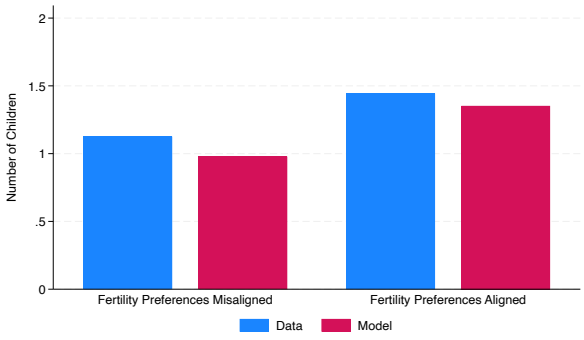
(a) Labor Supply



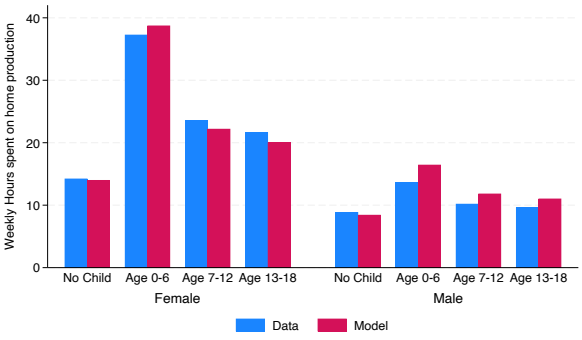
(b) Wage Profiles



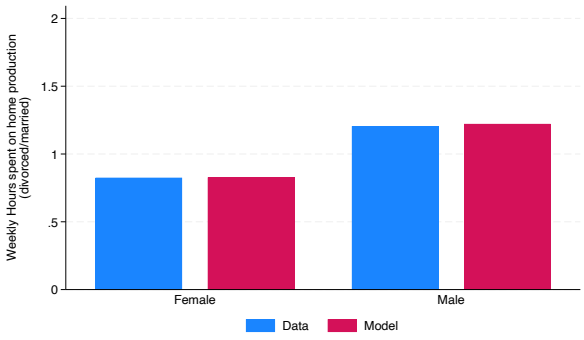
(c) Marriage and Children



(d) Number of Children
(By Couple's Fertility Preferences)



(e) Home Production Hours
(by the age of the youngest child)



(f) Home Production Hours Ratio
(Married/Divorced)

Figure 4: Model Fit

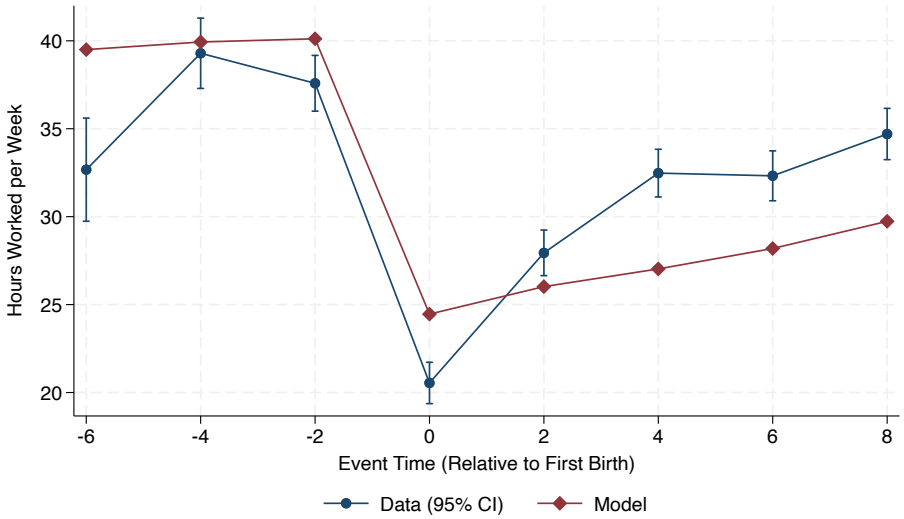


Figure 5: Women's Labor Supply Around the First Birth

the empirical age distribution of women at the time of the reform and use it to construct the probability that a woman was exposed to the policy at each age.

Second, in the model, each woman is assigned an exposure age drawn from this distribution. Before reaching her exposure age, she forms expectations over her maximum number of children, as in the pre-reform baseline. Upon reaching it, she updates her expectations to accommodate the possibility of a second child. This approach replicates the exogenous timing of policy eligibility across cohorts. Finally, I impose the same sample restrictions in the simulation as in the empirical analysis. Specifically, I focus on married couples who formed before the policy's introduction, and estimate the weighted average treatment effect in the four years following the policy relative to the two years preceding its implementation.

Table 1 compares the empirical coefficients from the CFPS (Figure 2) with their simulated counterparts using the empirical specification (2). For the reference group (*Both=2*), the reported coefficients represent the weighted average of the post-reform year dummy coefficients relative to the base year 2014 (η_t). For the treatment groups, the reported coefficients represent the differential policy response γ_t relative to the reference group. The model closely matches the empirical patterns observed in the data: fertility responds most strongly when both partners desire a second child. In both the data and the model, couples in this group have approximately 0.41 more children. Turning to divorce, divorce responds most strongly when the husband wants more children than his wife (*Wife = 1, Husband = 2*). These households exhibit a significantly higher divorce rate relative to the reference group: 3.0 percentage points in the data and 1.7 percentage points in the model.

Table 1: Validation of Reduced-Form Estimates: Data and Model

	Number of Children		Divorced	
	Data	Model	Data	Model
Wife=1, Husband=2	-0.134^{***}	-0.190^{***}	0.030^{**}	0.017^{***}
	[−0.202,−0.066]	[−0.211,−0.170]	[0.005,0.055]	[0.010,0.025]
Wife=2, Husband=1	-0.182^{***}	-0.281^{***}	0.006	-0.004^{**}
	[−0.244,−0.120]	[−0.301,−0.260]	[−0.008,0.020]	[−0.008,−0.001]
Both=1	-0.182^{***}	-0.256^{***}	0.012	0.011
	[−0.248,−0.117]	[−0.296,−0.215]	[−0.005,0.029]	[−0.005,0.027]
Both=2 (Ref.)	0.406^{***}	0.410^{***}	0.015^{***}	0.009^{***}
	[0.367,0.444]	[0.398,0.422]	[0.007,0.023]	[0.006,0.011]

Note: The table presents the estimated coefficients of the empirical specification (2) for both the data and the model. For the reference group (*Both=2*), the reported coefficients represent the weighted average of the post-reform year dummy coefficients relative to the base year 2014 (η_t). For the treatment groups, the reported coefficients represent the policy effects γ_t relative to the reference group. 95% confidence intervals in brackets. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

5 Long-Run Effects of Relaxing Fertility Restrictions

This section uses the estimated model to evaluate the long-run consequences of a permanent relaxation of fertility constraints at the beginning of women's reproductive age. The long-run analysis proceeds in two steps. First, I document how completed fertility responds across household fertility preference types and female education groups. Second, I trace individual marriage adjustments: accept or reject a partner with different fertility preferences, changes in the timing of marriage, and divorce behavior, and explain how these factors drive the differential fertility responses in the long-run.

Specifically, I focus on women who are constrained to at most one child under the baseline model, and consider two counterfactual policy scenarios.

Under the *short-run* counterfactual, women experience an unexpected policy relaxation at a given age and are subsequently permitted to have a second child, so that only the remaining reproductive horizon is unconstrained. The empirical age distribution of women at the time of the reform and the probability that a woman was exposed to the policy at each age are constructed as described in Section 4.3. Unlike the empirical analysis in Section 2, which examines only the four years immediately after the reform, the short-run counterfactual simulates outcomes over the entire life cycle, enabling me to observe how policy effects change throughout all stages.

Under the *long-run* counterfactual, the policy constraint is permanently relaxed from the beginning of reproductive age, so that all women can fully anticipate the possibility of having up to two children throughout their life cycle. Under this scenario, women optimally adjust their marriage and fertility decisions and achieve optimal life-cycle family planning.

5.1 Completed Fertility Response in the Long Run

Table 2 reports the short-run and long-run effects of relaxing fertility restrictions on completed fertility across households with different fertility preference types. Completed fertility is defined as the total number of children a woman has by the end of her reproductive period. In the baseline under the One-Child Policy, all households are constrained to have exactly one child, so completed fertility equals 1.0 for all couples.

First, the long-run fertility response exceeds the short-run response for couples in which at least one spouse prefers a second child. Under the short-run relaxation, women have already aged under one-child restrictions and cannot recover lost fecundity. In the long run, by contrast, women can fully anticipate the expanded reproductive choice set and optimally front-load births to periods of high fecundity. Furthermore, fertility responses are concentrated among couples in which at least one spouse prefers a second child. Couples where both spouses prefer two children (*Both = 2*) exhibit the largest response: completed fertility increases from 1.00 in the baseline to 1.71 in the short run and 1.99 in the long run, with the long-run increase exceeding the short-run increase by 16.37%. In contrast, couples where both spouses prefer one child (*Both = 1*) are unaffected across all scenarios.

Second, the long-run amplification is highly asymmetric when couples have misaligned fertility preferences. When the wife has the stronger fertility preference (*Wife = 2, Husband = 1*), completed fertility rises from 1.33 in the short run to 1.45 in the long run—an amplification of 9.02%. When only the husband has the stronger preference (*Wife = 1, Husband = 2*), however, the amplification is a much smaller 3.91% (1.28 to 1.33). This asymmetry highlights the dominant role of women's fertility preferences and birth intentions for higher-order births, consistent with Doepke and Kindermann (2019) and Fang and Liu (2026).

As discussed below, this asymmetry in completed fertility can be driven by differences in women's bargaining power arising from educational attainment and adjustments in household formation and dissolution.

Heterogeneity by Women's Education Table 3 examines heterogeneity in fertility responses by women's education. Education shapes fertility outcomes through two key channels: labor market earnings and women's bargaining positions within the household. On the one hand, higher educational attainment raises earnings potential and the opportunity cost of time devoted to child-rearing, thereby increasing the shadow price of fertility. On the other hand, it simultaneously enhances women's outside options in marriage, strengthening their bargaining position within the household. The net fertility response thus reflects the interactions between these opposing forces.

As shown in Panel A of Table 3, among women with high school education and above, the direction of the long-run amplification depends critically on the wife's underlying fertility preferences. When the wife has the weaker fertility preference (*Wife = 1, Husband = 2*), completed fertility among highly educated women changes by -0.34% in the long run relative to the short

Table 2: Long-Run Effects: Completed Fertility

	Baseline	Short-run (SR)	Long-run (LR)	Δ % ((LR - SR)/SR)
Wife = 1, Husband = 2	1.00	1.28	1.33	+3.91%
Wife = 2, Husband = 1	1.00	1.33	1.45	+9.02%
Both = 2	1.00	1.71	1.99	+16.37%
Both = 1	1.00	1.00	1.00	0.00%

Note: The table presents completed fertility under the baseline, short-run, and long-run scenarios (by couples' preference types). Completed fertility is measured as the total number of children born by the end of the reproductive period. Spousal fertility preferences are denoted by the ideal number of children, where $q \in \{1, 2\}$ for both the wife and the husband. The analysis focuses on households subject to the one-child restriction under the baseline. The *short run* refers to the case in which women experience an unexpected relaxation of the fertility constraint at a given age and are subsequently able to have a second child. The *long run* refers to the case in which all women face the relaxed fertility constraint from the beginning of the reproductive period, at age 22. The percentage change is defined as $\Delta\% = (F^{LR} - F^{SR})/F^{SR} \times 100$, where F^{SR} and F^{LR} denote outcomes in the short-run and long-run scenarios, respectively.

run—the only negative amplification in the Table 3. Conversely, when the wife has the stronger fertility preference (*Wife = 2, Husband = 1*), the long-run amplification reaches 13.59%. The negative amplification for women with low fertility preferences, but positive amplification for those with high fertility preferences, is consistent with the bargaining interpretation, and is difficult to reconcile with standard income or substitution effects alone. A pure income effect would predict positive long-run responses for highly educated women across both preference types, since higher lifetime earnings relax household budget constraints. A pure substitution effect, conversely, would predict lower completed fertility among highly educated women, due to their high opportunity cost of time. Neither mechanism, operating in isolation, can generate a reversal in the sign of amplification across women who differ only in their fertility preferences.

The differential fertility responses for highly educated women with different fertility preferences point to intrahousehold bargaining as the operative channel. When the wife prefers more children than her husband does, their stronger outside options give them the bargaining leverage to enforce their strong second-birth intentions. So the long-run response exceeds the short-run response. When the wife prefers fewer children than her husband does, that stronger bargaining power works in the opposite direction, enabling her to resist her husband's higher fertility desires and reducing realized fertility in the long run below the short-run level.

By contrast, among women with below-high-school education, the long-run amplification relative to the short run is uniformly positive, ranging from 5.61% (*Wife = 1, Husband = 2*) to 12.83% (*Both = 2*). Weaker outside options mean they accept larger deviations from their own preferred fertility in both directions: upward when their husbands desire more children (5.61% vs. -0.34%) and downward when they themselves desire more (5.91% vs. 13.59%), relative to highly educated women.

Table 3: Long-Run Effects on Completed Fertility by Women's Educational Attainment

	Baseline	Short-run (SR)	Long-run (LR)	Δ % ((LR - SR)/SR)
Panel A: Women with High School Education and Above				
Wife = 1, Husband = 2	1.000	1.193	1.189	-0.34%
Wife = 2, Husband = 1	1.000	1.273	1.446	$+13.59\%$
Both = 2	1.000	1.656	1.983	$+19.75\%$
Both = 1	1.000	1.000	1.000	0.00%
Panel B: Women with Below High School Education				
Wife = 1, Husband = 2	1.000	1.354	1.430	$+5.61\%$
Wife = 2, Husband = 1	1.000	1.371	1.452	$+5.91\%$
Both = 2	1.000	1.761	1.987	$+12.83\%$
Both = 1	1.000	1.000	1.000	0.00%

Note: The table presents completed fertility under the baseline, short-run, and long-run scenarios (by couples' preference types and women's educational attainment). Completed fertility is measured as the total number of children born by the end of the reproductive period. Spousal fertility preferences are denoted by the ideal number of children, where $q \in \{1, 2\}$ for both the wife and the husband. The analysis focuses on households subject to the one-child restriction under the baseline. The *short run* refers to the case in which women experience an unexpected relaxation of the fertility constraint at a given age and are subsequently able to have a second child. The *long run* refers to the case in which all women face the relaxed fertility constraint from the beginning of the reproductive period, at age 22. The percentage change is defined as $\Delta\% = (F^{LR} - F^{SR})/F^{SR} \times 100$, where F^{SR} and F^{LR} denote outcomes in the short-run and long-run scenarios, respectively.

5.2 Household Formation and Dissolution in the Long Run

Since childbearing in East Asian contexts occurs predominantly within marriage, marriage incentives are central to understanding fertility outcomes (Myong et al., 2021). The fertility responses also reflect endogenous adjustments in family formation and dissolution behavior. When fertility constraints are permanently relaxed, the value of marriage changes differentially depending on the fertility preferences of prospective partners. Given the random matching process and the waiting time to meet a partner in each period, women optimally adjust their marriage timing, their selection of partners, and whether to remain married.[20]

Marriage response Table 4 reports the distribution of married couples that ultimately formed over women's life cycles by preference type under the baseline, short-run, and long-run policy scenarios.[21] Two main patterns emerge. First, positive assortative matching on fertility preferences strengthens in the long run. The share of couples in which both partners desire one child (*Both = 1*) rises from 3.06 % in the baseline to 4.00 %, and the share in which both desire two children (*Both = 2*) rises from 70.43 % to 72.60 %. When fertility restrictions are relaxed, preference alignment generates greater joint surplus, making assortative matches more attrac-

[20] In the long-run analysis, I assume that the distributions of education and fertility preferences among single women and men remain fixed. In principle, relaxing fertility constraints can alter the relative attractiveness of potential partners, changing matching patterns and thus the value of being single (Greenwood et al., 2016). Women's educational choices may also respond, driven by the insurance value of education against divorce risk (Guvenen and Rendall, 2015). These extensions are beyond the scope of this paper.

[21] Noting that divorce is an absorbing state, women will have at most one marriage over their life cycle.

tive at the margin. Second, the share of mismatched couples declines across both mismatch directions. The share of couples in which the wife has lower desired fertility than the husband (*Wife = 1, Husband = 2*) declines modestly, from 16.19 to 15.21 percent, whereas the share of couples in which the wife has higher desired fertility than the husband (*Wife = 2, Husband = 1*) falls more sharply, from 10.32 to 8.18 percent. Given that the long-run scenario opens the opportunity to satisfy an ideal family size of two children, individuals with stronger fertility preferences are more likely to reject partners with low fertility preferences.

Appendix Figure F.1 reports the dynamics of marital status over women's life cycle. I divide women based on their fertility preferences and examine the timing at which they enter marriage with partners of the same or different fertility preferences. The results show that, when women meet partners with the same fertility preferences in a given period, they are more likely to accept and enter marriage compared to baseline. On the contrary, when women meet partners with different fertility preferences, they are more likely to reject them and wait for future opportunities, remaining single in the meantime. Consequently, households where couples have aligned preferences form earlier than the baseline, whereas those with misaligned preferences form later. Given that fertility is only possible within marriage, the timing of first births among couples with misaligned fertility preferences is also delayed.

Table 4: Distribution of Married Couples by Preference Type (%)

	Baseline	Short-run (SR)	Long-run (LR)	Δ % ((LR - SR)/SR)
Wife=1, Husband=2	16.19	16.07	15.21	−5.35%
Wife=2, Husband=1	10.32	10.14	8.18	−19.33%
Both = 2	70.43	70.61	72.60	+2.82%
Both = 1	3.06	3.19	4.00	+25.39%

Note: The table presents the distribution of married couples by their preference types under the baseline, short-run, and long-run scenarios. Spousal fertility preferences are denoted by the ideal number of children, where $q \in \{1, 2\}$ for both the wife and the husband. The analysis focuses on households subject to the one-child restriction under the baseline. The *short run* refers to the case in which women experience an unexpected relaxation of the fertility constraint at a given age and are subsequently able to have a second child. The *long run* refers to the case in which all women face the relaxed fertility constraint from the beginning of the reproductive period, at age 22. The percentage change is defined as $\Delta\% = (F^{LR} - F^{SR})/F^{SR} \times 100$, where F^{SR} and F^{LR} denote outcomes in the short-run and long-run scenarios, respectively.

Divorce response Table 5 examines the fraction of households that have ever divorced by couples' fertility preference type. Different from the empirical analysis in Section 2, which considers only the four years immediately following the reform, the short-run counterfactual simulates outcomes over the entire life cycle, thereby capturing the full divorce response that cannot be observed in the data.

First, the asymmetric divorce response among households in which spouses hold divergent fertility preferences persists under both the short-run and long-run scenarios. In the long run, for couples in which the wife holds the higher fertility preference (*Wife = 2, Husband = 1*), the divorce rate declines substantially from 4.62 % in the short run to 0.74 % in the long run.

Conversely, when the husband holds the higher fertility preference (*Wife = 1, Husband = 2*), the divorce rate rises from 7.02 % in the short run to 10.01 % in the long run.

This suggests that both disagreement in fertility preferences and the distribution of childbearing costs within the household are equally important. In the model, the partner who prefers fewer children experiences disutility, and this is applied symmetrically across households with misaligned fertility preferences, regardless of whether it is the husband or the wife who desires a second child. The asymmetric divorce response therefore stems from the fact that women bear a disproportionate share of childbearing costs.

When the husband has stronger fertility preferences than the wife, she faces dual pressures: (1) the prospect of an unwanted birth, and (2) a further deterioration in both her labor market performance and her bargaining position within the household. Therefore, the gains from marriage decline, her participation constraint becomes binding, and she prefers the outside option. In contrast, when the wife desires more children than the husband, divorce rates decline. In this case, achieving her desired fertility raises the wife's utility and partially offsets the unequal childbearing costs borne by mothers, making marital dissolution less likely.

For couples in which both partners desire a second child, the increase in the divorce rate can be attributed to two factors. First, such couples tend to enter marriage earlier and may be more willing to accept a lower-quality match in order to achieve their desired fertility sooner (Appendix Figure F.1). As a result, these marriages may be less stable from the outset. Second, once desired fertility is achieved, the gains from marriage decline sharply. In particular, the husband, who is typically the primary earner and bears the majority of the monetary costs of child-rearing, may face a reduced incentive to remain in the marriage. Consequently, his marital surplus, defined as the value of remaining married relative to divorcing, is more likely to turn negative in the long run (Appendix Figure F.2).

Table 5: Fraction of Ever Divorced (%)

	Baseline	Short-run (SR)	Long-run (LR)	Δ % (LR - SR)/SR
Wife=1, Husband=2	7.02	8.14	10.01	+22.97%
Wife=2, Husband=1	4.62	3.50	0.74	-78.86%
Both = 2	11.78	13.54	19.71	+45.57%
Both = 1	7.95	8.28	7.61	-8.09%

Note: The table presents the fraction of households that have ever divorced under the baseline, short-run, and long-run scenarios (by couples' preference types). Spousal fertility preferences are denoted by the ideal number of children, where $q \in \{1, 2\}$ for both the wife and the husband. The analysis focuses on households subject to the one-child restriction under the baseline. The *short run* refers to the case in which women experience an unexpected relaxation of the fertility constraint at a given age and are subsequently able to have a second child. The *long run* refers to the case in which all women face the relaxed fertility constraint from the beginning of the reproductive period, at age 22. The percentage change is defined as $\Delta\% = (F^{LR} - F^{SR})/F^{SR} \times 100$, where F^{SR} and F^{LR} denote outcomes in the short-run and long-run scenarios, respectively.

6 Quantifying Limited Commitment Frictions

In this section, I compare the limited-commitment model against two counterfactual scenarios in order to quantify the role of commitment frictions in shaping fertility and marriage outcomes. The first counterfactual assumes full commitment within marriage, thereby eliminating commitment frictions altogether. The second moves in the opposite direction by weakening women's outside options: it increases the probability that child custody is assigned to the mother by 50 percent in the event of divorce.[22] Figures 6 presents the dynamics of fertility and marriage over women's life cycle in the long run.

In the first counterfactual, under full commitment, bargaining power is determined at the time of marriage and remains fixed thereafter. Therefore, spouses can fully commit to future transfers even in the presence of shocks that affect partners asymmetrically (Theloudis et al., 2025). As a result, fertility choices depend only on total effective child-rearing costs rather than on how these costs are distributed between spouses. As illustrated in Figure 6, the removal of commitment frictions generates an increase in completed fertility over the life cycle, manifesting in both earlier entry into motherhood and a higher total number of children.

Furthermore, the life-cycle average marriage rate increases from 82.61 percentage points under limited commitment to 86.31 percentage points under full commitment. This is driven by both a higher propensity to marry and greater marital stability. Consistent with these patterns, the life-cycle average divorce rate declines from 8.52 percentage points under limited commitment to 5.14 percentage points under full commitment. Under full commitment, divorce occurs if and only if it is Pareto efficient. Hence, a substantial share of divorces observed under limited commitment are inefficient, arising from unresolved fertility-related conflicts rather than from mutual gains to separation.

At the other extreme, the second counterfactual weakens women's outside options by increasing the probability that child custody is assigned to the mother by 50 percent following divorce. By construction, individuals continue to derive utility from the existence of their children regardless of marital status. However, without spousal support, the wage penalties associated with childbirth imply lower consumption in the event of divorce (Fernández and Wong, 2017). Consequently, this scenario places heavier financial and childcare burdens on divorced mothers who retain child custody, inducing larger utility losses, lowering the value of being single, and amplifying commitment frictions. As shown in Figure 6, in the second counterfactual, the deterioration of women's outside options makes agreement on additional childbearing more difficult, further compressing fertility. Completed fertility decreases by 1.97% and life-cycle average marriage rates fall sharply by 22.35% compared to the long run baseline. Women are more reluctant to enter marriage. Conditional on marriage, the ever-divorce rate rises at later stages of the life cycle. These two counterfactuals highlight the quantitative importance of limited commitment frictions for fertility and marriage rates.

[22] In the second counterfactual, the probability that women obtain custody is 57.81% $\times$ (1+50%) = 86.715%.

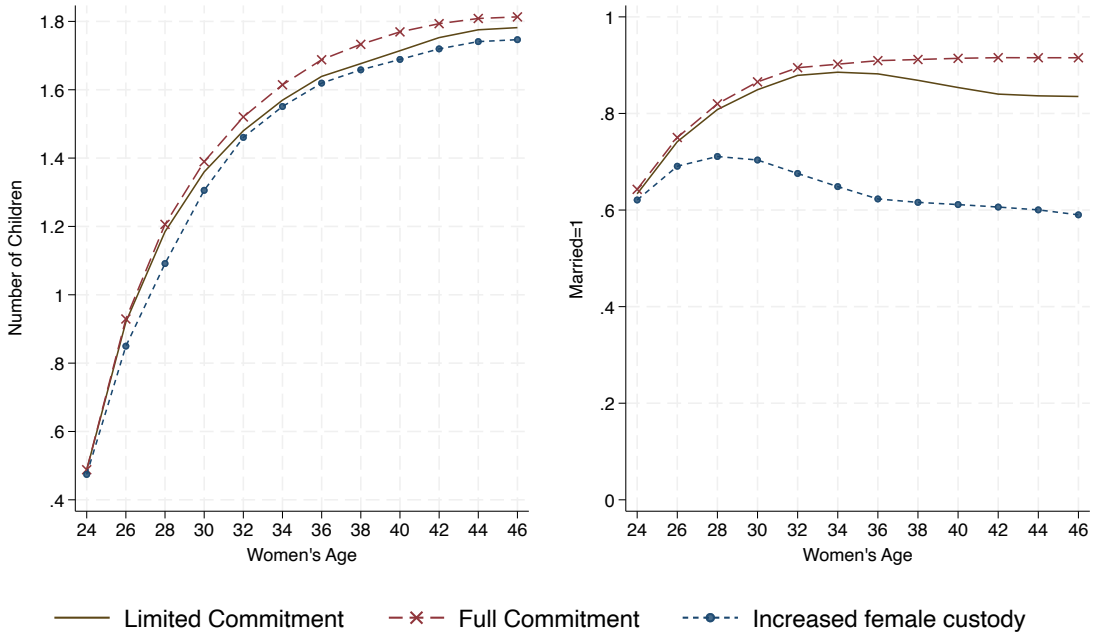


Figure 6: Alternative Commitment Assumptions: Fertility and Marriage

7 Policy Experiments

To examine how policies can simultaneously promote fertility and empower women, I simulate three hypothetical policy experiments commonly used by governments: a pronatalist cash transfer, an in-work benefit, and a public childcare subsidy. Each policy affects fertility through a different channel, with distinct implications for female labor supply and marriage, and consequently, for whether it mitigates or exacerbates bargaining frictions within marriage. In what follows, I first discuss the policy effects under limited commitment, and then turn to the differential policy responses under full commitment.

7.1 Policy Response Under Limited Commitment

Panels (a), (c), and (e) of Figure 7 report long-run average outcomes for women with low fertility preferences under limited commitment.[23] The first bar in each panel represents the baseline under permanent fertility relaxation in the long run, and the remaining bars correspond to the three policy experiments. The numbers above the bars indicate each policy's effect relative to the long-run limited commitment baseline.

Pronatalist Cash Transfer Pronatalist cash transfers are a policy instrument to directly stimulate fertility. In the model, this is implemented by providing married households with a subsidy of 4,500 RMB per year per child for children aged 0-6, equivalent to approximately 10%

[23] Since the maximum number of children in the model is capped at two, by construction, women with high fertility preferences already achieve outcomes close to their ideal family size. This leaves little scope for policy-induced increases in fertility. I therefore focus on women with low fertility preferences in the main text. Results for all the women are reported in Appendix Figure F.3 and are qualitatively consistent with the main results.

of average household income in the observed data. As shown in panel (a) of Figure 7, the transfer raises completed fertility by 0.46% relative to the baseline under limited commitment. By directly lowering the cost of childbearing, the transfer makes an additional birth more affordable.[24] However, this comes at a cost to female labor supply: women's average weekly working hours decline by 7.38% (panel (c) of Figure 7). The subsidy reduces women's incentives to work. As women reduce labor force participation, their human capital accumulates more slowly, weakening their outside options and exacerbating limited commitment frictions. While universal pronatalist transfers successfully raise fertility, they unintentionally deepen gender inequality within the household. As a result, the marriage rates decline by 4.38% (panel (e) of Figure 7).

In-Work Benefits In-work benefits are designed to directly encourage female labor force participation by subsidizing the labor income of working women. To maintain budget neutrality, the subsidy amount is set to match total government expenditure under the pronatalist transfer experiment. As shown in panel (c) of Figure 7, the policy increases women's average weekly working hours by 8.86%, which raises wages and strengthens bargaining positions within the household. Despite these gains, completed fertility declines by 2.39% (panel (a) of Figure 7). The reason is that labor market improvements do not resolve the fundamental tension between career and family. Women continue to exit the labor market following childbirth due to preferences and comparative advantage in home production. Meanwhile, stronger labor market prospects raise the opportunity cost of childbearing, making fertility more costly. Marriage rates also decline by 4.10%. While higher female earnings increase their attractiveness as partners, the lower fertility reduces the gains within marriage.

These results suggest that labor market policies alone, while effective at improving women's employment outcomes and their bargaining positions, are insufficient to generate positive fertility responses. The underlying commitment friction remains: women continue to lose bargaining power following childbirth, and with higher wages, the cost of that loss becomes larger, further dampening fertility incentives.

Public Childcare Provision The third policy establishes publicly provided childcare support, offering 10 hours of home care per week to married households with children aged 0-6. Under limited commitment, this policy generates the largest fertility increase among all three experiments: completed fertility rises by 1.09%. Unlike the pronatalist transfer, the public childcare subsidy simultaneously increases women's weekly working hours by 7.85%. The public childcare subsidy achieves this dual outcome by relaxing the time constraint that typically forces women to choose between market work and childrearing. By lowering the time cost of having a child, the policy makes an additional birth less costly without requiring a cor-

[24]For comparison, Adda et al. (2017) analyze the effects of introducing a cash transfer of 6000 euros in Germany, the proportion of women with two children increases 0.2%. Zhou (2025) employ an overlapping generations model to simulate the impact of a baby bonus with a net present value equivalent to 10% of a household's annual income, and the model predicts a 0.7% increase in fertility.

responding reduction in female labor supply. Strengthened labor market attachment in turn improves mothers' outside options, reducing limited commitment frictions and improving their bargaining positions within the household. Consequently, women are more willing to have births, and their work hours and fertility increase simultaneously.

7.2 Policy Response Under Full Commitment

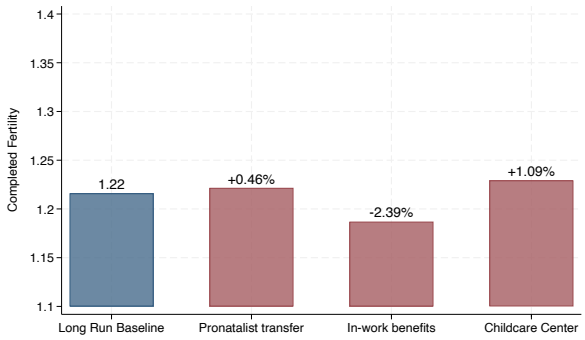
Panels (b), (d), and (f) of Figure 7 report long-run average outcomes for women with low fertility preferences under full commitment. The numbers above the bars report the policy effects relative to the long-run full commitment baseline. As discussed in Section 6, when spouses can credibly commit to sharing rules at the time of marriage, both fertility and marriage rates are higher relative to the limited commitment baseline. Accordingly, for women with low fertility preferences, the long-run baseline completed fertility rises from 1.22 under limited commitment to 1.33 under full commitment, while the marriage rate increases from 89.51% to 97.76%.

The same policy can have qualitatively and quantitatively different effects depending on the underlying commitment environment. First of all, under full commitment, the pronatalist transfer no longer exacerbates bargaining frictions: because women can be adequately compensated by their partners, the transfer produces the largest fertility response among the three policies, with completed fertility rising by 2.69%, which is substantially larger than the 0.46% increase under limited commitment. Second, in-work benefits raise fertility by 0.42% and marriage rates by 0.78%, a reversal of the fertility decline observed under limited commitment. When the value of marriage is no longer subject to changes in individual outside options, women are more willing to have children even though childbearing remains costly, because they can receive full compensation from their partners. As a result, higher female earnings complement rather than compete with fertility. Put differently, full commitment enables couples to capture the gains from dual-earner partnership without the fear that future renegotiation will erode those gains. Finally, the public childcare subsidy remains effective under full commitment, increasing fertility by 1.04% and marriage rates by 0.31%.

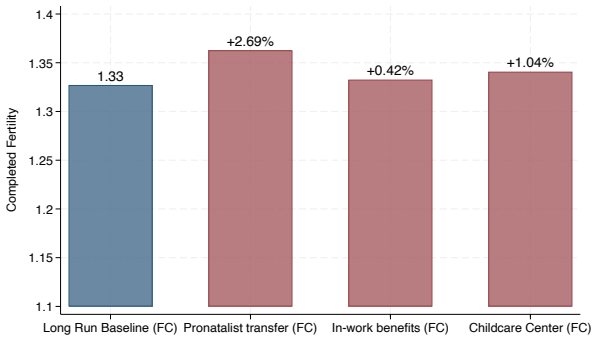
To summarize, these contrasts highlight that the effectiveness of family policies depends not only on their direct financial incentives but also on the degree to which couples can credibly commit to sharing the resulting gains.

8 Conclusion

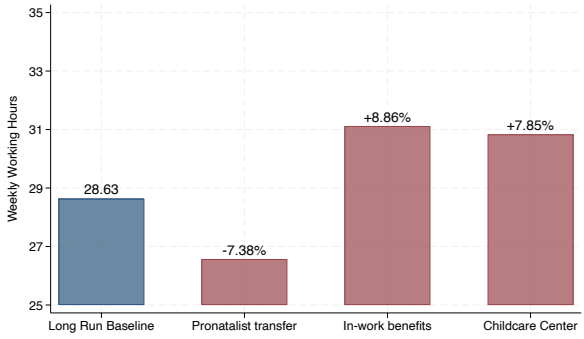
This paper analyzes the role of intrahousehold bargaining in shaping fertility decisions over women's life cycle. The central mechanism operates as follows: childbirth lowers women's wages and outside options, weakening their bargaining position and feeding back into subsequent fertility decisions. This feedback amplifies the fertility-depressing effects beyond what standard unitary or full-commitment household models would predict. Moreover, since bargaining power determines the division of marital surplus, it shapes fertility not only within



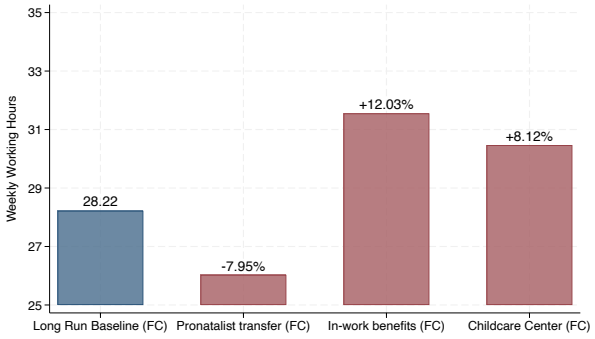
(a) Completed Fertility (Limited Commitment)



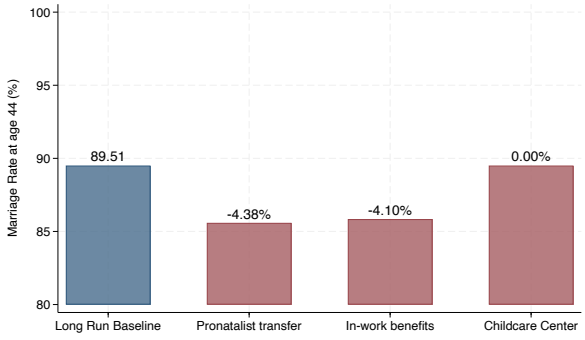
(b) Completed Fertility (Full Commitment)



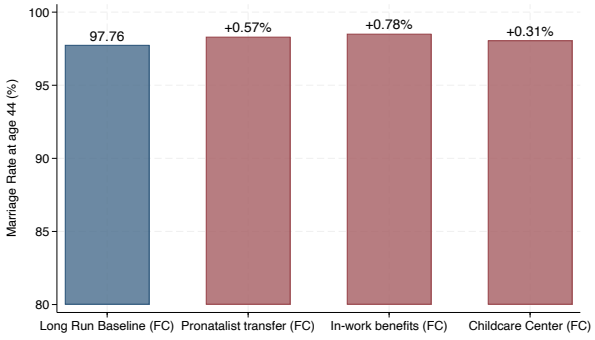
(c) Weekly Working Hours (Limited Commitment)



(d) Weekly Working Hours (Full Commitment)



(e) Marriage Rate at Age 44 (Limited Commitment)



(f) Marriage Rate at Age 44 (Full Commitment)

Figure 7: Policy Experiments (Women with Low Fertility Preferences)

existing marriages but also through its influence on household formation and dissolution. This paper speaks to a question of broad economic significance: why fertility rates have fallen globally, and how intrahousehold bargaining contributes to this trend.

The findings carry direct implications for the design of family policy. The central takeaway is that policy effectiveness depends critically on the degree of commitment within the household. Limited-commitment frictions are important in depressing marriage incentives, generating inefficient divorce, and thereby suppressing fertility at the household level. When couples can make a full commitment, fertility responses are larger, and marital stability improves. Therefore, policy interventions that ignore how childbearing reshapes women's outside options may have limited or unintended effects on fertility. In contrast, policies that reduce commitment frictions, such as those strengthening marital property rights, enforcing prenuptial agreements, or improving women's post-divorce resources through child support enforcement, can potentially serve as powerful complements to conventional pronatalist policies.

Future research could extend this framework to examine heterogeneity across institutional environments and social norms, the role of childcare markets, and the interaction between fertility policies and gender wage gaps on the labor market. Understanding how couples share childcare responsibilities and how this shapes women's outside options is essential to achieving both higher fertility and greater female empowerment.

References

Adda, J., C. Dustmann, and K. Stevens (2017). The career costs of children. *Journal of Political Economy 125*(2), 293–337.

Aksoy, Y., H. S. Basso, R. P. Smith, and T. Grasl (2019). Demographic Structure and Macroeconomic Trends. *American Economic Journal: Macroeconomics 11*(1), 193–222.

Bang, M. (2022). Job Flexibility and Household Labor Supply: Understanding Gender Gaps and the Child Wage Penalty. *Working Paper*.

Basu, K. (2006). Gender and say: A model of household behaviour with endogenously determined balance of power. *The Economic Journal 116*(511), 558–580.

Berresheim, U. and D. Koll (2026). Staying together forever? Life-cycle effects of overoptimistic couples. *Working Paper*.

Bick, A. (2016). The Quantitative Role of Child Care for Female Labor Force Participation and Fertility. *Journal of the European Economic Association 14*(3), 639–668.

Blundell, R., M. Browning, and C. Meghir (1994). Consumer Demand and the Life-Cycle Allocation of Household Expenditures. *The Review of Economic Studies 61*(1), 57–80.

Bronson, M. A. (2019). Degrees are forever: Marriage, educational investment, and lifecycle labor decisions of men and women. *Working Paper*.

Bronson, M. A., D. Haanwinckel, and M. Mazzocco (2024). Taxation and Household Decisions: An Intertemporal Analysis. *Working Paper*.

Chen, Y. and H. Fang (2021). The long-term consequences of China's "Later, Longer, Fewer" campaign in old age. *Journal of Development Economics 151*, 102664.

Chiappori, P.-A. (1988). Rational household labor supply. *Econometrica : journal of the Econometric Society*, 63–90.

Chiappori, P.-A. (1992). Collective labor supply and welfare. *Journal of Political Economy 100*(3), 437–467.

Ciscato, E. (2024). Assessing Racial and Educational Segmentation in Large Marriage Markets. *Review of Economic Studies*, rdae115.

Cruces, L. and F. J. Rodrıguez-Roman (2025). Financial Incentives to Fertility: From Short to Long Run. *Working Paper*.

Doepke, M., A. Hannusch, F. Kindermann, and M. Tertilt (2023). The economics of fertility: A new era. In S. Lundberg and A. Voena (Eds.), *Handbook of the Economics of the Family*, Volume 1 of *Handbook of the Economics of the Family, Volume 1*, pp. 151–254. North-Holland.

Doepke, M. and F. Kindermann (2019). Bargaining over babies: Theory, evidence, and policy implications. *American Economic Review 109*(9), 3264–3306.

Doepke, M. and F. Kindermann (2024). Negotiating Parenthood: An Account of the Changing Relationship between Women's Work and Fertility. *Working Paper*.

Doepke, M. and M. Tertilt (2018). Women's empowerment, the gender gap in desired fertility, and fertility outcomes in developing countries. In *AEA Papers and Proceedings*, Volume 108, pp. 358–62.

Eckstein, Z., M. Keane, and O. Lifshitz (2019). Career and family decisions: Cohorts born 1935–1975. *Econometrica : journal of the Econometric Society 87*(1), 217–253.

Fang, H. and C. Liu (2026). Desired fertility, realized fertility and the effects of China's Universal Two-Child Policy∗. *Journal of Development Economics 182*, 103796.

Fernández, R. and J. C. Wong (2017). Free to leave? a welfare analysis of divorce regimes. *American Economic Journal: Macroeconomics 9*(3), 72–115.

Foerster, H. (2025). Untying the Knot: How Child Support and Alimony Affect Couples' Dynamic Decisions and Welfare. *The Review of Economic Studies 92*(5), 3029–3066.

Francesconi, M. (2002). A joint dynamic model of fertility and work of married women. *Journal of Labor Economics 20*(2), 336–380.

Gayle, G.-L. and A. Shephard (2019). Optimal taxation, marriage, home production, and family labor supply. *Econometrica : journal of the Econometric Society 87*(1), 291–326.

Giorgi, L. and E. Raiber (2025). For Better or for Babies: Fertility Constraints and Marriage in China. *Working Paper*.

Gobbi, P. E. (2018). Childcare and commitment within households. *Journal of Economic Theory 176*, 503–551.

Goldin, C. (2025). The Downside of Fertility. *Working Paper*.

Gonzalez, L. and H. Zoabi (2026). Does Paternity Leave Promote Gender Equality within Households? *Working Paper*.

Greenwood, J., N. Guner, G. Kocharkov, and C. Santos (2016). Technology and the Changing Family: A Unified Model of Marriage, Divorce, Educational Attainment, and Married Female Labor-Force Participation. *American Economic Journal: Macroeconomics 8*(1), 1–41.

Guner, N., E. Kaya, and V. Sánchez-Marcos (2024). Labor Market Institutions And Fertility. *International Economic Review 65*(3), 1551–1587.

Guo, N. and A. Xie (2026). Childbirth and Welfare Inequality: The Role of Bargaining Power and Intrahousehold Allocation. *Working Paper*.

Guo, R., J. Yi, J. Zhang, and N. Zhang (2025). Rationed Fertility: Treatment Effect Heterogeneity in the Child Quantity–Quality Tradeoff. *Journal of Political Economy*.

Guvenen, F. and M. Rendall (2015). Women's emancipation through education: A macroeconomic analysis. *Review of Economic Dynamics 18*(4), 931–956.

Hopenhayn, H., J. Neira, and R. Singhania (2022). From Population Growth to Firm Demographics: Implications for Concentration, Entrepreneurship and the Labor Share. *Econometrica 90*(4), 1879–1914.

Hu, D., H. Li, T. Li, L. Meng, and B. T. Nguyen (2023). The burden of education costs in china: A struggle for all, but heavier for lower-income families. *Working Paper*.

Huang, W., X. Lei, and A. Sun (2021). Fertility Restrictions and Life Cycle Outcomes: Evidence from the One-Child Policy in China. *The Review of Economics and Statistics*, 1–17.

Huang, W., Y. Pan, and Y. Zhou (2023). One-child policy, marriage distortion, and welfare loss. *Review of Economics and Statistics*, 1–47.

Jakobsen, K. M., T. Jørgensen, and H. Low (2025). Fertility and Family Labor Supply. *Working Paper*.

Jayachandran, S. and A. Voena (2025). Women's power in the household. *Working Paper*.

Jones, C. I. (2022). The End of Economic Growth? Unintended Consequences of a Declining Population. *American Economic Review 112*(11), 3489–3527.

Jorgensen, T. H., A. Hallengreen, and A. M. Olesen (2026). Fast solution of dynamic intra-household bargaining models. *Working Paper*.

Keane, M. P. and N. Wasi (2016). Labour supply: The roles of human capital and the extensive margin. *The Economic Journal 126*(592), 578–617.

Kleven, H., C. Landais, and G. Leite-Mariante (2025). The Child Penalty Atlas. *The Review of Economic Studies 92*(5), 3174–3207.

Knowles, J. A. (2013). Why are married men working so much? An aggregate analysis of intra-household bargaining and labour supply. Review of Economic Studies *80*(3), 1055–1085.

Lafortune, J. and C. Low (2023). Collateralized Marriage. *American Economic Journal: Applied Economics 15*(4), 252–291.

Leridon, H. (2004). Can assisted reproduction technology compensate for the natural decline in fertility with age? A model assessment. *Human Reproduction 19*(7), 1548–1553.

Li, X. (2024). The Unintended Impacts of the One-child Policy Relaxation in China on Women's Labor Market Outcomes. *Working Paper*.

Lin, L., H. Yang, J. Yi, and H. Zhu (2025). Second Chance, Second Child? Renegotiation over Childbearing, Divorce, and Resource Allocation. *Working Paper*.

Lise, J. and K. Yamada (2019). Household sharing and commitment: Evidence from panel data on individual expenditures and time use. *Review of Economic Studies 86*(5), 2184–2219.

Low, H., C. Meghir, L. Pistaferri, and A. Voena (2025). Marriage, labor supply and the dynamics of the social safety net. *Working Paper*.

Maestas, N., K. J. Mullen, and D. Powell (2023). The Effect of Population Aging on Economic Growth, the Labor Force, and Productivity. *American Economic Journal: Macroeconomics 15*(2), 306–332.

Mazzocco, M. (2007). Household intertemporal behaviour: A collective characterization and a test of commitment. *Review of Economic Studies 74*(3), 857–895.

Mazzocco, M., C. Ruiz, and S. Yamaguchi (2014). Labor Supply and Household Dynamics. *American Economic Review 104*(5), 354–359.

McFadden, D. (1989). A method of simulated moments for estimation of discrete response models without numerical integration. *Econometrica: Journal of the Econometric Society*, 995–1026.

Melentyeva, V. and L. Riedel (2025). Child Penalty Estimation and Mothers' Age at First Birth. *Working Paper*.

Myong, S., J. Park, and J. Yi (2021). Social norms and fertility. *Journal of the European Economic Association 19*(5), 2429–2466.

Olivetti, C. and B. Petrongolo (2017). The Economic Consequences of Family Policies: Lessons from a Century of Legislation in High-Income Countries. *Journal of Economic Perspectives 31*(1), 205–230.

Rasul, I. (2008). Household bargaining over fertility: Theory and evidence from Malaysia. *Journal of Development Economics 86*(2), 215–241.

Reynoso, A. (2024). The Impact of Divorce Laws on the Equilibrium in the Marriage Market. *Journal of Political Economy 132*(12), 4155–4204.

Tertilt, M., M. Doepke, A. Hannusch, and L. Montenbruck (2022). The Economics of Women's Rights. *Journal of the European Economic Association 20*(6), 2271–2316.

Theloudis, A., J. Velilla, P.-A. Chiappori, J. I. Giménez-Nadal, and J. A. Molina (2025). Commitment and the dynamics of household labour supply. *The Economic Journal 135*(665), 354–386.

United Nations (2024). World Population Prospects 2024: Ten Key Messages. Technical report, United Nations, Department of Economic and Social Affairs, Population Division.

Voena, A. (2015). Yours, mine, and ours: Do divorce laws affect the intertemporal behavior of married couples. American Economic Review *105*(8), 2295–2332.

Wang, H. (2026). Fertility and Family Leave Policies in Germany: Optimal Policy Design in a Dynamic Framework. *Working Paper*.

Wu, X. (2022). Fertility and maternal labor supply: Evidence from the new two-child policies in urban China. *Journal of Comparative Economics 50*(2), 584–598.

Yamaguchi, S. (2019). Effects of parental leave policies on female career and fertility choices. *Quantitative Economics 10*(3), 1195–1232.

Zhang, C. (2020). Are children from divorced single-parent families disadvantaged? New evidence from the China family panel studies. *Chinese Sociological Review 52*(1), 84–114.

Zhang, J. (2017). The Evolution of China's One-Child Policy and Its Effects on Family Outcomes. *Journal of Economic Perspectives 31*(1), 141–160.

Zhang, X., S. Chen, and M. Wang (2024). Gender bias in child custody judgments: Evidence from Chinese family court. *Plos one 19*(7).

Zhou, A. (2025). The Macroeconomic Consequences of Family Policies. *Working Paper*.

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A Institutional Background

A.1 Fertility Policies in China

China's fertility policies have undergone substantial evolution since the late twentieth century. I summarize the policy stages here, as they are directly relevant to the sample restrictions applied below. Figure A.1 presents a schematic timeline illustrating the evolution of key fertility policies in China from the early 1970s to 2016. The evolution of China's birth control campaign is documented in Scharping (2013), and a review of the One-Child Policy can be found in Zhang (2017).

In 1970, China's population exceeded 820 million, and the total fertility rate was 6.1 births per woman.[25] To control rapid population growth and address concerns about overpopulation and the deterioration of living standards, the Chinese government launched a nationwide family planning campaign in the early 1970s (Chen and Fang, 2021).

In 1979, a stringent population control policy, the One-Child Policy, was introduced, under which households were generally restricted to having only one child. The One-Child Policy was implemented at the couple level.[26] Births exceeding the quota were subject to penalties. For example, households with unauthorized births faced monetary fines calculated as multiples of local annual household income (Ebenstein, 2010). Urban residents employed in state-owned enterprises could lose their jobs or access to social welfare benefits (Zhang, 2017).

In the mid-1980s, due to practical difficulties in enforcing the One-Child Policy in rural areas, the central government relaxed the policy and allowed rural couples whose first child was a daughter to have a second child (Guo et al., 2025). In general, fertility restrictions were more stringent in urban areas than in rural areas and primarily targeted the Han population, the largest ethnic group in China, accounting for approximately 92% of the total population (Huang et al., 2021). Accordingly, in the main sample, I restrict attention to Han ethnicity and exclude rural households where the first child is a daughter.

Entering the 21st century, China's total fertility rate fell below the replacement level. In response to persistently low fertility, the government gradually relaxed fertility restrictions. In 2011, a limited relaxation allowed couples in which both partners were only children to have two children. However, because such couples represented a very small share of the population, this policy had little impact on the overall fertility trend. In 2014, the government further expanded eligibility, permitting couples to have two children if at least one partner was an only child. Several empirical studies have documented positive effects of this reform on household fertility (Li, 2024, Wu, 2022). Therefore, in the main sample, I exclude couples where at least one spouse is an only child and therefore eligible for a second child before 2016.

[25] Data Sources: Population in China: https://worldpopulationreview.com/countries/china; Fertility rate, total (births per woman) in China: https://data.worldbank.org/indicator/SP.DYN.TFRT.IN?locations=CN.

[26] Eligibility for additional births through remarriage was not uniformly defined at the national level but instead regulated by local governments, resulting in variation over time and across regions.

On October 29, 2015, the government announced the universal Two-Child Policy, allowing all married couples to have two children starting January 1, 2016. This reform primarily affected couples in which both spouses had siblings (He et al., 2023). Based on the 2010 National Population Census and the National Fertility Intention Survey, the population eligible under the universal Two-Child Policy accounted for 46% of all married women of reproductive age (20-44), corresponding to more than 96 million families (Wang et al., 2016). Therefore, the policy change impacted a substantial share of married couples in China.

In the study sample of this paper (2010-2020), the maximum number of children is two in the post-reform period. Beyond the sample period, in 2021, China implemented the Universal Three-Child Policy, allowing couples to have up to three children. In 2022, all restrictions on the number of children were fully removed in China.

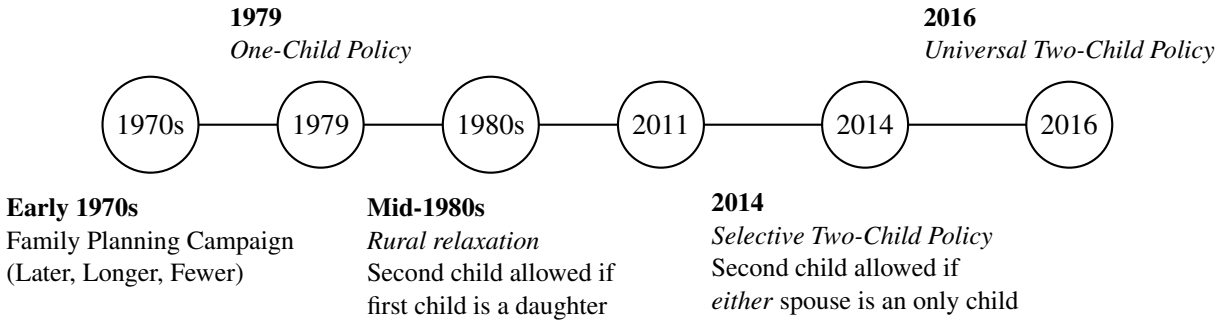


Figure A.1: Timeline of Major Changes in China's Fertility Policies

A.2 Divorce Law in China

Given that divorce responses play a central role in the analysis, this section summarizes the key institutional features related to divorce in China.

Quasi-Unilateral Divorce Regime China's modern divorce law, implemented in 2001, provides two primary pathways for marital dissolution: registered divorce and litigated divorce (Xia et al., 2021). Registered divorce is a consensual process that requires mutual agreement between both spouses.[27] Litigated divorce, by contrast, allows for unilateral initiation. Either spouse may petition the court to dissolve the marriage without the other's consent, particularly in cases involving domestic violence and extramarital relationships (Sun and Zhao, 2016). More importantly, either spouse can eventually obtain a divorce by asserting a lack of mutual affection following a two-year separation period (Huang et al., 2023). Therefore, China's legal framework can be characterized as a *quasi-unilateral divorce regime*.

[27] In January 2021, Article 1077 of the Civil Code of the People's Republic of China introduced a mandatory divorce "cooling-off" period (Zhang and Zhang, 2023), which increased the cost of registered divorce. This reform lies outside the sample period.

Spousal Maintenance and Custody arrangements Post-divorce spousal maintenance (like alimony or spousal support) is generally not mandated in China unless explicitly agreed upon by both parties.[28] Moreover, only a small fraction of single parents receive child maintenance payments. For these reasons, I abstract from alimony and maintenance payments in the analysis.

In terms of custody, for cases involving minor children, child custody is awarded to mothers when children are two years old or younger, prioritizing the child's need for maternal care during early development. For children older than two, divorce law custody is determined based on the "best interests of the child". There is no preference for custodial rights to be given to the mother. The custodial parent bears primary responsibility for child-related expenses. Empirically, custody outcomes are relatively balanced by gender. Using court decisions from 2014–2016, Zhang et al. (2024) document that mothers receive custody in 57.81% of cases, while fathers receive custody in 42.19%.[29] As suggested in Zhang (2020), in China, paternal custody is prevalent due to the patriarchal culture, and the proportion of single fathers residing with children is high.

B Data Appendix

B.1 Data and Variables

This paper uses data from the China Family Panel Studies (CFPS, 2010–2020), a nationally representative longitudinal survey designed to capture the social, economic, and demographic dynamics of Chinese households. The baseline survey, conducted in 2010, covers 14,960 households across 25 provinces and municipalities, representing approximately 95% of the Chinese population.[30] Five follow-up waves were conducted in 2012, 2014, 2016, 2018, and 2020, enabling the tracking of households and individuals over a ten-year period. The China Family Panel Studies (CFPS) data used in this paper are publicly available through the Institute of Social Science Survey (ISSS) of Peking University, China.

The CFPS collects detailed individual-level questionnaires for all household members and thus provides comprehensive information for both spouses. It covers a wide range of variables, including economic activities (e.g., employment status, annual labor income, and household educational expenditures), educational attainment, and family dynamics such as fertility, marriage, and time allocation across activities. The main study sample is constructed according to the criteria described in Section 2. Table B.1 reports summary statistics for the main variables in the study sample.

[28]The post-divorce financial relief system in the current Marriage Law consists of three parts, which are "post-divorce financial assistance system" (analogous to the American concept of "alimony" or "spousal support"), "economic compensation at divorce" and "divorce damage claims system". Despite this framework, practical application is limited (Lee, 2019).

[29]These statistics are based on 10,093 first-instance divorce rulings from China Judgements Online, an official judicial database established by the Supreme People's Court.

[30]Excluding Taiwan, Macao, Hong Kong, Tibet, Inner Mongolia, Xinjiang, Qinghai, Ningxia, and Hainan.

Table B.1: Summary Statistics (CFPS 2010–2020)

	Mean	SD	Obs.
Fertility-related characteristics			
Number of children	1.002	0.496	6,618
Wife's ideal number of children (2014)	1.735	0.441	7,265
Husband's ideal number of children (2014)	1.741	0.438	7,265
Household characteristics			
Wife's age	33.979	6.732	7,265
Husband's age	36.129	7.172	6,237
Wife's years of schooling	10.016	3.823	5,549
Husband's years of schooling	10.360	3.645	5,260
Divorced status	0.011	0.102	7,265
Labor market characteristics			
Wife employed (=1)	0.753	0.432	5,646
Husband employed (=1)	0.928	0.259	5,399
Wife's annual income	14,714.443	16,602.272	4,492
Husband's annual income	26,062.940	20,472.437	4,161
Wife's hourly wage	8.219	7.876	2,872
Husband's hourly wage	10.756	9.134	3,341
Time allocation			
Wife's weekly work hours	44.266	21.357	3,925
Husband's weekly work hours	50.009	18.330	4,188
Wife's weekly housework hours	6.973	8.807	4,651
Husband's weekly housework hours	4.162	6.896	4,440

Notes: This table presents descriptive statistics for the household sample constructed from the CFPS dataset covering the years 2010–2020.

In what follows, I describe the key variables used in the empirical analysis and model estimation.

Fertility Preferences In the 2014 wave of the CFPS, respondents are asked: *"Without considering any policy restrictions, how many children do you consider ideal?"* I use responses to this question to measure individuals' intrinsic fertility preferences, defined as the ideal number of children they desire.

Figure B.1 provide a descriptive overview of the ideal number of children as reported by individuals in the 2014 China Family Panel Studies (CFPS). The x-axis categorizes responses into four groups: 0 children, 1 child, 2 children, and 3 or more children, while the y-axis measures the percentage of respondents selecting each category. Approximately 24%-26% of individuals report an ideal number of one child, about 71% express a desire to have two children, and around 2%-4% report an ideal number greater than two. Given that few individuals report an ideal of zero children or higher than two children, I focus on the two dominant preference categories, one versus two children, and restrict the discussion accordingly.

Figure B.2 provides the average number of children by individuals' stated fertility preference in 2014, who had already obtained eligibility prior to 2016. The actual number of children is positively associated with the stated fertility preference among individuals who had already obtained eligibility prior to 2016.

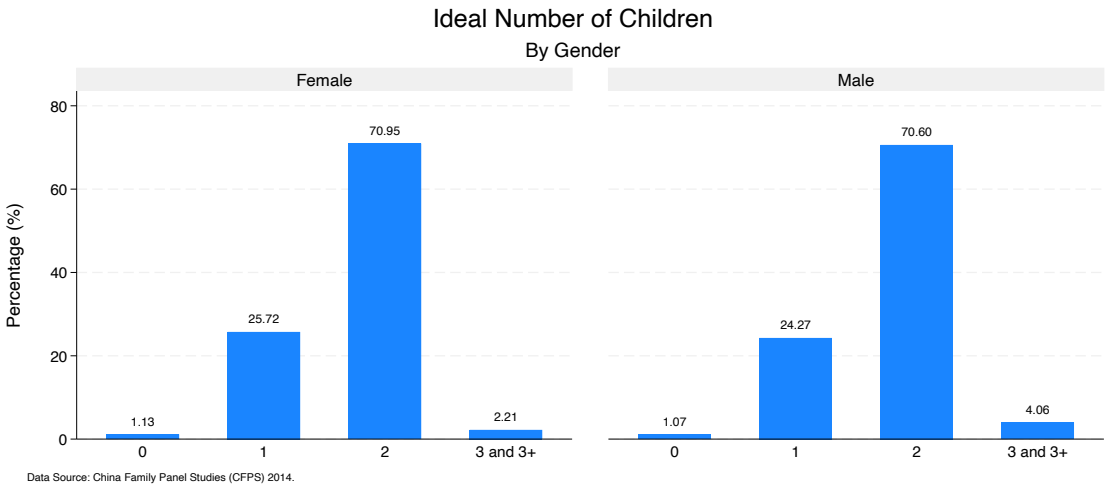


Figure B.1: Ideal Number of Children by Gender

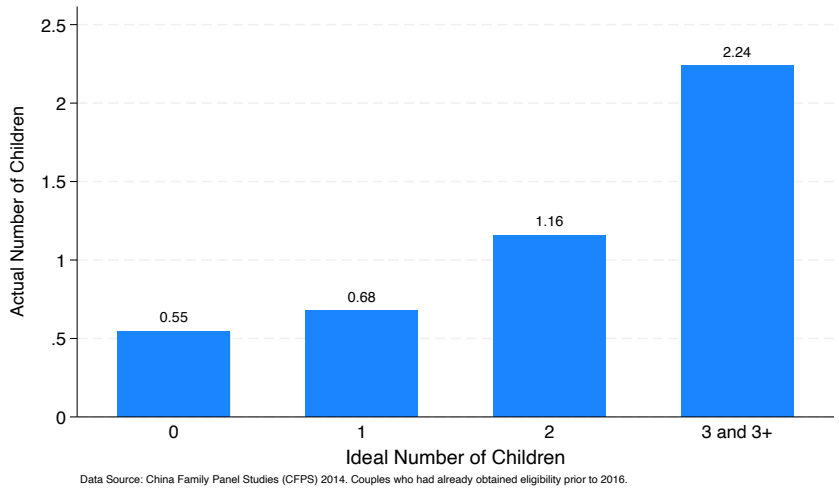


Figure B.2: Ideal Number of Children vs. Actual number of children (couples who get eligibility before 2016)

Importantly, both wives and husbands answer this question, allowing me to examine whether fertility preferences are aligned within couples. As shown in Figure B.3, approximately 56.51% of couples report that both spouses ideally desire two children, while 12.04% report that both spouses prefer one child. Preference discordance is also common: in 12.86% of households, the husband prefers two children while the wife prefers one or fewer, and in 12.34% of households, the reverse holds.

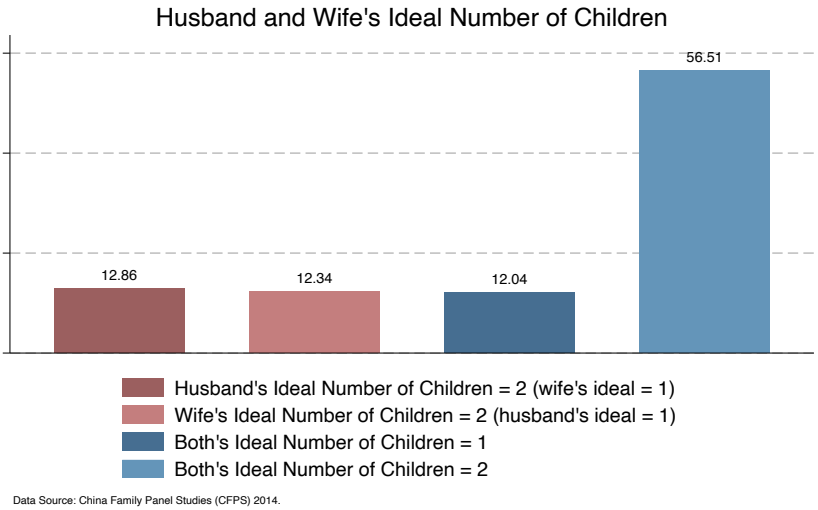


Figure B.3: Couples' Fertility Preference Types

Furthermore, fertility preferences exhibit little variation across age groups for both women and men, as shown in Figure B.4. Accordingly, the model treats individual fertility preferences as a fixed type that remains constant over the life cycle.

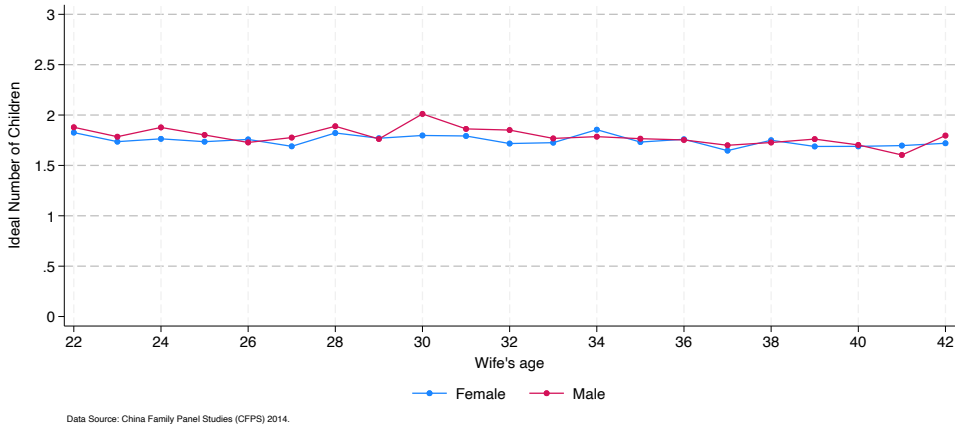


Figure B.4: Ideal Number of Children by Gender and Age

Table B.2 presents descriptive statistics and t-test comparisons between preference-aligned and preference-misaligned couples in the pre-reform period (2010–2014). Overall, the two groups differ only modestly along two dimensions, age and education, while remaining broadly comparable across all other characteristics, including marriage timing, the transition to parenthood, and labor market outcomes. This balance across economic and behavioral characteristics

suggests that preference misalignment is not systematically correlated with observable differences in household circumstances prior to the reform.

Preference-misaligned couples are slightly but significantly older than their aligned counterparts: wives are on average 0.79 years older (31.80 vs. 31.01, p=0.001) and husbands 0.76 years older (34.47 vs. 33.71, p=0.004). Preference-aligned households also have significantly higher educational attainment for both spouses: wives have 0.42 more years of schooling (9.96 vs. 9.54, p=0.010) and husbands 0.45 more years (10.33 vs. 9.88, p=0.004). These differences, while statistically significant, are modest in magnitude.

By contrast, the two groups are statistically indistinguishable across all remaining characteristics. The age at first marriage and age at first birth are similar for both wives and husbands across the two groups. Labor market outcomes, including employment rates, weekly working hours, annual incomes, and hourly wages, show no significant differences, with all p-values exceeding 0.10. Housework time is likewise comparable for both wives and husbands (p=0.681 and p=0.171, respectively).

Table B.2: Household Characteristics by Spousal Fertility Preference Alignment

	Preference-Aligned Couples		Preference-Misaligned Couples		p-value
	Mean	SD	Mean	SD	
Household characteristics					
Wife's age	31.01	6.13	31.80	6.01	0.001
Husband's age	33.71	6.53	34.47	6.56	0.004
Wife's years of schooling	9.96	3.85	9.54	3.70	0.010
Husband's years of schooling	10.33	3.61	9.88	3.73	0.004
Timing-related characteristics					
Wife's age at first marriage	24.02	2.89	23.88	2.92	0.794
Husband's age at first marriage	25.52	3.34	25.91	4.70	0.601
Wife's age at first birth	24.88	3.52	24.74	3.74	0.353
Husband's age at first birth	26.94	4.06	26.92	4.43	0.896
Labor market characteristics					
Wife Employed (=1)	0.70	0.46	0.73	0.44	0.119
Husband Employed (=1)	0.90	0.30	0.89	0.31	0.387
Wife's weekly work hours	42.13	22.20	41.92	22.05	0.842
Husband's weekly work hours	48.72	17.99	48.77	18.88	0.955
Wife's main annual income (RMB)	11,047.03	13,965.96	11,153.53	13,469.28	0.866
Husband's main annual income (RMB)	20,556.17	18,183.69	20,106.40	18,808.35	0.607
Wife's hourly wage (RMB)	6.84	6.85	6.65	6.24	0.609
Husband's hourly wage (RMB)	9.05	8.09	9.03	8.43	0.966
Home production					
Wife's weekly housework hours	1.96	1.50	2.00	1.52	0.681
Husband's weekly housework hours	0.90	1.13	0.98	1.38	0.171

Note: This table reports summary statistics for couples classified as preference-aligned and preference-misaligned based on spouses' fertility preferences using the CFPS sample from 2010–2014. Column (3) reports p-values from tests of mean differences between the two groups.

Fertility Outcomes Fertility outcomes are constructed from the CFPS family questionnaire, which contains detailed information on all household members, including children. For each child, the questionnaire records key characteristics such as age, sex, and co-residence status. Fertility is measured as the number of children ever born to the household.

Educational Groups Individuals are classified into two groups based on their highest completed level of schooling. Individuals with education below high school are categorized as *low education*, while those with a high school degree or above are categorized as *high education*.

Labor Market Outcomes Employment status is defined as a binary indicator equal to one if an individual is currently employed. Both agricultural and non-agricultural workers report employment status. Weekly working hours are measured using the question: *"Excluding lunch breaks but including additional working hours, regardless of whether they are paid, how many hours per week did you spend on this job during the last 12 months?"* Figure B.5 shows that the average weekly hours for full-time and part-time female workers are 52 and 28 hours, respectively. China, like other East Asian countries, is characterized by long working hours, and the average for all workers is 45 hours in the CFPS. [31]

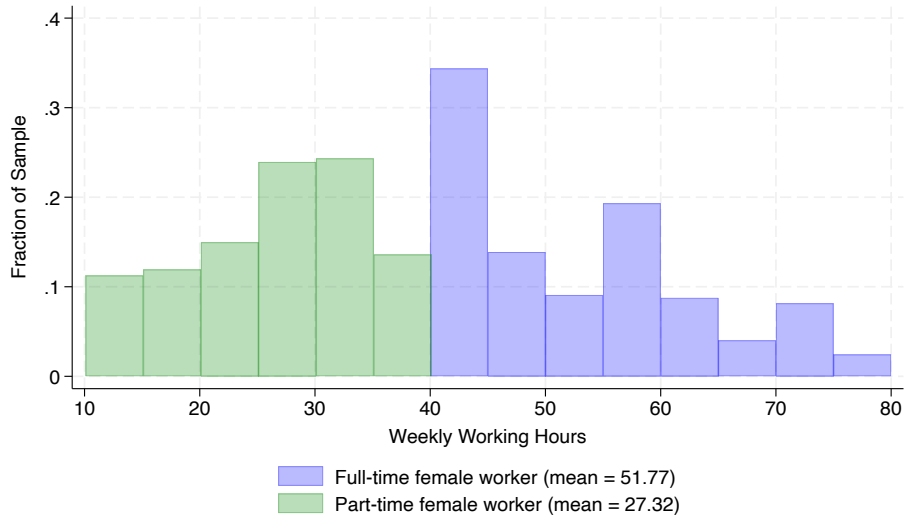


Figure B.5: Distribution of Female Working Hours

Annual labor income is based on the question: *"Including salary, bonuses, cash benefits, and in-kind benefits, and excluding taxes, insurance contributions, and public housing funds, how much in total did you earn from this job in the last 12 months (RMB)?"* Hourly wages are calculated by dividing annual labor income by total annual hours worked, restricting the sample to individuals working more than 10 hours per week. All monetary variables are expressed in 2010 Chinese RMB.

Time Allocation in Home Production The 2010 CFPS wave includes a detailed time-use module that records how respondents allocate their time across different daily activities on both workdays and rest days during a typical non-holiday month. Time spent on family care includes caring for both children and elderly household members. Housework time captures

[31] By comparison, average weekly hours in East Asia are 40.3, 42.7, 45.6, and 44.5 for married women, single women, married men, and single men, respectively, whereas the corresponding hours worked in Western OECD countries are 35.2, 37.9, 44.0, and 42.5. Data Sources are from Appendix Table A7 of Ho and Wang (2024).

hours devoted to household chores such as cooking, cleaning, and laundry. These measures allow me to construct indicators of time spent on home production, encompassing both housework and childcare.

Home production time primarily comprises childcare and housework. Figure B.6 demonstrates that variation in home production time is driven predominantly by the age of the youngest child rather than by the total number of children. Furthermore, as shown in Figure B.7, dissolution of the marriage is associated with a reduction in women's home production time and a corresponding increase in that of men.

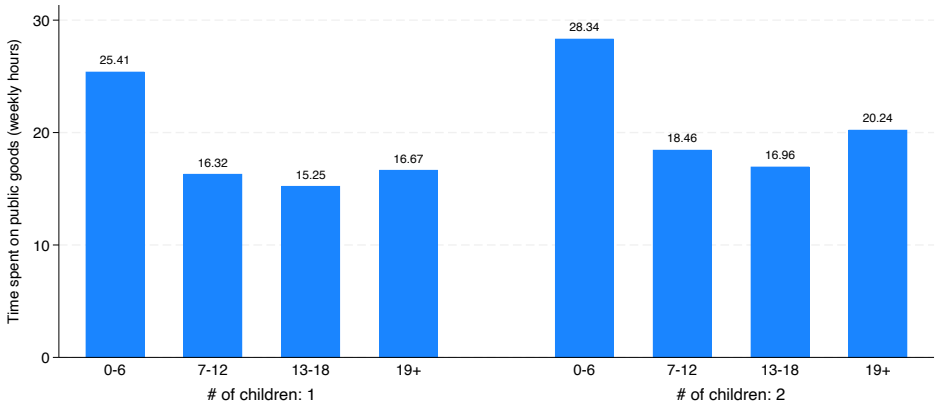


Figure B.6: Home Production Hours by Number of Children and Age of Youngest Child

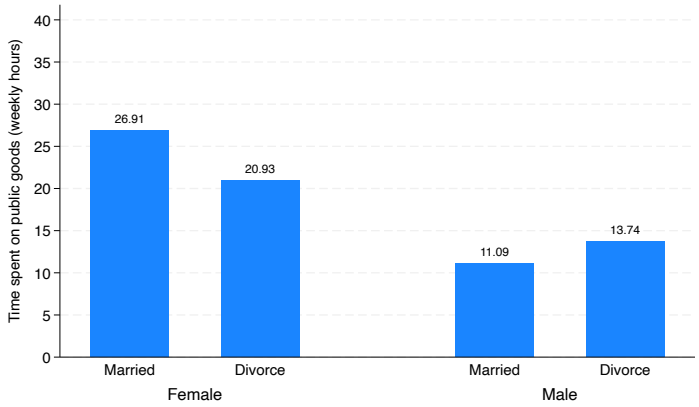


Figure B.7: Home Production Hours by Marital Status

Childcare Arrangements Parents are asked: *"In the most recent month when the parents were not on vacation, who mainly took care of the child during the daytime or nighttime?"* Response options include: (i) the child's father, (ii) the child's mother, (iii) nursery or kindergarten, (iv) babysitter, (v) paternal or maternal grandparents, and (vi) self-care (applicable only when the child is older than 12). Appendix Figure B.8 shows that mothers overwhelmingly serve as the primary childcare providers, while the use of market-based childcare services, such as babysitters, is extremely limited.

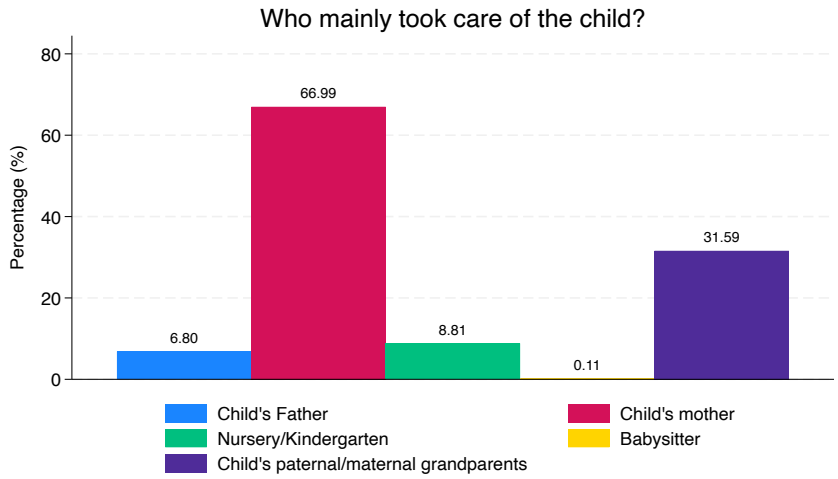


Figure B.8: Childcare Arrangements

C Reduced Form Appendix

C.1 Comparison with Prior Empirical Studies

Prior empirical studies have documented positive effects of the Two-Child Policy on fertility among married couples, adopting a difference-in-differences design to identify the policy effects (Fang and Liu, 2026, Li, 2024, Lin et al., 2025, Wu, 2022). Some studies also find negative effects of the number of children on maternal labor supply at both the extensive and intensive margins (Li, 2024, Wu, 2022). Regarding marriage and divorce, Lin et al. (2025) find that couples whose firstborn child is a daughter are more likely to divorce, driven by remarriage incentives under the new policy. Giorgi and Raiber (2025) document that men previously permitted a second child exhibit lower marriage rates relative to those who were not, attributing this to sex ratio imbalances and heightened marriage market competition.

To assess the comparability of my sample with those used in these studies, I follow the identification strategy of Fang and Liu (2026) and estimate the policy's effect on the number of births. Specifically, I define the control group as women who had one living child and were already eligible for a second child under the "Single-Only" Two-Child Policy in 2014—namely, those for whom either the woman or her husband had no siblings. The treatment group consists of women who became newly eligible to have a second child under the Two-Child Policy but were ineligible under the "Single-Only" Two-Child Policy in 2014—specifically, women with one living child whose both they and their husbands had at least one sibling. I employ a difference-in-differences (DID) strategy to identify the effects of the Two-Child Policy on fertility outcomes:

$$Y_{it} = \beta \text{Eligible}_i \times \text{Post}_t + \text{Post}_t + \alpha_i + X_t + \varepsilon_{i,t}$$

where the primary outcome variable Y_{it} is the number of births a woman had in year t. Eligible$_i$ equals 1 if the respondent was eligible to have a second child under the Universal Two-Child Policy (2016) but not under the "Single-Only" Two-Child Policy in 2014. Post$_t$ equals 1 for years 2016 and beyond. X_t includes wife's age group fixed effects and husband's age group fixed effects. Standard errors are clustered at the household level.

Table C.1 reports the fertility results. In Column 1, I do not control for individual fixed effects and instead include Eligible$_i$ directly. The estimated DID coefficient indicates that the Two-Child Policy modestly increased births among eligible women by approximately 0.0354 over the period 2016–2020. For comparison, Fang and Liu (2026) estimate that the policy increased births among eligible women in 2016–2017 by approximately 0.0217. The difference in magnitude can be attributed to two factors. First, my estimates capture the average birth rate response over a longer post-reform window (2016–2020), whereas theirs cover only 2016–2017; over a longer horizon, more women have time to respond to the policy change, yielding a larger cumulative fertility response. Second, my sample is restricted to observations for which both the wife's and husband's ideal number of children are observed, whereas husbands' fertility preferences are unavailable in the China Fertility Survey used by Fang and Liu (2026). Notwithstanding these differences, I find a consistent and positive fertility response among eligible women, in line with their findings.

Table C.1: Effects of the Universal Two-Child Policy on Fertility

	(1)	(2)	(3)
Dep. Var.	Number of Births		
Eligible$_i$ × Post$_t$	0.0354*	0.0567**	0.0543**
	(0.021)	(0.023)	(0.023)
Eligible$_i$	-0.0293*		
	(0.016)		
Observations	6554	6450	6450
Dependent Mean	0.0975	0.0969	0.0969
Individual FE	No	Yes	Yes
Wife Age Group FE	Yes	Yes	Yes
Husband Age Group FE	Yes	Yes	Yes

Notes: This table reports difference-in-differences estimates of the effect of the Universal Two-Child Policy on fertility. The dependent variable is the number of births in a given survey wave. Eligible$_i$ is an indicator equal to one for households affected by the policy reform, and Post is an indicator for the post-reform period. Columns (2)–(3) include individual fixed effects. Standard errors clustered at the household level are reported in parentheses. *, **, and *** denote significance at the 10%, 5%, and 1% levels, respectively.

C.2 Policy Effects on Remarriage Rates

This section analyzes the impact of the relaxation of the One-Child Policy on remarriage rates. As shown in Figure C.1, remarriage rates do not differ significantly following the policy for couples with misaligned preferences compared to the control group.

Additionally, 28% of divorced individuals in the sample subsequently remarry, suggesting that the proportion of remarried individuals is relatively small. Remarriage is therefore not treated as a primary determinant of divorce outcomes and is excluded from the main empirical analysis. Consistent with this, remarriage decisions are also abstracted from the structural model.

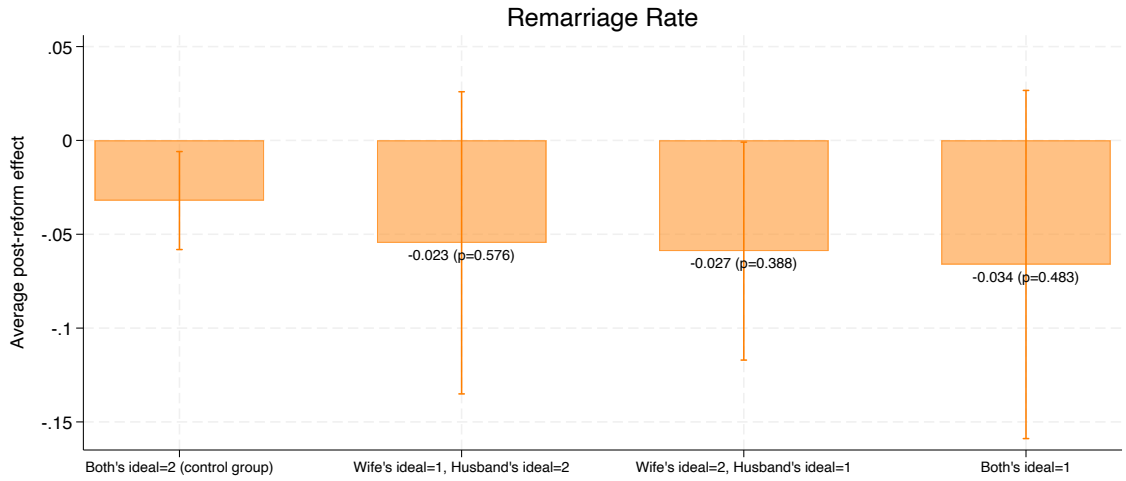


Figure C.1: Remarriage by Couples' Fertility Preferences

C.3 Fertility Responses When Husbands Prefer More Children

Focusing on households in which husbands have stronger fertility preferences, I examine how women's bargaining positions shape fertility responses using three proxies: (i) wife's educational attainment, (ii) wife's pre-reform hourly wage, and (iii) wife's pre-reform annual income relative to her husband's, as introduced in Section 2.

Figure C.2 shows that households in which the wife has a weaker bargaining position exhibit significantly higher fertility in the post-reform period. In particular, fertility is higher when the wife's pre-reform hourly wage is low (p-value = 0.00) or when her pre-reform income share relative to her husband is low (p-value = 0.04).

C.4 Labor Market Performances Around Childbirth

This section analyzes the effects of the first birth on the labor market performances of women and men, using the event study approach (Kleven et al., 2019). The child-penalty sample focuses on women from the birth cohort of 1972 to 1992, who were aged 24 to 44 in 2016. These women were observed for at least one year during the five years before their first birth and for

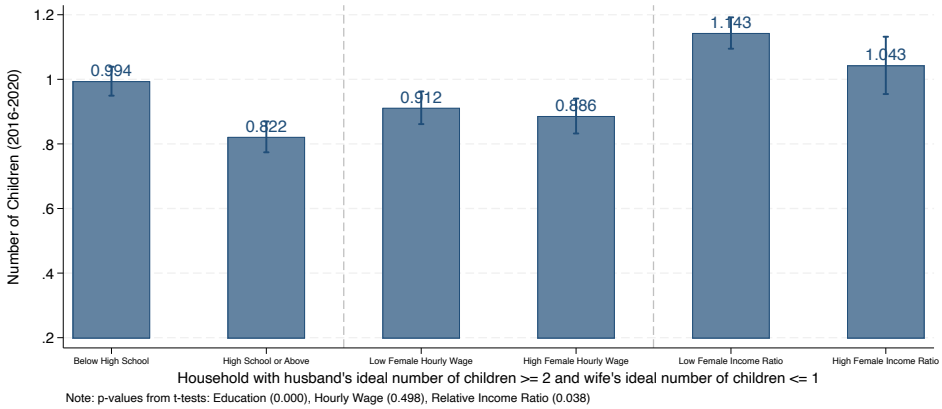


Figure C.2: Policy Effects on Fertility by Women's Bargaining Position

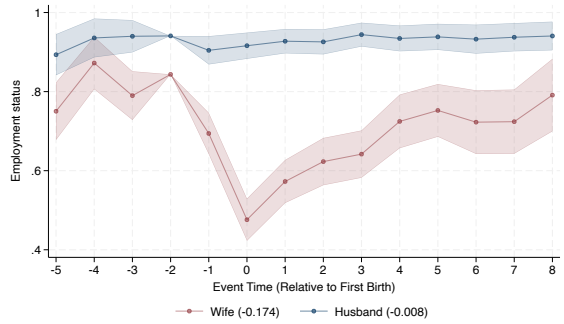
at least one year during the eight years following it. For individual i with gender g in age a and year t at the the event time j, the outcomes Y_{ijt}^g is determined by

$$Y_{ijt}^g = \sum_{\substack{j=-5 \\ j\neq -2}}^{8} \alpha_j^g \cdot \mathbf{1}[j = t - e^i] + \sum_a \beta_a^g \cdot \mathbf{1}\left[a = age_{it}\right] + \sum_y \gamma_y^g \cdot \mathbf{1}[y = t] + \nu_{ijt}^g$$

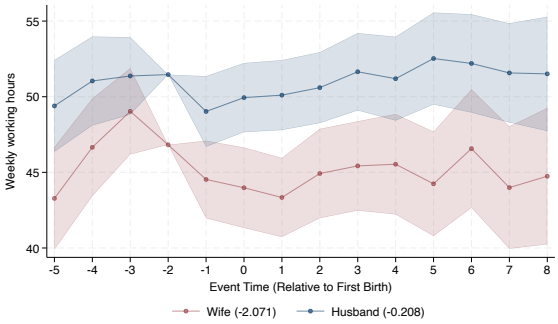
To compare the gender gap in the labor market, I normalize the coefficients using the average outcome levels at period $t = -2$ following Foerster (2025).

Labor Market Performances of Men and Women The results are reported in Figure C.3. First, women experience a substantial decline in employment following their first birth. At the time of childbirth, the employment rate falls from 80% at baseline ($t = -2$) to 40%. Second, women's hourly wages decline gradually, though the effect is modest. Therefore, the reduction in women's labor earnings is largely driven by the employment margin rather than reductions in hours or wages.

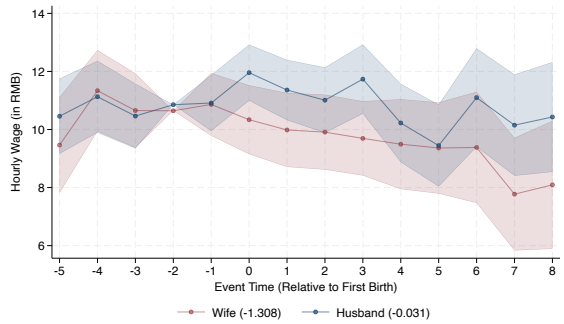
Labor Market Performances of Women by Educational Attainment Since education is a key determinant of women's returns to human capital and labor supply, this section investigates the heterogeneous effects of childbirth across educational backgrounds. The results are shown in Figure C.4. First, more-educated women exhibit higher employment rates prior to childbirth and experience a relatively smaller decline afterward. Nevertheless, their post-birth employment rates do not fully recover to pre-birth levels. In contrast, less-educated women face a larger employment decline around childbirth, but their employment recovers more rapidly. Second, the working hours of highly educated women who remain employed change little before and after childbirth, whereas less-educated women reduce their working hours. Finally, both highly and less-educated women experience declines in wages and earnings following childbirth; however, highly educated women maintain higher average wages and earnings.



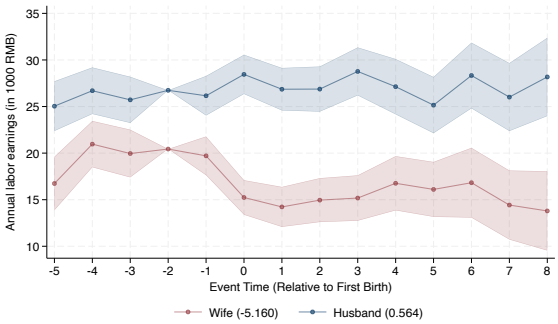
(a) Employment Status



(b) Working Hours

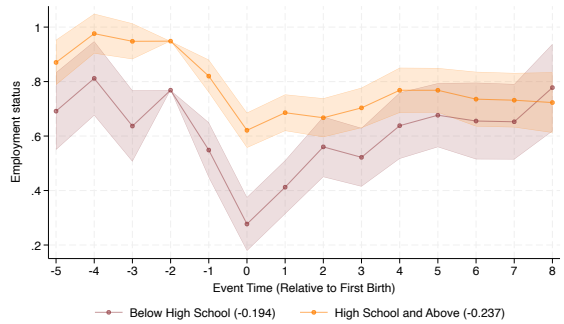


(c) Hourly Wages

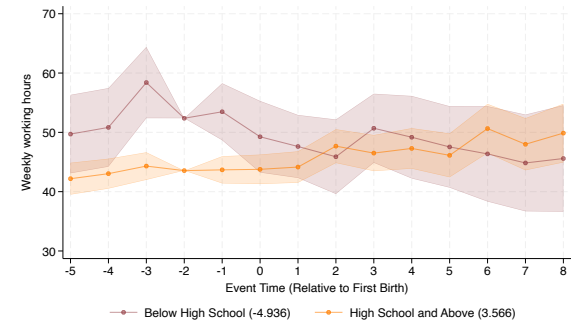


(d) Annual Labor Earnings

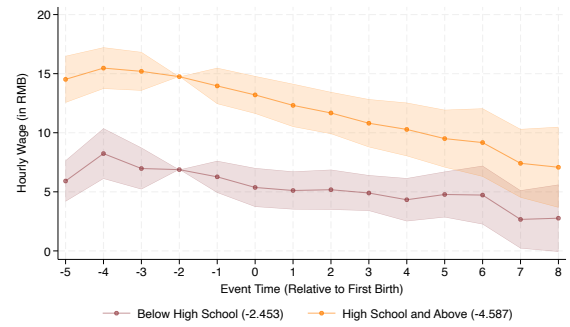
Figure C.3: Labor Market Performances of Men and Women



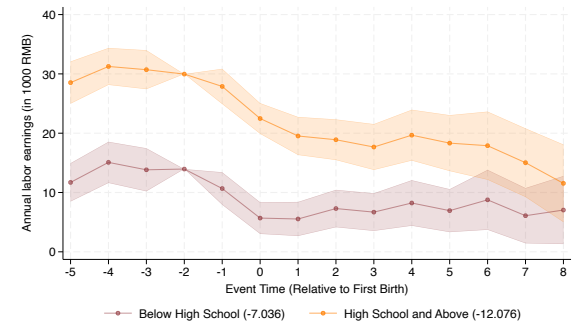
(a) Employment status



(b) Weekly Working Hours



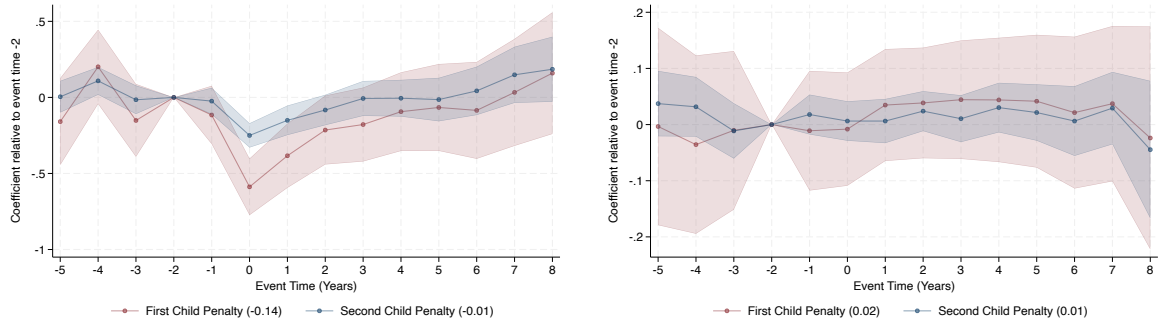
(c) Hourly Wages



(d) Annual Labor Earnings

Figure C.4: Labor Market Performances of Women by Education Type

Second Child Penalties The analysis examines whether the effect of children on labor supply is amplified at the second birth. As shown in Figure C.5, women's employment declines further upon the birth of a second child, whereas men exhibit no discernible change in employment. These findings are consistent with those reported in Zhou et al. (2022).



(a) Women (b) Men

Figure C.5: Second Child Penalties in Employment

D Model Appendix

D.1 Problem of Retirement

In this section, I formalize the value functions of retirement for both married and divorced individuals. Retirement is exogenous at T_R. The retirement problems differ from those in the working age phase in the following aspects: first, individual labor supply is constrained to be zero in retirement, $h_{jt} = 0$. Time is allocated between leisure and home production. There is no idiosyncratic wage shock ϵ_{jt} any more. Second, Income in retirement is estimated based on the potential earnings an individual would make with their pre-retirement wages w_{jt} and full-time employment $\bar{h}$. Third, following Jakobsen et al. (2025), individuals can have dependent children who require time and financial resources to raise, unless they have moved out.

Problem of the Divorced Retiree Consider a divorced individual $j \in \{w, m\}$ who has entered retirement. In the retirement phase, the individual chooses consumption c_t, leisure ℓ_{jt}, and home production time q_{jt} and their working hours h_{jt} is fixed at zero. The choice set is given by

$$C_t^{d,ret} = \{c_{jt}, \ell_{jt}, q_{jt}, h_{jt}\}$$

The state variables of a divorced individual j at period t are

$$S_t^{d,ret} = \{K_{jt}, n_{jt}, \kappa_{jt}, e_j, I_j\}$$

where K_{jt} denotes human capital, n_{jt} the number of children, κ_{jt} is the youngest child at home, e_j education, I_j an individual ideal number of children.

The value function of a divorced retiree j at time $t = T_R$ is defined as

$$\begin{aligned} V^{d,\text{ret}}_{j,T_R}(S^{d,ret}_{T_R}) = \max_{C^{d,ret}_t} \quad & u^j(c_{jt}, \ell_{jt}, Q_{jt}, n_{jt}) + \beta \mathbb{E}_t[V^{d,\text{ret}}_{j,T_R+1}(S^{d,ret}_{T_R+1})] \\ \text{s.t.} \quad & T = \ell_{jt} + q_{jt} \\ & Q_t = \pi_j q_{jt} \\ & c_{jt} = w_{jt}\bar{h} + y_{jt}(e_j) - CC_t(n_{jt}, \kappa_{jt}, e_j) \end{aligned}$$

In the terminal period of life, the continuation value is normalized to zero:

$$V^{d,\text{ret}}_{j,T_R+1} = 0$$

Problem of Married Couples Retiree Entering retirement, a married couple would not face divorce choice and thus the bargaining power remain at $\mu_t = \mu_{t-1}$. The household choice vector is given by

$$C^{m,ret}_t = \{h_{wt}, h_{mt}, \ell_{wt}, \ell_{mt}, q_{wt}, q_{mt}, p_t, c_t\},$$

where both partners working hours h_{wt}, h_{mt} are fixed at zero.

The state variables of a married household are

$$S^{m,ret}_t = \{K_{wt}, K_{mt}, n_t, \kappa_t, e_w, e_m, I_w, I_m, \psi_t, \mu_{t-1}\},$$

where K_{jt} denotes individual human capital, n_t the number of children, κ_t the age of the youngest child living at home, e_j education, I_j the individual ideal number of children, ψ_t a marriage-quality shock, and μ_{t-1} the bargaining weight of the wife carried over from the previous period.

The value function of married couples at time $t = T_R$ is defined as

$$\begin{aligned} V^{m,\text{ret}}_{T_R}(S^{m,ret}_{T_R}) = \max_{C^{m,ret}_t} \quad & \mu_t\, u^w(c_t, \ell_{wt}, Q_t, n_t) + (1-\mu_t)\, u^m(c_t, \ell_{mt}, Q_t, n_t) \\ & + \beta \mathbb{E}_t[V^{m,ret}_{T_R+1}(S^{m,ret}_{T_R+1})] \\ \text{s.t.} \quad & T = \ell_{jt} + q_{jt} \quad j \in \{w, m\} \\ & Q_t = (\pi q^{\rho}_{wt} + (1-\pi) q^{\rho}_{mt})^{\frac{1}{\rho}} \\ & c_t = \sum_{j \in \{w,m\}} w_{jt} h_{jt} + y_t(e_w, e_m) - CC_t(n_t, \kappa_t, e_w) \end{aligned}$$

In the terminal period of life, the continuation value is normalized to zero:

$$V^{m,ret}_{T_R+1}(S^{m,ret}_{T_R+1}) = 0$$

D.2 Age of the Youngest Child and Children Moving Out

Age of the Youngest Child To reduce the state space, child aging is modeled probabilistically. The age of the youngest child, denoted by κ_t, is discretized into four categories:

$$\kappa_t \in \{NC,\ 0\text{–}6,\ 7\text{–}12,\ 13+\},$$

corresponding to no children, early childhood (ages 0-6), middle childhood (ages 7-12), and adolescence or older, respectively.

The transition of κ_t follows the rules below. Conditional on no new birth occurring in period $t+1$ (i.e., $b_{t+1}=0$) and no children moving out (i.e., $x_{t+1}=0$), the age category of the youngest child increases with probability $1/6$ and remains unchanged otherwise. If a new child is born ($b_{t+1}=1$), the age of the youngest child resets to the early childhood (ages 0-6). If children move out ($x_{t+1}=1$), the household transitions to the no-children state, capturing the fact that the demand for parental time declines as children reach adolescence. The children moving out process is described below. Formally, the law of motion for κ_t is given by

$$\kappa_{t+1} = \begin{cases} 0\text{–}6, & \text{if } b_{t+1}=1, \\ \kappa_t^+, & \text{if } b_{t+1}=0,\ x_{t+1}=0, \kappa_t \in \{0\text{–}6,\ 7\text{–}12\} \text{ with probability } \frac{1}{6}, \\ \kappa_t, & \text{if } b_{t+1}=0,\ x_{t+1}=0, \kappa_t \in \{0\text{–}6,\ 7\text{–}12\} \text{ with probability } \frac{5}{6}, \\ 13+, & \text{if } b_{t+1}=0,\ x_{t+1}=0, \kappa_t \in \{13+\}, \\ NC, & \text{if } b_{t+1}=0,\ x_{t+1}=1, \kappa_t \in \{13+\}, \\ NC, & \text{if } \kappa_t = NC. \end{cases} \tag{D.1}$$

where κ_t^+ denotes the next higher age category.

Children Moving Out Children can move out after the fertile period T_f ends, provided they are aged 13 or older. Let $x_{t+1} \in \{0,1\}$ denote an indicator for a moving-out event at the beginning of period $t+1$, where $x_{t+1}=1$ indicates that children leave the household. The moving-out process is stochastic and follows

$$x_{t+1} = \begin{cases} 1 & \text{with probability } q_t(n_t, \kappa_t), \\ 0 & \text{with probability } 1 - q_t(n_t, \kappa_t), \end{cases} \tag{D.2}$$

where the probability of a moving-out event $q_t(n_t, \kappa_t)$ depends on the number of children residing at home, n_t, and the age category of the youngest child, κ_t:

$$q_t(n_t, \kappa_t) = \begin{cases} P & \text{if } n_t > 0,\ t > T_f,\ \kappa_t \in \{13+\}, \\ 0 & \text{otherwise,} \end{cases} \tag{D.3}$$

where $P = \frac{1}{12}$ following Bronson et al. (2024). For simplicity, when a moving-out event occurs ($x_{t+1} = 1$), all children residing in the household leave simultaneously.

D.3 Problem of the Unmarried

Unmarried individuals face a marriage decision. In period t, a single woman meets a potential partner with probability λ_t, which captures search frictions and reflects the time required to encounter potential partners. Each potential partner is characterized by his human capital K_{pt}, education level e_p, desired number of children I_p, and a temporary wage shock ϵ_{pt}, which is realized before the marriage decision. Thus, the state of a potential partner is $S_t^p = \{K_{pt}, e_p, I_p, \epsilon_{pt}\}$. Since unmarried individuals have no children, the number of children is set to $n_{pt} = 0$ and the age of the youngest child is set to $\kappa_{pt} = NC$.

The expected value of entering period t as a single Upon meeting, the pair draws an initial match quality ψ_0 and jointly decides whether to marry. To characterize this decision, let $V_{jt}^{s\to s}$ denote the value of individual j entering a period t as single and remaining single until the next period. Analogously, let $V_{jt}^{s\to m}(S_t^s, S_t^p)$ denote the value of individual j entering a period t as single and choose marry, which depends on the state variables of both the individual and the potential partner S_t^p.

The expected value of entering period t as a single is:

$$EV_{j,t}^s(S_t^s) = \mathbb{E}\{\lambda_t[M_{j,t}^* V_{j,t}^{s\to m}(S_t^s, S_t^p) + (1 - M_{j,t}^*)V_{j,t}^{s\to s}(S_t^s)] + (1 - \lambda_t)V_{j,t}^{s\to s}(S_t^s)\}$$

where $M_{j,t}^* \in \{0, 1\}$ is the binary optimal marriage decision at t.

The value of remaining unmarried If $M_{j,t}^* = 0$, the individual remains unmarried in period t and waits until the next period to meet an alternative partner. The value function for remaining unmarried is

$$V_{j,t}^{s\to s}(S_t^s) = \max_{C_t^s} U_{jt}(c_{jt}, \ell_{jt}, Q_{jt}, n_t) + \beta \mathbb{E}_t[EV_{j,t+1}^s(S_{t+1}^s)]$$

$$\text{s.t.} \quad \text{time constraint (7), individual budget constraint (12),}$$

$$\text{home production (6), wage process (9), human capital evolution (10).}$$

The value of entering marriage If $M_{j,t}^* = 1$, the individual enters marriage with a partner of state S_t^p. The value of transitioning into marriage, $V_{j,t}^{s\to m}(S_t^s, S_t^p)$, is determined in two steps.

First, the initial Pareto weight μ_t^0 is determined by the symmetric Nash bargaining game

between the potential partners:

$$\mu_t^0(S_t^s, S_t^p) = \arg\max_{\mu} G_{w,t}^0(S_t^s, S_t^p, \mu)\, G_{m,t}^0(S_t^s, S_t^p, \mu),$$

where the initial marital surplus for individual j is

$$G_{j,t}^0(S_t^s, S_t^p, \mu) = V_{j,t}^{s\to m}(S_t^s, S_t^p, \mu) - V_{j,t}^{s\to s}(S_t^s).$$

Marriage occurs only if $G_{j,t}^0 > 0$ for both partners.

Second, given the optimal μ_t^0, the household solves the joint decision problem:

$$\max_{C_t^m} \quad \mu_t^0(S_t^s, S_t^p) V_{wt}^{s\to m} + [1 - \mu_t^0(S_t^s, S_t^p)] V_{mt}^{s\to m}$$

s.t. time constraint (7), household budget constraint (11), home production (5), wage process (9), human capital evolution (10), children evolution (8).

The value of entering marriage for individual j is therefore

$$V_{j,t}^{s\to m}(S_t^s, S_t^p) = U_{jt}(c_t, \ell_{jt}, Q_t, n_t) + \psi_t + \beta \mathbb{E}_t[V_{j,t+1}^m(S_{t+1}^m, \mu_t^0)].$$

E Estimation Appendix

E.1 Husband Earnings

The male wage equation is estimated outside the structural model using the 2010–2014 CFPS sample of men aged 20–50. To maintain symmetry between the male and female wage processes, human capital is normalized such that its minimum value corresponds to the entry age and its maximum value corresponds to the retirement age. Given that men are assumed to participate in the labor market throughout their working lives, age serves as a proxy for accumulated human capital. Log hourly wages are estimated as a function of age, its square, and education level. The standard deviation of the wage shock of the husband $\sigma_{\epsilon m}^2$ is directly estimated using the variance of residual wages after running an OLS regression.

Table E.1 reports estimates of log hourly wage equations. The estimated education effects are similar with and without year fixed effects. Therefore, the model estimation employs the coefficients obtained from the specification reported in column (2) of Table E.1.

Figure E.1 presents the fitted life-cycle wage profiles for men implied by the estimated individual wage equation. The fitted curves closely track observed wages over the life cycle, indicating that the wage specification provides a very good fit to the male age-wage relationship.

Table E.1: Log hourly wage rates (men)

	Log hourly wage (men)	
	(1)	(2)
Age	0.0740***	0.0727***
	(0.0116)	(0.0115)
Age Squared	-0.0010***	-0.0010***
	(0.0002)	(0.0002)
High School and Above	-1.7272***	-1.7084***
	(0.3161)	(0.3154)
High School and Above × Age	0.1186***	0.1170***
	(0.0187)	(0.0187)
High School and Above × Age Squared	-0.0015***	-0.0015***
	(0.0003)	(0.0003)
Constant	0.6570***	0.6791***
	(0.1963)	(0.1952)
Year FE		✓
Observations	12378	12378
R-Square	0.070	0.077

Note: Individuals aged 20-50. Before 2016. Whole Sample.. Standard errors are shown in parentheses.
* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

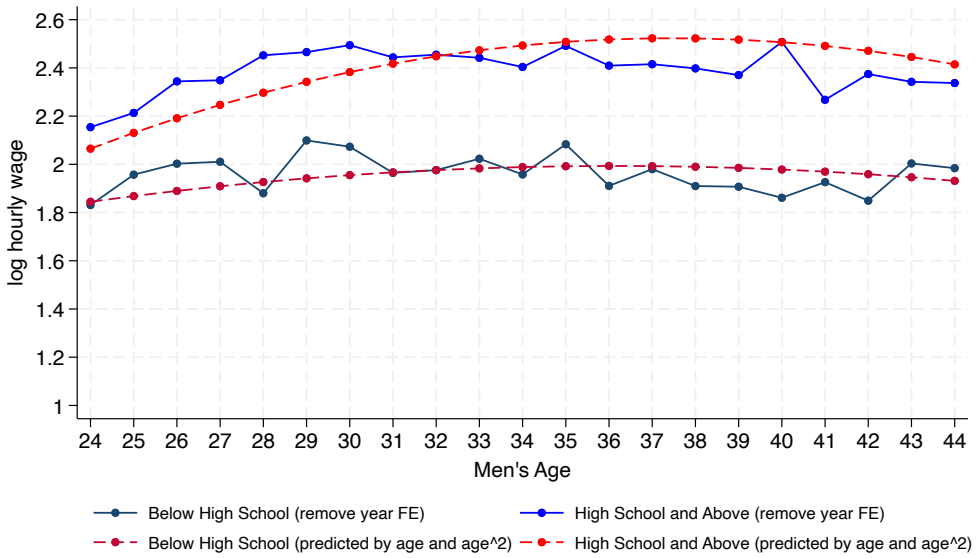


Figure E.1: Wage Profiles of Men over the Life Cycle

E.2 Non-Labor Income

In the CFPS, total family income comprises five components: wage income, business income (gross and net), property income, transfer income, and other income. Non-labor income is defined as total family income net of primary wage income, which depends on marital status and educational attainment. Education is categorized as low (below high school) or high (high school and above).

Results for married couples are reported in Table E.2. Non-labor income increases systematically with household educational attainment, ranging from 34,721 RMB in households where both spouses have below-high-school education to 49,868 RMB in households where both spouses have attained at least a high school education. Households with mixed educational attainment exhibit intermediate levels of non-labor income.

Table E.2: Non-Labor Income of Married Couples by Education

	(1) Married Women Both low	(2) Married Women Wife low, Husband high	(3) Married Women Wife high, Husband low	(4) Married Women Both high
Non-labor Income	34720.519	39964.393	40460.123	49868.470
Observations	5789	714	1114	1750

Note: Individuals aged 20-50. Before 2016. Whole Sample.

Results for single individuals are reported in Table E.3. Higher educational attainment is associated with substantially greater non-labor income for both women and men. Among single individuals, men with below-high-school education exhibit the lowest levels of non-labor income.

Table E.3: Non-Labor Income of Singles by Education

	(1) Single Women Below High School	(2) Single Women High School and Above	(3) Single Men Below High School	(4) Single Men High School and Above
Non-labor Income	31508.809	39172.085	27760.074	38226.708
Observations	773	1020	1596	1181

Note: Individuals aged 20-50. Before 2016. Whole Sample.

E.3 Biological Fecundity

Biological fecundity, denoted f_t, declines with age. The probability of a child being born conditional on a couple attempting to conceive is based on the medical evidence reported in Leridon (2004). The estimated age-specific probability of fecundity is presented in Figure E.2. Women are infertile after age 45 and cannot have additional children.

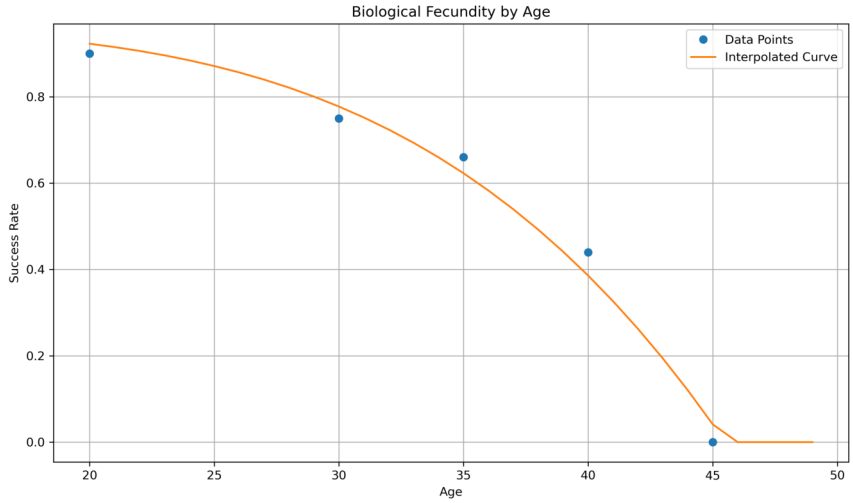


Figure E.2: Biological Fecundity by Women's Age

E.4 Childcare Costs

The monetary cost of childcare, denoted $CC_t(n_t, \kappa_t, e_j)$, depend on the number of children in the household (n_t), the age of the youngest child (κ_t), and the individual's highest education level (e_j). In China, the largest component of monetary expenditures related to children is education-related costs (Hu et al., 2023). Therefore, we use the educational costs as a proxy for the overall monetary cost of childcare. Table E.4 presents the childcare costs used in the estimation. Childcare costs increase with both the number of children and the age of the youngest child. Additionally, households with higher educational attainment incur substantially higher childcare costs at each child age category.

Table E.4: Monetary Cost of Childcare

Characteristics			Education Cost
Number of Children	Education Level	Age of Youngest Child	(10000 RMB)
1	Below High School	0–6	0.1429
1	High School and Above	0–6	0.2807
1	Below High School	7–12	0.2255
1	High School and Above	7–12	0.3803
1	Below High School	13–18	0.4136
1	High School and Above	13–18	0.6233
2	Below High School	0–6	0.2196
2	High School and Above	0–6	0.3843
2	Below High School	7–12	0.3252
2	High School and Above	7–12	0.4486
2	Below High School	13–18	0.4646
2	High School and Above	13–18	0.6922

E.5 Education-Specific Fertility Constraints

The baseline model introduces heterogeneity in fertility constraints via education-specific upper bounds on children. At the start of adulthood, women are probabilistically assigned a maximum fertility level $n_{\max} \in \{1, 2\}$, with assignment probabilities calculated above. Women assigned $n_{\max} = 1$ are restricted to having at most one child over the life cycle, whereas women assigned $n_{\max} = 2$ may have up to two children.

Between ages 22 and 45, the maximum number of children a woman can have depends on her education level.[32] To discipline the mapping from education to $n_{\max}$, I use completed fertility outcomes of women aged 40–49 prior to 2016, who have largely completed childbearing under the one-child policy regime. Table E.5 documents substantial differences in completed fertility by education.

Permanent infertility is not modeled. As shown in Table E.5, childlessness among women aged 40–49 prior to 2016 is rare, with rates below 3% across all education groups. This indicates that fertility decisions in this cohort are largely characterized by variation in the number of children rather than by the extensive margin of having any children.

Table E.5: Completed fertility for women (age 40-49)

	(1) Women	(2) Women (Below High School)	(3) Women (High School and Above)
Childlessness Rate	0.028	0.028	0.032
Prop (Child Ever Born = 1)	0.448	0.377	0.760
Prop (Child Ever Born = 2)	0.523	0.595	0.208
Observations	5513	4494	1019

Note: Female aged 40-49. Before 2016. Whole Sample.

Let $\pi_e(n = 1)$ and $\pi_e(n = 2)$ denote the empirical shares of women with education level e who report having exactly one or two children, respectively. For each education group, the probability that a woman is assigned a maximum number of children equal to one is given by

$$\Pr(n_{\max} = 1 \mid e) = \frac{\pi_e(n = 1)}{\pi_e(n = 1) + \pi_e(n = 2)}, \tag{E.1}$$

and the probability of being assigned $n_{\max} = 2$ is

$$\Pr(n_{\max} = 2 \mid e) = \frac{\pi_e(n = 2)}{\pi_e(n = 1) + \pi_e(n = 2)}. \tag{E.2}$$

[32] This specification allows the model to match the observed shares of one- and two-child families in the data and captures institutional differences under the one-child policy. Specifically, rural women, who on average have lower educational attainment, faced less stringent fertility restrictions than urban women (as described in Section A.1).

For women with less than a high school education, this implies

$$\Pr(n_{\max}=1)=\frac{0.377}{0.377+0.595}=0.388, \qquad \Pr(n_{\max}=2)=\frac{0.595}{0.377+0.595}=0.612.$$

For women with a high school education or above, this implies

$$\Pr(n_{\max}=1)=\frac{0.760}{0.760+0.208}=0.785, \qquad \Pr(n_{\max}=2)=\frac{0.208}{0.760+0.208}=0.215.$$

E.6 Distribution of Characteristics among Single Men and Women

Individuals form expectations about potential partners based on the distribution of two key characteristics: educational attainment and the ideal number of children. The probabilities of encountering a partner with a given characteristic are estimated from the CFPS data. The results are reported in Table E.6.

Table E.6: Distribution of Education and Fertility Preferences

	(1) Women	(2) Men
Below High School	0.698	0.672
High School and Above	0.302	0.328
Ideal Number of Children = 1	0.196	0.204
Ideal Number of Children ≥ 2	0.804	0.796
Observations	8009	7684

Note: Individuals aged 20-50. Before 2016. Whole Sample.

E.7 Method of Simulated Moments

I use the Method of Simulated Moments (MSM) (McFadden, 1989) for internal estimation. The parameter vector Θ comprises four sets of parameters: (1) the wage process for women by educational level $(\eta^e_{w,0}, \eta^e_{w,1}, \eta^e_{w,2}, \sigma_{\epsilon,w})$; (2) preferences of women and men over leisure, public goods, and deviations between actual and ideal fertility $(\alpha_\ell, \alpha^j_Q, \alpha_n)$; (3) parameters governing home production technology (π, ρ); and (4) the variance of match quality (σ^2_ξ) and the probability of meeting a partner (λ).

Let m^{data}_j denote moment j in the empirical data and $m^{sim}_j(\Theta)$ the corresponding moment generated by the model simulation given parameter vector Θ, for $j=1,\ldots,J$, where J is the total number of moments. I estimate parameters by minimizing the objective function

$$\min_{\Theta} J(\Theta) = g(\Theta)' W g(\Theta) \tag{E.3}$$

where the vector of differences is

$$g'(\Theta) = \left[m^{data}_1 - m^{sim}_1(\Theta), \ldots, m^{data}_j - m^{sim}_j(\Theta), \ldots, m^{data}_J - m^{sim}_J(\Theta)\right]$$

Simulated moments are obtained from numerical simulations of the model, using a sample of 20,000 women to generate the vector of simulated moments. The weighting matrix W is diagonal, with entries equal to the inverse of the estimated variance of each moment. Asymptotic standard errors are reported.

Parameters Estimates Table E.7 reports the parameter estimates obtained using the Method of Simulated Moments. First, the estimate of α_ℓ is positive (0.820), indicating that individuals derive utility from leisure. In contrast, α_n is negative (-0.121), implying that individuals experience utility losses when realized fertility deviates from their ideal number of children. This generates incentives for individuals to align fertility outcomes with their preferences and drives differential fertility outcomes across couples with aligned versus misaligned fertility preferences.

Second, preferences over household public goods, α_Q^j, vary systematically with the presence and age of the youngest child, as well as divorce status. The baseline utility weight on public goods in the absence of children is small (0.008), reflecting limited valuation of home production activities such as routine household chores (cleaning or cooking). This value increases sharply when children are present, with the highest weight observed when the youngest child is aged 0–6, consistent with the importance of intensive parental time during early childhood. As children grow older, the estimated preference for public goods declines to 0.023 for ages 7–12 and further to 0.019 for ages 13 and above, reflecting reduced childcare demands and rising female labor force participation at later stages of child development.

Following divorce, the preference weights on public goods rise for both women ($\delta_f = 1.533$) and men ($\delta_m = 1.120$). They suggest that the dissolution of marriage increases the marginal value of home production, as single parents face greater constraints in substituting between market work and childcare responsibilities. The higher preference values reflect the greater difficulty of raising children alone, which requires a stronger preference for home production to balance the competing demands of childcare and work.

Third, in the home production process, $\pi = 0.614$ implies that wives are relatively more productive in home production than their spouses. The estimated elasticity of substitution between spouses' time inputs, $\rho = 0.108$, implies that male and female time inputs are imperfect substitutes in household production. This complementarity is consistent with observed patterns in which spouses' home-production hours move together-rising during periods of intensive childcare and declining as children age.

Fourth, in terms of wage processes, women without a high school degree exhibit highly persistent wages that increase only moderately with age. The lower returns to labor for these women increase the likelihood of specializing in home production. By contrast, women with a high school education or higher experience steeper wage growth over the life cycle.

Finally, turning to the marriage process, the estimated arrival rate of potential partners is $\lambda = 0.452$, indicating relatively infrequent marriage opportunities over the life cycle. The

estimated dispersion of match-specific shocks is small, suggesting limited heterogeneity in match quality conditional on observables.

Table E.7: Parameters Estimated by Method of Simulated Moments

Parameter	Description	Estimate	(Std. Error)
Preference for leisure and children			
α_ℓ	Preference for leisure	0.820	(0.006)
α_n	Disutility from fertility mismatch (actual vs. ideal)	−0.121	(0.001)
Preference for public goods			
α_{Q_1}	No children	0.008	(0.000)
α_{Q_2}	Youngest child aged 0–6	0.064	(0.000)
α_{Q_3}	Youngest child aged 7–12	0.023	(0.000)
α_{Q_4}	Youngest child aged 13+	0.019	(0.000)
δ_f	Divorce taste shifter (women)	1.533	(0.013)
δ_m	Divorce taste shifter (men)	1.120	(0.012)
Household production function			
π_w	Women's relative home productivity	0.614	(0.002)
ρ	Elasticity of substitution	0.108	(0.001)
Wage process (women)			
$\eta_{w,1}^{low}$	Low education: constant term	0.439	(0.003)
$\eta_{w,2}^{low}$	Low education: return to experience	0.055	(0.000)
$\eta_{w,3}^{low}$	Low education: return to experience (squared)	−0.0005	(0.000)
$\eta_{w,1}^{high}$	High education: constant term	−0.006	(0.003)
$\eta_{w,2}^{high}$	High education: return to experience	0.140	(0.000)
$\eta_{w,3}^{high}$	High education: return to experience (squared)	−0.002	(0.000)
σ_ϵ^w	Std. dev. of wage shocks	0.729	(0.003)
Marriage process			
λ	Meeting probability	0.452	(0.000)
σ_ξ	Std. dev. of match quality shocks	2.516×10^{-4}	(0.000)

Notes: The table reports the parameter estimates obtained using the Method of Simulated Moments (MSM). Standard errors, reported in parentheses, are computed using the asymptotic variance–covariance matrix of the MSM estimator. The parameter vector is jointly estimated by minimizing the objective function in Equation (E.3).

F Counterfactual Appendix

F.1 Long-Run Effects

Figure F.1 illustrates the dynamics of marital status over women's life cycle in the long run. This analysis aims to characterize how marital status evolves over the life cycle and how these dynamics depend on both the type of spouse a woman marries and the timing of marriage entry. Women are categorized according to their fertility preferences, and I examine the timing of marriage formation with partners who either share or differ in fertility preferences. For women whose ideal number of children is one, marriage to a husband with the same fertility preference corresponds to household type (*Wife = 1, Husband = 1*), whereas marriage to a

husband with a different fertility preference corresponds to (*Wife = 1, Husband = 2*). An analogous classification is applied to women whose ideal number of children is two.

Figure F.1 shows that women are substantially more likely to enter marriage upon meeting partners who share their fertility preferences. By contrast, when women encounter partners with different fertility preferences, they are more likely to postpone marriage and remain single while waiting for future matching opportunities.

Figure F.2 reports the fraction of households that dissolve, decomposed by whether divorce is initiated by a wife experiencing negative marital surplus or by a husband experiencing negative marital surplus. In the long run, among couples with aligned fertility preferences (*Wife = 2, Husband = 2*), the share of divorces initiated by husbands with negative surplus increases substantially. In particular, the proportion of divorces in which the husband has negative marital surplus rises from 2.35% to 11.90% following the permanent fertility relaxation.

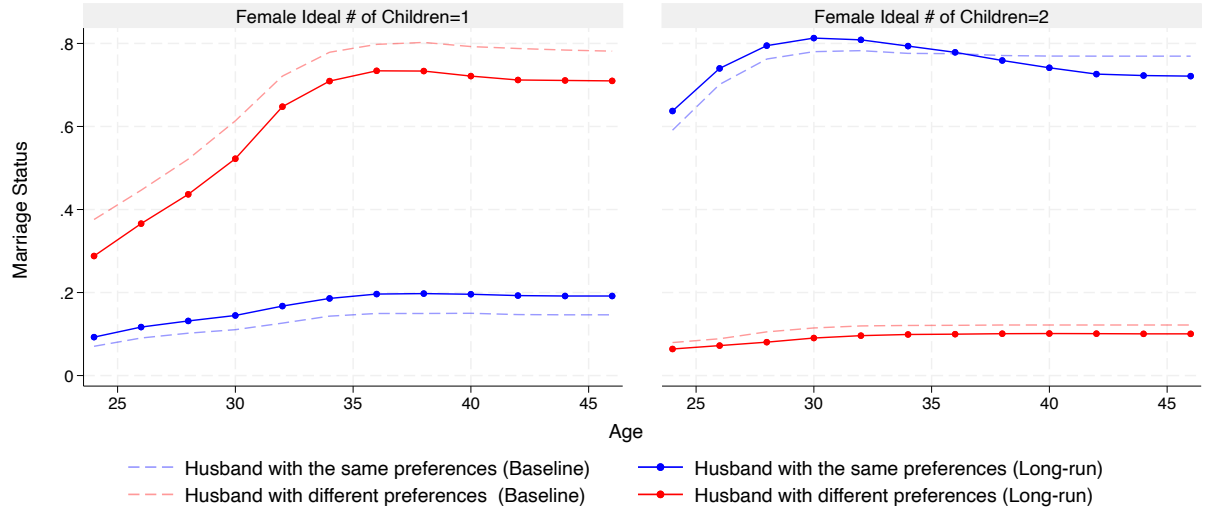


Figure F.1: Marriage Rates over the Life Cycle of Women

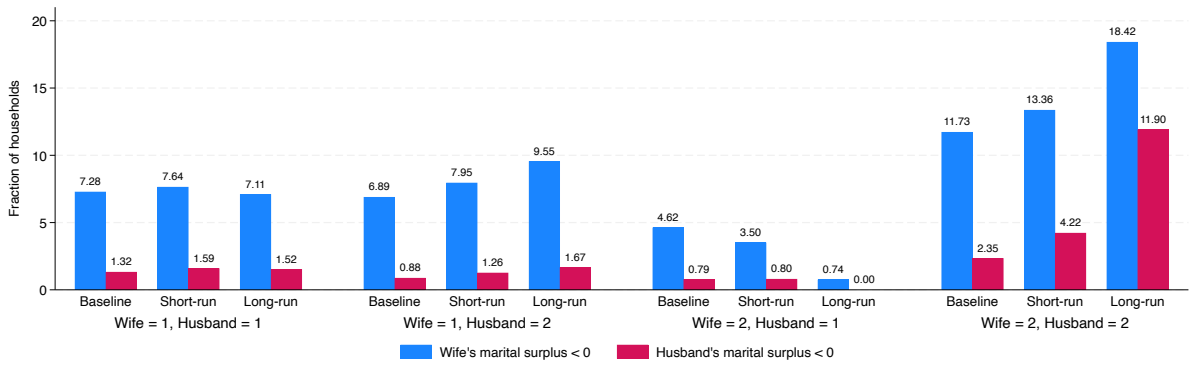
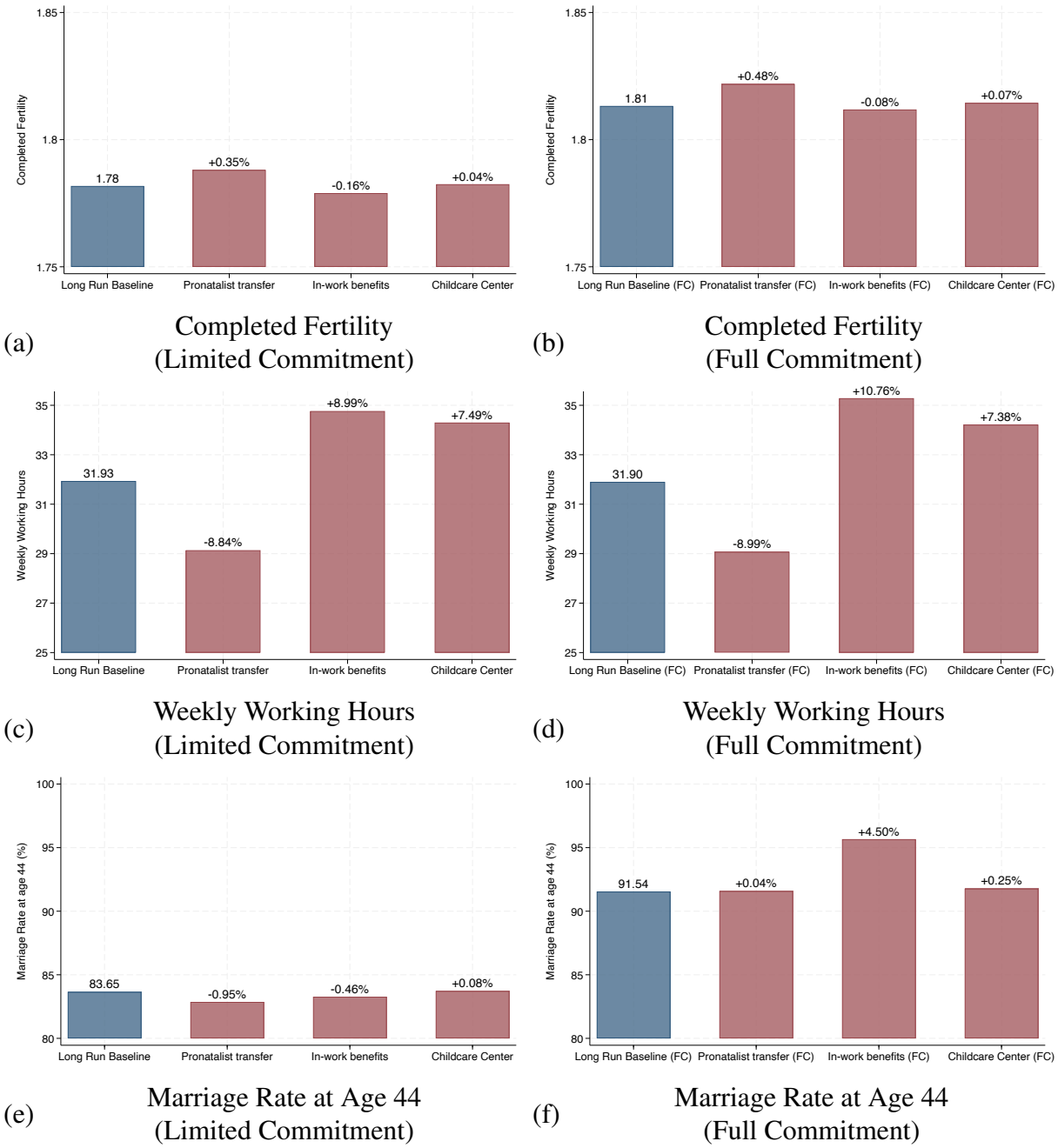


Figure F.2: Fraction of Divorces Initiated by Spouse with Negative Marital Surplus

F.2 Policy Experiments

Figure F.3 reports long-run average outcomes under permanent fertility relaxation for all women. The first bar in each panel of Figure F.3 reports the long-run baseline outcomes under limited and full commitment. The remaining bars correspond to the three policy experiments. The numbers above the bars indicate each policy's effect relative to the long-run baseline.



(a) Completed Fertility (Limited Commitment)

(b) Completed Fertility (Full Commitment)

(c) Weekly Working Hours (Limited Commitment)

(d) Weekly Working Hours (Full Commitment)

(e) Marriage Rate at Age 44 (Limited Commitment)

(f) Marriage Rate at Age 44 (Full Commitment)

Figure F.3: Policy Experiments (All Women)

Appendix References

Bronson, M. A., D. Haanwinckel, and M. Mazzocco (2024). Taxation and Household Decisions: An Intertemporal Analysis. *Working Paper*.

Chen, Y. and H. Fang (2021). The long-term consequences of China's "Later, Longer, Fewer" campaign in old age. *Journal of Development Economics 151*, 102664.

Ebenstein, A. (2010). The "Missing Girls" of China and the Unintended Consequences of the One Child Policy. *Journal of Human Resources 45*(1), 87–115.

Foerster, H. (2025). Untying the Knot: How Child Support and Alimony Affect Couples' Dynamic Decisions and Welfare. *The Review of Economic Studies 92*(5), 3029–3066.

Guo, R., J. Yi, J. Zhang, and N. Zhang (2025). Rationed Fertility: Treatment Effect Heterogeneity in the Child Quantity–Quality Tradeoff. *Journal of Political Economy*.

He, H., S. X. Li, and Y. Han (2023). Labor Market Discrimination against Family Responsibilities: A Correspondence Study with Policy Change in China. *Journal of Labor Economics 41*(2), 361–387.

Ho, C. and Y. Wang (2024). Social Institutions and Low Birth Rates. *Working Paper*.

Hu, D., H. Li, T. Li, L. Meng, and B. T. Nguyen (2023). The burden of education costs in china: A struggle for all, but heavier for lower-income families. *Working Paper*.

Huang, W., X. Lei, and A. Sun (2021). Fertility Restrictions and Life Cycle Outcomes: Evidence from the One-Child Policy in China. *The Review of Economics and Statistics*, 1–17.

Huang, Y., J. Pantano, H. Ye, and J. Yi (2023). Property division upon divorce and household decisions. *Journal of Human Resources 58*(2), 532–560.

Jakobsen, K. M., T. Jørgensen, and H. Low (2025). Fertility and Family Labor Supply. *Working Paper*.

Kleven, H., C. Landais, and J. E. Søgaard (2019). Children and gender inequality: Evidence from Denmark. *American Economic Journal: Applied Economics 11*(4), 181–209.

Lee, J. (2019). Does china have alimony?: A study of china's current post-divorce financial relief system. *UCLA Pacific Basin Law Journal 36*.

Leridon, H. (2004). Can assisted reproduction technology compensate for the natural decline in fertility with age? A model assessment. *Human Reproduction 19*(7), 1548–1553.

Li, X. (2024). The Unintended Impacts of the One-child Policy Relaxation in China on Women's Labor Market Outcomes. *Working Paper*.

Scharping, T. (2013). *Birth Control in China 1949-2000: Population Policy and Demographic Development*. Routledge.

Sun, A. and Y. Zhao (2016). Divorce, abortion, and the child sex ratio: The impact of divorce reform in China. *Journal of Development Economics 120*, 53–69.

Wang, K., J. Ding, and F. Wang (2016). Influence of the implementation of the universal two-child policy on demographic structure and population spatial distribution in China. *35*(11), 1305–1316.

Wu, X. (2022). Fertility and maternal labor supply: Evidence from the new two-child policies in urban China. *Journal of Comparative Economics 50*(2), 584–598.

Xia, J. et al. (2021). Legal grounds for divorce in china: Origin and evolution. *China and WTO Review 7*(2).

Zhang, B. and X. Zhang (2023). The divorce cooling-off period in China: Implementation, effects, and improvements. *International Journal of Law, Policy and The Family 37*(1).

Zhang, C. (2020). Are children from divorced single-parent families disadvantaged? New evidence from the China family panel studies. *Chinese Sociological Review 52*(1), 84–114.

Zhang, J. (2017). The Evolution of China's One-Child Policy and Its Effects on Family Outcomes. *Journal of Economic Perspectives 31*(1), 141–160.

Zhang, X., S. Chen, and M. Wang (2024). Gender bias in child custody judgments: Evidence from Chinese family court. *Plos one 19*(7).

Zhou, X., J. Ye, H. Li, and H. Yu (2022). The rising child penalty in China. *China Economic Review 76*.