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The Dynamics of Fertility, Bargaining, and Human Capital Accumulation

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Abstract

This paper studies the role of intrahousehold bargaining in shaping women's fertility decisions over the life cycle. 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 under limited commitment, with endogenous marriage and divorce. A central feature of the model is a dynamic feedback loop: childbirth lowers women's wages and outside options, weakening their bargaining position and feeding back into subsequent fertility decisions. Exploiting the relaxation of fertility restrictions in China, I document empirically that couples with misaligned fertility preferences exhibit significantly smaller fertility responses and higher divorce rates than couples with aligned preferences. The estimated model replicates these reduced-form moments and further reveals the quantitative importance of limited-commitment frictions in depressing marriage incentives, generating inefficient divorce, and thereby suppressing fertility rates. Eliminating them raises completed fertility by 1.77% and marriage rates by 4.48%. Finally, the effectiveness of family policies depends critically on the degree of commitment within the household.

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

JEL Codes: D15, J12, J13, J16

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1 Introduction

Total fertility rates have collapsed across major economies, falling well below the replacement threshold of 2.1 births per woman (United Nations, 2024). At the same time, women's rights have expanded remarkably worldwide over the past half-century, with women gaining greater economic, political, labor, and bodily rights (Goldin, 2025, Tertilt et al., 2022). Women today exercise substantially more autonomy over their careers and reproductive decisions than they did a generation ago. This raises a natural question: what role does women's bargaining power play in shaping fertility decisions? The global decline in fertility has attracted considerable research attention (Doepke et al., 2023), yet one of its most fundamental determinants remains largely unexplored: intrahousehold bargaining.

This paper analyzes the role of intrahousehold bargaining in shaping women's fertility decisions over the life cycle. I build a quantitative life-cycle model in which fertility is jointly determined by female labor supply and women's bargaining power within the household, under a limited-commitment framework. Importantly, fertility and marriage decisions are not independent, and women decide whom to marry, when to marry, and whether to remain married. Since a woman's bargaining position determines the share of marital surplus she can capture, it shapes both her willingness to enter a relationship and her decision to exit one. This leads naturally to the second question: how does women's bargaining power interact with household formation and dissolution to shape fertility outcomes? To capture the full effect of bargaining power on fertility, I endogenize the marriage and divorce margins jointly. Counterfactual analysis highlights the quantitative importance of limited-commitment frictions in depressing marriage incentives, increasing inefficient divorce, and thereby lowering fertility at the household level. The effectiveness of family policies is shaped by the degree of commitment within the household.

A central innovation of the model is to study the feedback loop between bargaining and fertility — in which bargaining shapes fertility and fertility shapes bargaining — within a unified framework. On the one hand, bargaining power shapes fertility outcomes. Spouses often want different numbers of children, and such differences have been shown to affect realized fertility outcomes (Doepke and Tertilt, 2018). When spouses hold conflicting preferences, women with stronger bargaining positions can shift fertility decisions in their favor. On the other hand, a woman's bargaining position is itself endogenous to fertility. Following the birth of a first child, women experience substantial and persistent declines in employment, wages, and earnings (Kleven et al., 2025). Since wages are a key determinant of outside options in marriage, these earnings losses shift the balance of bargaining power toward husbands (Guo and Xie, 2026, Lise and Yamada, 2019). The loss of women's bargaining power will have lasting consequences for subsequent fertility decisions. Building on the existing literature on limited-commitment frictions (Doepke and Kindermann, 2019), I further endogenize female labor supply and wages, and thereby endogenize women's outside options and bargaining positions within the household. When couples cannot credibly commit to future allocations, women anticipate that childbirth will weaken their bargaining position. This intensifies limited-commitment frictions, depressing fertility and prompting adjustments along the marriage and divorce margins as well.

To assess whether limited-commitment frictions arise in practice, the first part of the paper provides empirical evidence on how couples negotiate births when their fertility preferences diverge. To address the endogeneity concern that women with stronger fertility preferences may self-select into weaker bargaining positions, I exploit the end of China's One-Child Policy in 2016 as an exogenous shock that relaxes fertility constraints for married couples. The data are from the China Family Panel Studies (CFPS, 2010–2020). 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. Furthermore, heterogeneity in women's labor market outcomes generates variation in pre-existing bargaining positions within marriage. 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. The difference of 0.13 children represents a large policy effect, equivalent to approximately 15% of the average fertility level in the pre-reform year 2014. The divorce effect is primarily driven by households where husbands hold stronger fertility preferences and wives hold stronger outside options. Since the policy expanded the feasible fertility set and thus the Pareto frontier for households, the divorce response is inefficient and represents a key margin through which limited-commitment frictions manifest.

Motivated by these facts, I develop an intertemporal collective model in which individuals decide on marriage and divorce, fertility, and labor supply over the life cycle under the limited commitment framework (Mazzocco, 2007, Voena, 2015). Women's bargaining power, also known as the Pareto weight, is defined as their degree of influence over cooperative household decision-making (Jayachandran and Voena, 2025). In the model, 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.[1] In each period, singles randomly meet a potential partner with specific characteristics, such as education and fertility preferences. A marriage forms when both partners find it mutually beneficial to marry rather than remain single. 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, bargaining power is updated as outside options evolve: higher wages strengthen women's outside options, increasing the share of marital surplus they can claim and making it easier for her to renego-

[1]Importantly, 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.

tiate intrahousehold allocations or exit the marriage when household decisions go against her interests.

Furthermore, a novel feature of the model is to capture the downstream bargaining consequences of childbirth for women. The model builds on the established finding that parenthood reduces female labor supply and that career interruptions depreciate human capital and earning potential, causing women to forgo earnings growth during the early and mid-career stages (Adda et al., 2017, Blundell et al., 2016, Guner et al., 2020, Melentyeva and Riedel, 2025).[2] 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. The model thus provides a unified framework for understanding how child penalties translate into losses in intrahousehold bargaining power, and how these shifts feed back into future fertility decisions, intrahousehold allocations, and marital stability. At the heart of this framework is a new intertemporal trade-off: time devoted to childbearing today weakens bargaining power tomorrow. Women must therefore weigh the utility of having children against the long-run cost of a diminished position within the household. Consequently, women's bargaining power shapes not only the timing of births and completed fertility, but also how the associated costs and benefits are allocated within the marriage.

I estimate the model using the method of simulated moments, targeting moments from the pre-reform period in China (2010–2014). I then assess external validity by examining its ability to replicate two sets of non-target moments. The estimated model successfully replicates the fertility and divorce responses to the policy shock, with magnitudes quantitatively consistent with the reduced-form estimates. It also closely matches the observed decline in female labor supply around the first birth. Therefore, in the final part of the paper, I use the model to conduct three sets of counterfactual analyses.

The first counterfactual evaluates the long-run effects of a permanent relaxation of fertility constraints, focusing on women who are restricted to at most one child under the baseline regime. Specifically, I analyze how women would optimally adjust their marriage behaviors if they could fully anticipate the possibility of having a second child from the outset of their reproductive life. The results show that permanent relaxation of fertility constraints enhances positive assortative matching based on fertility preferences, leading to an increase in preference-aligned couples and a decrease in preference-misaligned couples. Furthermore, couples with misaligned fertility preferences tend to marry later than the baseline scenario. As a result, their first birth occurs later, leading to a lower long-term fertility response compared to couples with aligned preferences. Conditional on marriage, the long-run divorce rate is higher when the husband desires more children than the wife. This is explained by the dual pressures that such women face within the model: the prospect of an unwanted birth, and the deterioration in both

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

labor market outcomes and intrahousehold bargaining power. In contrast, when the wife desires more children than the husband, achieving her desired fertility raises her utility and partially offsets the unequal childbearing costs borne by mothers, thereby making marital dissolution less likely.

Additionally, the long-run fertility response exceeds the short-run response, as full anticipation of the relaxed constraint allows women to optimally front-load births to earlier periods when fecundity is high. However, heterogeneity by women's educational attainment reveals a sign reversal in long-run amplification. Among highly educated women, the long-run amplification is negative (-0.34%) when the wife has a lower fertility preference than her husband, but strongly positive (13.59%) when she has a higher fertility preference. Education enhances women's outside options and thus their bargaining positions within the household, enabling them to enforce their own fertility preferences, in either direction, relative to their less-educated counterparts.

The second counterfactual quantifies the role of bargaining frictions in shaping fertility choices over the life cycle. I compare long-run fertility and marital stability in the limited-commitment model against two alternative scenarios. The first assumes full commitment within marriage, eliminating bargaining frictions entirely. The second increases the probability of child custody assigned to mothers following divorce by 50%, making the financial and childcare burdens heavier for mothers, reducing the value of being single, and thus amplifying bargaining frictions. With full commitment, average completed fertility increases by 1.77%, as compensating transfers allow couples to internalize child-rearing costs without being constrained by how these costs are distributed between spouses. Furthermore, marriage rates increase by 4.48% by eliminating inefficient divorce. In contrast, assigning more child custody to mothers weakens women's outside options, reducing completed fertility by 1.97%. Marriage rates also decline as women are more reluctant to enter marriage due to lower bargaining positions.

The third counterfactual examines how policies can simultaneously promote fertility and empower women. I simulate three hypothetical family policy experiments commonly used by governments: a pronatalist cash transfer, an in-work benefit, and a childcare center subsidy. For women with low fertility preferences, the pronatalist transfer modestly raises completed fertility by 0.46% but reduces women's weekly working hours by 7.38%, weakening their outside options and exacerbating intrahousehold inequality. In-work benefits, by contrast, substantially increase women's working hours by 8.86% and strengthen their bargaining positions. However, it reduces completed fertility by 2.39% as stronger labor market attachment raises the opportunity cost of childbearing. These results suggest that neither pronatalist transfers nor labor market policies alone can simultaneously promote fertility and female empowerment. The childcare center subsidy achieves this dual outcome by relaxing the time constraint that typically forces women to choose between market work and child-rearing, raising completed fertility by 1.09% and weekly working hours by 7.85% at the same time.

Importantly, the same policy can have qualitatively and quantitatively different effects depending on the underlying commitment environment. Under full commitment, fertility responses are uniformly larger and marriage rates increase across all three policies, compared to the limited commitment case. Therefore, 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.

The remainder of the paper is organized as follows. Section 2 discusses the related literature. Section 3 provides the empirical evidence. Section 4 develops the life-cycle model. Section 5 discusses estimation and model validation. Section 6 studies the fertility, marriage, and divorce responses under the long-run permanent fertility relaxation. Section 7 quantifies limited commitment frictions. Section 8 discusses the policy response under limited commitment and full commitment. Section 9 concludes.

2 Related Literature

This paper contributes to three streams of literature. First, it contributes to the growing literature on fertility decisions under limited commitment (Doepke and Kindermann, 2019, 2024, Gonzalez and Zoabi, 2021, Rasul, 2008, Xi and Zhou, 2025). Doepke and Kindermann (2019) show that fertility can be depressed when mothers bear a disproportionate share of childcare responsibilities, reducing their outside options and preventing couples from reaching mutually beneficial fertility agreements. Relatedly, Doepke and Kindermann (2024) shows that women with high wages can reduce the marginal child penalty by purchasing market childcare, thereby alleviating bargaining frictions and raising fertility.

I contribute to this literature in two ways. First, I explicitly account for the two-way interaction between women's bargaining power and fertility decisions. This dynamic feedback amplifies limited commitment frictions and renders women more reluctant to have children. Second, I examine how women's bargaining positions affect not only fertility but also household formation and dissolution. Fertility decisions over the life cycle are shaped not only by choices made within existing marriages, but also by whether couples choose to marry in the first place and whether they subsequently choose to divorce. Accounting for both margins is essential for identifying the full effect of intrahousehold bargaining on fertility.

Second, this paper contributes to the literature on collective household models. The collective approach was developed by Chiappori (1988, 1992), and more recent work has found strong evidence in favor of limited commitment, rejecting both full commitment and no commitment assumptions (Theloudis et al., 2025). Previous studies emphasize that the inability to commit to post-divorce allocations can limit household specialization and generate inefficient outcomes (Lafortune and Low, 2023, Mazzocco et al., 2014, Reynoso, 2024). In particular, Lafortune and Low (2023) show that investment in public goods reduces individual human capital and thus creates inefficiencies through divorce risk. I examine such inefficiencies in the context of fertility decisions. Exploiting the end of China's One-Child Policy in 2016 as a source of exogenous variation, I document the presence of limited commitment frictions in couples' negotiation over second-child decisions, and show that both spouses' fertility preferences and outside options are important determinants of fertility outcomes. Furthermore, in dynamic collective model settings, intertemporal choices are often modeled with fertility treated as exogenous (Bronson, 2019, Bronson et al., 2024, Foerster, 2025, Low et al., 2025). In contrast, I show that fertility decisions are endogenously shaped by the intrahousehold bargaining process, and that spouses' relative labor market performance determines how women's bargaining position evolves over time and, in turn, shapes how couples negotiate subsequent fertility decisions.

Third, this paper contributes to the literature on life-cycle models where fertility and female labor supply are jointly determined (Adda et al., 2017, 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). Cruces and Rodrıguez-Roman (2025) study how financial incentives shape fertility in both the short and long run, calibrating a rich life-cycle model to Spain's 2007 baby check. In their model, women are the sole decision-makers and differ in their desired fertility. In contrast, I treat fertility as a joint household decision and allow for preference misalignment within couples. Jakobsen et al. (2025) examine the feedback mechanisms between fertility and labor supply, showing that fertility adjustments amplify women's labor supply elasticities through a "fertility multiplier" channel. While existing studies examine the human capital and labor market consequences of childbirth, they largely abstract from the implications for intrahousehold bargaining. I show that within the model, childbirth triggers diverging labor market trajectories within couples: as wives' wages fall relative to their husbands' following childbirth, their outside options weaken over time. The career costs of children extend beyond monetary losses in labor-market performance: childbirth weakens women's outside options and reshapes the entire dynamics of marriage.

3 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 end of China's One-Child Policy as a shock that relaxes the 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, called the "Two-Child Policy", affected a substantial share of married couples in China. The institutional background and policy details are provided in Appendix A.1. Since the reform was universal, the goal is not to identify its overall causal effect, but rather to examine differential policy responses between couples who agree and those who disagree on fertility preferences.[3]

[3] Prior empirical studies have documented positive effects of the Two-Child Policy on birth rates among married couples and reductions in female labor supply, typically assuming that marital status is fixed (Fang and Liu, 2026,

Data and Sample Selection 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. Details about the data and variable construction are provided in Appendix A.2 and Appendix A.4.

The main sample is defined by the following restrictions. First, I restrict the sample to married couples directly affected by the 2016 reform, excluding those already eligible for a second child before 2016. Second, I restrict to already-formed couples prior to the reform, so that matching on fertility preferences is predetermined. Heterogeneity in women's labor-market outcomes then generates variation in bargaining power within marriage. The sample includes couples with zero or one child in 2014, as both groups were potentially eligible for the two-child policy. Appendix A.3 provides more details on the sample restrictions. Appendix Table A.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 to this question to measure fertility preferences.[4] Importantly, both wives and husbands answer this question, allowing me to assess whether fertility preferences are aligned within couples. Most couples are aligned: 57% report that both spouses ideally want two children. 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 A.3). 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 below.

Appendix Table A.2 compares household characteristics 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 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.

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

He et al., 2023, Li, 2024). In terms of marriage and divorce, Lin et al. (2025) find that couples whose firstborn child is a daughter are more likely to divorce due to remarriage incentives. Giorgi and Raiber (2025) find that men previously allowed a second child have lower marriage rates compared to those not allowed, due to the sex ratio imbalance and the marriage competition. In this paper, I focus on differential policy responses based on couples' fertility preferences and women's bargaining positions, which are determined by their labor market performance.

[4] In the 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 A.2).

or two). I estimate:

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

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. α_A denotes women's age-group fixed effects, which flexibly account for age-specific life-cycle patterns.[5] α_i are household fixed effects.

3.1 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.[6]

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.

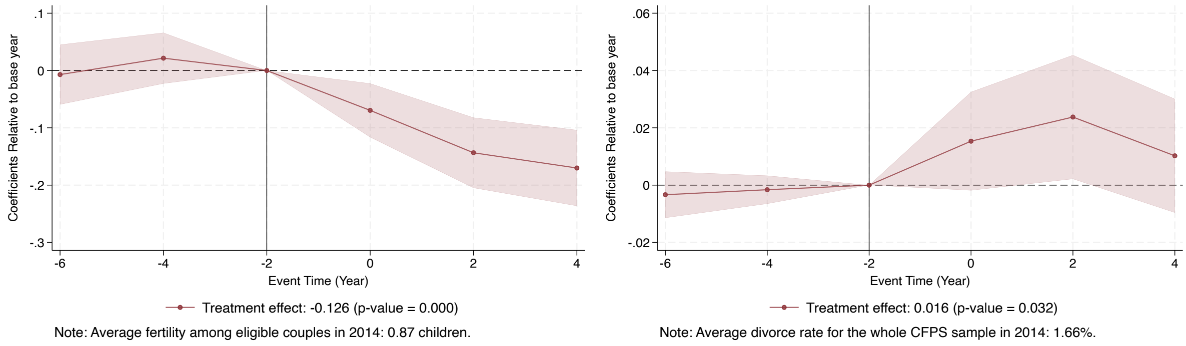
Next, I classify households into four groups according to each spouse's stated ideal number of children, in order to analyze whether policy responses vary depending on which spouse desires more children. Using the same event study design outlined in equation (1), I treat households in which both partners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

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

where $G_i \in \{1, 2, 3\}$ indexes the three treated household types: $G_i = 1$ indicates that only

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

[6] 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.



(a) Number of Children (b) Divorce Status

Figure 1: Policy Effects on Fertility and Divorce

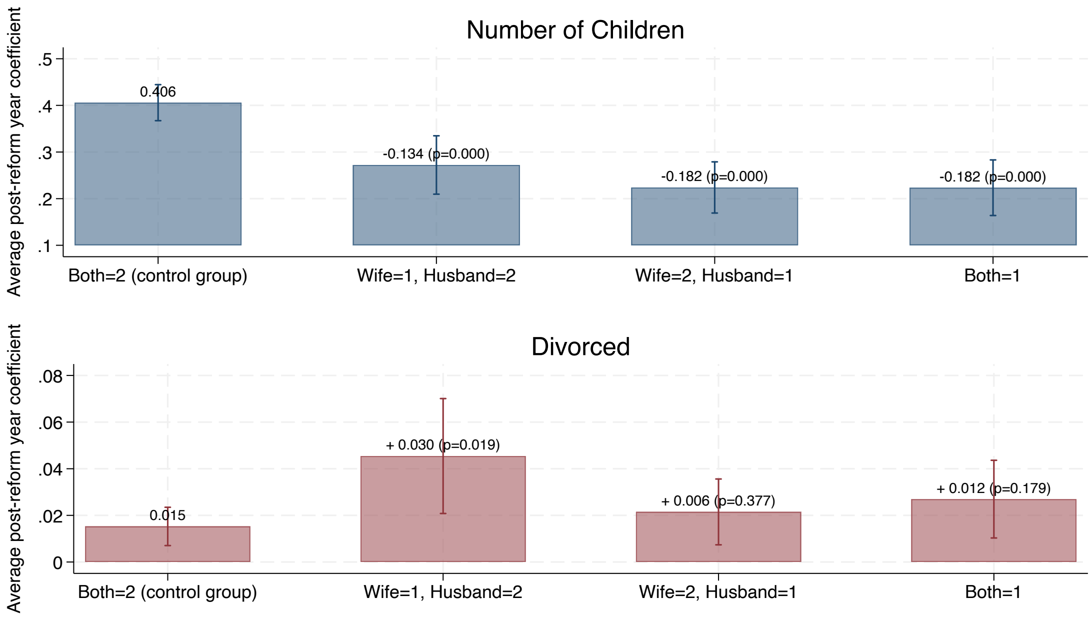
the husband desires a second child (*Wife = 1, Husband = 2*); $G_i = 2$ indicates that only the wife desires a second child (*Wife = 2, Husband = 1*); and $G_i = 3$ indicates that neither partner desires a second child (*Both = 1*). The coefficients $\gamma_{t,g}$ capture the differential year-specific 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.[7] 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 B.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.

[7] 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

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 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 Figure B.1 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)

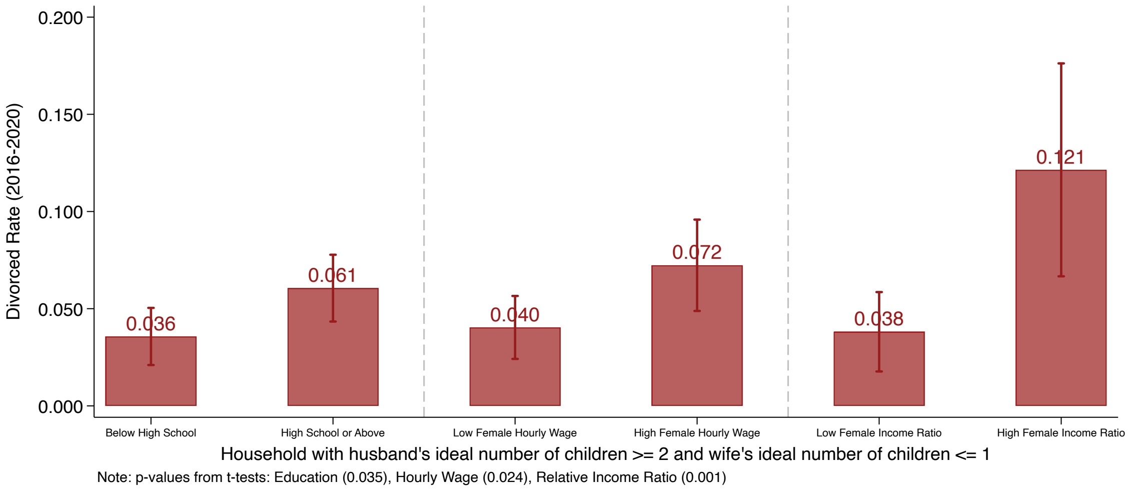


Figure 3: Policy Effects on Divorce by Women's Bargaining Positions

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:

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 potential gains from cooperation exist. The resulting divorce is therefore inefficient and provides direct evidence of limited-commitment frictions within households.

In the years immediately following the policy reform, a significant divorce response is observed. In the long run, however, forward-looking women who anticipate future bargaining over fertility decisions will incorporate these concerns into their earlier choices. The prospect of intrahousehold conflict over fertility therefore feeds back into decisions regarding marriage timing and partner selection. Motivated by these empirical findings, the next section develops a life-cycle model to address two related questions. First, what mechanisms account for the asymmetric divorce response observed following the policy reform? Second, how do limited-commitment frictions systematically shape women's fertility choices over the life cycle, and what are the implied long-run consequences for marriage formation and dissolution?

4 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.[8] 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 C.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 mutually decide whether to marry M_t. If they marry, initial bargaining power is determined via Nash bargaining. After entering 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.

4.1 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,

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

early childhood (ages 0–6), middle childhood (ages 7–12), and adolescence or older (ages 13 and above).[9] 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,

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

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 and become older with a probability of $1/6$. Further details regarding the how the age of youngest child is determined are provided in Appendix C.2.

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, children affect individuals' preferences for public goods α_Q^j. 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.

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:

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

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 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

[9] 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 A.6.

constraint for individual $j \in \{w, m\}$ is:

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

4.2 Wages and Human Capital

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

$$\log w^e_{jt} = \eta^e_{j,1} + \eta^e_{j,2} K_{jt} + \eta^e_{j,3} K^2_{jt} + \epsilon_{jt} \tag{8}$$

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

$$K_{j,t+1} = \begin{cases} K_{jt} + 1, & \text{if } h^F_{jt} = 1, \\ K_{jt}, & \text{if } h^P_{jt} = 1, \\ \delta^U K_{jt}, & \text{if } h^U_{jt} = 1. \end{cases} \tag{9}$$

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.

4.3 Budget Constraint

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

$$c_t = \sum_{j \in \{w,m\}} w_{jt} h_{jt} + y_t(e_w, e_m) - CC_t(n_t, \kappa_t, e_w), \tag{10}$$

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.[10]

For divorced or unmarried individuals, the budget constraint is:

$$c_{jt} = w_{jt} h_{jt} + y_{jt}(e_j) - CC_t(n_{jt}, \kappa_{jt}, e_j), \tag{11}$$

Household non-labor income y_t captures the roles of savings and asset accumulation.[11] For

[10]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 A.8.

[11]The existing literature typically assumes that assets are divided equally upon divorce (see, for example, Berresheim and Koll (2026), Jakobsen et al. (2025)). Under this assumption, asset levels affect the outside options of both spouses symmetrically, which may influence the estimated parameters but would not qualitatively alter the

married couples, non-labor income is assumed to depend on the education levels of both the wife, e_w, and the husband, e_m, in order to capture assortative matching along the educational dimension. For single individuals, it depends solely on own education level.

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 and 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. Finally, it constrains the maximum number of children feasible over the life cycle, which will be discussed in Section 5 below.

4.4 Fertility Process and Children

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

$$n_{t+1} = n_t + b_t(p_t, f_t) - x_{t+1} \tag{12}$$

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. Children can move out after the fertile period T_f ends, provided they are aged 13 or older. $x_{t+1} \in \{0, 1\}$ 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. Further details regarding the children moving out process are provided in Appendix C.2.

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 $n_{j,t+1} = n_{j,t}$.

4.5 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.

model's predictions. Given the limited information available in the CFPS dataset regarding the actual distribution of savings and assets at dissolution, non-labor income is specified as a function of marital status and education.

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. time constraint (7), individual budget constraint (11), home production (6), wage process (8), human capital evolution (9).

Child custody and alimony First, in the event of divorce, all children either remain with their mother with exogenous probability p_{cust_f}, or with their father with probability $1 - p_{\text{cust}_f}$.[12] Second, alimony or spousal support is generally not granted, and only a small fraction of sole parents receive child maintenance. Given these institutional features in China, I do not model maintenance payments and therefore abstract from any strategic interactions between divorcees. Third, I assume that the number of children realized does not depend on an individual's custody status. Consequently, an individual who desires only one child may choose divorce to avoid potential future births and to prevent deviations from their fertility preference.

4.6 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, which may be updated at t as introduced below. The bargaining process and the recursive formulation for a married couple are as follows, with the notation for value functions following Jorgensen et al. (2026).

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. time constraint (7), household budget constraint (10), home production (5), wage process (8), human capital evolution (9), children evolution (12).

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

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 Next, 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

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

Importantly, 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.5 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. Divorce can be inefficient because couples cannot commit to future transfers. Even if both partners would prefer to stay married under certain future contingencies, one partner may anticipate that future bargaining could leave them worse off, leading them to choose divorce prematurely.

4.7 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 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 $S_t^p = \{K_{pt}, e_p, I_p, \epsilon_{pt}\}$. 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 A.1). Details of the marriage process are described in Appendix C.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 children, (4) income pooling, (5) (partial) risk sharing in the face of negative wage shocks, and (6) match-specific love shocks.

5 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 $T_{max} = 52$. Each model period t

corresponds to two real-world years, resulting in a total of $T = 15$ periods.

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.[13] Importantly, 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.

5.1 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).[14] Individuals have a total of $\bar{T} = 100$ hours 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 D.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 D.2.

Biological Fecundity, Childcare Costs, and Custody First, biological fecundity, denoted f_t, is estimated based on medical evidence from Leridon (2004). The age-specific probability of conception is reported in Appendix D.3. Women are no longer fertile and cannot have more children after age $T_f = 45$. Second, 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

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

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

estimation are reported in Appendix D.4. Third, in the event of divorce, I assume that women attain custody with probability $p^f_{cust} = 57.81\%$, based on statistics from Zhang et al. (2024).[15] This implies that women are slightly more likely to retain custody of children. In China, there is no legal preference for awarding custody to mothers. Paternal custody is relatively prevalent due to patriarchal cultural norms, and the proportion of single fathers residing with children is also substantial (Zhang, 2020).

Education-Specific Fertility Constraints I compute the distribution of the maximum number of children, $n_{\max} = \{1, 2\}$, which depends on educational attainment. 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. This difference stems from their different eligibility to have a second child, which is primarily reflected in educational differences. Specifically, rural women, who on average have lower educational attainment, faced less stringent fertility restrictions than urban women. Therefore, the model introduces heterogeneity in fertility constraints via education-specific upper bounds on children. 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 procedures are described in Appendix D.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 D.6.

5.2 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 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 D.7 describes further details of the MSM procedure, including the objective function, weighting matrix, and standard error. Appendix Table D.7 reports the estimation results of the parameters.

Targeted Moments and Identification Our 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.

[15] Many structural papers assume that women automatically obtain full custody. This modeling difference does not qualitatively affect the model's predictions. Imposing maternal custody would further lower the wife's outside option, reinforcing the bargaining implications in this framework.

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.

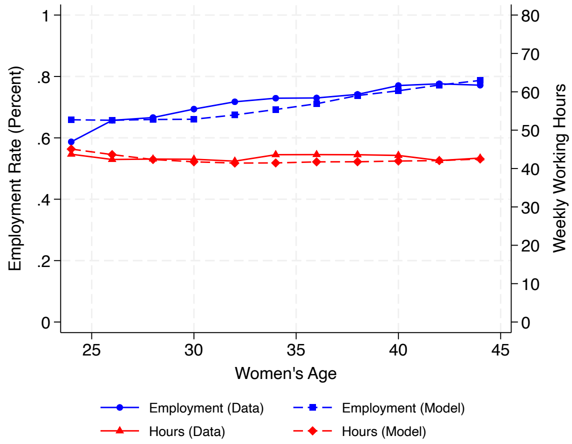
The second set of moments includes the life-cycle profile of women's hourly wages by educational attainment (Figure 4, panel (b)). These moments identify the parameters governing women's returns to human capital accumulation, $\eta^e_{w,0}, \eta^e_{w,1}, \eta^e_{w,2}$, by education level e. Higher wage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

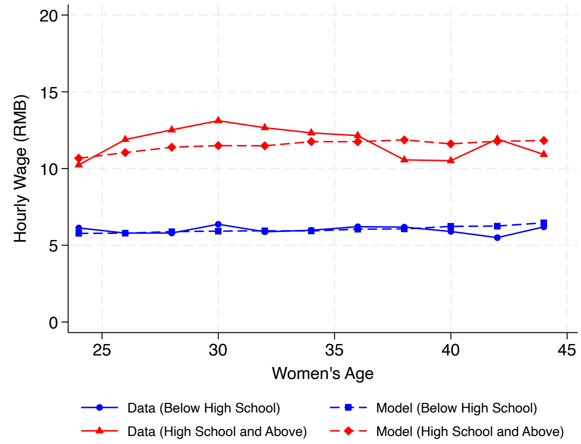
The fourth set of moments relates to the life-cycle profile of the probability of marriage (Figure 4, panel (c)). Marriage probabilities at early ages are informative about the meeting probability in the marriage market, λ. A higher λ implies a greater likelihood of encountering a potential partner, 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.

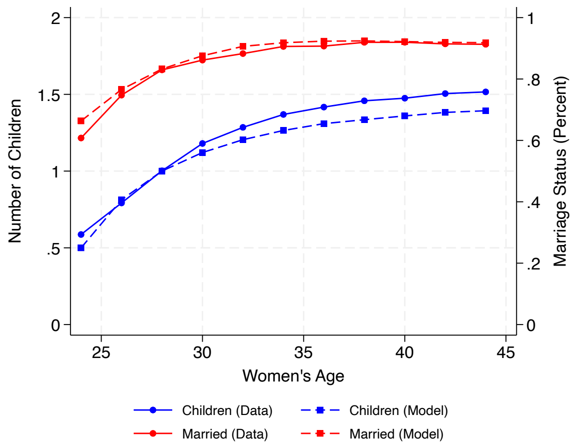
Model Fit I evaluate the model's fit by comparing simulated moments to their empirical counterparts. Figure 4 shows that the model provides a good fit to the data. In particular, the model successfully captures (i) the dynamics of women's marriage, fertility choices, and labor market participation throughout 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.



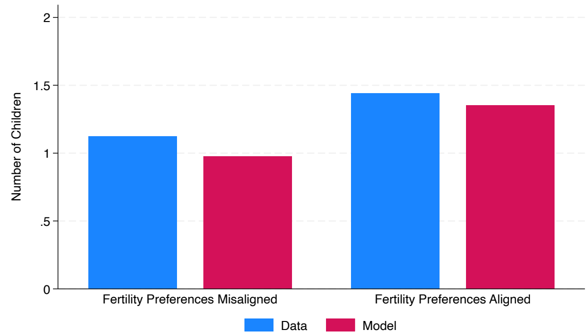
(a) Labor Supply



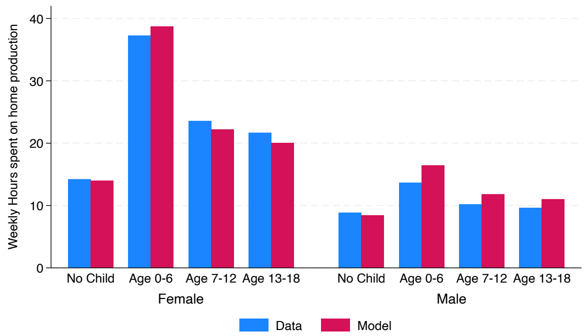
(b) Wage Profiles



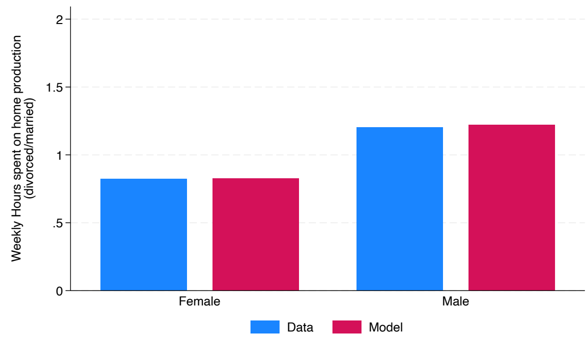
(c) Marriage and Children



(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

5.3 Validation

In this Section, I evaluate the external validity of the model by examining its ability to replicate key empirical patterns that are not explicitly targeted in the estimation. 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. The goal of these exercises is to validate that the model captures the key trade-off related to births before using the calibrated model to conduct counterfactual analysis.

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.

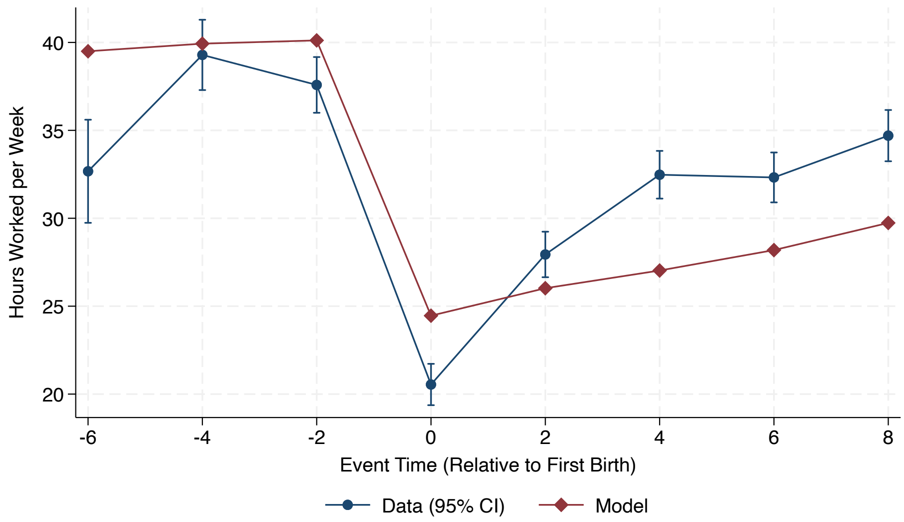


Figure 5: Women's Labor Supply Around the First Birth

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 3, 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 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.

6 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 objective is to analyze how women would behave if they could fully anticipate the prospective possibility of having a second child in a forward-looking manner. 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 regimes. Under the *short-run* counterfactual, women experience an unexpected policy relaxation at a given age and are subsequently permit-

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. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

ted 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 5.3. Unlike the empirical analysis in Section 3, which examines only the four years immediately after the reform, the short-run counterfactual simulates outcomes over the entire life cycle, enabling us 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 anticipate the possibility of having up to two children throughout their life cycle. Under this relaxed regime, women optimally adjust their marriage and fertility decisions and achieve optimal life-cycle family planning.

6.1 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 regime 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 regimes.

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.

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 regimes, respectively.

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 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 (5.26% vs. -1.71%) and downward when they themselves desire more (5.63% vs. 16.54%), relative to highly educated women.

6.2 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 documented above may therefore 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 — conditional on marriage — their propensity to divorce. In this section, I demonstrate that the marriage channel constitutes a quantitatively important amplifier through which the permanent relaxation of fertility constraints shapes women's long-run fertility responses.[16]

[16] 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.

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 regimes, respectively.

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 regimes.[17] 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 percent in the baseline to 4.00 percent, and the share in which both desire two children (*Both = 2*) rises from 70.43 percent to 72.60 percent. When fertility restrictions are relaxed, preference alignment generates greater joint surplus, making assortative matches more attractive at the margin. Second, the share of mismatched couples declines across both mismatch directions. The share of (*Wife = 1, Husband = 2*) couples declines from 16.19 to 15.21 percent. By contrast, the share of (*Wife = 2, Husband = 1*) couples falls sharply from 10.32 to 8.18 percent. Given that the long-run regime 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 E.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. On the contrary, when women meet partners with different fertility preferences, they are more likely to reject them and wait for future opportunities,

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

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 regimes, 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 3, 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 regimes. 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 percent in the short run to 0.74 percent in the long run. Conversely, when the husband holds the higher fertility preference (*Wife = 1, Husband = 2*), the divorce rate rises from 7.02 percent in the short run to 10.01 percent 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 E.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 E.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 regimes, respectively.

7 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, placing heavier financial and childcare burdens on divorced mothers and thus amplifying commitment frictions within marriage. 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. Accordingly, completed fertility rises from 1.78 children per woman under the limited-commitment regime to 1.81 under full commitment, representing an increase of 1.77%. Furthermore, the life-cycle average marriage rate increases from 82.61 percentage points under limited commitment to 86.31 percentage points under full commitment, representing an increase of 4.48%. 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.[18] 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.

To summarize, these two counterfactuals highlight the quantitative importance of limited commitment frictions for fertility and marriage rates.

8 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 childcare center 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.

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

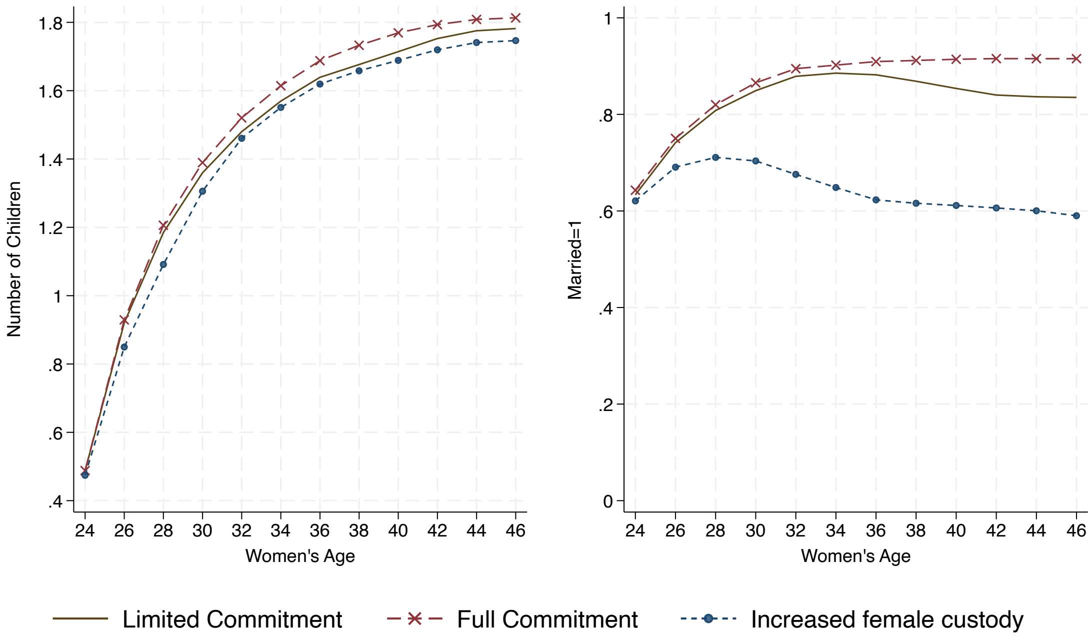


Figure 6: Alternative Commitment Assumptions: Fertility and Marriage

8.1 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.[19] 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% 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.[20] 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

[19]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 E.3 and are qualitatively consistent with the main results.

[20]For comparisons, Adda et al. (2017) analyze the effects of introducing the cash transfer of 6000 euros in Germany, the proportion of women with two children increases 0.2%.

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%. 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.

Childcare Center Subsidy 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%. Crucially, unlike the pronatalist transfer, the childcare subsidy simultaneously increases women's weekly working hours by 7.85%. The 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 corresponding 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.

8.2 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 are reporting the policy effects relative to the long-run full commitment baseline. As discussed in Section 7, 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%.

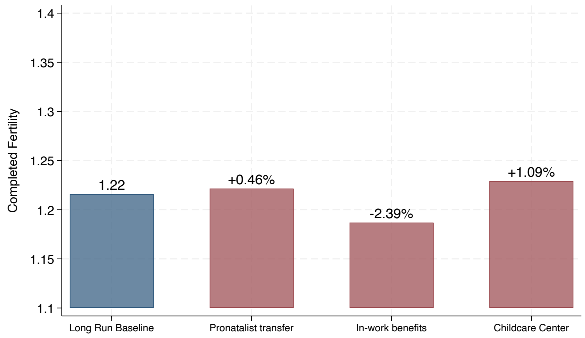
Importantly, the same policy can have qualitatively and quantitatively different effects depending on the underlying commitment environment. First of all, under full commitment, the pronatalist transfer no longer exacerbates bargaining frictions: because women can be adequately compensated by their partners, 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 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.

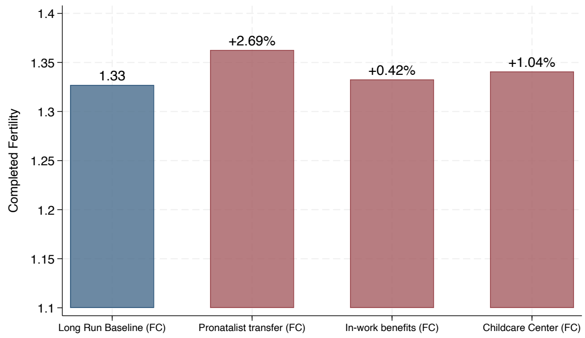
9 Conclusion

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 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 — a largely overlooked mechanism — contributes to this trend.

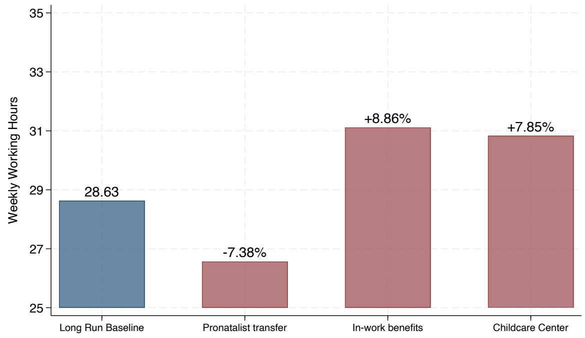
The findings carry direct implications for the design of family policy. The central takeaway is that policy effectiveness depends critically on the degree of commitment within the household. Limited-commitment frictions are important in depressing marriage incentives, generating inefficient divorce, 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



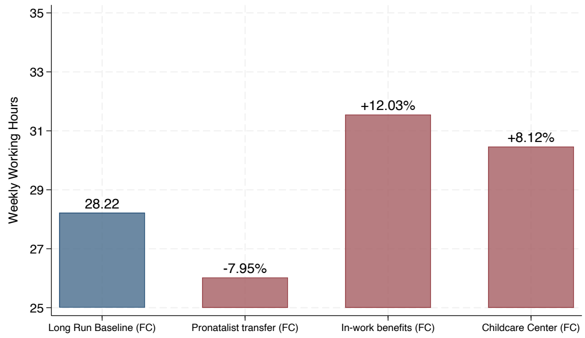
(a) Completed Fertility (Limited Commitment)



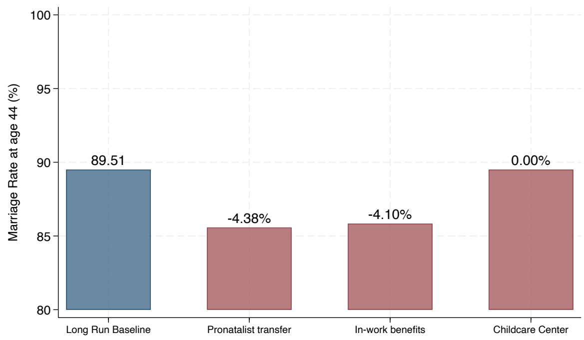
(b) Completed Fertility (Full Commitment)



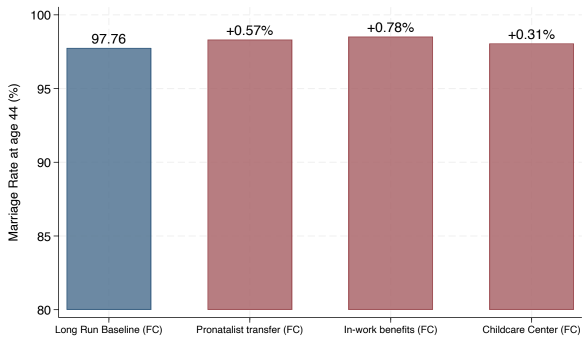
(c) Weekly Working Hours (Limited Commitment)



(d) Weekly Working Hours (Full Commitment)



(e) Marriage Rates (Limited Commitment)



(f) Marriage Rates (Full Commitment)

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

commitment frictions, such as those strengthening marital property rights, enforcing separation agreements, or improving women's post-divorce resources through child support enforcement, can potentially serve as powerful complements to conventional pronatalist policies.

Overall, this paper highlights the importance of intrahousehold bargaining for understanding fertility behavior and for designing effective family 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.

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APPENDIX

Appendix

A Data Appendix

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.[21] 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.[22] 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 2013, 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.

[21]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.

[22]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.

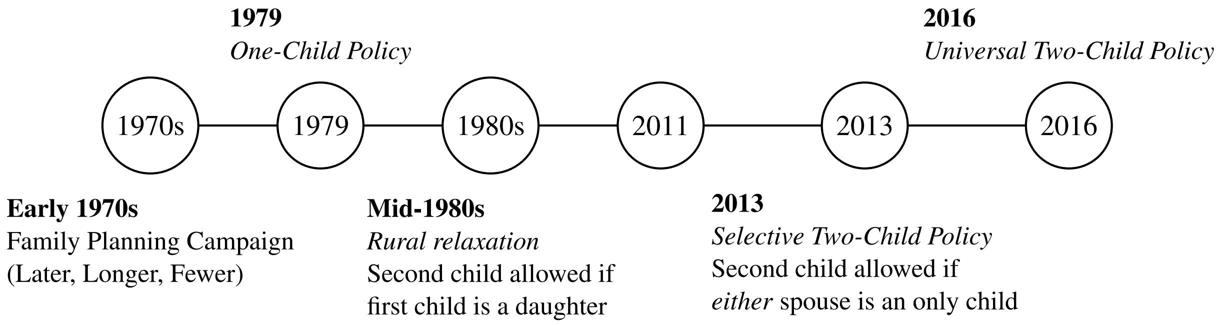


Figure A.1: Timeline of Major Changes in China's Fertility Policies

A.2 Data

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.[23] 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.

A.3 Sample Selection

Based on the institutional background of fertility policies described in Section A.1, the main study sample is constructed according to the following criteria.

First, the sample is restricted to individuals of Han ethnicity, the main population targeted by the One-Child Policy. Rural households whose first child is a daughter are excluded, as

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

such households were permitted to have a second child beginning in the mid-1980s. Second, 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 2013. Third, the sample is restricted to women born between 1972 and 1992, who were of prime reproductive age in 2016. Fourth, the sample is further restricted to already-formed couples as of 2014, as these households were directly affected by the policy change. Finally, to ensure reliable identification 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.

Table A.1 reports summary statistics for the main variables.

Table A.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.

A.4 Definitions of Variables

The China Family Panel Studies (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. Below, 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.[24]

Figure A.2 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 our discussion accordingly.

Importantly, both wives and husbands answer this question, allowing us to examine whether fertility preferences are aligned within couples. As shown in Figure A.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.

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

Table A.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.

[24] Since this question was asked prior to the universal Two-Child Policy reform, it alleviates concerns that reported fertility preferences may be endogenous to policy relaxation.

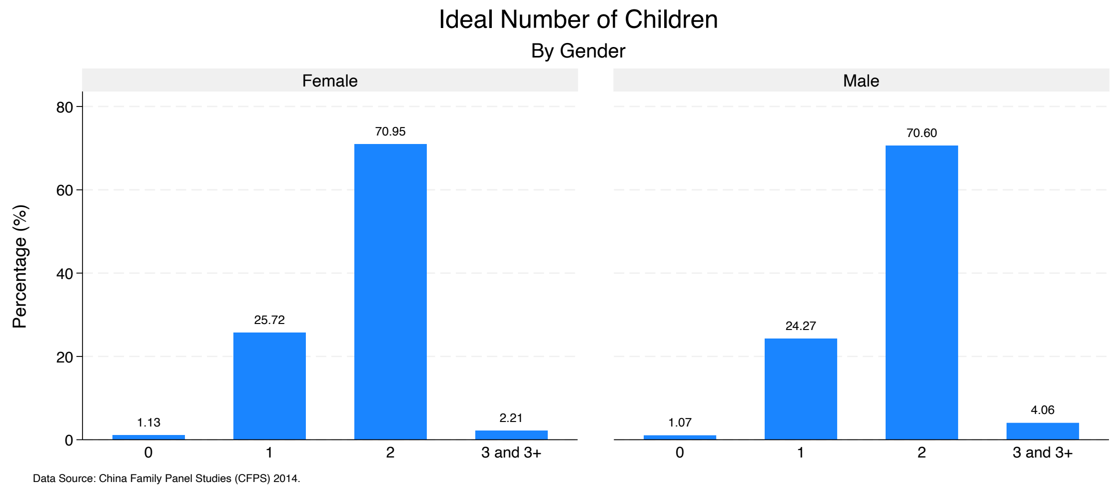


Figure A.2: Ideal Number of Children by Gender

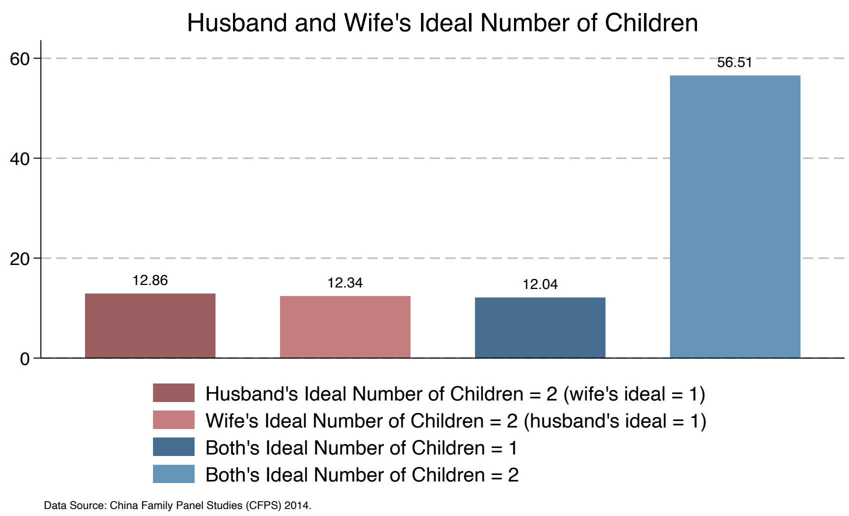


Figure A.3: Couples' Fertility Preference Types

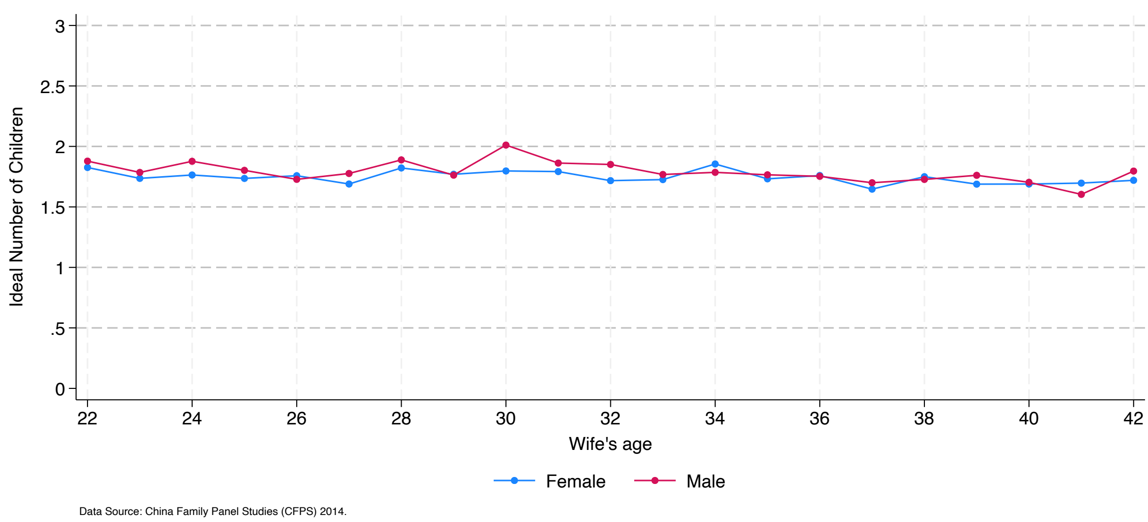


Figure A.4: Ideal Number of Children by Gender and Age

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 A.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 A.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. [25]

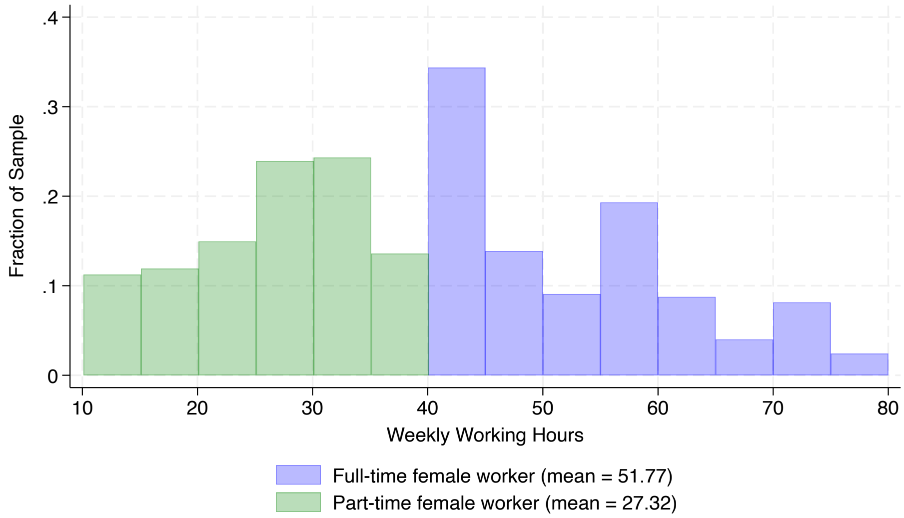


Figure A.5: Distribution of Female Working Hours

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

Home production time primarily comprises childcare and housework. Figure A.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 A.7, dissolution of the marriage is associated with a reduction in women's home production time and a corresponding increase in that of men.

[25] 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).

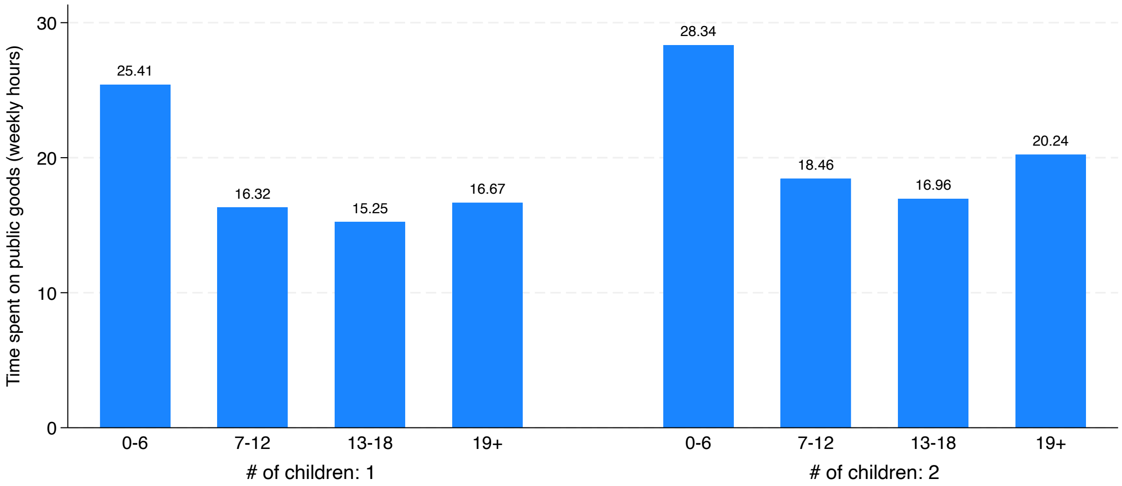


Figure A.6: Home Production Hours by Number of Children and Age of Youngest Child

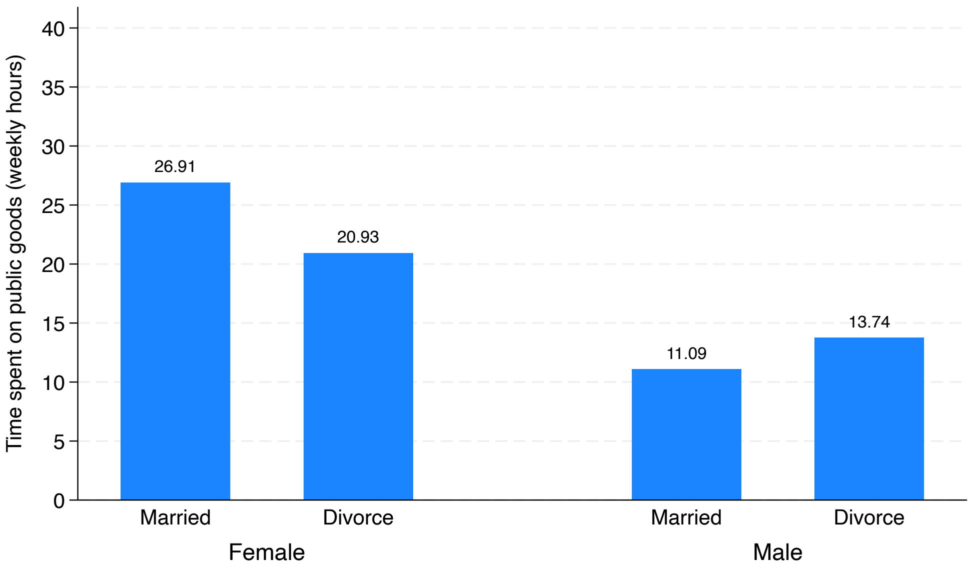


Figure A.7: Home Production Hours by Marital Status

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 A.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.

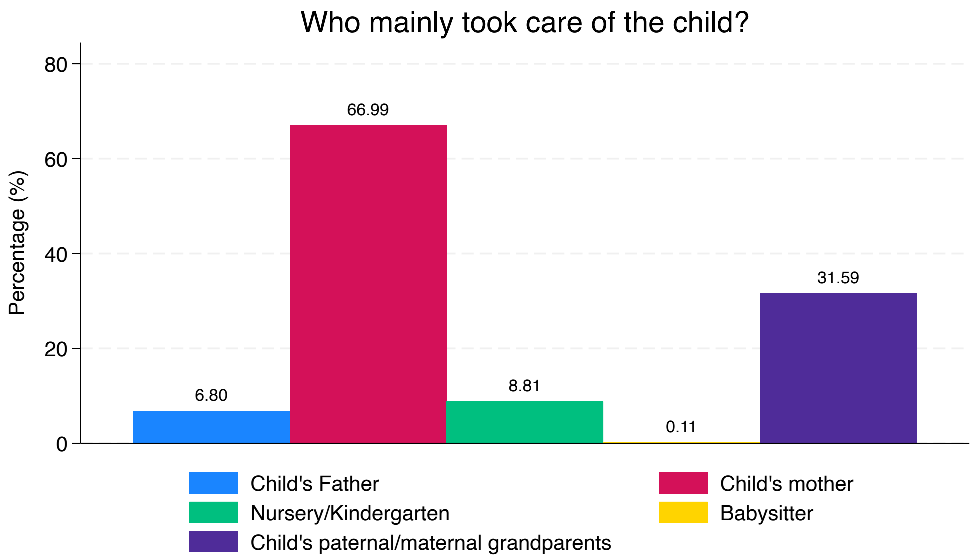


Figure A.8: Childcare Arrangements

A.5 Divorce Law

Given that divorce responses play a central role in our 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.[26] 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*.

[26] 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 our 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. 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%.[27]

B Reduced Form Appendix

B.1 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 3.

Figure B.1 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).

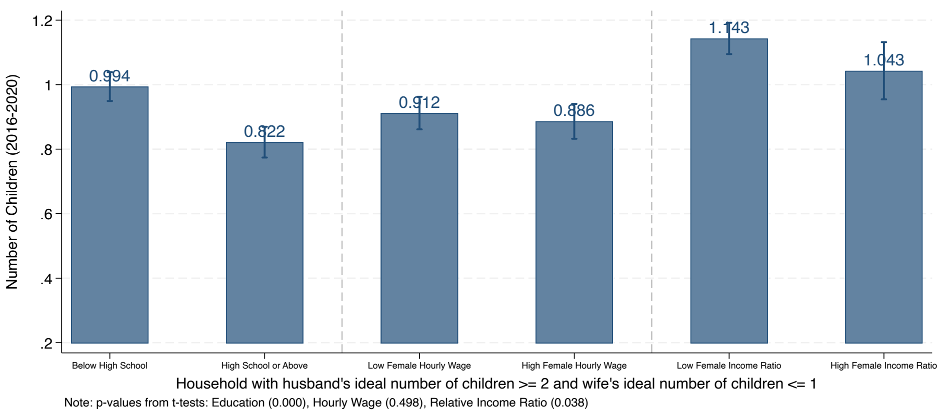


Figure B.1: Policy Effects on Fertility by Women's Bargaining Position

[27]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.

B.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 B.2, 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.

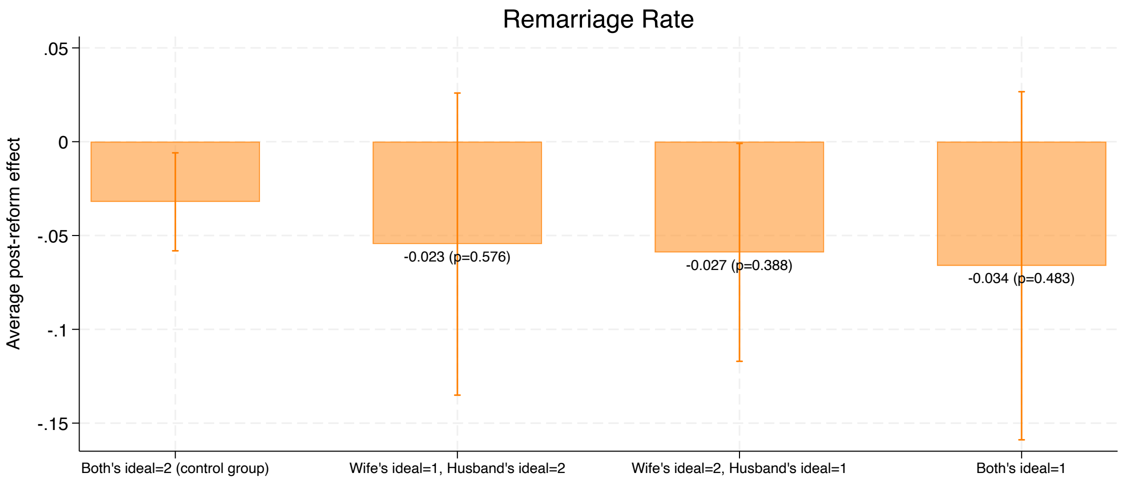


Figure B.2: Remarriage by Couples' Fertility Preferences

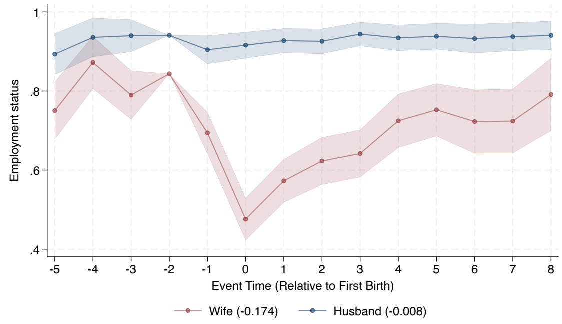
B.3 Labor Market Performances Around Childbirth

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 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^g_{ijt} is determined by

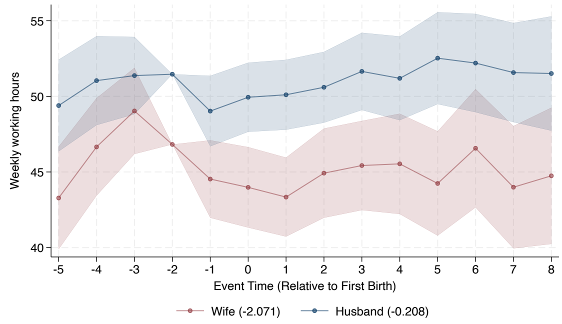
$$Y^g_{ijt} = \sum_{\substack{j=-5 \\ j\neq -2}}^{8} \alpha^g_j \cdot \mathbf{1}[j = t - e^i] + \sum_a \beta^g_a \cdot \mathbf{1}\left[a = age_{it}\right] + \sum_y \gamma^g_y \cdot \mathbf{1}[y = t] + \nu^g_{ijt}$$

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).

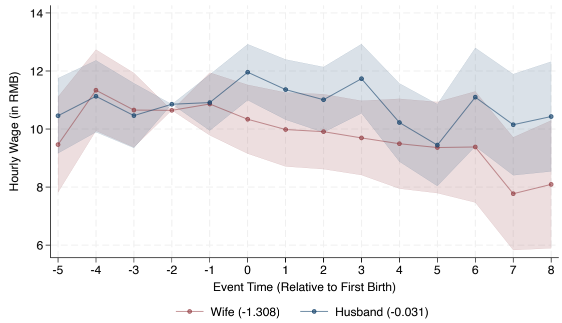
Labor Market Performances of Men and Women The results are reported in Figure B.3. First, women experience a substantial decline in employment following their first birth. At the time of childbirth, the employment rate falls from 80% at baseline ($t = -2$) to 40%. Second, women's hourly wages decline 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.



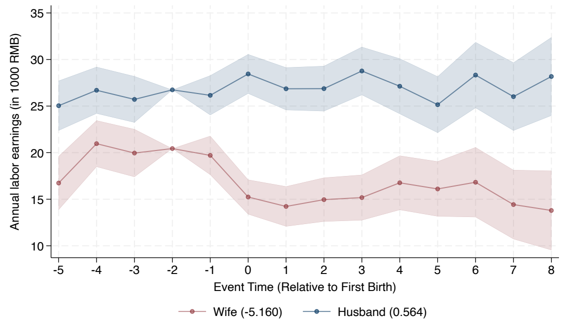
(a) Employment Status



(b) Working Hours



(c) Hourly Wages

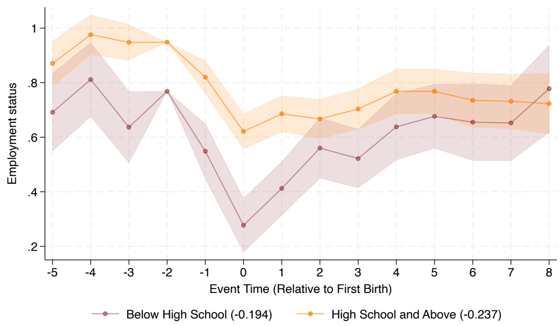


(d) Annual Labor Earnings

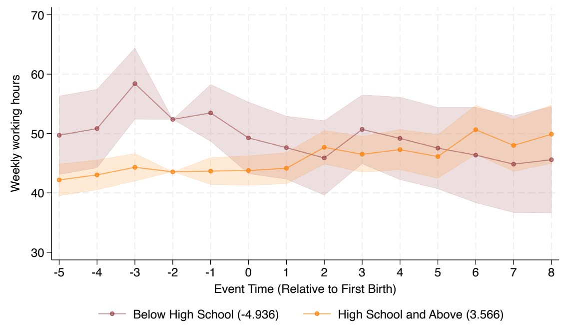
Figure B.3: Labor Market Performances of Men and Women

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 B.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.

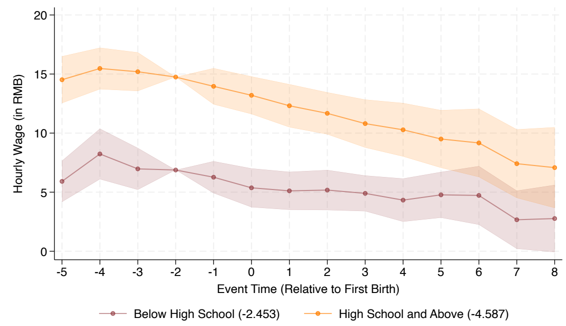
Second Child Penalties The analysis examines whether the effect of children on labor supply is amplified at the second birth. As shown in Figure B.5, women's employment declines further upon the birth of a second child, whereas men exhibit no discernible change in employment. These findings are consistent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



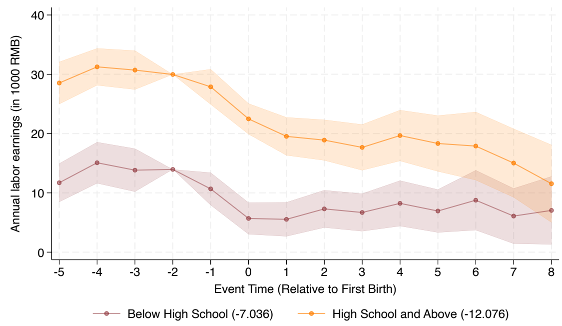
(a) Employment status



(b) Weekly Working Hours

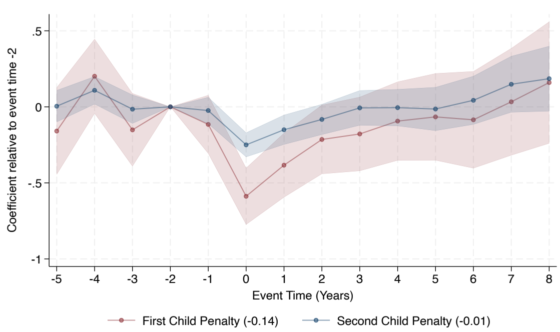


(c) Hourly Wages

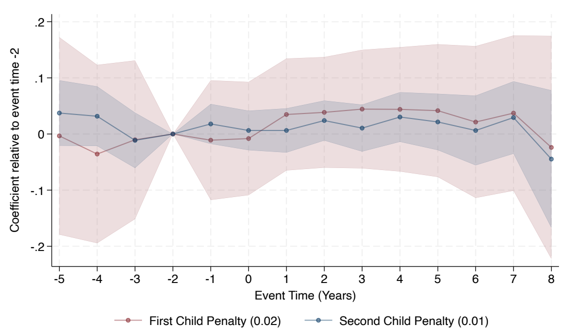


(d) Annual Labor Earnings

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



(a) Women



(b) Men

Figure B.5: Second Child Penalties in Employment

C Model Appendix

C.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

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

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

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

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

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

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

The state variables of a married household are

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

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

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

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

$$V_{T_R+1}^{m,ret}(S_{T_R+1}^{m,ret}) = 0$$

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

Age of the Youngest Child 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, middle childhood, and adolescence or older, respectively.

To reduce the state space, child aging is modeled probabilistically. 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 0–6 category. If children move out ($x_{t+1} = 1$), the household transitions to the no-children state.

The moving out process is described below. Formally, the law of motion for κ_t is given by

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

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

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

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:

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

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. Consequently, after the fertile period T_f has ended, the number of children at home evolves according to

$$n_{t+1} = \begin{cases} 0 & \text{if } x_{t+1} = 1, t > T_f \\ n_t & \text{if } x_{t+1} = 0, t > T_f. \end{cases} \tag{C.4}$$

C.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

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

s.t. time constraint (7), individual budget constraint (11),
home production (6), wage process (8), human capital evolution (9).

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 (10), home production (5), wage process (8), human capital evolution (9), children evolution (12).

The value of entering marriage for individual j is therefore

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

D Estimation Appendix

D.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 D.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 D.1.

Figure D.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.

D.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 D.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 D.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.
* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$

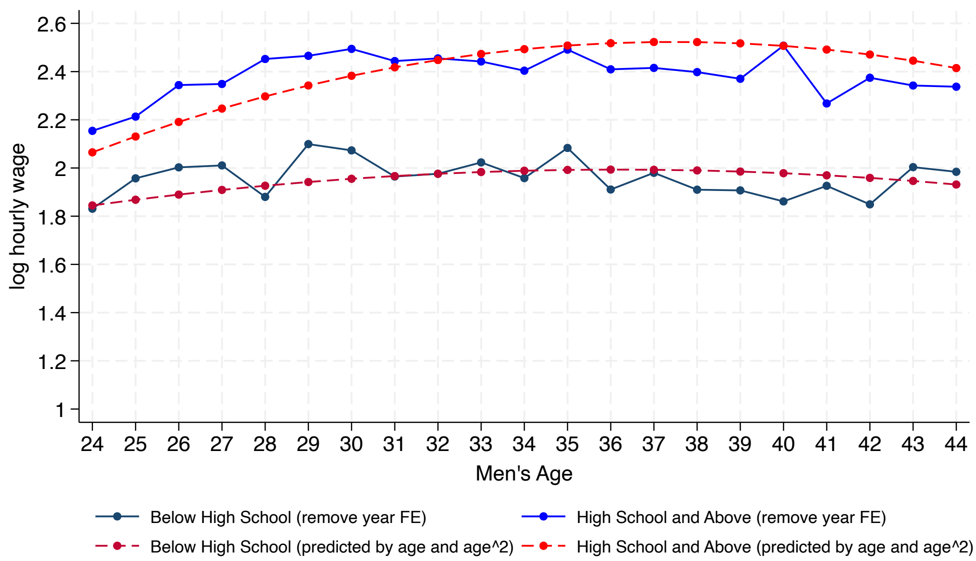


Figure D.1: Wage Profiles of Men over the Life Cycle

Results for single individuals are reported in Table D.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 D.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.

Table D.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.

D.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 D.2. Women are infertile after age 45 and cannot have additional children.

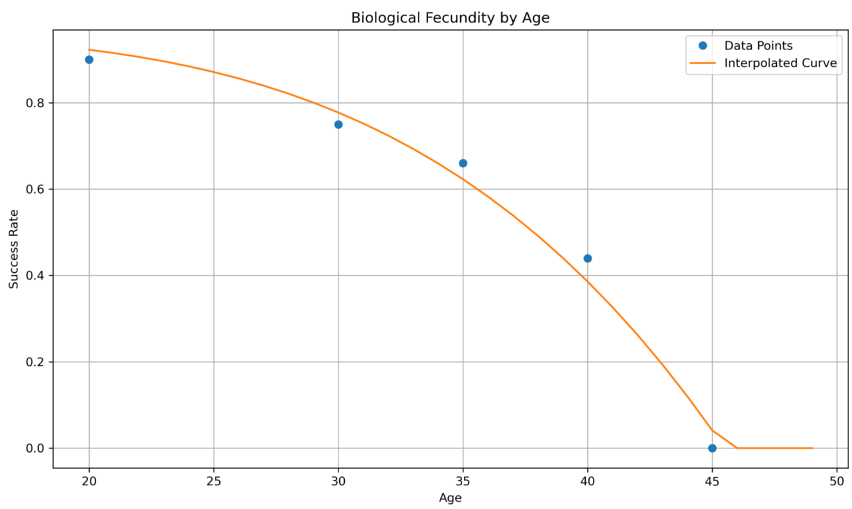


Figure D.2: Biological Fecundity by Women's Age

D.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 D.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. For example, for a single child aged 0–6, the average annual childcare cost is 1,429 RMB for households where the mother has below high school education, compared with 2,807 RMB for households where the mother has high school education or above. Similar patterns are observed for households with two children and for older children, reflecting both the intensity and quality of childcare investments associated with higher-educated families.

Table D.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

D.5 Education-Specific Fertility Constraints

Between ages 22 and 45, the maximum number of children a woman can have, denoted by $n_{\max} = \{1, 2\}$, depends on her education level. 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).

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 D.5 documents substantial differences in completed fertility by education.

Permanent infertility is not modeled. As shown in Table D.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 D.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

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

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

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

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

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

Among women with less than a high school education, the majority have two children (61.2%), compared with 38.8% with one child. In contrast, women with a high school education or higher are more likely to have only one child: 78.5% have exactly one child and 21.5% have two children.

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.

D.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 D.6. The majority of individuals have below a high school education, with 69.8% of women and 67.2% of men falling into this category. Regarding fertility preferences, most individuals prefer two or more children, with 80.4% of women and 79.6% of men indicating an ideal number of children greater than or equal to two.

Table D.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.

D.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

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

where the vector of differences is

$$g'(\Theta) = \left[m_1^{data} - m_1^{sim}(\Theta), \ldots, m_j^{data} - m_j^{sim}(\Theta), \ldots, m_J^{data} - m_J^{sim}(\Theta)\right]$$

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 D.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 D.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 (D.3).

E Counterfactual Appendix

E.1 Long-Run Effects

Figure E.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 E.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 E.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 permenant fertility relaxation.

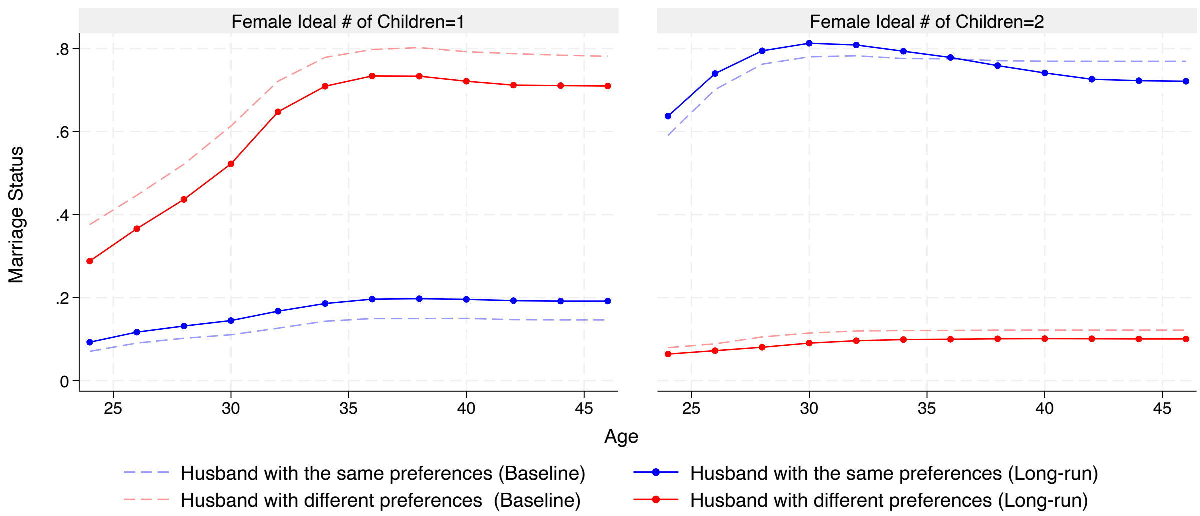


Figure E.1: Marriage Rates over the Life Cycle of Women

E.2 Policy Experiments

Figure E.3 reports long-run average outcomes under permanent fertility relaxation for all women. The first bar in each panel of Figure E.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.

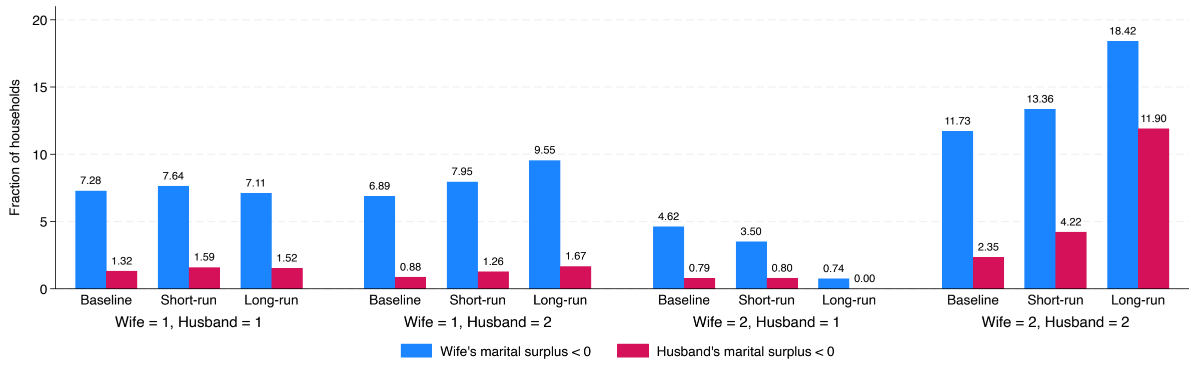


Figure E.2: Fraction of Divorces Initiated by Spouse with Negative Marital Surplus

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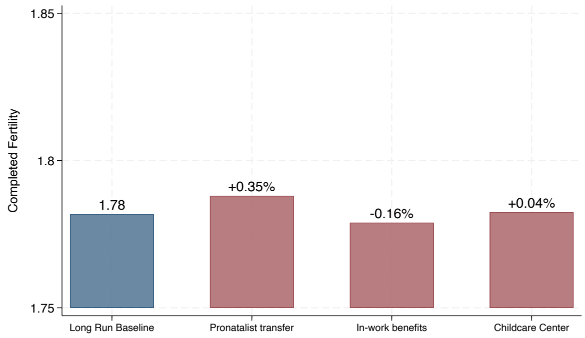
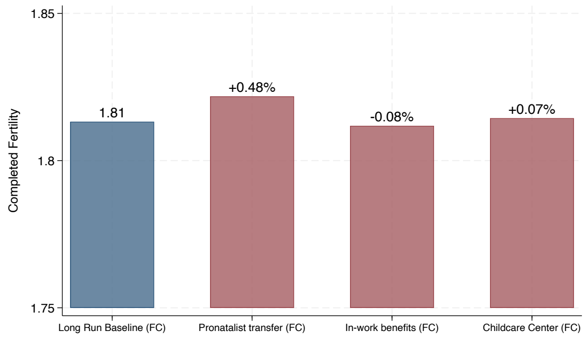
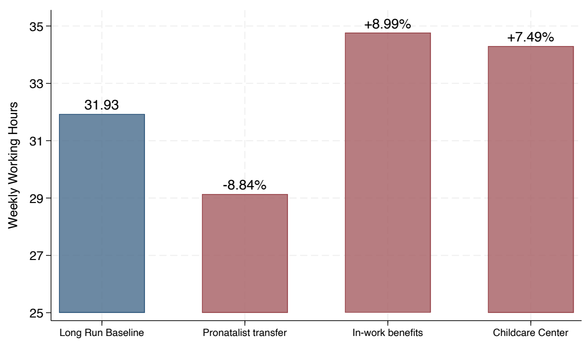


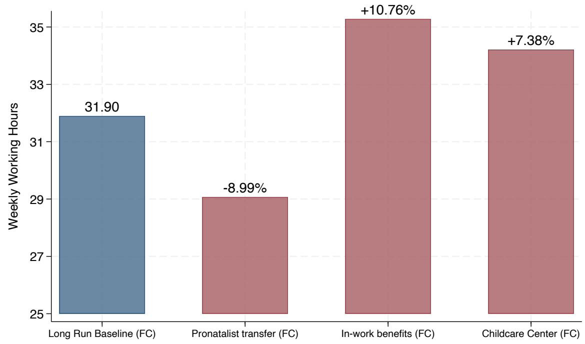
(a) Completed Fertility (Limited Commitment)



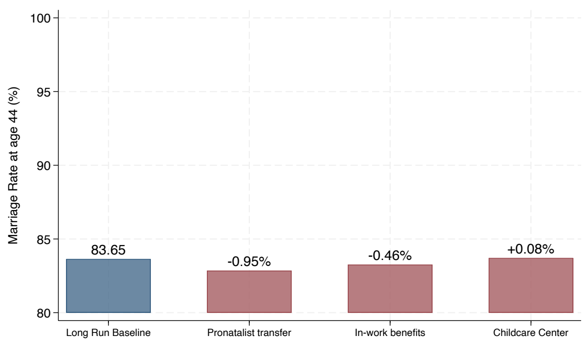
(b) Completed Fertility (Full Commitment)



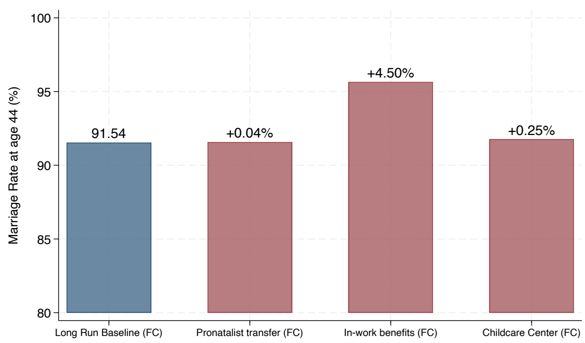
(c) Weekly Working Hours (Limited Commitment)



(d) Weekly Working Hours (Full Commitment)



(e) Marriage Rates (Limited Commitment)



(f) Marriage Rates (Full Commitment)

Figure E.3: Policy Experiments (All Women)

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