Proceedings of ICEMGD 2025 Symposium: Innovating in Management and Economic Development
DOI: 10.54254/2754-1169/2025.LH27674

Income Inequality and the Realization of Fertility Desires in China: Evidence from CGSS Panel Data

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Abstract. China is currently grappling with a critically low fertility rate and rapidly aging population, both of which pose significant threats to its long-term socioeconomic sustainability. Despite the relaxation of the one-child policy, the fertility outcomes remain far below replacement levels, indicating that policy alone is insufficient. This study shifts focus from fertility intentions to the realization of these intentions, examining the impact of regional income inequality on the fertility gap—defined as the difference between an individual's ideal and actual number of children. Using panel data from the China General Social Survey (CGSS) spanning 2013 to 2023, this research employs a two-way fixed effects model at the province and year levels. Results indicate that higher regional income inequality significantly widens the fertility gap, primarily through intensifying individuals' sense of relative deprivation and lowering their perceived socioeconomic status. Furthermore, the heterogeneity analysis indicates that this negative impact is more pronounced among urban residents, individuals aged 30-40, and those residing in the eastern regions of China. These findings underscore the need to address economic inequality and implement targeted policy interventions to foster a more fertility-supportive environment.

Keywords: Income Inequality, Fertility Gap, CGSS, Relative Deprivation, Socioeconomic Status

1. Introduction

In response to declining fertility rates and growing population aging, China has implemented a series of progressive policy relaxations, moving from the one-child policy to the three-child policy. However, fertility outcomes remain unsatisfactory: by 2023, the total fertility rate had dropped to around 1.01, far below the replacement level of 2.1 [1], indicating that the trend of negative population growth has not been reversed. While existing research has emphasized macroeconomic conditions and policy factors, limited attention has been given to micro-level mechanisms. In particular, little is known about how income inequality shapes individuals' ability to realize their fertility desires. Moreover, most studies focus on fertility rates or intentions, overlooking the gap between desired and actual fertility. This study, therefore, investigates how regional income inequality affects individuals' ability to achieve their fertility desires. Utilizing multiple waves of panel data from the China General Social Survey (CGSS), this study employs a two-way fixed-

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effects model to analyze this relationship and examine the mediating roles of relative deprivation and perceived socioeconomic status. This research aims to provide a more nuanced understanding of the socioeconomic barriers to fertility realization. The findings will provide valuable insights for policymakers, indicating that future strategies should not only focus on pronatalist measures but also address underlying economic disparities and socio-psychological pressures to effectively support individuals in realizing their fertility goals.

2. Theoretical framework and hypotheses

2.1. Fertility determinants in China

Research on fertility in China has identified three broad sets of determinants. At the micro level, education, gender norms, and employment status shape reproductive choices, with higher educational attainment and the rising opportunity costs of female employment generally associated with lower fertility intentions [2-5]. Institutional constraints such as housing prices, social security, and fiscal policies also matter: while public expenditures and tax incentives may encourage fertility, land finance and escalating housing and education costs are found to depress it [5-9]. Beyond objective economic factors, subjective perceptions such as happiness, security, and satisfaction with public services have been found to correlate positively with desired fertility [10].

2.2. Inequality and fertility outcomes

An emerging strand of literature emphasizes the role of income inequality. Studies suggest that greater inequality restricts access to resources, heightens educational anxiety, and lowers perceived social mobility, thereby reducing fertility intentions [11-13]. This raises a broader question of whether structural constraints, such as inequality, translate into obstacles in achieving intended demographic outcomes.

2.3. From intentions to outcomes: the fertility gap

Building on these insights, this paper contributes by shifting attention from intentions to outcomes, focusing on the fertility gap—the discrepancy between desired and actual number of children. This perspective allows us to evaluate how inequality may not only shape intentions but also hinder the realization of those intentions. Two key psychological mechanisms are considered:

Relative deprivation. Income inequality can heighten perceptions of unfairness and class rigidity, leading to anxiety and reduced confidence in long-term commitments such as childbearing [11,14].

Subjective socioeconomic status. Perceptions of one's social standing influence optimism about the future. In high-inequality contexts, individuals may feel they have lower status and fewer opportunities for upward mobility, which discourages fertility [10,15].

2.4. Hypotheses

Hypothesis 1 (H1): Individuals living in regions with higher levels of household income inequality experience larger fertility gaps, which reflects a lower realization of their fertility intentions.

Hypothesis 2a (H2a): Income inequality increases relative deprivation, which in turn reduces the realization of fertility intentions.

Hypothesis 2b (H2b): Income inequality lowers perceived socioeconomic status, thereby hindering the realization of fertility intentions.

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3. Data and variable description

3.1. Methodology

3.1.1. Data source

The analysis draws on six waves of the China General Social Survey (CGSS, 2013–2023), covering 30 provinces (excluding Hong Kong, Macao, and Taiwan). After excluding missing values and extreme values, a pooled dataset of 17,355 respondents was constructed with harmonized variable definitions.

3.1.2. Variable description

Dependent Variable. The outcome of interest is the fertility gap, defined as the difference between the ideal and actual number of children. Following standard demographic research [15], we adopt the "ideal minus actual" approach, which captures long-term structural barriers to fertility realization. Responses outside the range of 0–10 were excluded to ensure validity.

Key Independent Variable. Provincial household income inequality is measured by the Mean Log Deviation (MLD) index, with robustness checks using the Gini coefficient yielding consistent results. The household-level measure better reflects fertility decision-making than individual income.

Control Variables. Individual controls include gender, age, education, marital status, health status, and hukou. Household-level controls cover income, assets, car ownership, investment behavior, and subjective socioeconomic status. Year and province fixed effects are included to absorb unobserved macro variation.

Descriptive Statistics. On average, respondents report a fertility gap of 0.75, indicating actual fertility falls short of ideals. The mean fertility desire is 1.87, while average provincial inequality (MLD) is 0.35, with large inter-provincial variation. Summary statistics are presented in Table 1.

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Table 1. Descriptive statistics table

Variable	Description	Mean	SD	Min	Max
fertility_decision	Fertility gap (desired minus actual children)	0.75	0.85	0	10
fertility_desire	Desired number of children	1.87	0.79	0	10
MLD_fam	MLD index (by province)	0.35	0.16	0.07	1.21
Gini_fam	Gini index (by province)	0.43	0.08	0.2	0.72
age	Age of respondent	39.66	10.22	17	60
marriage	Marital status (1 = married)	0.81	0.39	0	1
hukou	Household registration type (1 = urban)	0.47	0.50	0	1
gender	Gender (1 = male)	0.56	0.50	0	1
educ	Years of education	11.68	3.74	4	21
self_reported_health	Self-rated health status	4.01	0.86	1	5
kids	Number of children	1.10	0.75	0	6
annualwage	Individual annual wage income	67015.56	253482.70	0	9948000
annual_family_income	Annual family income	116194.20	222060.10	0	9970000
house_property	Number of owned properties	1.16	0.75	0	30
own_car	Car ownership (1 = owns a car)	0.41	0.49	0	1
investment	Investment behavior (1 = has investment)	0.32	0.47	0	1
socioeconomic_status	Subjective socioeconomic status (1 = low, 5 = high)	2.75	0.68	1	5

Model Specification. We estimate two-way fixed effects models at the province and year levels:

$$FerGap_{it} = a + b \cdot MID_{pt} + g \sum IC_{ipt} + m_p + l_t + \varepsilon_{it} \quad (1)$$

where FerGap_{it} represents the fertility gap of individual i in year t. MLD_{pt} represents the income inequality, and IC_{ipt} are individual and household controls, and μ_P and λ_t capture province and year fixed effects.

4. Empirical results and discussion

Baseline Regression. Table 2 presents the baseline results using provincial MLD as the core explanatory variable. Controlling for individual, household, year, and province effects, income inequality is found to significantly increase the fertility gap.

Table 2. Baseline regression results (SE clustered by year)

	Dependent variable:				
	No Controls (1)	+Demographics (2)	Fertility Gap +SES (3)	+Assets/Income (4)	+Full Controls (5)
MLD fam	0.057	0.050	0.068	0.069*	0.072*
_	(0.037)	(0.035)	(0.042)	(0.042)	(0.042)
gender		0.102***	0.088***	0.088***	0.089***
		(0.011)	(0.011)	(0.011)	(0.011)

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age		- 0.105*** (0.003)	- 0.063*** (0.004)	-0.065*** (0.004)	-0.064*** (0.004)
I(age^2)		0.001*** (0.00004)	0.001*** (0.00004)	0.001*** (0.00004)	0.001*** (0.00004)
educ			0.027***	0.024***	0.024***
			(0.002)	(0.002)	(0.002)
self_reported_health			- 0.0001	0.0003	- 0.002
			(0.007)	(0.007)	(0.007)
marriage			- 0.482*** (0.018)	- 0.479*** (0.018)	- 0.480*** (0.018)
hukou				0.049***	0.048***
				(0.013)	(0.013)
own car				0.002	- 0.005
_				(0.013)	(0.013)
house_property				0.001 (0.012)	- 0.001 (0.013)
investment				0.001	- 0.001
				(0.017)	(0.017)
annualwage				0.00000 (0.00000)	0.00000 (0.00000)
economic status					0.024***
_					(0.009)
Constant	0.707*** (0.014)	3.153*** (0.071)	2.209*** (0.085)	2.232*** (0.087)	2.187*** (0.088)
Year FE	No	No	Yes	Yes	Yes
Province FE	No	No	Yes	Yes	Yes
Observations	17,355	17,355	17,355	17,355	17,355
R^2	0.0001	0.132	0.207	0.208	0.208
Adjusted R^2	0.0001	0.132	0.205	0.206	0.206
Residual Std. Error	0.782	0.729	0.698	0.698	0.697
F Statistic	2.253	651.468***	114.785***	102.195***	100.145***

Note: *p<0.1; **p<0.05; ***p<0.01

Robustness Checks. To ensure robustness, alternative specifications were estimated. Replacing MLD with the provincial Gini coefficient yields consistent results (Table 3). Similarly, substituting the dependent variable with a binary indicator of whether individuals desire two or more children produces qualitatively similar findings. Restricting the sample to provinces with at least 100 respondents also does not alter the results (Table 4). Collectively, these checks confirm the stability of the baseline conclusion.

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Table 3. Robustness check: substituting key independent variables

	Dependent variable:	
	MLD (Family)(1)	fertility_gap Gini (Family)(2)
MLD_fam_z	0.011* (0.006)	
Gini_fam_z		0.014** (0.007)
Year FE	Yes	Yes
Province FE	Yes	Yes
Observations R^2 Adjusted R^2	17,355 0.207 0.205	17,355 0.207 0.205

Table 4. Robustness check: alternative dependent variables and sample adjustments

	Dependent variable:			
	fertility_gap OLS Baseline (1)	fertility_2plus logistic probit Logit (Fertility ≥2) (2)	 Probit (Fertility ≥2) (3)	fertility_gap OLS Sample ≥100 (4)
MLD_fam	0.073* (0.042)	0.293* (0.160)	0.159* (0.092)	0.074* (0.042)
Observations	17,355	17,355	17,355	17,355
R^2	0.207			0.207
Adjusted R^2	0.205			0.205
Log Likelihood		- 8,987.806	- 8,978.253	
Akaike Inf. Crit.		18,067.610	18,048.510	

Policy Adjustments. Given China's recent fertility policy reforms, we further control for the universal two-child (2016) and three-child (2021) policies by including policy dummies. Results (Table 5) remain robust, suggesting that the effect of inequality on fertility realization is not driven by policy shifts.

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Table 5. Controlling for policy changes

	Dependent variable:			
	fertility_gap			
	Baseline	Post-2016	Post-2021	Both Policies
	(1)	(2)	(3)	(4)
MLD_fam	0.072*	0.066*	0.084**	0.083**
	(0.042)	(0.039)	(0.040)	(0.040)
post2016		- 0.040***		- 0.027**
		(0.013)		(0.013)
post2021			- 0.060***	- 0.050***
			(0.015)	(0.016)
Year FE	Yes	No	No	Yes
Province FE	Yes	Yes	Yes	Yes
Observations	17,182	17,182	17,182	17,182
R^2	0.208	0.207	0.208	0.208
Adjusted R^2	0.206	0.206	0.206	0.206
Residual Std. Error	0.697	0.698	0.697	0.697
F Statistic	102.424***	112.163***	112.365***	109.741***

Endogeneity Treatment. To mitigate endogeneity, this study employs several strategies. First, income inequality is measured using both the MLD index and the Gini coefficient, with consistent results. Second, the fertility gap is directly derived from CGSS questions on ideal and actual children, avoiding proxy bias. Third, rich individual and household controls, together with province and year fixed effects, alleviate omitted variable bias. Finally, reverse causality is unlikely, as individual fertility gaps cannot meaningfully affect regional inequality in the short run.

Mechanism Analysis. Results in Table 6 provide evidence for the proposed mediating channels. Inequality significantly increases residents' sense of relative deprivation, which in turn reduces fertility realization, confirming H2a. Similarly, inequality lowers perceived socioeconomic status, which is positively associated with achieving fertility desires, confirming H2b. Together, these findings suggest that inequality affects fertility not only through economic costs but also via psychological pathways involving social comparison and status perception

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Table 6. Mechanism analysis: relative deprivation and socioeconomic status

	Dependent variable:			
	relative_gap Stage 1: RelGap (1)	fertility_gap Stage 2 (2)	socioeconomic_status Stage 1: EconStat (3)	fertility_gap Stage 2 (4)
MLD_fam	0.568*** (0.103)	0.077* (0.042)	- 0.112*** (0.039)	0.073* (0.042)
relative_gap		- 0.006* (0.003)		
socioeconomic_status	- 0.319*** (0.022)	0.023** (0.009)		0.025*** (0.009)
Year FE	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes
Observations	17,355	17,355	17,355	17,355
R^2	0.139	0.207	0.130	0.207
Adjusted R^2	0.137	0.205	0.127	0.205
Residual Std. Error	1.724	0.697	0.638	0.697
F Statistic	63.738***	100.645***	59.921***	102.811***

Heterogeneity Analysis. The effects of inequality on fertility realization are not uniform (table 7). First, urban residents show a stronger response: greater inequality significantly enlarges the fertility gap, reflecting both higher living costs and more intense social comparisons. Rural effects are weaker. Second, by age, the impact is concentrated among those aged 30–40, who face overlapping career and family pressures; effects are insignificant among the under-30 group (whose fertility plans are not yet realized) and the over-40 group (whose fertility is largely completed). Third, regional differences show that inequality matters most in the eastern provinces, where service-based economies, higher costs, and more individualistic values intensify status concerns. In contrast, central and western regions exhibit weaker or insignificant effects, possibly due to lower living costs and the persistence of family-oriented cultural norms.

Table 7. Heterogeneity analysis of income inequality on fertility gap

	Dependent variable: fertility_gap							
	Urban	Rural	Under 30	Age 30–40	Over 40	East	Central	West
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
MLD_fam	0.107* (0.063)	0.033 (0.056)	- 0.093 (0.106)	0.200*** (0.077)	0.048 (0.056)	0.198** (0.084)	- 0.149 (0.118)	0.020 (0.052)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	7,977	9,205	3,237	4,911	9,034	6,677	4,344	6,161
R^2	0.165	0.244	0.189	0.171	0.048	0.221	0.182	0.214
Adjusted R^2	0.160	0.240	0.178	0.163	0.043	0.218	0.177	0.211

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5. Conclusion

Using six waves of CGSS data from 2013 to 2023, we estimate two-way fixed effects models and find that higher provincial income inequality significantly enlarges the fertility gap, a result robust across multiple checks.

Mechanism analysis shows that inequality heightens relative deprivation and lowers perceived socioeconomic status, both undermining fertility realization. Heterogeneity analysis reveals stronger effects among urban residents, those aged 30–40, and eastern provinces, where costs and social comparisons are most acute.

These results carry several policy implications. First, reducing inequality is essential: policies should strengthen redistribution and expand the middle-income group. Second, fertility-support policies should be regionally differentiated—in eastern provinces need cost reduction measures, while central and western regions require economic revitalization. Third, targeted measures should ease the high costs for families in their 30s and raise income expectations for younger cohorts to narrow the fertility gap.

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