【研究論文】

Economic Determinants of Fertility in Contemporary China : A Multilevel Analysis

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Summary

This study investigates the impact of economic variables on fertility patterns in China, leveraging data from the Chinese General Social Survey from 2010 to 2015. Employing a multilevel-ordered regression model, the analysis accounts for regional heterogeneity, offering an understanding of how income inequality, gross domestic product (GDP) per capita, family income, and employment status shape preferences for the desired number of children and contribute to the fertility gap. A notable finding is the presence of an inverted U-shaped relationship between GDP per capita and fertility preferences. The results underscore the importance of balancing economic development with social equity to effectively address the evolving demographic landscape in contemporary China.

Key Words

Fertility, Regional Heterogeneity, Income Inequality, GDP, Chinese General Social Survey

1 . Introduction

China is on the verge of a pivotal demographic shift, transitioning from a period of population growth to an anticipated decline. In the past, numerous scholars and institutions assumed a considerably high fertility rate for China. For instance, the United Nations relied on a total fertility rate of 1.7 to forecast China's population dynamics (Cai, 2022). However, findings from the seventh national population census in 2020 revealed a more modest actual total fertility rate of 1.3.

The China Population and Development Research Center, along with the United Nations Population Fund in China (2022), conducted a probabilistic forecast for the total fertility rate. By 2050, the 0-14 age group is predicted to constitute only 11.6% of the total population, whereas the proportion of individuals aged 65 and above is expected to reach 30.8% of the total population. The sustained decrease in fertility and longer lifespans are likely to lead to a significantly older population as well as a reduction in population size, producing a range of noteworthy social consequences, such as slowed economic growth and increased labor costs (Hondroyiannis and Papapetrou, 2001; Lu and Cai, 2014).

Family planning policies have significantly influenced China's demographic transition. The Chinese Communist Party initially promoted higher birth rates but later realized the need for family planning. In 1979, the "one-child" policy

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was introduced to control fertility. To address the declining birth rate and aging population, restrictions on childbirth were gradually relaxed. In 2013, families wherein one spouse was an only child were allowed to have two children. In 2015, the "Population and Family Planning Law" recommended two children per couple. In 2021, the government further relaxed childbirth constraints, allowing couples to have three children, with additional measures to enhance fertility policy (Fudan University, 2015). The long-term implementation of the "one-child" policy has led to drastic changes in the population structure, with the fertility rate remaining low for an extended period. Concurrently, reforms in China's economic system and improvement in people's living standards since the reform and opening-up era may have substantially influenced fertility behaviors. Despite recent policies aimed at promoting childbirth, fertility rates remain consistently low.

Wang (2010) suggests that China's population policy has influenced fertility preferences but is not the exclusive or most significant factor contributing to the low fertility rate. Factors affecting low fertility rates in other countries, including economic factors like income inequality and individual employment situations, could also impact China (Zheng et al., 2009; Cai, 2010). While fertility behavior has been extensively researched in developed countries, few studies have considered the impact of economic factors, such as income inequality, on fertility preferences and behavior in China. This study aims to address this gap by examining the factors influencing the desired number of children and the fertility gap in China, considering the country's population control policies and the current economic landscape. Utilizing microdata from the Chinese General Social Survey (CGSS) of 2010, 2012, 2013, and 2015 and employing a multilevel-ordered logistic model, the study assesses the impact of economic factors on desired number of children and the fertility gap. The study provides policy considerations based on the empirical findings, with the potential to mitigate the effects of declining birthrates and an aging population if individuals can attain their desired number of children.

The remainder of this study is organized as follows: Section 2 reviews the relevant literature, while Section 3 describes the data and empirical models. Section 4 summarizes the empirical findings. Finally, Section 5 concludes the study and explores potential avenues for addressing demographic challenges.

2. Literature review

2.1. Fertility aspirations

Comprehending the correlation between desired and actual fertility rates is crucial for understanding economic developments and forecasting future population dynamics. In predicting future population sizes, Pritchett (1994) emphasized the significance of the desired number of children, revealing that nearly all differences in actual fertility rates among countries stem entirely from variations in desired fertility rates. Moreover, in countries with higher fertility rates, women tend to desire more children than men. Sobotka (2009) utilized micro-census data from Austria to demonstrate that Austria's intended fertility rates began to decline to below replacement levels in the mid-1950s onwards, with subsequent cohorts maintaining similarly low fertility rates throughout their reproductive years.

Many scholars have extensively investigated the factors influencing the desire to have children. Using Dutch panel survey data, Liefbroer

(2009) examined intentions regarding family size, revealing that the intentions of some respondents remain constant as they age, whereas those of others tend to decrease, contributing to an overall downward trend. Additionally, individuals with higher education levels tend to desire families with more children (Heiland et al., 2005; Mills et al., 2008).

2.2. Fertility gap

Studies have suggested that individuals in different developed countries and regions typically desire two children, yet many struggle to achieve this aspiration, resulting in fertility rates persistently remaining below replacement levels (Philipov, 2009; Beaujouan and Berghammer, 2019). The term "fertility gap," introduced by Chesnais (1999), denotes the disparity between the desired and the actual number of children. This phenomenon is observed not only in developed countries but also in developing countries such as China and Iran (Wang and Wang, 2016; Hosseini et al., 2021). Drawing on data from the European demographic data sheet and other sources, Gauthier and Philipov (2008) examined the relationship between fertility policies and birth rates in various European countries, demonstrating that the implementation of fertility support policies can eliminate barriers to fertility and thus facilitate the achievement of the desired number of children.

A significant body of literature has discussed the fertility gap. Bongaarts (2001) introduced an analytical model to explore the factors influencing low fertility rates, using the desired number of children as a comparative benchmark. The model examines the shift from desired fertility to actions and identifies facilitating factors such as "unwanted fertility," "replacement of deceased children," and "sex preferences," as well as hindering factors including "rising age at childbearing," "involuntary infertility," and "competing preferences."

Based on Bongaarts's (2001) study, Morgan and Rackin (2010) utilized the 1979 National Longitudinal Survey of Youth and employed a multinomial logistic regression. Their findings suggest that social norms and various constraints significantly impact the timing of parenthood for men and women. Consequently, the accumulation of human capital and competitive demands of work contribute to disparities between fertility intentions and actual fertility.

2.3. Economic factors and fertility behavior

The current study specifically focuses on "competing preferences," which implies that achieving a balance between work and childcare is a considerable challenge when individuals prioritize career advancement or higher income. Many studies have indicated that as income increases, the desire for fertility decreases, as parents prioritize investing in the quality of their children (Bollen et al., 2007; Cordoba and Ripoll, 2016). However, a gap remains in the understanding of the relationship between income inequality and fertility behavior. Japaridze's (2019) model introduced a family consumption level comparison as a factor, considering the utility of childbearing. The results suggest that low-income families tend to mirror the consumption behaviors of higher-income households, connecting their consumption decisions with choices related to childbearing. Further, economic considerations play a greater role in childbearing decisions in regions with higher income inequality, where low-income families are exposed to higher consumption standards. Employing empirical regression analysis using data from the 2010 American

Community Survey, Japaridze (2019) found a negative correlation between income inequality and fertility rates, indicating that higher income inequality is associated with reduced fertility rates.

2.4. Main issues in the research field

Despite extensive research on fertility behavior, the existing literature lacks a comprehensive understanding of how regional heterogeneity and economic disparities specifically impact fertility decisions. In China, fertility levels across various provinces are inconsistent, mirroring differing developmental statuses and substantial income disparities among provinces. To fill this gap, this study uses a multilevel-ordered regression model. It also analyzes the regional disparities in fertility levels, addressing the heterogeneity among provinces to provide a more comprehensive understanding of fertility trends.

In addition, prior studies lack a deep understanding of the economic factors, such as income inequality, that may influence the gap between desired and actual fertility. Furthermore, there is limited empirical evidence addressing these issues within the Chinese context, where rapid economic development and significant regional heterogeneity present unique challenges and opportunities for understanding fertility behaviors. This study aims to address these deficiencies by exploring the relationship between income inequality and the desired number of children, providing a more detailed examination of how economic factors influence fertility behavior. Through this approach, the study aims to elucidate the underlying economic drivers of the fertility gap and suggest potential policy interventions to narrow this gap.

3. Data and model

3.1. Chinese general social survey

The data employed in this study are sourced from the CGSS of 2010, 2012, 2013, and 2015; this project is facilitated by the National Survey Research Center at Renmin University of China. Since 2003, the CGSS has encompassed cross-sectional surveys covering approximately 10,000 households across provinces, cities, and districts of mainland China. The study utilized data from 2010 onwards, considering the extraction design and the presence or absence of variables used.

3.2. Desired number of children and fertility gap

This section provides an overview of the sample population's desired number of children and the fertility gap. Regarding the desired number of children, the CGSS posed the question, "If no policy restrictions existed, how many children would you wish to have?" The actual number of children corresponded to respondents' current number of children. Cases in which either the desired or actual number of children exceeded six were excluded because of the very small sample sizes. The fertility gap is typically described as the difference between lifetime family size ideals or intentions and the period indicators of fertility in the recent past, such as the total fertility rate (Testa, 2012; Beaujouan and Berghammer, 2019). In this study, the fertility gap is defined as the difference between the desired number of children and the actual number of children, specifically calculated as the desired number of children minus the actual number of children[1)].

This study focuses on individuals aged between 18 and 45 years. Table 1, illustrating the distribution of the desired and actual number of

Table 1 Distribution of desired and actual number of children

Desired number	Frequency	Percent	Actual number	Frequency	Percent
0	248	1.57	0	3460	21.94
1	4048	25.67	1	7567	47.98
2	10497	66.56	2	4044	25.64
3	799	5.07	3	610	3.87
4	166	1.05	4	79	0.50
5	13	0.08	5	11	0.07
Total	15771	100.00	Total	15771	100.00

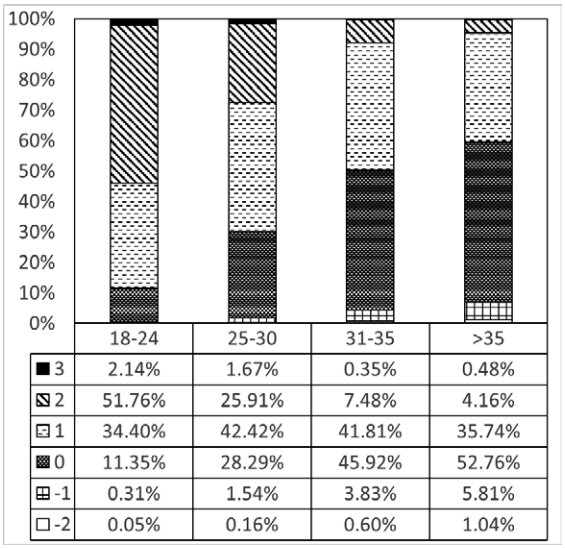

Figure 1 Fertility gap distribution at different age ranges

NOTE: Values ranging from −2 to 3 represent the deviation between the actual and desired number of children. Specifically, 0 indicates parity between actual and desired number, while negative and positive values denote an excess and shortfall in the desired number of children, respectively.

children, indicates that approximately 67% and 26% of individuals aspired to have two children and one child, respectively. Those with no desire for children or desiring four or more children represent less than 3% of the total number of cases. These findings are corroborated by the existing literature; for example, Wang and Wang (2016) suggest that the ideal number of children for Chinese individuals hovers around two (1.86, to be precise), while Song and Hu (2022) report that over 57% of Chinese couples aspire to have two children and 30% one child.

Regarding the actual number of children, Table 1 illustrates that approximately 48% of individuals had only one child, 26% had two children, and 22% had no children. Those with three or more children constituted less than 5% of the total sample. Therefore, despite the traditional belief in China that more children bestow more blessings, restrictions such as the "one-child" policy have resulted in Chinese individuals typically having fewer than three children. Consequently, they often tend to have fewer children than they desire.

Figure 1 illustrates the shift in the gap between the desired and actual number of children

across different age groups. Only 11% of individuals aged 18-24 years attained their desired number of children. Approximately 0.5% had more children than desired, whereas the majority (88%) had not achieved their desired family size. As age increases, the proportion of individuals who achieve the desired number of children gradually rises. Among those with fewer actual children than desired, the proportion of individuals with a fertility gap of two decreased as their age increased, whereas the proportion of those with a gap of one increased. Notably, even among individuals over 35 years of age, approximately 40% had not achieved their desired number of children.

3.3. Covariates

This study investigates the factors influencing the desired number of children and the fertility gap, focusing primarily on four economic indicators as the main explanatory variables:

1. The Gini coefficient, denoting income inequality for each province;

2. Gross domestic product (GDP) per capita (log transformation) for each province;

3. Family income (log transformation); and

4. Employment status (employed=1, unemployed=0).

Individual income data from the CGSS were used to calculate the Gini coefficients for each province, as the National Bureau of Statistics of China (2010-2016) does not publicly release Gini coefficients at the provincial level.

Adjustments for GDP per capita involved utilizing the Consumer Price Index to align incomes with the 2009 consumption levels. Data on the Consumer Price Index, GDP, and population were sourced from the China Statistical Yearbook for the respective years under consideration.

Table 2 Descriptive statistics for total sample

Variable	Obs	Mean	St.dev	Min	Max
Desired number of children	15771	1.7861	0.6116	0.0000	5.0000
Actual number of children	15771	1.1322	0.8181	0.0000	5.0000
Fertility gap	15771	0.6539	0.8357	−2.0000	3.0000
Gini coefficient	15771	0.5089	0.0898	0.2299	0.8594
log (GDP percapita)	15771	10.6357	0.4658	9.4901	11.5797
log (Family income)	15771	10.5113	1.1677	0.0000	16.0593
Employed	15771	0.8174	0.3864	0.0000	1.0000
Age	15771	34.3686	7.4195	18.0000	45.0000
Marriage					
Unmarried	3163	0.2006	0.4004	0.0000	1.0000
Marrired	12608	0.7994	0.4004	0.0000	1.0000
Sex					
Male	7731	0.4902	0.4999	0.0000	1.0000
Female	8040	0.5098	0.4999	0.0000	1.0000
Education					
Illiterate	527	0.0334	0.1797	0.0000	1.0000
Compulsory education	7891	0.5003	0.5000	0.0000	1.0000
High school	3232	0.2049	0.4037	0.0000	1.0000
Junior college	1890	0.1198	0.3248	0.0000	1.0000
University and above	2231	0.1415	0.3485	0.0000	1.0000

Information on family income and individual employment status was obtained from the CGSS. Similar adjustments were made to standardize family income to the same reference point. In addition, the explanatory variables included individual characteristics such as age, education level (illiterate=0, compulsory education=1, high school=2, junior college=3, university and above=4), and marital status (married and currently cohabiting=1, otherwise=0). Respondents with covariates with missing values were excluded from analysis[2]. Descriptive statistics are presented in Table 2.

3.4. Model

This study utilized two regression models to analyze the desired number of children and the fertility gap, both categorized into six levels. The first model examined factors influencing the desired number of children, while the second focused on factors affecting the fertility gap. Separate regression analyses were conducted for male and female subgroups within the sample. Recognizing the ordered nature of the desired number of children and the fertility gap, they were treated as ordinal data in the analysis, acknowledging their non-normal distributions.

While previous studies, such as Morgan and Rackin (2010), have discussed the gap between desired and actual children, they have often overlooked regional variations. China's vast size means diverse economic conditions across its provinces, which can influence attitudes toward childbirth and actual fertility levels. Surveyed individuals were dispersed across provinces, creating a multilevel structure. To address heterogeneity across provinces and considering the structure of the survey data, a multilevel-ordered logistic model was employed[3]. Level 1 included surveyed individuals and variables related to income inequality, economic conditions, and individual characteristics. Level 2 included the provinces[4].

The model is specified as follows. In this random intercept model, where i represents individuals and j represents groups, which in this study are the provinces. y_{ij} is the number of desired children or the fertility gap, while k indicates the category of each dependent variable. $\boldsymbol{\kappa}$ represents the cut points that indicate the thresholds (the points at which the probability of observing a particular category change to the probability of observing the next higher category). $\boldsymbol{\eta}_{ij}$ represents the linear predictor, $\in_{ij}$ represents the error term, $\mathbf{x}_{ij}$ is the vector of fixed-effect covariates, $\boldsymbol{\beta}$ is the associated vector of coefficients, and $\mathbf{u}_j$ is a set of cluster-level random effects. More comprehensive information can be found in StataCorp (2021, pp. 346-347).

$$
\begin{aligned}
p_{ij} &= \Pr(y_{ij}=k \mid \boldsymbol{\kappa}, \mathbf{u}_j) \\
&= \Pr(\kappa_{k-1} < \boldsymbol{\eta}_{ij} + \in_{ij} \leq \kappa_k) \\
&= \frac{1}{1+\exp(-\kappa_k + \boldsymbol{\eta}_{ij})} - \frac{1}{1+\exp(-\kappa_{k-1} + \boldsymbol{\eta}_{ij})} \\
&\text{where } \boldsymbol{\eta}_{ij} = \mathbf{x}_{ij}\boldsymbol{\beta} + \mathbf{u}_j
\end{aligned}
$$

4. Regression results

4.1. Desired number of children analysis

Table 3 presents the regression outcomes for the desired number of children and fertility gap[5]. The ensuing discussion adheres to a significance level of 5%. Columns 1 and 2 of Table 3 present the results of the desired number of children for men and women, respectively. While both groups demonstrate some similar trends regarding educational attainment and marital status, there are also key differences. For example, individuals with higher levels of education, such as high school or university graduates, tend to desire fewer children com-

Table 3 Regression results for desired number of children and fertility gap

	(a) Desired number of children		(b) Fertility gap	
	Male	Female	Male	Female
Gini	1.2303***	1.0698**	−0.2192	−0.2775
	(0.4392)	(0.4593)	(0.2915)	(0.3010)
log (GDP per capita)	−1.6427	7.2880***	9.1450***	−1.5270
	(4.1704)	(2.5770)	(2.9111)	(2.4871)
log (GDP per capita)_squared	0.1023	−0.3215***	−0.4189***	0.0796
	(0.2004)	(0.1234)	(0.1374)	(0.1181)
log (Family income)	0.0320	0.0198	0.0605*	0.0632**
	(0.0235)	(0.0208)	(0.0350)	(0.0267)
Employed	0.1706**	0.0003	0.1171	0.2130***
	(0.0800)	(0.0734)	(0.0955)	(0.0762)
Age	−0.0741***	0.0321	−0.3253***	−0.6589***
	(0.0284)	(0.0290)	(0.0485)	(0.0458)
Age_squared	0.0012***	−0.0002	0.0031***	0.0080***
	(0.0004)	(0.0004)	(0.0007)	(0.0007)
Education				
Compulsory education	−0.3444	−0.6854***	0.2304	1.0236***
	(0.2657)	(0.1593)	(0.3113)	(0.1679)
High school	−0.7811***	−1.1584***	0.8978***	2.0860***
	(0.2789)	(0.2087)	(0.3150)	(0.1818)
Junior college	−0.7036**	−1.0956***	1.4785***	2.5133***
	(0.2785)	(0.1758)	(0.2992)	(0.1674)
University and above	−0.6377**	−0.7787***	1.8834***	2.8761***
	(0.2821)	(0.2023)	(0.3045)	(0.1708)
Marriage	0.6030***	0.2541***	−2.9105***	−1.9681***
	(0.0870)	(0.0865)	(0.0985)	(0.0905)
Desired number of children				
1			3.9859***	3.6964***
			(0.1981)	(0.2220)
2			7.2040***	6.9430***
			(0.2859)	(0.3419)
3			9.8992***	8.9589***
			(0.4599)	(0.5569)
4			11.9165***	12.1767***
			(0.7998)	(1.0237)
5			11.6619	14.3269***
			(8.2955)	(4.9484)
/cut1	−10.3752	37.6305	40.1844	−20.1908
/cut2	−7.0865	40.8942	42.6966	−17.9143
/cut3	−3.0505	45.0013	47.2892	−13.3146
/cut4	−1.0810	46.6736	50.8576	−9.6229
/cut5	1.4928	49.3871	55.8281	−4.5961
Province				
var (_cons)	0.5922	0.5084	0.2574	0.3856
Number of obs	7731	8040	7731	8040
Number of groups	28	28	28	28
Obs per group:				
Min	46	73	46	73
Avg	276.1	287.1	276.1	287.1
Max	515	474	515	474
Wald chi2 test	Wald chi2(12) = 261.48	Wald chi2(12) = 205.80	Wald chi2(17) = 3655.07	Wald chi2(17) = 11483.99

NOTE: For the symbols, *p<.1, **p<.05, ***p<.01. The reference category for the number of desired children is set to 0. The cut point(/cut) represents the κ in the model's section (3.4). var (_cons) refers to the variation in the regional estimates. The Wald chi-squared test is used to test the null hypothesis that all coefficient values are zero.

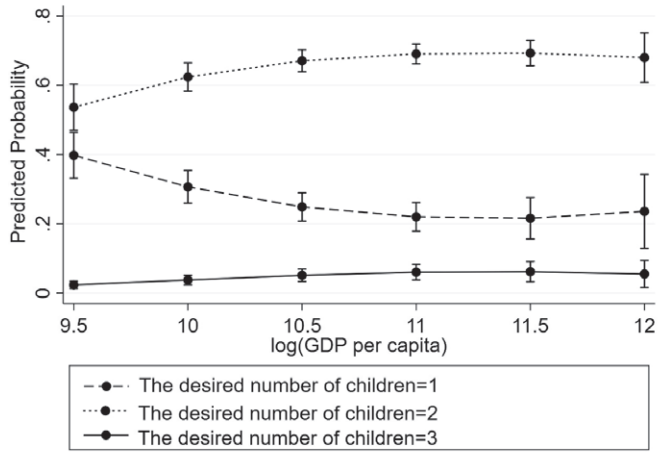

Figure 2 Predicted probabilities of the desired number of children at different levels of GDP per capita for women with 95% CIs

pared to those with the illiterate. This trend is consistent across both men and women, although the magnitude of the effect varies slightly. Additionally, married individuals express a significantly higher desire for children than do unmarried individuals, with the effect being stronger among men.

With an increase in the Gini coefficient, individuals from both sexes exhibited a greater desire for offspring. For men, employed individuals tended to express a greater desire for a higher number of children than unemployed individuals. Furthermore, considering that the parameter for GDP per capita is positive and the quadratic term (log (GDP per capita)_squared) is negative, there appears to be an inverted U-shaped relationship between GDP per capita and the desired number of children for women. Further exploration of GDP per capita was conducted utilizing predicted probabilities. Specifically, cases with a high predicted probability for the desired number of children (restricted to 1-3) were analyzed, whereas those involving a low predicted probability for the desired number of children (0, 4, or 5) were excluded. Figure 2 further shows that, holding other factors constant, for women, an increase in GDP per capita results in a decreased likelihood of desiring one child and an increased likelihood of desiring two or three children. However, at higher levels of GDP per capita, exceeding the turning point of approximately CNY 98715.77 (when log (GDP per capita) ≈ 11.5, equivalent to approximately US$13628.19), the likelihood of desiring two or three children modestly decreases, whereas the trend toward preferring only a single child shows a slight increase.

4.2. Fertility gap analysis

Columns 3 and 4 of Table 3 present the regression results of the fertility gap for men and women. Although the coefficient of compulsory education is not significant in the male population, the results from both men and women demonstrate that higher levels of education are associated with increased difficulty in attaining their desired number of children. For example, individuals with higher education, such as high school or university graduates, tend to have fewer children than they desire compared to the

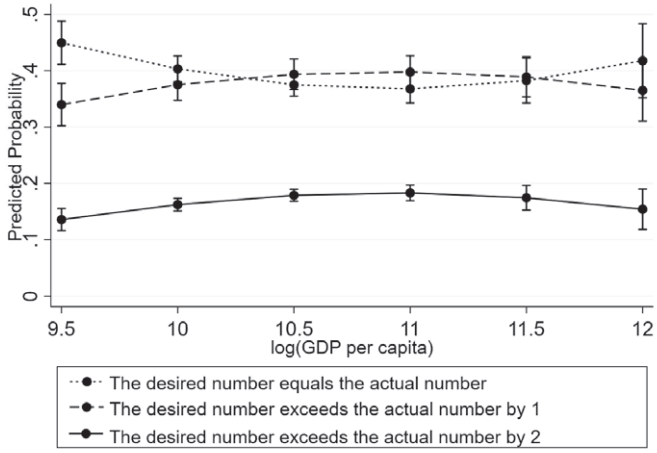

Figure 3 Predicted probabilities of the fertility gap at different levels of GDP per capita for men with 95% CIs

illiterate. Additionally, being in a marital relationship increases the likelihood of both men and women having their desired number of children compared to unmarried individuals.

Moreover, for women, higher family income or employment poses challenges in achieving their desired number of children, as indicated by the significantly positive parameters of the terms of family income and employment. Considering that the parameter for GDP per capita is positive and the quadratic term (log (GDP per capita)_squared) is negative, an inverted U-shaped relationship can be seen between GDP per capita and the fertility gap for men is apparent. As most individuals have either reached their desired number of children or have a shortfall of a few children compared to their desired number, this study conducts an empirical analysis to explore the precise influence of GDP per capita within these contexts by utilizing predictive probabilities. Figure 3 illustrates the variations in the predicted probabilities for men at different GDP per capita levels, holding the other conditions constant. With an increasing GDP per capita, the likelihood of achieving the desired number of children decreases, whereas the probability of falling one child short of the desired number increases. However, at higher GDP per capita levels, surpassing the turning point of approximately CNY 59874.14 (log (GDP per capita) = 11, equivalent to approximately US$8431.09), there is a reduction in the likelihood of falling short of the desired number by one or two children, while the trend of achieving the desired number increases.

5. Discussion and conclusions

In this study, the impact of various economic factors on fertility behavior was analyzed using data from the CGSS 2010, 2012, 2013, and 2015, considering regional differences. Although the analysis was conducted under the "one-child" policy, it utilized the desired number of children assuming the absence of such restrictions. The analysis utilized a multilevel-ordered-regression model. Subsequently in this section, the findings on the desired number of children and the fertility gap are examined and discussed based on previous studies and in the context of the current situation in China.

The findings indicate that, regardless of gender, regions with higher Gini coefficients tend to have a higher desired number of children, but the Gini coefficient was not significant in relation to the fertility gap. According to Li (2023), as the Gini coefficient increases, China's intergenerational income elasticity, which refers to the degree to which children's income levels are influenced by their parents' income levels, in central and western areas decreases, indicating higher income mobility. This means that the younger generation from low-income families has a higher potential to achieve better income compared to their parents. In other words, the economic environment becomes more conducive to upward mobility, and children have greater opportunities for financial success. In such a social context, parents may be more inclined to desire more children, anticipating that their offspring will have better income prospects. Therefore, the relationship between income inequality and intergenerational income elasticity observed in the underdeveloped regions of central and western areas suggests an indirect influence on the desired number of children. However, as economic development continues in these regions, this relationship of income inequality and intergenerational income elasticity may shift. When income inequality increases, intergenerational income elasticity also rises, as observed in more developed regions. In this situation, the younger generation from low-income families may struggle to surpass their parents' income, making it harder for them to achieve better financial outcomes. In such a context, they might limit their desired number of children accordingly.

In terms of the influence of GDP per capita, an inverted U-shaped relationship exists between GDP per capita and the desired number of children for women, implying that with an increase in GDP per capita, women have a greater desire for children; however, when GDP per capita reaches a high level, continued economic growth results in a slight decrease in the desired number of children. The relationship between GDP per capita and desired number of children was not observed in men. Instead, an inverted U-shaped relationship exists between GDP per capita and the fertility gap while controlling for the desired number of children. This suggests that with an increase in GDP per capita, men may find achieving their desired number of children more challenging. However, when the GDP per capita reaches a high level, continued growth increases the likelihood of men achieving their desired number of children.

Regarding the relationship between GDP per capita and the desired number of children, an increase in GDP per capita implies that residential areas may have improved access to education, culture, and healthcare resources, leading to higher living standards and a more conducive environment for personal development. Individuals may have a greater willingness to have children in such an environment. Nevertheless, as the economy progresses further, so do educational costs and the financial burden associated with childcare, and individuals may decide on a specific desired number of children.

As for the relationship between GDP per capita and the fertility gap. Prior research has pointed out that an increase in per capita GDP or human development indices is associated with an initial decline in fertility rates, followed by a potential resurgence (Myrskylä et al., 2009; Luci-Greulich and Thévenon, 2014). Jones et al. (2008) highlighted the increase in educational technology and expenses as pivotal factors explaining the decline in fertility accom-

panying economic development. First, as economies advance, parents may consider the benefits of education and invest their limited resources to improve the quality of their children. This may result in a decrease in the rates of achieving the desired number of children. Additionally, as the economy reaches a certain stage, individuals may gain more access to childcare due to the abundant existence of childcare facilities, hospitals, cram schools, and so on. This could offer more opportunities for parents to achieve their desired number of children. In China, ongoing economic development has led to a decreasing trend in childbirth rates in some regions, while the proportion of households not achieving their fertility goals may be rising.

Further, the regression results showed that, for the influence of employment status, employed men are associated with an increase in the desired number of children. For women, a high family income or employment status may bring greater challenges in achieving their desired number of children.

Employed men are likely to exhibit a stronger desire to have more children, as employment naturally provides them with greater economic resources to support their offspring. Based on this observation, maintaining economic stability and simultaneously establishing sufficient unemployment assistance systems positively impact the desire to have more children.

For women, a higher family income or being employed may pose challenges in achieving their desired number of children. Previous studies have shown a negative relationship between family income and childbirth (Bollen et al. 2007; Cordoba and Ripoll, 2016). Presently, China has a shortage of childcare services. Affluent households and employed women often prioritize their careers, leading to limited time investment in childcare, rendering attaining the desired number of children difficult.

China is currently undergoing significant economic and social transformations, accompanied by notable demographic changes. This study reveals the influence of various economic factors on reproductive behavior, indicating that in the absence of the "one-child" policy, economic conditions could play a significant role in shaping fertility trends. Specifically, economic development may hinder families' goals of reaching their desired number of children, particularly if there is inadequate societal support for childcare and related services. Therefore, balancing economic growth with social policies that support sustainable fertility levels is crucial. In addition, improving access to childcare and supporting women in balancing career and family responsibilities will contribute to creating a more inclusive and pro-natal environment, which is essential for addressing China's demographic challenges.

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Footnotes

1） Unlike the approach used by Morgan and Rackin (2010), which categorizes fertility outcomes into underachieved, achieved, and overachieved based on the comparison between actual fertility and desired fertility, this study directly calculates the fertility gap as the difference between the desired number of children and the actual number of children. This straightforward calculation method allows for a clear quantification of the gap between fertility intentions and outcomes.

2） Among the analyzed participants, approximately 6% had missing values. It is assumed that this level of missing data did not significantly affect the estimation. Therefore, the analysis proceeded with the complete dataset.

3） Models that do not account for provincial-level differences yield results that do not accurately reflect the actual situation in China. It is essential to apply a model that considers the regional heterogeneity within China.

4） The analysis was conducted using Stata Standard Edition 17.0, with robust standard errors employed for regression coefficients to ensure estimation robustness.

5） While the application of models such as the Seemingly Unrelated Regression (SUR) model could be considered for analyzing the desired number of children and the fertility gap, it is a natural assumption in fertility behavior analysis to first determine the desired number of children and then decide on actual childbearing. Therefore, in this analysis of the fertility gap, it is appropriate to use the desired number of children as a control variable.

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