Academic Journal of Management and Social Sciences
ISSN: 2958-4396 | Vol. 2, No. 2, 2023

Analysis of Influencing Factors of Fertility Intention Based on Logistic Model

Xue Li

School of Economics, Anhui University of Finance and Economics, Bengbu, Anhui, China
3011913960@qq.com

Abstract: With the continuous opening of the fertility policy and the improvement of economic development level, the fertility level of the population continues to decline, and the natural growth rate of the population also continues to decline. Based on China's comprehensive social survey data, this article uses binary selection for regression analysis to find that fertility intention is related to individual factors, family factors, self-evaluation, and social factors. Among them, married, party members, agricultural household registration, high income, existing girls or boys, and social equity fertility intention are stronger, while higher education level and less willingness to pay medical insurance for fertility. The government can make corresponding decisions based on different influencing factors to improve fertility levels.

Keywords: Fertility intention; Logistic model; Regression analysis.

1. Introduction

The "Single Two Child Policy" was implemented in 2013, but the decrease in fertility forced the implementation of the "Comprehensive Two Child Policy" in 2015 in hopes of increasing fertility. In 2021, the Political Bureau of the Central Committee of the Communist Party of China held a meeting to implement the three-child policy and proposed corresponding support systems for women. China's fertility policy is constantly opening up, and representatives of the National People's Congress have proposed increasing maternity leave to guide the increase in fertility rates. With the acceleration of social progress and the opening up of fertility policies, China's fertility rate has not reached the expected level. Back in 1978, China's birth rate was 18.25 ‰. As time went on, China's birth rate continued to increase, reaching a peak of 22.43 ‰ in 1986. Then it began to decline. Although the birth policy adjustment rose, it began to decline again. In 2021, China's birth rate will drop to 7.52 ‰, and in 2022, China's birth rate will be 6.77 ‰. The openness of China's policies has not returned to the previous fertility level, and it has been proven that the impact of policies on fertility is no longer decisive. The willingness to have children seriously affects China's fertility level.

Fertility intention is influenced by various factors, and scholars mainly discuss the influencing factors of fertility intention from the perspectives of individuals, families, and society. He Xiuling and Lin Limei (2021) used the probit model to analyze the impact of fertility desire from the perspective of individuals and families, and analyze the impact of family per capita income and education level of women of childbearing age on the willingness of Chinese women of childbearing age to have a second child. Research has found that women's educational level has a significant negative impact on their willingness to have a second child. The per capita household income and willingness to have a second child show a U-shaped curve. Shi Beibei et al. Yang Kewen (2019) studied the relationship between fertility intention and housing prices from the perspective of families, and found that families with different incomes have varying degrees of impact on housing price changes and fertility intention. The increase in housing prices in high-income families does not significantly affect fertility intention, while low-income families have different effects. Lu Xuelei et al. (2020) studied fertility levels from the perspective of individual mental health and found that women who are unwilling to have children are more psychologically unhealthy and do not have more energy to take care of their children, resulting in lower willingness to have children. Zhao Feng and Chen Liwei et al. (2023) used the perspective of life process theory to find an inverted "U" shaped relationship between age and fertility intention. The main factor affecting fertility intention is the socio-economic environment, and the younger the person, the lower the online expression of fertility intention [5]. Further exploration of the impact of the internet on women's fertility intention reveals that the internet suppresses women's fertility intention by changing their attitudes towards reproduction [6]. In addition, some scholars have used special survey data on platform employment to study and found that platform employment mainly improves the fertility willingness of individuals with high school and college education in urban areas through income effects, balancing work and family mechanisms [7]; Using data from the China Labor Force Dynamic Survey, it was found that the impact of social pension insurance on fertility intention is negative, but the impact of the new agricultural insurance on fertility intention is positive, indicating that the idea of "raising children to prevent aging" in rural areas has not changed [8]. In summary, most scholars only analyze the influencing factors of fertility intention from a certain perspective and have not comprehensively studied their impact on fertility intention. Based on this, this article studies the impact of individual, family, self-evaluation, and society on fertility intention, hoping to provide some inspiration for relevant policies.

Becker (1960) proposed the theory of maximizing family utility, stating that when children add utility to the family, the number of children increases, and when children reduce the effect on the family, the number of children tends to decrease [9]. Li Jianmin (2004) in China studied the mechanism of fertility stability based on the theory of fertility decision-making at four levels: institutional, social, economic, and

technological. He believed that economic, social, technological, and institutional factors all affect fertility willingness. Based on the above analysis, this study proposes the following research hypotheses for fertility intention:

H1: Individual characteristics and family factors are more correlated with fertility levels compared to self-evaluation and social factors.

H2: Married, party member, agricultural household registration, high income, having a girl or boy, the fairer the society, the stronger the willingness to have children, while the higher the education level and the less willingness to pay medical insurance for childbirth.

2. Research Design

2.1. Data Source

The China Social Comprehensive Survey is the first large-scale social survey project, which provides useful data for government services, decision-making, and international comparative research. The data studied in this article comes from the 2017 China Social Comprehensive Survey. After statistics, a total of 12582 valid CGSS samples were collected in 2017.

2.2. Variable Selection

2.2.1. Dependent variable

The dependent variable of this article is fertility intention. The article reflects people's willingness to have children based on "how many children would you want without policy restrictions". The desire to have zero children is defined as the lack of willingness to have children, and the desire to have children is defined as the willingness to have children.

2.2.2. Independent variable

The independent variables selected for the article are individual characteristics, family factors, self-evaluation, and social factors. Individual characteristics include registered residence, political outlook, marital status, education level, gender, age square, and age; Family factors include existing girls, boys, and family income; Self-evaluation includes physical and mental health, class identity, perceived fairness, and level of happiness; Social factors include elderly care, healthcare, neighborhood and friend interactions.

Table 1. Variables and explanation

Variables			Variable definition and assignment	Mean value	Standard deviation
Dependent variable	Fertility intention		Be unwilling to do=0, Be willing=1	0.979	0.143
	Individual characteristics	Age	Continuous variable	51.009	16.864
		Age squared	Continuous variable	2886.284	1743.398
		Gender	Male=1, Female=0	0.472	0.499
		Educational level	Uneducated=1, Literacy class=2, Primary school=3, Junior high school=4, High school/technical school/technical school=5,Junior college or above=6	3.78	1.291
		Marital status	Unmarried=0, Married=1	0.753	0.431
		Political status	Party member=1, Non-party member=0	0.112	0.315
		Household registration	Agricultural household registration=1, Resident account=0	0.627	0.484
	Family factor	Household relative income brackets	Well below average=1, Below average=2, Average=3, Above average=4, Well above average=5	2.547	0.756
		Real estate	Continuous variable	1.104	0.661
		Number of girls	Continuous variable	0.799	1.04
		Number of boys born	Continuous variable	0.905	0.861
	Self-evaluation	Happiness level	Very unhappy=1, Less happy=2, Can’t say happy or not happy=3, Relatively happy=4, Very happy=5	3.855	0.851
		Perception of fairness	Totally unfair=1, Compare unfairness=2, It’s not fair but it's not unfair=3, fairly=4, Perfectly fair=5	3.102	1.064
		Class identity	（bottom）1-10（Top level）	4.132	1.706
		Self-assessment of physical and mental health	Very good=1, Very good=2, Good=3, In general=4, Poor=5	3.115	1.234
	Social factor	Friendship	Almost every day=1, Once or twice a week=2, A few times a month=3, About once a month=4, Several times a year=5, Once a year or less=6, Never=7	4.028	1.869
		Neighborhood communication	Almost every day=1, Once or twice a week=2, A few times a month=3, About once a month=4, Several times a year=5, Once a year or less=6, Never=7	4.103	2.209
		Access to health insurance	No health insurance=0, Buy medical insurance=1	0.934	0.249
		Endowment insurance acquisition	No endowment insurance is purchased=0, Purchase endowment insurance=1	0.746	0.435

2.3. Research Methods

Due to the explanatory variable studied in this article being 'willingness to have children', this variable is a binary choice variable, namely willing or unwilling. Therefore, using logistic regression, the equation of this regression model is:

$$Y= \alpha+\beta j\ Xij+\varepsilon j \quad (1)$$

Where, Y is a binary variable. When Y=1, it indicates that the event occurred, and when Y=0, it indicates that the event did not occur, β is the regression coefficient, and X is the independent variable, α is a constant term and Ɛ is a random perturbation term. Perform statistical analysis using stata15.0.

3. Empirical Results and Analysis

The following article will incorporate individual, family, and self-evaluation into the logistic regression model for research and analysis, as shown in Table 2, and conduct a comprehensive evaluation of the results obtained.

3.1. Individual characteristics and fertility intention

According to model 1, education level, marital status, political outlook, and registered residence are all related to fertility intention. The higher the education level, the less strong the desire to have children. This may be because education delays the age of first marriage and reduces the desire to have children. Married couples have a stronger desire to have children than unmarried couples, and party members have a stronger desire to have children than non-party members. This may be due to the corresponding national call to increase the fertility level of party members, or it may be due to the higher income level of party members than non-party members, which increases their willingness to have children. The fertility desire of agricultural registered residence is stronger than that of residents. The lack of significant relationship between age and gender and fertility intention may be due to the traditional concept of fertility that considers fertility to be a major decision made by a family and not by one party. However, with the postponement of the age of first marriage, fertility is increasingly delayed.

3.2. Family Factors and Fertility Intention

On the basis of Model 1, family factors have been added. Table 2 shows that the higher the income level, the stronger the willingness to have children. When income increases, it can improve living standards. Even if children are born, it will not reduce the quality of life, but will make families happier. After giving birth to a girl, there may be a stronger desire to have children, which may be due to the preference of boys, leading to more families choosing to continue giving birth after giving birth to a girl. After having a boy, some people may choose to continue having children, which may be the idea of "having both children", allowing them to continue having children. Whether a family owns a property and has a childbearing relationship is not significant, which may be due to the influence of traditional fertility concepts. Even without a house, they will leave their own offspring to inherit the "incense".

3.3. Self-evaluation and fertility intention

Model 3 incorporates self-evaluation. When one feels fairer to society, their willingness to have children becomes stronger. However, the relationship between other self-evaluation effects and their willingness to have children is not significant. This may be because humans are social animals, and even if their level of happiness is low, they may believe that having children will make them happier. Class identification and self-assessment of physical and mental health are not the main reasons for affecting fertility. However, with the continuous development of society, the cost of childbirth and the cost of raising children continue to decrease. Fertilizers will pay more attention to themselves, especially when they feel physically or mentally unsuitable for childbirth and will not force themselves to give birth due to external voices.

3.4. Social Factors and Fertility Intention

Table 2. logistic regression analysis of fertility intention

Variable		Model1			Model2			Model3			Model4		
		coefficient	Standard error	p-value	coefficient	Standard error	p-value	coefficient	Standard error	p-value	coefficient	Standard error	p-value
Individual characteristics	Age	0.004	0.021	0.841	0.02	0.022	0.373	0.072*	0.038	0.062	0.091**	0.042	0.032
	Age squared	0.000	0.000	0.992	0.000	0.000	0.129	-0.001**	0.000	0.03	-0.001**	0.000	0.018
	Gender	0.071	0.129	0.581	0.168	0.131	0.199	0.020	0.225	0.929	-0.037	0.226	0.87
	Educational level	-0.196**	0.081	0.015	-0.157*	0.083	0.058	-0.073	0.156	0.638	-0.033	0.158	0.833
	Marital status	1.17***	0.14	0.000	0.725***	0.156	0.000	0.678**	0.282	0.016	0.72**	0.283	0.011
	Political status	0.964***	0.278	0.001	0.903***	0.287	0.002	0.732	0.501	0.144	0.743	0.503	0.14
	Household registration	0.809***	0.141	0	0.649***	0.142	0.000	0.798***	0.261	0.002	0.817***	0.259	0.002
Family factor	Household relative income brackets				0.352***	0.097	0.000	0.26	0.211	0.218	0.263	0.212	0.215
	Real estate				0.083	0.129	0.521	-0.087	0.188	0.644	-0.028	0.191	0.883
	Number of girls				0.617***	0.124	0.000	0.446***	0.163	0.006	0.426***	0.161	0.008
	Number of boys born				0.628***	0.156	0.000	0.432	0.266	0.104	0.448*	0.269	0.096
Self-evaluation	Happiness level							0.188	0.155	0.224	0.182	0.156	0.243
	Perception of fairness							0.182	0.12	0.129	0.209*	0.118	0.078
	Class identity							0.024	0.092	0.798	0.013	0.091	0.887
	Self-assessment of physical and mental health							-0.012	0.105	0.912	-0.012	0.107	0.908
Social factor	Friendship										-0.062	0.073	0.392
	Neighborhood communication										-0.008	0.06	0.896
	Access to health insurance										-1.909*	1.005	0.057
	Endowment insurance acquisition										-0.36	0.313	0.251
Pseudo-R2		0.073			0.098			0.098			0.113		

Note: * * *, * *, * respectively represent significance levels of 1%, 5%, and 10%.

Model 4 incorporates social factors, indicating that people who pay medical insurance and those who do not have a stronger willingness to have children may be less likely due to a more secure future after paying medical insurance, as they do not need to have children to ensure their quality of life in their later years. The weak relationship between friends, neighbors, and fertility intentions may be due to the accelerated pace of society, where people do not have more leisure opportunities to interact with neighbors and friends. The weak relationship between pension insurance and fertility

intentions may be due to the influence of traditional concepts of "having children".

4. Conclusion and Suggestions

4.1. Conclusion

This paper uses the 2017 CGSS database and logistic regression model to demonstrate the impact of individual characteristics, family factors, self-evaluation and social factors on fertility willingness, and draws the following conclusions: from the perspective of individual characteristics, marriage, party members, and agricultural registered residence registration have a significant role in promoting fertility willingness, and education inhibits fertility willingness by increasing the age of first marriage. From the perspective of family factors, income level and existing girls have a significant positive impact on fertility willingness. Higher income can bear the cost of raising children, while "boy preference" promotes families to continue having children after giving birth to girls. From the perspective of self-evaluation, the impact of happiness level, perceived fairness, class identity, and self-evaluation of physical and mental health on fertility intention is not significant. The possible explanation is that this is not the main reason for affecting people's fertility at the current stage. From the perspective of social factors, the impact of medical insurance on fertility intention is significantly negative, while the impact of pension insurance on fertility intention is not significant, indicating that people's thinking of "raising children to prevent aging" has not changed. The impact of friends and neighbors on fertility intention is not significant, indicating that with the acceleration of social progress, people do not have more leisure opportunities to interact with neighbors and friends.

4.2. Suggestions

Based on the argument above on the impact of individual characteristics, family factors, self-evaluation, and social factors on fertility intention, the following policy recommendations can be drawn:

First, use the power system to effectively protect women's reproductive rights and reduce women's opportunity cost of childbirth. According to the report of the 19th National Congress, "We must adhere to the basic national policy of gender equality and protect the legitimate rights and interests of women and children." In this regard, the country needs to fully promote women's equality in employment and income distribution, and implement the detailed rules of the legal system in various regions according to local conditions. Firstly, in terms of female employment, we must adhere to "gender equality" and eliminate discrimination in childbirth. And supporting policies should be implemented to ensure that women are no longer afraid of being unable to return to their careers due to childbirth. Secondly, referring to the local level, policies such as providing childcare subsidies and housing subsidies for women are provided to compensate for the increased costs caused by childbirth, and more scientific and reasonable maternity leave is formulated to provide more time support for childcare.

Secondly, promote and encourage the fertility groups of well-educated groups, and establish a correct concept of population resource fertility. The higher the level of education, the less strong the willingness to have children, and with the progress of the times, more and more people will increase their years of education. Therefore, in the long run, there is an urgent need to stimulate the willingness of these people to have children. Generally, people with high levels of education have been living under the nagging of parents who say that 'not being able to fall in love will affect their studies' since childhood. However, as they age, they are unable to' be compatible 'with men and can only continuously delay their first marriage age, thereby reducing their fertility level. It can improve the quality of men and give women more choices, so that they will not be left behind. It can also change the thinking of both men and women in choosing partners, families, and other aspects to adapt to modern society. In addition, various regions can formulate corresponding policies to encourage women to have children and improve the fertility level in various regions.

Thirdly, improve the social support system, balance work and family, and protect women's reproductive rights. We have now supported a comprehensive second child policy and relaxed the policy of having three children, but social subsidies have not yet been fully implemented. Raising children can cause a huge burden on families, and having children also requires help from others, which requires social care support. In addition, most households nowadays are dual income families. Women must take good care of their families. In addition to their work, there are also jobs and childcare work. Some parents are unable to provide support due to poor health or geographical isolation, so both spouses must hire a nanny, or one of them will give up work, which increases the financial burden of the family. This requires a good social support system, strengthening the construction of public service systems, and providing elderly care, medical services, and childcare support systems for women of childbearing age, so that those who want to have children have no worries.

Author Profile

Xue Li (1998-), female, born in Chuzhou, Anhui, is a master's student at the School of Economics at Anhui University of Finance and Economics. She mainly engages in research on urban and regional economy.

References

[1] He Xiuling, Lin Limei. Household per capita income, female education level, and the willingness of Chinese women of childbearing age to have a second child: an empirical analysis based on CGSS2017 data [J]. Fujian Forum (Humanities and Social Sciences Edition), 2021 (03): 98-108.

[2] Shi Beibei, Tang Dynasty Sheng, Hou Lin. Research on China's population's fertility desire and boy preference [J]. Population Journal, 2017,39 (02): 28-36.

[3] Yang Kewen. Does high housing prices affect fertility willingness-- Empirical analysis based on housing prices and reproductive willingness of women of childbearing age [J]. Southern Population, 2019,34 (05): 69-80.

[4] Lu Xuelei, Jiang Chunxiao, Wang Ling. A study on the fertility intention and mental health status of pregnant women aged 30 and above with two children in small and medium-sized cities in Anhui Province under the background of comprehensive two child policy [J]. Chinese Journal of General Medicine, 2020,23 (11): 1406-1410.

[5] Zhao Feng, Chen Liwei, Gui Yong. Ten Year Changes in the Fertility Intention of Young People (2012-2021): Analysis Based on Age, Period, and Generation [J/OL]. Northwest Population: 1-13 [2023-04-11]

[6] Pu Yanping, Zhang Lanxin, Yuan Baihui. Internet Use and Women's Fertility Intention: A Structural Reduction in Chinese Women's Fertility Intention [J]. Journal of Shanxi University of Finance and Economics, 2023,45 (03): 14-29.

[7] Ding Shouhai, Xia Zhangxu, Ouyang Yuxin. Can platform employment improve individual fertility willingness in the digital economy-- Evidence from special surveys [J]. Population Research, 2023,47 (01): 101-114.

[8] Jing Tao, Zhao Xinmeng, Luo Zhiwen. Research on the Impact of Social Pension Insurance on the Fertility Intention of Flexible Employment Personnel in China's New Business Forms [J]. Price Theory and Practice, 2022, No. 461 (11): 32-36+209.

[9] Becker G S. An economic analysis of fertility[M]. Columbia University Press, 1960: 29-240.

[10] Li Jianmin. Fertility rationality and decision-making and the transformation of China's low fertility level stability mechanism [J]. Population Research, 2004 (06): 2-18.