Analysis of the Influencing Factors of China's Birth Rate

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Abstract. The increasingly serious problem, population aging, in China has made people focus more on the factors affecting the fertility rate which plays a key role in affecting population aging. An increasing number of scholars have started to analyze various influencing factors in detail, but since most of them only focus on one or two specific factors, this paper tries to merge the key factors together and conduct the analysis. This paper separates the key factors into three levels: population, social and policy. The conclusion is yielded that people's unwillingness to have children, unbalanced sex ratio, advanced social security level, high income, high house price, and large education expenditure all contribute to the decrease in social fertility rate. However, the two-child policy and the growing education popularizing rate can help increase the birth rate. In particular, the average schooling year affects the birth rate with a U-shaped relationship, with a relatively low or high schooling year resulting in a high birth rate.

Keywords: population aging, birth rate, fertility rate, key factors.

1. Introduction

In recent years, China has been facing a serious problem, population aging, due to the fall in birth rate and rising life expectancy. Population aging refers to an increasing median age in a population. According to Statista, the share of persons aged above 60 and older in China has increased from 6.15% in 1970 to 17.84% , which is almost 3 times that in 1970, in 2020 [1]. This means the median age of the population in China is gradually increasing. The problem of population aging is becoming increasingly serious, which will in turn cause a lot of problems, including the increasing social financial burden, the shortage of labor force, and the gradually disappearing population dividend. In order to improve such a negative situation, China is recently paying attention to the growth of the birth rate, which plays a key role in relieving the population aging.

Birth rate has always been a key issue since the founding of China. In the first few years after the founding of China, the population was growing rapidly, which caused China's government to control the growth of the population by limiting the birth rate later. In 1971, China planned to implement a family planning policy, policy to encourage all families to have fewer children. Then in order to adapt to demographic changes, the Chinese government started to encourage fertility. In 2003, China implemented the two-child fertility policy for couples where either is from a single-child family, and in 2013, the two-child fertility policy for couples where either the husband or the wife is from a single-child family was introduced. In 2015, the one-child policy was fully relaxed due to the lower population growth [2]. In response to the constant change in the Chinese population, China is always improving and modifying the policy regarding the control of the birth rate.

Policy undoubtedly had a huge impact on the change of China's birth rate in the past. However, it hasn't managed to encourage the rapid growth of the birth rate in these years. Specifically, though the family planning policy has been fully relaxed, the birth rate still remains constant or even decreased in recent years. As CEI data shows, China's birth rate fell from 11.99‰ in 2015, the year when the family planning policy was fully relaxed, to 6.77‰ in 2022 [3]. Therefore, an increasing number of scholars have started to focus on analyzing the factors affecting the birth rate utilizing various methods and models. Since most scholars only analyze the impact of one or two factors in each research, this paper tries to merge all the key factors together and point out the effect of each key factor.

This paper will divide the influencing factors into three main parts, the population level, the social level, and the policy level. On the population level, the opinion of reproduction and sex ratio are

considered to affect the fertility rate. The social level, education level, social security level, and income and expenditure level which includes income, house price, and education expenditure are included to be analyzed. Finally, the main effect of these factors on China's birth rate will be analyzed completely and detailed in an orderly manner.

2. Analysis of the Influencing Factors of China's Birth Rate

2.1. Population Level

2.1.1 Opinion of reproduction

Opinion of reproduction refers to residents' thoughts, attitudes and willingness towards having children. This conducted a questionnaire survey to collect the reproductive opinions of residents of all ages. Among 217 data collected, this study found that only 23.5% of the childless population have a clear desire to have children, with the male willingness to have children much higher than the female willingness. In addition, except for the 21.2% of the residents with clear unwillingness to have children, there are 55.3% of residents unsure about their willingness to have children, but according to the reasons they provide for their uncertainty, it is obvious that they have more tendency towards not having children.

In recent years, with the changes in social trends and the improvement of the social status of women groups, an increasing number of unborn populations will choose not to have children while preferring to enjoy all kinds of resources that may be used to raise children themselves. According to the questionnaire, the main reasons for unwillingness to have children are huge expenses, physical and mental damage, and the lack of confidence in parenting skills. With the increase in living costs and people's stronger self-centeredness, it is reasonable to infer that the willingness to bear children will experience further decline, thus resulting in a decline in the social birth rate.

2.1.2 Sex ratio

Even though the opinion of "preferring boys to girls" in China has gradually disappeared, it still exists in some regions with relatively poor development and families deeply influenced by traditional opinions, which leads to the phenomenon that there is an imbalance in the sex ratio in China, with a male population greater than the female population. Data released by the National Bureau of Statistics in 2017 shows that there are over 32 million more males than females in China [2]. The male overpopulation leads to the fact that the excess men are unable to get married, resulting in a decrease in marriage and fertility rates according to the scholar Zhang Xiayu [2].

2.2. Social Level

2.2.1 Education level

Education is one of the most essential factors affecting the Chinese birth rate. According to two scholars Zhang Chong and Wan Xinyue, a family tends to give birth to more children when the average education level is relatively low or relatively high based on Becker's economic theory of fertility and the actual development of China's population [4]. By analyzing the data of 31 provinces in China from 2003 to 2017 with the use of spatial econometric modeling, Zhang Chong and Wan Xinyue produced the result presenting the relationship between the average schooling year, higher education popularizing rate, and the birth rate with the average schooling year and higher education popularizing rate as the explanatory variables and China's birth rate as the explained variable. First, the average schooling year has a significant impact on China's birth rate, with U-shaped relationship. When the average schooling year is below 8.8 years, the birth rate decreases with the increase of the average schooling year. With the average schooling year greater than 8.8 years, the birth rate increases when the average schooling year increases. Second, China's higher education popularizing rate has significant positive effect on the fertility rate, which means with the increase of China's higher education popularizing rate, the birth rate increases. Third, the average schooling year and higher

education popularizing rate significantly affect not only the local birth rate but also the birth rate of peripheral regions [4].

2.2.2 Social security level

Social security consists of social insurance, social assistance, and social welfare, which is one of the key factors that influence China's fertility rate. As a whole, the increase in the social security level, which is measured by social security fiscal expenditure, results in a decrease in the social fertility rate excluding the effect of the family planning policy according to the research of Wang Guojun, Zhao Xiaojing, and Zhou Xinfa with the data from 2000 to 2013 [5].

To be more specific, the scholar Chang Xuan uses four regression methods OLS, FE, DIFF-GMM, and SYS-GMM with the panel data of 31 provinces and regions in China to analyze the impact of three different kinds of social insurance on China's birth rate [6]. The existence of family planning policies, maternity insurance, medical insurance, and pension insurance has a negative impact on China's birth rate, which means the increase in the penetration rate and the improvement of the quality of the three insurances lead to a decrease in China's birth rate. Without family planning policies, maternity insurance has a positive impact on China's fertility rate, while medical insurance and pension insurance still have a negative impact on birth rate. Moreover, Chang Xuan points out that the economic development and the improvement of human capital level have a significant inhibitory effect on the social fertility rate through the role of social insurance [6].

2.3. Income and Expenditure Level

2.3.1 Income level

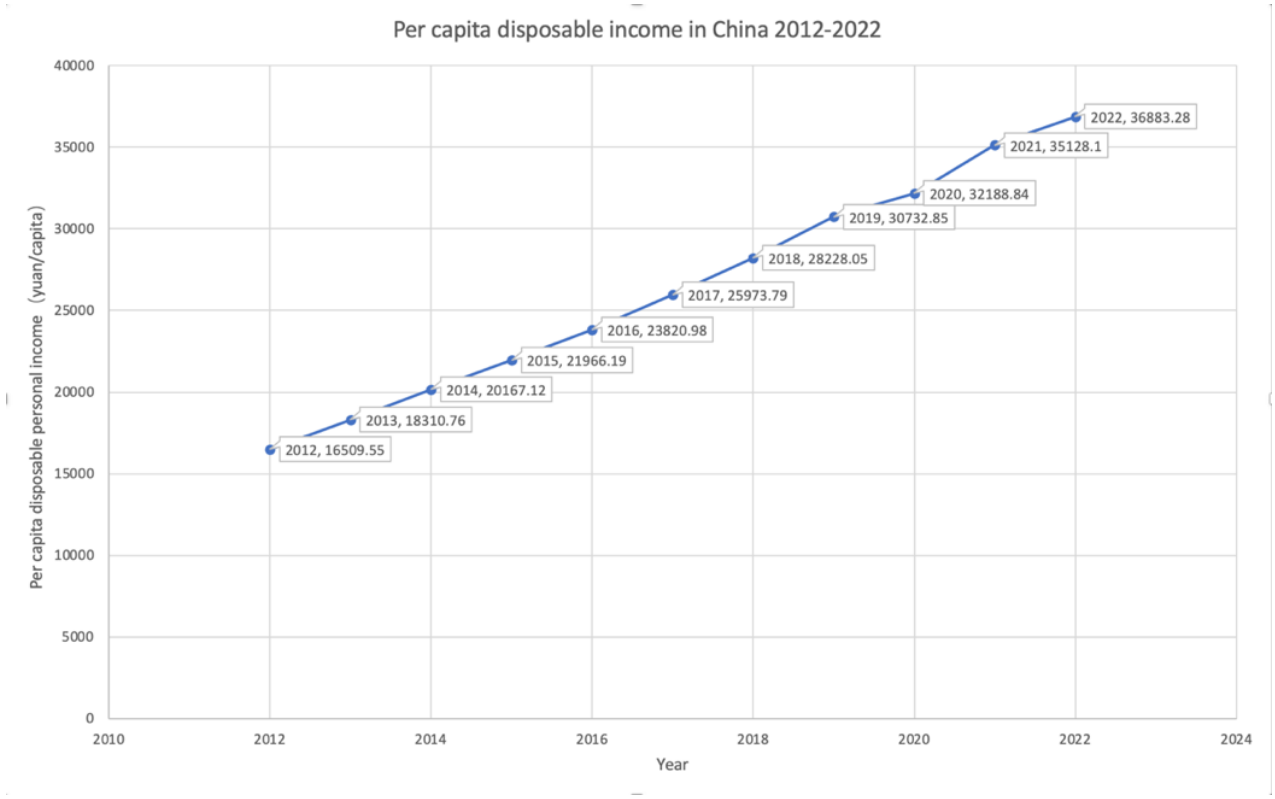


Fig. 1 Per capita disposable income in China 2012-2022

Data are from CEIdata

With the rapid economic development, per capita disposable income in China experienced a sharp increase from 2012 to 2022, with the income of 16509.55 yuan per capita in 2012 doubling to the income of 36883.28 yuan per capita in 2022 [7].

At the same time, China's fertility rate was experiencing a decrease, from 14.57‰ in 2012 to 6.77‰ in 2022 [3].



Fig. 2 Birth rate in China 2012-2022

Data are from CEI data

By associating the data of these two aspects, the relationship between per capita disposable income in China and China's birth rate can be derived clearly: There is a negative relationship between per capita disposable income in China and China's feryility rate. To be specific, when the per capita disposable income in China increases, China's birth rate decreases.

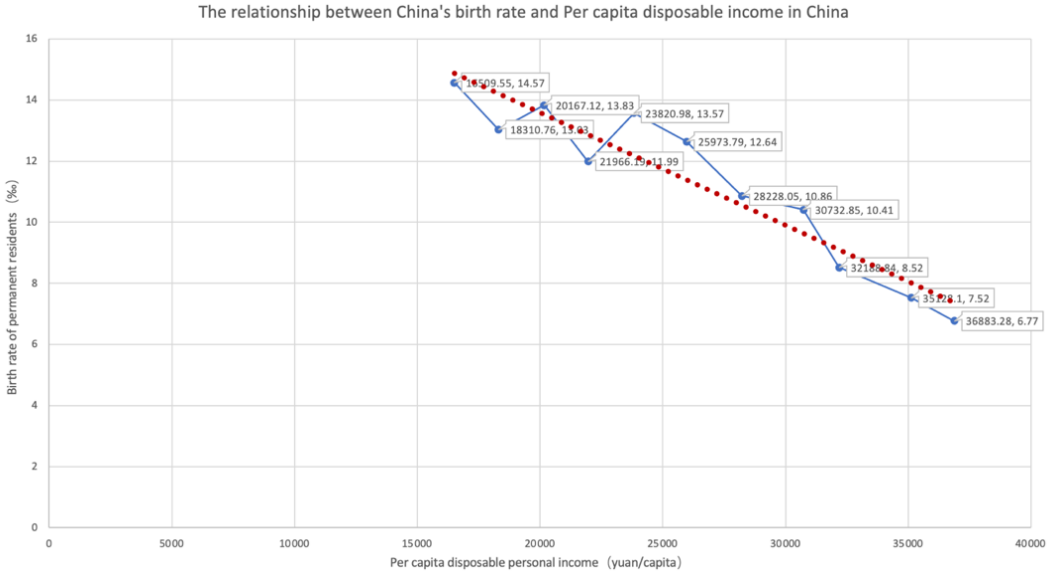


Fig. 3 The relationship between China's birth rate and Per capita disposable income in China

2.3.3 House price

The house price is experiencing an increase in China, and there are significant differences in house prices in different regions. According to data from the National Bureau of Statistics, the average price level of housing in China rose from 1948 yuan per square meter to 9860 yuan per square meter from 2000 to 2020, an increase of more than five times. Additionally, the average housing price in some first-tier and second-tier cities reached more than 30,000 yuan per square meter in 2020 [8].

By analyzing Chinese provincial-level data of house prices and birth rates covering 1998 to 2017 period with panel threshold regression, scholars Xiao Cuiyin and Chi Weisu produce a result presenting that there is a negative relationship between house prices and social fertility rate in China when the house price is higher than a threshold value, which means the excessive house prices will lead to the decrease in China's birth rate [9]. The similar result is also derived from the research

conducted by Peng Zhisheng, Chen Xiaoyi, and Cheng Siyu [8]. Based on the provincial panel data from 2009 to 2018, the panel regression model is used to yield a result that the increase in house prices has a significant inhibitory impact of China's social fertility rate [8].

2.3.4 Education expenditure

As the involution phenomenon becomes more and more universal in this society, parents tend to pay more amount of attention to improving children's grades and providing children with greater education chances, which largely increases parents' education expenditure on children. From a micro empirical study using the CFPS dataset conducted by Shen Yaru [10], the increase in education expenditure will result in a reduction in the birth rate. Specifically, based on Becker's quantity and quality (QQ) theory and the cross-sectional data from CFPS 2010, 2012, 2014 and 2016 data, the researcher established a 2SLS empirical model, finally producing a result that the increase in child education spending will decrease the fertility rate, with the birth rate in urban areas and low-income families more susceptible to child education spending [10].

2.4. Policy Level

In order to adapt to the rapid growth of the social population, China planned to implement a family planning policy, referring to the policy encouraging all families to give birth to fewer children since 1971. Then with demographic changes, the Chinese government started to encourage fertility. In 2003, a two-child fertility policy for couples where either is from a single-child family was implemented. In 2013, a two-child fertility policy for couples where either the husband or the wife is from a single-child family was put into effect. In 2015, the child policy was fully relaxed in response to the lower population growth [2]

According to scholars Xu Kun, Hu Dongwan, and Liu Yang [11], with the use of the provincial annual panel data from 1982 to 2013 and the threshold Model, they produced a result showing that the two-child policy effectively increased China's birth rate and slowed down the rate of the decline in China's birth rate. With reference to the model of Xu Kun, Hu Dongwan, and Liu Yang, it can be concluded that family planning policies, including the one-child policy and two-child policy, in China have a great influence on China's fertility rate, with the two-child policy stimulating the growth of China's fertility rate.

3. Conclusion

After analyzing the effect of each key factor on the birth rate, the conclusion can be drawn:

On the population level, people in China are becoming more and more unwilling to have children due to the increasing living costs and people's stronger self-centeredness, which contributes to the decrease in the birth rate. Moreover, the overpopulation of men results in a low birth rate because of the decrease in marriage.

On the social level, China's higher education popularizing rate affects the birth rate positively, and the average schooling year affects the birth rate with a U-shaped relationship, which means the relatively low or high average schooling year results in a high birth rate. In addition, the overall social security level has a negative impact on the social birth rate. Moreover, per capita disposable income, house prices, and education expenditures all affect the birth rate negatively.

On the policy level, the family planning policy did have an impact on China's fertility rate. To be specific, the two-child policy made residents more willing to have children, thus increasing the social birth rate.

After yielding the conclusion, some suggestions are provided to increase China's birth rate so as to alleviate the population aging:

China's government should publicize the advantages of having children, therefore increasing people's willingness to have children. Additionally, the incorrectness of the opinion of "preferring boys to girls" should be emphasized to balance the sex ratio.

The government should popularize education on a larger scale and encourage longer schooling years. The social security level can be lowered to some extent. Moreover, the government should reduce people's burden by increasing the income and decreasing the house price and the education costs.

A suitable policy to encourage people to have children should continue to be implemented.

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