

The Importance of Understanding the Fertility Rate of China under the Housing Price

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Abstract: Universal two-child policy is implemented in China to relieve the pressure of the increasing national aging problem. However, the implementation of the universal two-child policy indeed boosts the fertility rate while the larger decline in the birth rate of the first child offset the effect from the increase in two child families and has even worsened the national fertility rate. The whole society believes the increasing living cost is the main reason which causes the low incentive to give birth when the high housing price occupies the largest share among all the costs. This paper briefly investigates the fertility rate under the housing price using existed fundamental model of how house prices affect fertility rate and gives general ideas about how future research could be conducted based on unique characteristics of China. This paper aims at indicating the importance of understanding the fertility rate of China under the housing pricing for policy makers to issue the most efficient policy to achieve the expected target with lowest social costs.

Introduction

In January 2016, the central government of China abandoned the one-child policy which had been operated for decades and officially released two-child policy. The purpose of loosening the control of birth is to relieve the pressure of the increasing national aging problem. The data of China's population census (1950-2015) shows that the total fertility rate (TFR) had kept shrinking after the implementation of the one child-policy. Kohler et al. (2006) indicates that 1.3 children per women can be referred as the "lowest -low fertility" as the country whose TRF is below this number, its population will halve within the following 45 years. China's TRF is strictly below the standard. The effectiveness of the two-child policy boosted the fertility rate immediately after its implementation, however, this trend did not sustain for long. According to the data from National Bureau of Statistics of China, the national fertility rate increased from 12.07% in 2015 to 12.95% in 2016, nevertheless, such growth dropped to 12.42% in 2017 (National Bureau of Statistics of China). In 2017, the birth rate of second child was 11% higher than in 2016, while the number of birth rate of first child decreased significantly. In other words, the implementation of the universal two-child policy indeed boosts the fertility rate while the larger decline in the birth rate of the first child offset the effect from the increase in two child families and has even worsened the national^[3] fertility rate. The whole society believes the increasing living cost is the main reason which causes the low incentive to give birth when the high housing price occupies the largest share among all the costs. Therefore, whether the government should implement corresponding policies to subsidize the housing price becomes an increasingly important topic.

In the past few decades, due to the one-child-policy and better quality of lives, the low birth rate and higher life expectancy brought China great demographic dividend which heavily benefits its economic reform^[1](Wang, 2005). However, such demographic dividend will finally turn into debt. A number of studies have shown concerns about the upcoming ageing problem due to the shrinkage of the labor force and the low fertility rate^[2](Chen & Dietzenbacher, 2017; Lin, 2016; Luo, 2018). Extending the retirement age could alleviate the shortage of labor force in the short run but ensuring the appropriate fertility^[4] rate can maintain the demographic structure at an efficient level in the long run^[6]. In spite of the two-child-policy, the real problem to the fertility rate is the drop in the

birth rate of the first baby. To understand how the fluctuation of housing price can affect the incentive to give birth would help policy makers to manage the demographic structure effectively. Besides, analyzing the relation between the housing price and the childbearing decision can provide intuition to the government to issue the most efficient policy to achieve the expected target with lowest social costs.

1. Does The Housing Price Influence The Fertility Rate?

In the past 60 years, the increasing opportunity cost of childbearing contribute to the decline of fertility rate in developed countries and the increase in female education level, equally wage rates and higher labor force participation rates (Becker, 1960). However, the theory of the female labor force is insufficient to explain China’s demographical transition pattern. After the economic reform, China always maintains a high female labor force participation rate, but such rate keeps dropping by time. The rate of China has decreased from 73.2% to 61.49% in 2017 (The World Bank, 2018) while the fertility rate shows similar decreasing trend.

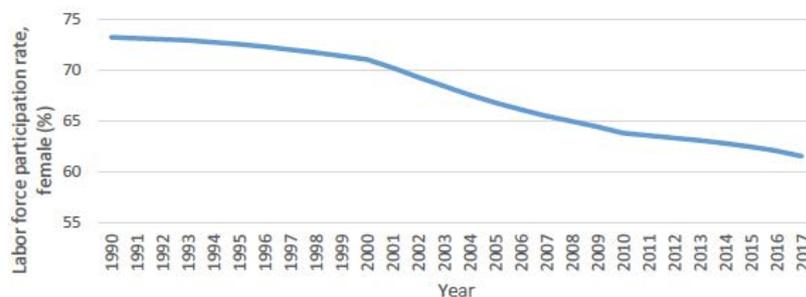


Figure 1. China’s labor force participation rate, female

Recent literatures indicate that housing price is a dominant factor which significantly decrease the fertility rate in East Asian economies. Based on annual data and included the factors of housing prices, female labor force participation rate and female wages, Yi (2010)^[10] points out that a 1% increase of housing prices is significantly related to a 0.45% decrease in fertility rates in Hong Kong from 1971 to 2005. Lin (2016)^[5] also finds that homeownership has positive effects on the number of children in families during and after 1987 housing booms in Taiwan. During the time period from 1971 to 2005, Hong Kong Taiwan were “Asian Tigers Economies”, which experienced huge increase in both per capita gross domestic product and house prices. It is convincible to believe that house price is a dominant factor which heavily affect China’s fertility rate as Hong Kong, Taiwan and China also share cultural similarity.

Per capita wages in China have risen much less than the increase in house prices for years. Deng (2012) points out that within China’s 35 major cities during the period from 2003 to 2011, 11 cities experienced more than 20% annual increase in land prices and such increase were higher than 10% for the remain 24 cities. However, the annual increase in income far from keeping pace with the rise in house prices. According to data from the National Bureau of Statistics, the cities with the highest ratio of house price to income are Shenzhen, Beijing, Shanghai, Xiamen and Sanya. Respectively, their house prices are 40.7, 33.4, 31.8, 30.4 and 28.4 times the average annual income of residents. For newly-married couples, it is unlikely to afford a house without financial help from their parents. Even they have sufficient money for down payment, the huge pressure of loan interest will still impress their incentive to childbearing (Li, 2018)^[8].

2. Fundamental Model

Becker (1960) assumed that addition children would bring utility to the household, but uncertainty involves into the childbearing decisions. Since it is impossible to predict the sex of the child, and people indeed have preference on gender under many circumstances, parents would

choose the action based on the expected utility.

Since each household consumes other kinds of goods, bearing one additional child incur addition costs. According to their income level, the household maximizes their aggregate level utility subject to its budget constraint, $\alpha px + \pi y = I$, under the condition when marginal utility from spending one additional dollar on the quantity of children equal to the MU from spending on their quality and the MU from spending on other goods.

X refers the quantity of children, p as an expenditure measure of the quantity of x, y is the index of other goods, π is the price of y, I is the total income and α is a parameter which shifts the cost of each quality of one specific x by the same percentage.

In addition, the capacity of producing children is also considered by Becker. Since each household may not achieve their desired quantity of children for some technical or physical constraints. He assumes that if is the desired number of children but one household can only produce of children, then are produced. Another household which also desires but no fewer than of children available, then are produced. Families who produce excess number of children have to consume less on other goods.

Becker's idea builds a bridge to connect the decision of quantity of children to the utility theory and Yi further provide supplementary ideas about the house prices on fertility rate. Firstly, Yi (2010) indicates that husband and wife have to sacrifice a proportion of their leisure time to take care of children and instead of the aggregate level of household income, Yi considers the wage of husband and wife separately. Therefore, the household tires to maximize , subject to , where N refers to the quantity of children, L refers to the leisure time, is the total direct cost of raising all children. In addition, is the market price of house and (N) is a function which describes the housing requirement for raising N number of children^[10]. I refers the income earned at household level and is the sum of wage earned by husband and wife. Yi indicates H is an increasing function of the number of children as more children requires more room of house. Therefore, the demand function of house can be specified as $(N) = a + bN\alpha$, ($0 < \alpha < 1$), where a is a constant number and refers the necessary room of house for parents and $bN\alpha$ is the requirement of room for all children. Since children can partially share the living places, α is less than 1. But the room cannot be shared perfectly, one possible reason is the difference in gender, hence α is great than 0. After solving the optimization problem, the income effect and compensated substitution effect of house price to number of children are negative. It can be concluded the total effect of house price on fertility is negative.

3. How Housing Price Affects the Childbearing Decision of Chinese Household

According to the fundamental model, there is a negative relation between house prices and fertility rate. However, a more specific model that describes Chinese household childbearing decision relevant to house prices still needs to be investigated. Future researches can be achieved by using the data from the National Bureau of Statistics of China and different provincial bureaus of statistics. It should be noted that after experiencing decades of economic growth, the differentiation of social class gradually gives certain characteristics to different groups of people that may influence their decisions on childbearing. Moreover, the budget constraint could be affected due to the financial support from elder family members for new-married couples. By considering more unique characteristics, future researches can find the optimal childbearing strategy of Chinese household under the high housing prices.

4. Importance for The Policy Makers

After knowing the childbearing behavior of Chinese household under the high housing prices, government could design appropriate policy to achieve the fertility rate at an efficient level. The government can achieve the targeted fertility rate through taxes and subsidies via housing channel. Putting the above into practice, an objective function of policy maker would be built based on the overall benefit from the society. The government's budget constraint and incentive constraint from the involved agents would be considered as well so that the optimal implementation theory based on

China's condition can be derived. By understanding these, policy makers are able to issue the appropriate policy to maintain the efficient demographic structure in the long run through the housing price channel.

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