

---

# Game Model Analysis on the Problem of Female Workers Birth Second Child

Danyang Li

Inner Mongolia University of Technology, China.

---

## Abstract

Since the adoption of the “two-child policy” in the Fifth Plenary Session of the 18th CPC Central Committee, many professional women are faced with the choice of whether to have a second child. However, due to the work reasons and the costs paid, most female employees are reluctant to have a second child. Therefore, it has led to the social problem of having a second child. This paper constructs a income function for the problem of female employees second-born and analyzes its implementation strategy by game theory. Finally, this paper will put forward reasonable suggestions for female employees to have a second child.

## Keywords

Female employee; Second child; Income function; Game analysis.

---

## 1. Raise a Question

In 1978, China implemented the “one-child” policy, namely family planning. The national constitution incorporated the family planning policy in 1982. Since the implementation of the “family planning” policy to the implementation of the “two-child policy”, China has entered a stage of low fertility rate led by cost-driven[1]. In order to promote the long-term development of the society, effectively improve the population development strategy, comprehensively implement a policy that a family can have two children, and actively respond to the problem of labor shortage in the future. The Decision of the Standing Committee of the National People's Congress on Amending the Population and Family Planning Law of the People's Republic of China, it was adopted at the Fifth Plenary Session of the 18th National Congress. The revised Population and Family Planning Law stipulates that “the state advocates that a couple can have two children”, which marks The "two-child policy" began to be implemented. However, since the implementation of the "two-child policy", the results have not been very satisfactory, and the birth rate has not risen and fallen. According to the relevant statistics, the number of births in 2016 is only less than the total of 1 million in the previous two years. Compared with the previous two years, the number of births in China has not increased significantly[2]. As the employment situation becomes more and more serious, women must face the choice of employment and childbirth in the context of the “two-child policy”. Therefore, it is necessary to study the relationship between the employment of female employees and the second birth. This paper uses the game theory model to analyze the reasons why female employees are unwilling to have a second child, and proposes targeted recommendations to achieve the optimal choice, that is, the relationship between female employees and the second child can be reasonable. So as to alleviate the shortage of human resources in the future.

## 2. Literature Review

### 2.1 Foreign Research Review

Western scholars have long studied the relationship between maternity and employment, so the theoretical content is quite rich. We analyze from two different perspectives. Firstly, from an economic point of view, Becker (1965) believes that economic costs account for a large proportion of female fertility and employment issues. The authors regards the total household income, work and family, time allocation and childcare costs as important factors influencing women's reproductive decision-making problems. When the cost of childbearing is smaller, the income is greater, women are more inclined to give birth than employment. Secondly, from the perspective of sociology, Jennings and Mcdougald (2007) believe that female fertility and employment are intrinsically incompatible. In other words, individuals divide time and emotion between work and family, the expression and behavioral pattern changes will play different roles, and these roles will conflict with each other.

### 2.2 Overview of Domestic Research

In recent years, China has gradually begun to study the relationship between female birth and employment, because China has been implementing a family planning policy for the past 30 years, that is, each family only needs one child, so women did not too much choice at that time. Starting from the implementation of the "two-child policy" in China, it means that women will have more choices on fertility issues, and there will be direct conflict between employment and childbearing. From the perspective of the factors affecting women's employment, fertility accounts for a large proportion. Among them, Song Chengjian (2016) believes that if a company recruits a woman who intends to have a second child, it will undoubtedly bring greater opportunity cost to the company. It includes the loss of women's maternity leave and the staff storage and distribution, and it also causes great employment pressure for female employees. Gan Chunhua (2017) believes that female fertility will have a certain negative impact on women's employment, that is, in the case that other controllable conditions do not change, for female workers, those who are not born often have to pay more than the wages of women. On the contrary, from the perspective of the impact of employment on female fertility, Pan Yunhua (2017) believes that fertility has a negative impact on women's employment, because female employees have a large proportion of the opportunity cost of birth and employment, especially for female employees. In terms of marginal cost, female employees have also reduced their desire to have two children because of their choice of employment. With the popularization of Chinese education and the implementation of the second-child policy, women's education level, subject consciousness, and social participation awareness are constantly increasing. At the same time, women's reproductive awareness is weakened compared with the past. Female employees began to focus on their work and chose not to have two children.

It can be seen that academics in our country have gradually seen the impact between women's birth and employment, but these studies still have many shortcomings, because most scholars look at it from the perspective of economics and sociology. This problem cannot reasonably judge its advantages and disadvantages. Therefore, this paper wants to study this problem by applying the analysis method of game theory model, which shows that the female birth of the second child is a game process involving multiple actors. Many women choose not to have a second child because of their own career, but the two children are essentially "public goods" belonging to the society, in order to ease the lack of labor resources in the future, and the society will also benefit from these future labor group. In order to ease the relationship between women's employment and childbirth, this paper will give some reasonable suggestions or countermeasures based on the results of the game model analysis.

### 3. Construction and Analysis of Game Model

#### 3.1 Basic Assumption

This article assumes that all women are employed and work, have a child, and are considering the stage of a second child in the context of the “two-child policy”. Furthermore, whether women have to give birth to a second in the enterprise the leadership of the child is informed, and the leadership of the company makes the corresponding decision in the early stage of the birth of female employees. Assuming that women decide to have a second child, the company will provide female employees with maternity leave, maternity benefits and other subsidies in the short term, but as time goes by, the economic cost of raising children is increasing, which will also give Female employees bring certain economic pressures. The paper also assumes that the information provider who provides the second child is a female employee, and whether the user who continues to hire a female worker is a business. The two sides of the game model are the enterprise and female employees. Based on the above analysis, the following specific assumptions are made:

(1) The income of female employees includes the following aspects:

R1: Female employees receive normal income when they have not given birth to a second child (Revenue)

R2: Female employees receive additional income when they give birth to a second child

R3: Additional compensation for corporate employees when they dismiss female employees

C1: Cost of female employees being dismissed by the company and looking for work again (Cost)

C2: The cost of raising a second child and the time and effort spent

Under normal circumstances, the income function of female employees is:

$$Y1=R1 \quad (1)$$

When a female employee of a company wants to have a second child, they will receive additional income (R2), including maternity leave, maternity benefits, and spiritual satisfaction for female employees. When a company wants to quit a female employee who wants to have a second child, the female employee will receive additional compensation (R3), but at the same time it will also bring some negative benefits, including the lack of economic resources caused by temporary unemployment. Then, find the economic cost of a job (C1). In addition, female employees may have to face the cost of raising two children and the consumption of their own time and energy (C2) after choosing to have a second child. In summary, the income function of a female employee who gives birth to two children can be expressed as:

$$Y1=R1+R2+R3-C1-C2 \quad (2)$$

(2) The income of the management of the company, including:

R4: Female employees receive normal income when they have not given birth to two children

R5: When the company dismisses the female employee and re-subscribes, the additional income is obtained.

F: Economic disputes caused by female employees suing enterprises in government departments (Fine)

C3: Female employees filed a lawsuit against the government for the negative social impact on the company.

R6: When the company does not dismiss female employees, they receive additional negative returns.

Under normal circumstances, the company's income function is:

$$Y2=R4 \quad (3)$$

If a female employee wants to have a second child, the company can respond to the behavior. If a company dismisses a female employee and wants to replace a new employee, this can bring additional benefits to the business (R5), including young and capable male employees and less expenses, that is,

pay less, however, enterprises also face economic disputes (F) caused by female employees who have dismissed from government departments and the negative effects (C3). If the company does not dismiss the female employees who want to have a second child, the company will bear the negative benefits (R6), because the company must abide by the relevant laws and regulations, and must give certain benefits to female employees who have a second child. Moreover, there is still a certain amount of salary but no corresponding labor compensation. Therefore, when a female employee chooses to have a second child, and the company decides to dismiss her, the company's income function is:

$$Y_2 = R_4 + R_5 - F - C_3 \tag{4}$$

### 3.2 Game Model Between Enterprises and Female Employees

According to the above assumptions, the enterprise and female employees give the following game matrix on the issue of female employees giving birth to a second child:

Table.1. Game matrix

		Female employees	
		Birth second child	Not birth second child
Company	Dismissal	(R4+R5-F-C3, R1+R2+R3-C1-C2)	(R4-R6, R1+R2-C2)
	Not dismissed	(R4-F-C3, R1+R-C)	(R4, R1)

For female employees, due to the limitations of Chinese traditional thinking and the influence of public opinion, it is inevitable for female employees to have one child, but the birth of two children is more affected by economic factors, especially the cost of raising children is more prominent. China has started to implement the “two-child policy” because of the low fertility rate. However, from the current point of view, it has not achieved the desired effect. Most young couples have received excellent education, which is more cost-effective for childcare and employment. Emphasis on women, women are more and more independent, they will have their own career, so they will temporarily put the birth of the second child. It can be seen from the above that the C2 cost of female employees is a large expenditure for herself, and it is far greater than the additional benefit brought by the birth of two children, that is:  $R_2 < C_2$ .

Under the game theory model established in this paper, enterprises choose to dismiss female employees and give certain dismissal compensation when they tend to maximize their own interests. The cost of female employees facing unemployment and continuing to find work is far greater than the dismissal of enterprises. ie  $C_1 > R_3$ . Since the company will find a new employee to replace her original position when the female employee is dismissed, and the female employee will find a new job to increase income after being dismissed by the company, so  $(R_3 - C_1)$  is just a short-term loss, but once the female employee chooses to have a second child, she will get the extra income for the second child, but the cost of raising the child is not as good, so  $(R_2 - C_2)$  is a long-term loss. in the long term, long-term losses are often much larger than short-term losses, ie  $(R_2 - C_2) > (R_3 - C_1)$ . From the above analysis, one conclusion can be drawn: female employees have a high probability of not choosing to have a second child.

For enterprises, if the female employees are dismissed by the company in the case of choosing a second child, the economic dispute (-F) and the negative impact (-C3) caused by the company are very large. However, from the game model established in this paper, the probability of causing economic disputes is very low. After weighing the pros and cons, the company may think that the additional income (R5) brought about by dismissing female employees is greater than the negative income of hidden costs (-F-C3). However, based on the above analysis, we believe that the dominant strategy of female employees is to have two children. Under normal circumstances, enterprises will not choose to dismiss employees. Therefore, to exclude other possibilities, the only strategic combination left in this

game model is Enterprises do not dismiss female employees, female employees do not have two children. However, from a realistic point of view, female employees are reluctant to consider giving birth to two children due to the loss of personal costs. This will not only affect social development, but also fail to implement the policy of "full two children", which will directly lead to the proportion of the demographic structure of the future society is dysfunctional and there is a shortage of labor resources in the future. Therefore, only through the government's regulation and intervention, the implementation of the "two-child policy" can be fully implemented.

#### 4. Conclusion and Suggestion

Through the above game model analysis, female employees will choose not to have two children for stable economic income, and according to the optimal strategic combination, the company will not dismiss female employees if the female employees choose not to have two children. If female employees do not have two children, it will lead to a series of serious problems such as the shortage of resources in the labor market in the future. Therefore, some specific suggestions and countermeasures will be proposed from the above research and analysis:

The government should provide more subsidies for enterprises and female employees. Firstly, the government should identify the scope of subsidies for enterprises and female employees. The subsidies are subsidies for female employees to give birth to two children. If the female employees in the enterprise choose to have two children, the government needs to give them a certain subsidy; If the female employee who wants to have two children is dismissed, the government can compensate the economic cost of the enterprise. However, if the enterprise dismisses the female employee who wants to have a second child, the government will not subsidize it. On the one hand, this policy can make up for the economic losses caused by female employees giving birth to the second child. On the other hand, it can encourage female employees to respond to the implementation of the "two-child policy" and promote long-term social development. Secondly, once this policy is formed, it needs to be tested in a local area for a period of time, and it can be implemented under the condition that it is feasible.

It is necessary to strengthen the construction of welfare public facilities. With the change of people's ideas, women employees are paying more and more attention to their own careers. Therefore, when they choose to have a second child, they will have to bear more pressure, not only to face the explicit and hidden costs of raising children. It is also necessary to spend a lot of time and energy on the growth of the child. Therefore, it is crucial for the government to strengthen welfare public construction. For example: the construction of public child care centers, a unified system management to ensure the safety and health of children; the construction of a large number of kindergartens, the establishment of public kindergartens as much as possible according to urban planning, which can alleviate the pressure on parents, especially for female employees, it is more necessary to have a place to look after their children to ensure that they can work normally; to promote maternity insurance and provide preferential medical services for women, through the government and the society to share the cost of raising two children in the family, so that women employees are psychologically satisfied. Only when the government and the society work together can we effectively balance the relationship between female employees and children.

#### References

- [1] Li Jianmin. China's Fertility Revolution. *Population Research*, 2009, 33(1): 1-9.
- [2] Mu Guangzong. The effect and prospects of the implementation of the "two-child comprehensive policy". *China Economic Report* 2017(1): 24-26.
- [3] Becker G S. A Theory of the Allocation of Time [ J]. *Economic Journal*, 1965, 75(299): 493-517.
- [4] Jennings, J. E., & Mcdougald, M. S. Work -family interface experiences and coping strategies: implications for entrepreneurship research and practice. *Academy of Management Review*, 2007, 32 (3) : 747-760.

- [5] Song Chengwei, Qu Shuai, Zhang Xinyi. Predicting the impact of the second child policy on Chinese women's occupation. *Legal System Expo*, 2016 (21).
- [6] Gan Chunhua. The performance and mechanism of "heavy wage punishment": research status quo. *Labor Economic Research*, 2017, (3) 120-134.
- [7] Pan Yunhua, Liu Pan. The "relative correlation" between the birth of two children and the employment of urban women——An economic analysis perspective. *Theoretical Guide*, 2017(3): 80-82.
- [8] Kang Rui, Lu Xuejing. A summary of the debate on the relationship between the policy of "full two children", fertility willingness and female employment. *Theoretical Monthly*, 2017(12): 155-161.
- [9] Yan Lei, Bo Xi, Yao Haixin. Game Analysis of Insurance Company's Earnings Management Problem. *Finance and Economy*, 2016(7): 86-90.
- [10] Wang Jun, Bai Chuqiao, Huang Xiaoying. Cost-benefit analysis of female children born in urban China. *Youth Exploration*, 2017: (5).