Research on the Choice of Retirement Time Based on the Perspective of Pension

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ABSTRACT

For specific female managers or female professional technicians, the policy stipulates that they can retire at the age of 60, but they can also voluntarily retire at the age of 55 upon their own application. Whether to retire at the age of 55 or 60 is the two options that need to be chosen. If employees extend their working years, their pension level will be improved correspondingly after retirement, but they need to pay more endowment insurance, and the period of enjoying pension will be shortened. This paper compares the time when the two schemes reach the balance in different interest rates and different return on investment, with the remaining life of the employees, as a reference for how to choose. Empirical research shows that the balance time is negatively related to the return on investment and positively related to the one-year deposit rate, and the pension received by the 60-year-old retirees is larger than that of the early retirees.

Keywords: pension, early retirement, compare, calculation model, numerical simulation

1. INTRODUCTION

The retirement policy involves the vital interests of employees, which naturally attracts wide attention from all aspects of society. For specific female managers or female professional technicians, the policy stipulates that they can retire at the age of 60, but they can also voluntarily retire at the age of 55 upon their own application. Whether to retire at the age of 55 or 60 is the two options that need to be chosen. The choice of retirement scheme is not only affected by social and economic factors such as national economic situation, pension insurance system, tax policy, but also restricted by personal life factors such as health level, domestic burden, marital status. In the late 1960s, Barfield and Morgan began to study the influencing factors of retirement intention. Using the Binary Logistic Regression (BLR) method, they found that the expected retirement income is the most important factor affecting the intention to retire. [1] It can be seen that pension is an important factor in determining whether the employees retire in advance. If employees extend their working years, their pension level will be improved correspondingly after retirement, but they need to pay more endowment insurance, and the period of enjoying pension will be shortened.

This paper compares the time when the two schemes reach the balance in different interest rates and different return on investment, with the remaining life of the employees, as a reference for how to choose. At present, there are two main research perspectives on endowment insurance: macro and micro. Here, from the micro perspective, we take the "representative employee" of specific female managers or female professional technicians as the research object to carry out the research on relevant issues.

2. BASIC HYPOTHESIS AND CALCULATION MODEL

The current endowment insurance system of government institutions in China adopts the operation mode of the combination of social pooling account and individual account. The endowment insurance payment rates of institution and individual are 20% and 8% respectively, and the contribution rate of occupational pension of institution and individual is 8% and 4% respectively.

2.1. Basic Assumptions

Here, the so-called "representative employee" refers to the person whose payment wage is the social average wage. Assume that "representative employee" retires at the age of k, the payment period is t_k, occupational pension funds are managed in the form of personal accounts, and all the contributions of institution and individual are accumulated in real accounts, and all revenues and expenditures occur at the beginning of each year.

2.2. Calculation Model

According to the regulations, the monthly standard of fundamental pension is based on the average monthly wage of local employees in the previous year and the average value of their indexed monthly average payment wage at the time of retirement, and 1% of the base amount will be paid for every full year of payment. The fundamental pension

that "representative employee" receives every month when he retires at the age of k is as follows:

$$P_k^1 = \frac{W_0}{12}(1+g)^{t_k} \times t_k\% \qquad (1)$$

Here, W_0 is the annual average wage of local employees at the time of initial payment of "representative employee", and g is the annual growth rate of wages. The accumulated values of individual account and occupational pension account of "representative employee" are as follows:

$$P_k^2 = c_1 W_0 \sum_{j=1}^{t_k}(1+g)^{j-1}(1+n)^{t_k-j+1} \qquad (2)$$

$$P_k^3 = (c_2+c_3)W_0 \sum_{j=1}^{t_k}(1+g)^{j-1}(1+r)^{t_k-j+1} \qquad (3)$$

In the above formula, c_1, c_2 and c_3 are the payment proportion of individual account, individual occupational pension, and institution occupational pension respectively,

n is the return on investment of individual account, and r is the return on investment of occupational pension. Individual account shall not be withdrawn in advance and shall be exempt from interest tax. The monthly standard of individual account pension is the individual account deposit divided by the number of calculation months. Here, according to the regulations, when the "representative employee" retires at the age of 55, the number of calculation months is 170, and when the "representative employee" retires at the age of 60, the number of calculation months is 139. In addition, if the payment of individual account fund is empty, it will continue to be paid by the pooling account. The pension payments corresponding to the two retirement schemes are shown in Figure 1.
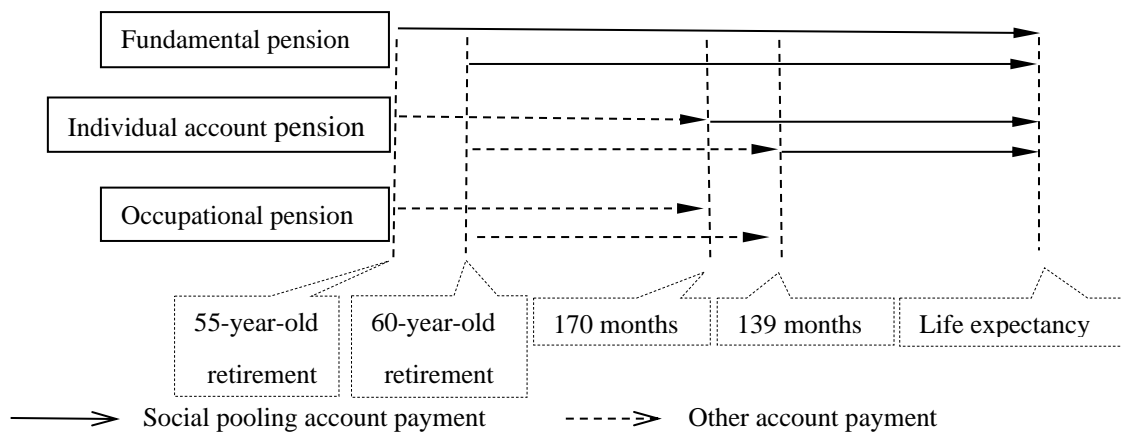

Figure 1 Payment of pension

Here, q_k is used to express the remaining life of "representative employee". m_k refers to the number of calculation months of pension in individual account, and u refers to one-year deposit interest rate. Therefore, the total value of pension received by "representative employee" are as follows:

1) If $0 \le q_k \le m_k$,   then $P_k = q_k P_k^1 + P_k^2 + P_k^3$
2) If $m_k \le q_k$,   then $P_k = q_k P_k^1 + \frac{q_k}{m_k}P_k^2 + P_k^3$

3. NUMERICAL SIMULATION

### 3.1. Parameter Setting

China's economy has entered the "new normal" stage of medium and high-speed development. It is assumed that the growth rate of China's GDP will remain at about 6% in the next 10 years. Considering that wage growth is closely related to economic growth, the social average wage growth rate is defined as GDP growth rate. One year fixed deposit rate can be considered as the most conservative investment

return rate. China's social insurance law clearly stipulates that the accounting interest rate of individual accounts shall not be lower than the bank fixed deposit interest rate. [2] Here, based on the one-year deposit interest rate, add 1 percentage point as the return rate of individual account investment. The floating range of the return on investment of occupational pension is that the interest rate of one-year deposit rises by 3 percentage point. Since 1999, the fluctuation range of one-year deposit interest rate is 1.5% - 4.14%. [3] Therefore, the following simulation calculation will be carried out in the range of 2% - 4% interest rate change.

3.2. Calculation Results

Figure 2 shows the pension received by "representative employee". As can be seen from the figure that the pension is positively related to the number of months from the age of 60, for each type of "representative employee", the pension growth rate of retirement at the age of 60 is higher than that of early retirement.
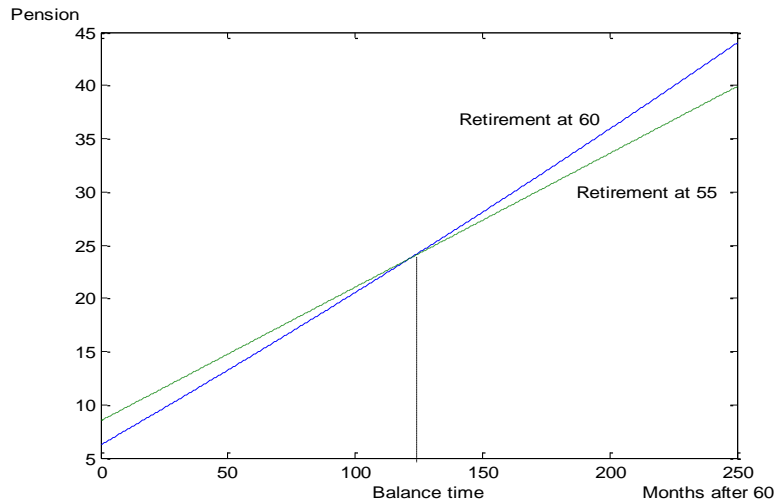
Figure 2 The pension for two retirement schemes

Table 1 shows the time when the two pension schemes reach balance under different interest rates and different return on investment. It is assumed that the "representative employee" is 55 years old and has paid the endowment insurance for 30 years.

Table 1 The balance time

One-year deposit interest rate	2%			3%			4%		
Earning rate of individual account	3%			4%			5%		
Earning rate of occupational pension account	2%	3%	4%	3%	4%	5%	4%	5%	6%
The balance time (in hour)	99	97	94	123	120	116	154	151	148

It can be seen that the balance time is negatively related to the return on investment and positively related to the one-year deposit rate. The one-year deposit interest rate has a great influence on the balance time, and the general fluctuation range is 20-30 months. Meanwhile, for every 1% increase in the return on investment of occupational pension account, the balance time will be about three months in advance. The life expectancy of women in China's life insurance related pension business is 83.7 years old. Obviously, the balance time only accounts for 30% - 50% of the remaining life after 60 years old. That is, within 50% - 70% of the time after retirement, the pension received by the 60-year-old retirees is larger than that of the early retirees, and the gap is growing as time goes on.

4. CONCLUSION

Based on the assumptions made by different scholars when they study endowment insurance, this paper establishes the calculation model of pension, analyses and discusses the relationship between the monthly pension and the number of months to receive pension, and gives the balance time under the conditions of different interest rates and different return on investment, which provides a reference for specific female managers or female professional technicians to make decisions. On the contrary, the working attitude of these women formed over the years makes them hope that they are still valuable to the society and not willing to fully enjoy their leisure time. The specific female managers or female professional technicians have relatively high educational background, and their self-awareness may be more accurate. The policy of retirement of specific women to the age of 60 is of great significance to enhance the enthusiasm of staff and realize the optimal allocation of human resources. From the perspective of making full use of social excellent human resources, giving up the option of early retirement is an appropriate choice. There is no doubt that increasing the return on investment can reach the balance time ahead of time. Therefore, the relevant government departments should take a positive and prudent attitude to invest properly, to ensure that the investment return rate is high and stable for a long time.

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