

# Actuarial Research Based on Pension Insurance for Urban Residents in China

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## ABSTRACT

In the context of the rapid development of social economy and the accelerating process of urbanization, the state and relevant departments have also put forward new tasks and requirements for the development of urban residents' pension insurance. It is emphasized that it is necessary to link with reality and provide more powerful protection for the pension of urban residents by optimizing the adjustment of the pension insurance benefits for urban residents. This study is mainly to make in-depth research on the actuarial calculations in China's urban residents' pension insurance, and through the combination of existing research results and survey analysis to effectively solve the problem of urban residents' low level of pension replacement and make a comprehensive analysis and comprehensive analysis. [1] Then, by proposing a more targeted adjustment strategy for urban residents' pension insurance, and by scientifically clarifying more reasonable standards for the replacement rate of urban residents' pension insurance funds, a more feasible adjustment plan is designed to provide urban residents with a basic living standard after retirement. Only in this way can the positive role of the pension insurance work for Chinese urban residents be fully brought into play.

**Keywords:** Chinese urban residents; pension insurance; actuarial research

## 1. INTRODUCTION

The establishment and continuous improvement of the pension insurance system for urban residents. The main purpose is to provide a certain guarantee for the normal life of some rural residents, as well as those urban residents who do not have a fixed income. From the traditional rural social endowment insurance in its generation period to the current unified urban residents' endowment insurance, it has gone through four stages. Regardless of whether it is before or after the merger of urban housing insurance and new rural insurance, many scholars have used actuarial methods to make a lot of research on urban residents' pension insurance. This article also starts from this perspective to conduct a deeper analysis. [1] It is hoped that this can provide a strong reference for the scientific development of the pension insurance work for urban residents in China in the future, so that the basic life of urban residents after retirement can be more effectively guaranteed.

## 2. THE TARGET REPLACEMENT RATE STANDARD OF URBAN RESIDENTS' PENSION INSURANCE FUNDS

Through in-depth analysis of related theoretical research results, it can be clarified that if the pension level is not adequate, it will not be possible to guarantee the basic life of the elderly. At the same time, it is difficult to effectively stimulate consumption growth. And as the level of pensions continues to increase, people's enthusiasm for work is also difficult to stimulate and effectively maintain. Over time, it will lead to increasing financial pressure on the government. Therefore, in the actuarial research, the design of the pension insurance benefit level plan for urban residents must not ignore the definition of the appropriate level standard. [2] On the one hand, with regard to the subsistence allowance standard, in the process of establishing the target replacement rate subsistence allowance standard, it should be clarified around the average of one year. On the other hand, in terms of the Engel coefficient standard, the analysis of the Engel coefficient in the past few years should be regarded as an important basis, and then the regression analysis should be carried out, with emphasis on predicting the

Engel coefficient in the next few decades. Based on this, we can clarify the proportion of various expenditures in the per capita net income and disposable income of rural and urban residents. Then, on this basis, this paper can draw up a logarithmic regression equation to obtain reasonable prediction results. [3]

### **3. DESIGN OF ADJUSTMENT PLAN FOR URBAN RESIDENTS' PENSION INSURANCE**

Through more in-depth actuarial research, we can fully realize that a "basic guarantee" is a criterion that must be followed in the establishment of urban residents' pension insurance. To put it simply, it is necessary to reasonably control the level of pension replacement rate of benefit recipients within the receiving cycle to avoid substantial changes. [4] This article focuses on the following two options: The first one: to ensure that the total replacement rate of the basic pension and the personal account pension can be coordinated with the lower limit of the living security level. In the subsequent research and adjustment process, in addition to the full integration of the basic pension replacement rate borne by the system, efforts must also be made to implement the overall target replacement rate level; the second type: to ensure the replacement of basic pensions and personal account pensions. The sum of the rate can be consistent with the level of food expenditure. In the subsequent research and improvement, it is necessary to ensure the full integration of the basic pension replacement rate borne by the system. Through the design, improvement and implementation of this kind of adjustment plan, it can provide a more powerful guarantee for the scientific and fairness of urban residents' pension insurance benefits. [5]

### **4. THE ADJUSTMENT STRATEGY OF URBAN RESIDENTS' PENSION INSURANCE**

First, build a more innovative and complete pension adjustment mechanism. Under the new situation, it can be clarified through in-depth understanding of the data and information related to the adjustment of urban residents' pension insurance funds that the selection of the target replacement rate of pension insurance is closely related to many factors. In this regard, in order to provide a certain guarantee for the scientific and fairness of the urban residents' pension insurance benefits, we must start from the status quo of my country's social and economic development, integrate reality, and build a more complete and suitable pension adjustment mechanism. Through reasonable adjustments to income distribution, the value of social security can be fully utilized. [6] To this end, relevant staff should pay full attention to it, and in the process of actuarial

research, through further improvement of the adjustment mechanism to ensure that various tasks can be implemented efficiently and in place. From the current point of view, the implementation of my country's pension mechanism still exists: the lack of levels of the social pension insurance system makes it difficult for the social insurance relationship to be effectively transferred and continued, which has also brought about the free flow of labor to a certain extent. The coverage of endowment insurance is small, which can easily lead to financing difficulties and misappropriation of funds; the rural endowment insurance system also needs to be improved. This can be improved from the following aspects:

The first one, pay attention to the further advancement of the construction of a multi-level pension system, so that social relief, family security, and social basic pensions and other different levels of pension insurance systems for the poor who cannot afford to pay. The model can be comprehensively covered.

The second one, the rational construction of different forms of urban and rural old-age security models should be emphasized. In this way, we can ensure that the quality of life of urban residents after retirement can be effectively guaranteed, so that businesses, enterprises, families and many other aspects can pay enough attention to actively participate in the innovative exploration of urban and rural pension insurance models. [7]

The third one, optimize and adjust the structure of fiscal expenditure in a scientific and timely manner. In actuarial research, it is feasible to set the target replacement rate between the subsistence allowance and Engel coefficient by combining the reasonable replacement rate level in the future. But what needs to be considered is that because of the fact that financial subsidies will account for a large proportion of local fiscal revenues, if social security expenditures are to be reasonably expanded and greater social security efforts are to be exerted, it must be based on reality. Timely optimize and adjust the structure of fiscal expenditures. On this basis, in order to further improve the relevant mechanisms, it is also possible to construct a local fiscal sharing mechanism that is compatible with the level of social and economic development, so as to provide a certain guarantee for the scientific integrity of the fiscal expenditure structure.

Third, reasonably regulate the payment standards. Many scholars have found in actuarial research that by appropriately increasing the contribution level, the replacement rate of the pension level in the personal account can be effectively enhanced.

Based on this, in the process of adjusting the pension insurance benefits of urban residents, the payment

standards should be further regulated in light of specific conditions, so as to effectively increase the level of personal account replacement rate and at the same time give full play to the binding force of the system. To ensure the realization of the above goals, it is necessary to regard per capita real income and disposable income as important basis for payment, and then make reasonable adjustments to the payment mechanism through a comprehensive analysis of income growth in this area, so as to make a reasonable adjustment to the payment mechanism. The further improvement of the stability of the pension replacement rate provides a strong guarantee. In addition, for urban residents, their endowment insurance must pay attention to the setting of reasonable payment intervals, and clearly define the upper and lower limits to fully highlight the scientific and standardized payment standards. For this reason, in the subsequent actuarial research, relevant staff should give full consideration, so as to lay a good foundation for the subsequent development of relevant work.

The fourth one, in the calculation and distribution of pension benefits, the role of personal accounts has been brought into full play. In the urban residents' old-age insurance system, personal accounts generally adopt the "real-account system" operation mode, which is different from the old-age insurance for urban employees. Only by accurately grasping the value of individual accounts can the replacement rate of individual accounts be determined. Level. Therefore, in the pension benefit mechanism, full consideration should be given to the value role played by personal accounts. In connection with the actual development of each stage, through the reasonable construction of the personal account fund investment operation model, the economies of scale can be fully utilized. Only in this way can it be ensured that the protection of personal accounts and strong conditions for appreciation can be obtained. For this reason, in actuarial research, its staff should give in-depth analysis, start from different levels, make reasonable adjustments and continuous improvement, and lay a good foundation for the effective play of the positive role of personal accounts. [8]

## 5. CONCLUSION

To sum up, this article makes an in-depth analysis of the problems of the low level of pension replacement for urban residents in the development of my country's urban residents' pension insurance system. The optimization of the structure, as well as the full use of personal accounts, have further explored my country's pension insurance system. Then through the establishment and application of actuarial models, a more comprehensive understanding of the current development situation of my country's pension insurance system is to pay attention to the construction

of a multi-level pension system, as well as the establishment and improvement of different forms of urban pension insurance models. Only through the construction and implementation of a new pension system can the organic integration of all forces be realized, so that society, enterprises, families and many other aspects can be given full attention and actively participate in the actuarial research of urban residents' pension insurance. It is hoped that this can provide a certain reference for the effective development of China's urban pension insurance-related work in the future, so that the advantages of my country's urban residents' pension insurance system can be fully utilized.

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## REFERENCES

- [1] Han Lili. Actuarial model of urban residents' pension insurance under random interest rates[J]. *Fortune Times*, 2020, (12): 187-188.
- [2] Zuo Xiangru, Zhu Mei, Tang Cheng, Liu Yafang, Gong Xuan. Research on the Income Redistribution Effect of Urban Residents' Pension Insurance: Taking Hunan Province as an Example [J]. *World of Labor and Social Security*, 2020, (12): 35-37.

- [3] Cheng Hui, Lu Yuan. Research on Pension Insurance Revenue and Expenditure Calculation Based on Improved Population Actuarial Model—Taking Hainan Province as an Example[J]. *Research World*, 2019, (01): 36-41.
- [4] Yang Zaigui, Xu Yan, He Qin. Actuarial model and application of basic pension insurance for urban and rural residents[J]. *Central Finance and Economics University Journal*, 2019(2): 31-42.
- [5] Deng Dasong, Xue Huiyuan. The new type of actuarial model of rural social pension insurance replacement rate and its empirical analysis [J]. *Economic Management*, 2010 (5): 164-171.
- [6] Feng Tieying, Li Mengyi. Simulation and prediction of the balance of income and expenditure of the new-type rural social pension insurance fund—Based on the perspective of system risk parameter optimization [J] . *Journal of Public Management*, 2010 (10): 100-110, 127.
- [7] Jiang Yunyun. Research on the Impact of my country's New Rural Pension Insurance on the Sustainability of the Financial System—Analysis Based on Intergenerational Accounting [J] . *Financial Research*, 2011 (12): 4-15.
- [8] Liu Changping, Yin Baoming. The feasibility study of the new rural social endowment insurance financial subsidy mechanism—based on the pay-as-you-go balance model [J]. *Journal of Jiangxi University of Finance and Economics*, 2010 (3): 35-40.