

Problems of Financing Structure and Its Adjustment Based on the Context of New Rural Pension Insurance Policy in China

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Abstract

New Rural Pension Insurance Policy is a social pension insurance policy implemented in Chinese rural areas. This policy has changed farmers' self-financing payment and strengthened government's responsibility, but it still has some problems, especially in financing structure. On the one side, the fact that farmers' self-payment fixed certain grade, causes farmers' payment to separate from their income. It is impossible to mobilize the enthusiasm of farmers. On the other side, the standard of government subsidies is too low and the standards are different in various areas. In order to solve these problems, inter-temporal choice theory is used to construct farmers' objective functions to maximize their individual utility functions and meet characteristics of New Rural Pension Insurance Policy. And the government should determine the reasonable ratio between government subsidies and farmers' self-payment.

Key Words: New Rural Pension; inter-temporal choice theory; objective functions

1 Introduction

New Rural Pension Insurance Policy was released by government in September 2009 after a long time of consulting opinions of the public. According to this policy, new rural pension insurance is financed by three sources: self-payment, collective subsidy and government subsidies. There are not compulsory provisions on collective subsidy. It is just stated as follow. "Conditional village collectives can pay the insured farmers a subsidy and the standards must be decided openly by local village committee meeting", which means current policy of collective subsidy, is just encouraging suggestions. Meanwhile, from current situation of rural, rural collective economy is indeed weak and just exists in some coastal areas. When considering financing structure, we can just put aside this funding source. That is to say; only individual contributions and government subsidies are taken into account in financing studies of New Agricultural Insurance.

2. Financing Structure and Its Problems

New Rural Pension Insurance Policy is a major improvement to the old one. It changes farmers' self-financing payment mode, and strengthens government's responsibility. But it still has some problems.

Firstly, in terms of self-financing, the feasibility of fixed pay grades is questionable. Above all, it makes farmers' pay level unrelated with their income. Some scholars has analyzed on the replacement rate of this insurance and concluded as follow: Fixed grades of contribution is not conducive to make appropriate adjustments according to the level of rural income growth.^[1]In addition, from the perspective of policy's incentive effect, this practice is not likely to mobilize the enthusiasm of farmers. On individual contributions, it is required in guidance that five grades of fixed payment standards such as 100 Yuan, 200 Yuan, 300 Yuan, 400 Yuan, 500 Yuan can be chosen. Although this meets the principle of farmers' self contributions, such practice may make farmers choose the lowest grade of contributions.

Secondly, in government subsidies respect, guidance on the requirements of government subsidies is rather blurred. For example, the local government subsidies paid to farmers for each insured standard must not less than 30 Yuan per month, based on the reality of huge differences in the regional developing level. This leads to such a phenomenon: subsidies governments given to the insured person vary in different provinces, and even different cities and counties in the same province. In this way, not only farmers in low subsidies areas are discouraged, but also a new household registration barrier may appear because of regional differences in subsidies.^[2]

Furthermore, the standard of government subsidies is too low when considering our aging status and current situation of rural development.^[3] All these determine, government should bear considerable responsibility if social pension insurance system is implemented in Chinese rural areas.

The two points above are both financing structural issues. What we must do is to determine a funding criterion which maintains the consistency of New Agricultural Insurance system, and adapts to different local economic development levels as well.

3. Farmers' Objective Function Model

Referring to the optimal contribution rate of old-age insurance for urban workers, the article estimates the ratio between local government subsidies and individual farmer's contributions by maximizing the utility of farmers' life cycle.^[4]

Most academics believe that in the financing of new agricultural insurance, the farmers should follow a certain percentage of the previous year revenue contribution.^[5] This paper argues that farmers consider the benefits enjoyed many years later only after meeting recent consumption. Individuals pay part of the insured farmers should follow the remainder of farmers (farmers' annual income minus expenses)

3.1. Assumptions

This paper has the following main assumptions based on intertemporal choice theory.

First, we divided the life cycle of insured farmers into two parts: pension contribution period and pension receipt period. Farmers' first phase is to pay for pension. They gain pension in the next phase.

Second, farmers work in the first period for the reason that they receive pension from their 60-year-old. Insured farmers do not work in their second period. When they reach 60, the income only includes two parts: basic pension paid by government and individual account pension accumulated from Individual contribution. As this personal account is fully funded, all the contribution in the first phase will be used to pay the pension of the second phase.

Third, farmers' savings are not considered here, namely farmers' income is only used for individual consumption and paying the costs of new agricultural insurance. Changes in the number of farmers will be ignored here. We assume that each farmer is homogeneous and each farmer's annual labour income is exactly equal to the average annual income of national farmers.

Fourth, according to this policy's guidance, individual contributions are annual payment. And payment period is calculated in accordance with cumulative period. In this article, individual farmers do not stop paying since beginning until they are 60 years old

3.2. Construction of insured farmers' utility function

Insured farmers' individual utility is a function of their consumption level. Contributions and benefits of this policy have changed farmers' consumption structure in two periods, and then changed their lifecycle utility. Based on the above assumptions, the first period consumption of insured farmers is equal to labour income in the first phase minus personal contributions, and the second phase is the sum of basic pension and individual account pension. Individual account pension equals to individual farmers' contributions, local government subsidies and new agricultural insurance fund.

Assuming each insured farmer's total utility of the lifecycle is $U = U_1(c_1) + U_2(c_2)$, of which U_1 stands for the insured farmers' utility in the first phase, U_2 for the utility in the second phase.

Insured farmers' savings are not considered here, that is to say, farmers' payment in the first period is equal to the amount of income deducting consumption value. Assuming the ratio between local government subsidies and insured farmers' contribution is θ .

Based on these assumptions, it is easy to deduce that an individual insured farmer's consumption in the second phase is as follows:

$$c_2 = 55 + [(1 + \theta)(m_1 - c_1)](1 + r_1) \quad (1)$$

The above formula means farmers’ consumption in the second phase is made up of basic pension paid by the government (55Yuan) and individual account pension $(1+\theta)(m_1-c_1)(1+r_1)$ of which 55 is the basic pension paid by the government, r_1 for the fund benefits of the new agricultural insurance. c_1 is fund benefits of new agricultural insurance in the first period. c_2 is farmers’ consumption in the second period. m_1 is farmers’ revenue in the first period. Interest rate on personal accounts is expressed as "personal account interest rates refer to one-year deposit rate" in guidance, so in model one is presented as bank’s regular deposit rates in the first period.

3.3 Solving the value of θ

Our mission is to calculate the ratio between local government subsidies and insured farmers’ payment by maximizing farmers’ lifecycle utility. This article constructs a Lagrangian to solve it. Assuming insured farmers have the same utility function in two phases of their lifecycles. It is $U = c^2$.

$$\max [U_1(c_1) + U_2(c_2)] \tag{2}$$

$$\text{s.t. } c_2 = 55 + [(1 + \theta)(m_1 - c_1)](1 + r_1) \tag{3}$$

$$\text{Lagrangian function is: } L = U_1(c_1) + U_2(c_2) + \lambda \{55 + [(1 + \theta)(m_1 - c_1)](1 + r_1) - c_2\} \tag{4}$$

$$\text{Maximizing this function, we get the expression of } \theta : \theta = \frac{c_1}{c_2(1+r_1)} - 1 \tag{5}$$

Deducing from above expression related with θ , it links to farmers’ consumption in paying period c_1 , consumption in receiving period c_2 , and bank deposit rate r_1 . As long as farmers’ consumption value in both periods and bank deposit rates in their paying period are given, we can measure the value of θ .

3.4 Measurement and analysis of θ when parameter values are given

It was required in Guidance that individual account should refer to RMB one-year deposit interest rate of financial institutions announced by People’s Bank of China. According to RMB deposit interest rate in 2002 -2012, this article will take one-year bank deposit rate as 3% (average value of RMB deposit interest rates in 2002-2012), and then the insured farmers’ annual return rate is 3%.

Medical issues of insured farmers, to some extent, have been solved by New Rural Cooperative Medical Care. That is to say, the biggest expense of the rural elderly has been guaranteed. The paper will take rural minimum living standards as the annual expenditure of rural elderly. Some scholars concluded as follow: the rural minimum living standard was 2040Yuan in 2006 and 1716 Yuan in 2007. ^[8] Based on this, average annual expenditures for rural elderly will be taken as the value of 2,000 Yuan. Insured farmers’ per capita annual expenditure in paying period will be taken as 4500 according to Table 1. Assuming insured farmers are homogeneous and their life expectancies are the same. They everyone can receive a 10 years’ pension. Based on these assumptions, we can easily come into conclusion that farmers’ expenditure c_2 is 20,000 Yuan. (average annual expenditures of the elderly multiplies pension receiving time)

Table 1 Per capita consumption expenditure of rural residents (Yuan)

Year	Per capita expenditure
2010	4,381.82
2011	5,221.13

Below three different age ranges of insured farmers, 16 years old to 59 years old, 25 years old to 59 years old, 35 years old to 59 years old will be selected to calculate. Farmers’ insured periods in these age ranges are respectively 44 years, 35 years and 25 years. The measured value of θ has been shown in Table 2. If an insured farmer keeps paying for the insurance from the age of 16 to 59, his paying period is 44 years.

The annual expenditure in his paying period is 4,500 Yuan and we can draw a conclusion that spending expenditure c_1 in his first period is 198000Yuan. Therefore, $r_1 = (1 + 0.03)^{44}$, the value of θ is 1.696.

If an insured farmer keeps paying for the insurance from the age of 25 to 59, his paying period is 35 years. Spending expenditure c_1 in his first period is 157500 Yuan. Therefore, $r_1 = (1 + 0.03)^{35}$, the value of θ is 1.799. If an insured farmer keeps paying for the insurance from the age of 35 to 59, his paying period is 25 years. Spending expenditure c_2 in his first period is 112500 Yuan. Therefore, $r_1 = (1 + 0.03)^{25}$, the value of θ is 1.687. Deducing from the value of θ , subsidies local governments paying to each farmer should be 1.7 times more than individual farmer's contribution.

Table 2 Measurement of θ (percent, %)¹

$c1$	$(1+r)n$	$c2$	θ
198000	3.671	20000	1.696
157500	2.814	20000	1.799
112500	2.094	20000	1.687

This article takes 2011 as an example to analyze if governments' subsidies to insured farmers are appropriate. This paper selected 50% of farmers' remaining as their contributions. The value of θ measured above is 1.7.

Guidance provides that farmers over 16 years old can voluntarily participate in New Rural Pension Insurance and receive pensions at the age of 60. In other words, the age range farmers participate in the new agricultural insurance is from 16 to 59 years old. In table 3, we take farmer's average annual income of the eastern, central, western and northeastern regions in 2011 as annual income, the annual expenditure for the farmers in each region as average annual expenditure. Annual remaining is the value of annual income minus annual expenditure. This paper got the number of 16-59 year-old farmers in every province according to provincial rural population age structure of the sixth census in 2010. Then calculating the number of 16 to 59 year-old farmer in eastern, central, western and northeastern regions. If all farmers in their insured ages (i.e. 16-59 years old) are insured, then the local government subsidies this year is equal to the number of 16-59 year-old farmers in this region and government subsidy for each farmer.

Table 3 Proportions of local government subsidy accounted for provinces budget expenditure²

<i>Area</i>	<i>Eastern</i>	<i>Central</i>	<i>Western</i>	<i>Northeast</i>
Annual remains (Yuan)	2728.70	1743.94	1058.81	2392.03
Insured farmers' number (ten thousand)	10676.5	11553.6	8828.9	1424.4
Payment amount (Yuan)	1364.35	871.97	529.41	1196.02
Per capita subsidy (Yuan)	2319.40	1390.55	900.00	2033.23
Total subsidy (one billion Yuan)	247.63	160.66	79.46	28.96
Government spending (one billion Yuan)	3724.96	1918.58	2739.67	890.17
Proportion (%)	6.65	8.84	2.90	3.25

4. Conclusions and Acknowledgement

Based on the above estimates on funding structure of New Agricultural Insurance, following recommendations are made from the aspect of individual contributions and government subsidies.

First, in individual contributions, change fixed grade payment to 50% of farmers' remains.

Based on above calculations, farmers' minimum payment is 529.41 Yuan, significantly higher than the lowest pay grade, 100 Yuan. It can be seen from above calculations that farmers' contribution levels in all regions were followed as eastern, northeast, central and western. This is also linked with regional economic development level.

Second, in government subsidies, local governments pay 1.7 times of each insured farmer's contribution. From local governments subsidies accounted for the proportion of provincial budget calculations in Table 3, we can conclude that the local government can afford these subsidies. Western region' accounts for the smallest proportion of government budget, which is 2.90%. Even the area accounting for the largest proportion of budget, central region is only 8.84%.

¹ Source: China Statistical data application support system / database of living for the year / per capita peasant family living expenses

² Data Source: China Statistical Bureau website "China Statistical Yearbook (2012)," and the sixth census-related data

It appears that local governments' paying for new agricultural insurance subsidies is quite reasonable, within the budget of various regions. Thus, the idea is relatively reasonable that local government pay 1.7 times of each insured farmer's contribution. This will not only enhance the enthusiasm of farmers insured, but can also increase their future pension amount. And this subsidy standard is consistent with the actual situation. With the increase of farmers' income, in the case of consumption remains unchanged, the annual surplus will increase. Meanwhile, with the development of society, provincial government revenue will also increase. Then the proportion government subsidies accounted for budget expenditure will keep reasonable.

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