Research on the Optimization of Incentive Payment Policy of China's Basic Social Pension System Based on Supply Constraints

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Abstract:

In the context of the continuing outbreak of COVID-19, the Chinese people, together with the people of the world, are suffering from the problems brought about by COVID-19. Besides the goal of adequacy, how to improve affordability, sustainability and robustness of pension system is also the key issue as limited individual contribution capacity and limited financial affordability of governments at all levels, and the need for sustainable level of basic living needs. Therefore, this article focuses on limited supply constraints, analyzes individual contribution capacity, and discusses the relationship between individual contribution capacity and government financial subsidies, then, based on the analysis of limited supply constraints above, this article discusses the needed individual contributions of rural residents in China based on the condition that the multi-level annual basic living needs are satisfied to achieve the goal of adequacy. At last, some suggestions for optimizing the incentive payment policy of rural social pension system in China are put forward. The aims are to promote rural residents to continue to pay their contributions, raise the payment level and extend the payment period within the scope of their abilities, then to achieve the goals of adequacy, affordability, sustainability and robustness.

Keywords: *Basic pension system, Incentive payment policy, Supply constraints, Moderate rural individual contribution capacity, Replacement rate.*

I. INTRODUCTION

In the context of the continuing outbreak of COVID-19, the Chinese people, together with the people of the world, are suffering from the problems brought about by COVID-19. As Pension Outlook 2020 mentioned, retirement savings and old-age pensions have suffered a large shock because of COVID-19 [1]. As the negative impact on retirement savings and social pensions, some experts worry about whether retirement income adequacy could be reached or not. Actually, adequate benefits ensure the elderly have the capacity to remain out of extreme poverty in old age. However, facing economic decline, tough fiscal

environment and increasing employment, although adequacy is one of key issues, it is very important to address affordability, sustainability and robustness of pension system in current time. The World Bank holds that pension systems should provide adequate, affordable, sustainable and robust benefits [2]. Actually, it is hard for one nation to achieve them at same time before COVID-19, not to mention now.

In China, with the deepening of aging population, providing for the aged is one of the main problems faced by urban and rural residents, especially for rural residents as the historical problems. Although new rural social pension system was piloted in 2009 and was implemented fully in 2012, then was merged with urban residents into a united system in 2014: Basic Pension System for Urban and Rural Residents, which united contributions, benefits, transfer and succession policies in nation. Therefore, it is a great feat in China with such a large population that the social pension systems have covered all Chinese people, however, there are still many problems.

The problems mainly focus on the following aspects. Firstly, the basic pension is still very low, the lowest standard currently is RMB¥88 per month which has been improved twice from 2009, original one is RMB¥55 per month in 2009, then it is increased to RMB¥70 per month in 2014 for the first time, the second adjustment is raised to RMB¥88 in 2018. If rural residents only rely on it without the other income sources, the basic survival needs of rural residents cannot be satisfied. Secondly, contribution levels of individual account are still low, too. Given the limited individual contribution capacity, the piloted system set only RMB¥100 per year of the minimum individual contribution, and only RMB¥500 per year of the maximum contribution in 2009. Currently, some local governments in China have improved the maximum individual contribution, for example, the maximum level of Jinhua city in Zhejiang province is RMB¥7500 in 2020, although the minimum individual contribution is still RMB¥100. According to the simulation results of this paper, only basic living needs (I) could be met by choosing the maximum level in 2020, the total pensions with basic pension and the maximum individual account pension cannot get to the amount of the most basic survival needs for rural residents in 2010. The basic living needs in this article are stratified by three levels by the author. The first level consists of the most basic survival needs which is only for food, and basic survival needs which is for food and clothing; The second level consists of basic living needs (I) which include the basic needs for food, clothing and health care, and basic living needs (II) which include the basic needs for food, clothing, health care and housing; The third level consists of basic living and development needs which include the basic needs for food, clothing, health care, housing, home equipment and services, and total needs of basic life which include the basic needs for food, clothing, health care, housing, home equipment and services, education and entertainments, transportation and communications, etc. Thirdly, existing incentive payment policy cannot encourage rural residents effectively to pay more. Several investigations show that about over 80% rural residents who joined the social pension system chose the minimum level [3]. Analyzing the reasons why these rural residents do not choose higher contribution levels and how to encourage them to pay more are key issues. This paper argues that limited income is

the main reason, and distinguishing different income groups to encourage more payment may be useful.

Apparently, if adequacy need to be satisfied, the level of basic pension needs to be improved, and individuals need pay more contributions, however, individual contribution capacity and financial affordability of governments at all levels are limited. Therefore, without affordability, sustainability and robustness of social pension system, adequacy is meaningless.

Besides the goal of adequacy, how to improve affordability, sustainability and robustness of pension system is also the key issue as limited individual contribution capacity and limited financial affordability of governments at all levels, and the need for sustainable level of basic living needs. Therefore, this article focuses on limited supply constraints, analyzes individual contribution capacity, and discusses the relationship between individual contribution capacity and government financial subsidies, then, based on the analysis of limited supply constraints above, this article discusses the needed individual contributions of rural residents in China based on the condition that the multi-level annual basic living needs are satisfied. At last, some suggestions for optimizing the incentive payment policy of rural social pension system in China are put forward. The aims are to promote rural residents to continue to pay their contributions, raise the payment level and extend the payment period within the scope of their abilities, then to achieve the goals of adequacy, affordability, sustainability and robustness.

II. THE THEORETICAL BASIS AND DEFINITION OF SUPPLY CONSTRAINTS UNDER MODERATE SUPPLY LEVEL OF SOCIAL PENSION SYSTEM

2.1 The Theoretical Basis of the Level of Social Pension System Supply

2.1.1 The intertemporal allocation of consumption theory

On a personal level, supporting elderly is a kind of consumer behavior, which is considered by the consumer when they change too old to lose labor or loss of labor income for the consumption need to make an income arrangement [4]. Since the social pension system emphasizes equivalence of individual rights and obligations, individual contributions are typical behaviors, which mean that individuals will transfer part of the income used for current consumption through the social pension system to retirement, which is cross-period consumption. From the intra-generational and inter-generational point of view, there are cross-period consumption problems.

Personally, the life cycle hypothesis of American economist Franco Mordigliani, based on the theory of consumer behavior, discusses the redistribution of cross-period income in one's life, and is the theoretical fulcrum of the emergence and development of the personal account pension system. Modigliani believes that a rational consumer can reasonably distribute their income and consumption, so

as to maximize the effective use. Thus, the consumption of individuals and households will depend on the income of a lifetime, not the current income, so that the income of a lifetime is equal to consumption. He believes that the relationship between consumption and income levels is different from the point of view of different periods of one's life. During the working period, income will be greater than consumption and saving, while in retirement, income will be less than consumption, consuming savings. In this way, people distribute the current and future expected income proportionally to the various periods of life, that is, smooth life income to make consumption decisions.

But in terms of income and consumption, it often involves not only a person's life, but also income and consumption issues between the working and retirement generations. Another theory, the Over Lapping Generation Model (OLG), was proposed by Allais (1947) and Samuelson (1958), and then developed by Diamond (Diamond, 1965) [5]. The OLG model assumes that people of different ages live at any given moment, consisting of two generations of young and old. Each generation trades with different generations at different times of their lives, while also allowing different generations of consumers to consume differently. The difference is reflected in the young people's labor income divided into consumption and savings, the elderly mainly spend. Thus, the OLG model deals with how to redistribute consumption and income across generations. On the basis of the OLG model, it is also possible to compare the advantages and disadvantages of different pension models, such as H. J. Aaron, who proposed the Aaron Condition on the basis of Samuelson's research. It is proved that when the contribution rate is not increased, if the sum of the labor force growth rate and the real wage growth rate of a country is greater than the real market interest rate, the pay-as-you-go system is more conducive to the improvement of the pension benefits than the fund accumulation system.

2.1.2 "Limited finance" theory

Yang Cuiying, Mi Hong (2007) [6] put forward the theory of "limited finance", and proposed innovatively the construction plan of the rural endowment insurance system under limited financial responsibility. The "limited finance" refers to that the government's insurance premium subsidy and pension payment risk provided by the rural endowment insurance is a time-limited and quota-limited liability in a specific population and a specific period of time, it is based on China's rural population structure, population development stage and population change characteristics, as well as the future development of China's urban and rural economic development of regional characteristics and the central financial transfer capacity of the development of forecasting and analysis, and other factors, calculated under scientific actuarial and forecasting methods. The aim of "limited finance" is to ensure that the Government's financial responsibility passes safely and risk-free for a limited period of time through the future retirement payment peak. "Limited finance" is not contrary to the financial subsidy which secures for the payment of the pension funds. The theory of it holds that rural old-age insurance belongs to contributory social insurance, and the government must bear the responsibility, but which is limited and

moderate, and the risks that will occur in the future must be manageable. The government's responsibility is divided into different time periods, and the financial budget is also to ensure the risk-free payment of pensions for the elderly brought by the two fertility peaks in 1950-1958 and 1962-1973.China's rural pension system based on the concept of "limited finance" has many advantages: (1) the system is sustainable; (2) Limited contribution levels are within the affordability of rural residents; (3) The level of security can meet basic living needs; (4) Financial subsidy should reflect the responsibility of the government, and financial pressures are within the limits of government affordability.

2.2 Definition of Moderate Level of Social Pension System Supply

The World Bank holds that pension systems should provide adequate, affordable, sustainable and robust benefits to achieve the goals of mandated schemes [2]. This article uses two indicators to analyze adequacy, one is the amount of basic living needs, the other is the replacement rate, because Holzman and Hinz (2005) indicate that adequate refers to both the absolute level (preventing old-age poverty) as well as the relative level (replacing sufficient lifetime earnings) of retirement income that the pension system will provide [2]. Since adequacy is more of a measure of pension demand replacement rates, it is not described separately here at the level of supply. This part mainly defines the appropriate level of social pension system supply from the three objectives of affordability, sustainability and robustness.

2.2.1 Affordability

Holzman and Hinz (2005) argue that affordability refers to the ability of individuals and society to finance [2]. The level of contributions and subsidies do not exceed the financial affordability of individuals, society and government.

From the point of view of supply capacity, the affordability of social pension is actually the supply capacity of individual, social and government finance, which also determines the level of social pension fund raising. From a macro perspective, it is related to the overall level of economic development of the country and region. But specifically, it is directly related to the level of government revenue, the income level of residents, the level of residents' savings, etc. Therefore, if the level of contributions and subsidies exceed the affordability of individual, social and government finances, it will not only make individuals unwilling to join the social pension system, the government cannot afford excessive expenses, but also will lead to the social pension system as an obstacle to economic development.

The paper discusses and analyzes the affordability of individual, social and government finance, which is the premise and foundation of ensuring the social insurance supply capacity, and also the constraint value of it.

2.2.2 Sustainability

Holzman and Hinz (2005) argue that sustainability refers to the financial stability which pension schemes should have now and in future [2]. As a result, they believe that sustainability is primarily reflected at the financial level.

This paper holds that the financial stability of social pension system depends to a large extent on the sustainability of pension premiums, benefits, and balance of pension revenue and expenditure, because the source of funds of social insurance is from individual, social and government finance.

First, the sustainability of pension contributions depends on the abilities of individuals to contribute, enterprises to contribute and governments to subsidize, which is closely related to macroeconomic development, enterprise development and individual income levels, and all need to be within the affordable range and not exceed a moderate level;   Second, whether the pension is sustainable depends on whether the existing or higher level of benefit can be maintained, whether eligible insured persons can continue to receive benefits, and whether the level of treatment can play a guaranteed role, which is not only related to the level of fund raising, but also depends on whether the pension fund investment operation is appropriate, and whether the pension system model is in line with the development of population and   economy; Third, the sustainability of the pension balance is mainly reflected in whether " contribution " in a single year or several years is greater than or equal to the "expenditure", so that the pension fund can always remain in a payable state.

2.2.3 Robustness

Holzman and Hinz (2005) argue that robustness means that in unpredictable conditions and circumstances in the future, the pension system has the ability to withstand risk shocks and maintain institutional viability [2]. Here, they argue that it is primarily the goal of the pension system to be able to maintain income replacement rates over the long term. In this paper, from the antonym of robustness, not only the ability to resist the impact of risk, but also the ability to deal with uncertainty. Nicholas Barr (2006) argues that the risks and uncertainties of the pension system are different, and that the probability of possible outcomes is distributed as known or estimated facing risks, so actuarial insurance can cope with it, but not uncertainty [7]. Nicholas Barr (2006) argues that the uncertainties of the pension system at least include macroeconomic shocks, population fluctuations, political risks, operational risks, investment risks and annuity market risks.

From the basic pension replacement rate formula and the individual account pension replacement rate formula, the long-term maintenance of income replacement rate depends on the numerator, not the

denominator, which means that it is not just the government's ability to do so in the long run, individuals should be able to pay contributions, and when the national economic development declines, pension funds appear poor management or even deficit, and investment is affected by a variety of factors, resulting in low or negative returns, coupled with experiencing the peak of the old-age population, and even political instability, still have the ability to maintain the operation of the social pension system. This paper thinks that it depends on the security of financial system and transfer payment system, the perfection of social security system and the management of social pension fund.

First of all, from the point of view of the government financial system, the source of social insurance also needs the guarantee of public expenditure of government finance. For social insurance fund raising, it is indeed different from social relief, social welfare and other sources of funding, such as social insurance needs to reflect reciprocal relationship between the rights and obligations of the insured, but social assistance, social welfare, special security system does not emphasize this reciprocal relationship, often more in favor of rights, therefore, the rights of the insured to a certain extent depends on the contribution which is a very important source of funding, it seems that the financial transfer is not important. However, from the development of social security, including the United Kingdom, many countries influenced by the Beveridge Report think that the social security system should cover the entire population, this general idea of protection let the level of treatment received by individuals away from contributions, to ensure that all citizens can be secured by at least the minimum living standard. The World Bank (1996) considers the aim of this "non-contributory" pension is to eradicate poverty in old age and providing basic income security for elderly people [8]. Johnson and Williamson (2010) argued that non-contributory generalized system of preferences (GSP) annuity is also applicable in low-income countries [9]. From the perspective of GSP, the multi-pillar social pension system, which includes zero pillar, does not emphasize that the reciprocal relationship of rights and obligations is based solely on the contribution and expenditure, but accommodates various ideas such as state interventionism and welfare economics, and emphasizes the function and importance of the state in managing economy and ensuring basic welfare. Therefore, the source of social insurance also needs the guarantee of government public expenditure, which improves the ability of the pension system to resist the risk impact.

Secondly, from the perspective of the improvement of the social security system, a diversified social security system, including social insurance, social assistance, social welfare and special security system, can meet the security needs of different types of people. When the individual cannot pay social insurance as insufficient contribution ability, a sound social security system can make citizens still in the social security system enjoying basic social security rights, which could help citizens to resist the impact of risk [10].

Thirdly, from the perspective of the management and operation ability of the social pension fund, improving the safety and profitability of investment, as well as the efficiency of management and the ability to operate, can effectively resist multiple risks. The management and operation of social pension fund is not only to ensure the fund raising and payment, but also to help the fund itself to maintain and increase value. Effective and reasonable management mode can cope with long-term demographic and economic changes, allocate and transfer risks reasonably. Moreover, fund investment with both safety and profitability can not only ensure the payment of the fund, but also promote economic development.

In summary, the three objectives of affordability, sustainability and robustness are defined as evaluation criterion of social pension level. These three objectives are influenced by factors that have their own emphasis and overlapping aspects. In different countries and regions, it is necessary to combine different models of pension system to analyze.

III. The DEFINITION AND MODEL OF MODERATE RURAL INDIVIDUAL CONTRIBUTION LEVEL IN CHINA

Combined with China's rural social pension system, rural social pension supplies are mainly from the government, society and individual. But how much money governments, societies and individuals can spend on it is a very complex issue, involving not only the micro-issues that is the old-age care of individuals, but also the macro-issues that is the need to support all rural elderly people, not only the contribution capacity of individuals and families, but also financial burden of the governments, not only the current level of pensions, but also the sustainability of future pension levels.

Therefore, from the point of view of moderate supply level, we must first clarify moderate rural individual contribution level firstly. Under the guidance of the theory of "limited finance" and combined with the characteristics of China's rural pension system, the supply level is mainly related to the individual contribution burden, the financial subsidy at all levels of governments and the pension level under the definition of affordability, sustainability and robustness.

3.1 The Basic Meaning of the Level of Individual Contribution

The level of individual contribution reflects whether it is within the economic affordability of individuals and families. Then, it is very important to assume that rural residents are willing to pay. In addition, the level of individual contribution burden is also related to the family, because the family often involves the children, the elderly and other individual expenses, so the individual contribution burden level should actually be considered as the family's contribution burden for the insured individuals. Therefore, it would be appropriate to use data on per capita income and consumption.

3.2 The Model and Parameters of Individual Contribution Level

The contribution that individuals can spend on social pension is not unlimited, depending on the income of rural residents and the necessary consumption. After breakeven of the income and expenditure, the rural residents can allocate the left part and use it to pay social insurance.

Measuring the burden of individual contributions, it is necessary to differentiate town and rural residents. Mu Huaizhong et al. (2011) chose the contribution grade of rural residents divided by the difference between the per capita disposable income of rural residents and the daily consumption of rural residents participating in old-age insurance as the computation model [11]. This paper makes further exploration on the differences of income and consumption between rural residents and urban residents as the land system in China. Actually, urban residents get and while the rural ones use in the form of income in kind and consumption in kind. In order to analyze whether to distinguish between cash consumption surplus and total consumption surplus, it is need to analyze historical data.

As mentioned in related papers, most rural residents have so far been able to rely on land for survival and development, and many elderly people living in rural areas, as long as conditions permit, are planting grain, vegetables, fruits, etc. to subsidize the family, to maintain a certain standard of living, that is a relatively common phenomenon. According to data of 2012, cash income accounts for about 88.6 per cent of rural net income per capita, with 11.4 per cent in the form of income in kind. In terms of cash consumption, cash consumption accounts for 91.65 percent of consumption, and according to data analysis of consumption, the difference between cash consumption and total consumption is in food and residential consumption items. But since 2000, as shown in figure 1, the percentage of net cash income in rural residents' per-capita net income, as well as the percentage of cash consumption in total consumption, is increasing year by year. This also means that with the development of urbanization, the increasement of landless rural residents, the improvement of rural residents' living standards, the percentages of their income in-kind and expenditure in-kind are declining.
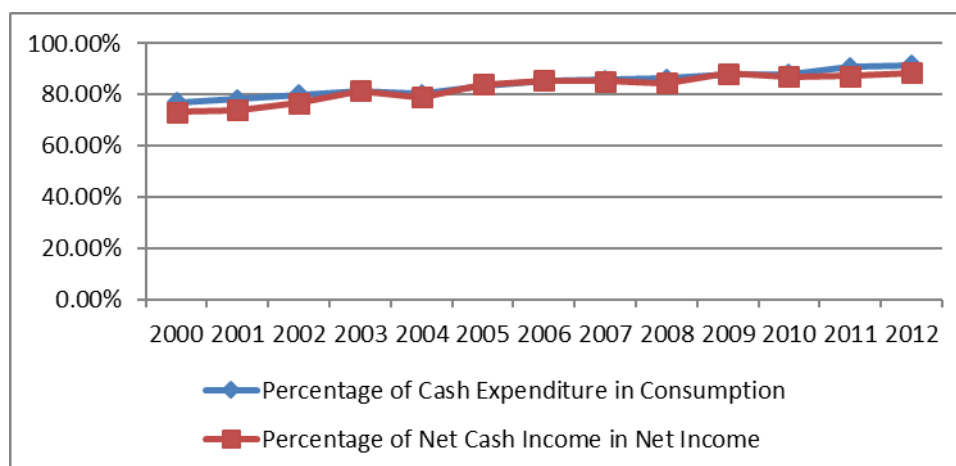
Figure 1: Percentages of Rural Residents' Net Cash Income and Cash Expenditure (2000-2012).

Then the per-capita consumption surplus of rural residents in China is calculated. According to table I, it can be indicated that the absolute value of per- capita consumption surplus and per-capita cash consumption surplus is different, and the cash consumption surplus is significantly lower than the consumption surplus. In order to see the development since 2000, using the consumption surplus minus the cash consumption surplus, and then using the three-year moving average to add trend line analysis, as shown in figure 2, it is known that from 2000 to 2006 the balances are shrinking, and from 2006 to 2012, the balances have gradually expanded, the overall is U-shaped. From the analysis of the causes of the difference, it can be indicated that the patterns of consumption surplus balance and per-capita net income balance are similar, that due to the changes of balances between net income per capita and cash net income per capita.

Table I. Income and Expenditure Per Capita of Rural Residents in China (2000-2012)

Unit: RMB Yuan

year	Net Income per capita	Consumption per capita	**Consumption Surplus**	Cash Net Income per capita	Cash Expenditures per capita	**Cash Consumption Surplus**
2000	2253.4	1670.1	**583.3**	1648.7	1284.7	**364**
2001	2366.4	1741.1	**625.3**	1748	1364.1	**383.9**
2002	2475.6	1834.3	**641.3**	1899.8	1467.6	**432.2**
2003	2622.2	1943.3	**678.9**	2134.9	1576.6	**558.3**
2004	2936.4	2184.7	**751.7**	2317.4	1754.5	**562.9**
2005	3254.9	2555.4	**699.5**	2738.3	2134.6	**603.7**

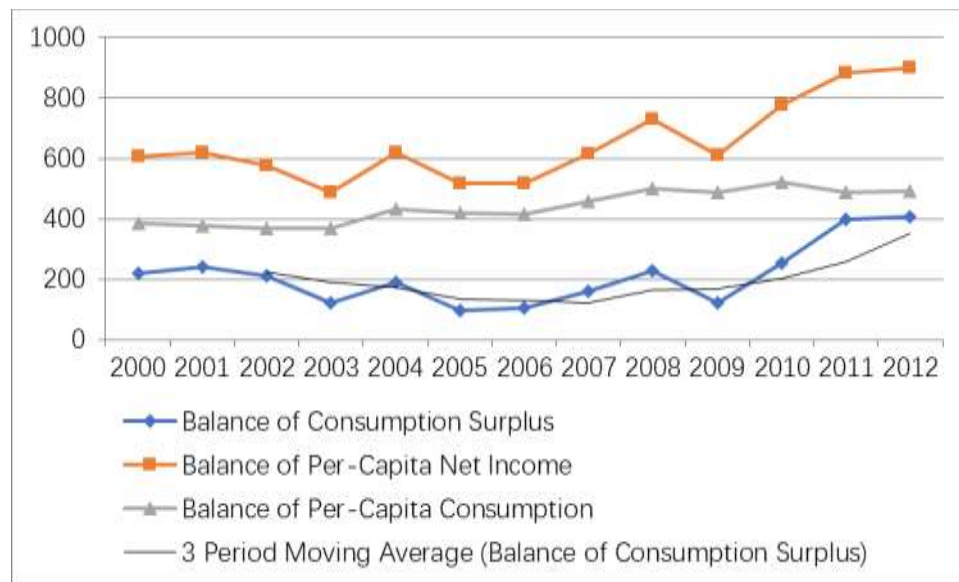| 2006	3587	2829	**758**	3067.8	2415.5	**652.3**
2007	4140.4	3223.9	**916.5**	3525.6	2767.1	**758.5**
2008	4760.6	3660.7	**1099.9**	4029.7	3159.4	**870.3**
2009	5153.2	3993.5	**1159.7**	4542.7	3504.8	**1037.9**
2010	5919	4381.8	**1537.2**	5143.7	3859.3	**1284.4**
2011	6977.3	5221.1	**1756.2**	6092.6	4733.4	**1359.2**
2012	7916.6	5908	**2008.6**	7014.9	5414.5	**1600.4**

Figure 2: The Balances of Per-Capita Consumption Surplus and Per-Capita Cash Consumption Surplus (2000-2012).

Therefore, this paper thinks that the application of the calculation of payment model and parameters can be made some amendments based on cash income and cash expenditure. Individual contribution should be calculated by cash using contributions to divide by the balances between net cash income per capita cash and cash expenditure per capita.

Thus, two models of individual contributions can be obtained, equation (1) is a cash neutral model, equation (2) is a model that can be measured in cash.

$$\upsilon_I = \frac{C_I W_I}{y_t - o_t} = \frac{C_I y_{t-1}}{y_t - o_t} \tag{1}$$

Where net income per capita of rural residents last year is used as the contribution base, $C_I W_I = C_I y_{t-1}$.

where C_I is the individual contribution rate, W_I is the contribution base, y_t is net income per capita of rural residents, o_t is consumption expenditure per capita, t is year.

In order to calculate further individual contribution using net cash income per capita and cash expenditure per capita of rural residents, the individual cash contribution rate is set as $C_{\alpha I}$, the percentage of net cash income per capita in net income per capita of rural residents is α_y, and the percentage of net cash expenditure per capita in consumption of rural residents per capita is α_o, then net cash income per capita is $\alpha_y y_t$, net cash expenditure per capita is $\alpha_o o_t$, individual contribution burden in cash could be calculated as the following formula:

$$v_{\alpha\beta I} = \frac{C_{\alpha I}\alpha_y y_{t-1}}{\alpha_y y_t - \alpha_o o_t} \tag{2}$$

3.3 The Definition and Constraints of Lower Limit of Moderate Individual Contribution

Moderate level of personal contribution burden needs to define the upper and lower limits, so that the level of personal supply fluctuates within this reasonable range. Here the lower limit is defined firstly.

The definition of the lower limit is mainly related to the personal pension account of the rural social pension system in China. Although the government has an inescapable responsibility to secure the basic survival level of the elderly, it is not realistic to let the government fully bear the basic economic responsibility of them at current stage. Individuals and families still need to play important roles in it. Under the framework of pension system, relying solely on basic pensions cannot meet the basic living needs of the elderly, and it is possible to reach the basic living needs above the first level by relying on personal pension account. From the results of the calculation in previous paper, taking "middle people" as an example, individual contributions need to be in the RMB¥300 and above grade, together with the basic pension, the first level of "most basic survival needs" could be satisfied. Here, the "middle people" is defined as that the age was from 46 to 59 when the new rural pension system was implemented. The "middle people" has basic pension and personal account pension, but the contribution years of the personal account pension may be less than 15, this means that the amount accumulated will be less, but the system allows them to make up their premiums. In order to measure the social pension replacement rate of this group, this paper assumes the "middle people" scheme: It is supposed that rural resident is 59 old in 2010, they are allowed to pay personal contributions in one time, then in 2011 they can receive the personal account pension. Then, taking "new people" as an example, in the absence of an increase in the basic pension, even if the individual contribution is in the RMB¥500 grade, together with the basic

pension, it will not be able to meet the replacement rate level of most basic survival needs in cash. The "new people" is defined as that the age was under 45 when the new rural pension system was implemented. The " new people " has basic pension and personal account pension, but the contribution years of the personal account pension may be more than 15, this means that the amount accumulated will be on work according to the system. In order to measure the social pension replacement rate of this group, this paper assumes the "new people" scheme: It is supposed that rural resident is 45 old in 2010, they are allowed to pay personal contributions by year, then in 2025 they can receive the personal account pension.

Therefore, the definition of the lower limit is related not only to the basic survival level of the elderly, but also to the basic pension level.

To see specific value of the new rural pension system in China, in order to reflect the individual's contribution responsibility, RMB¥100 as the most basic payment grade, is a necessary condition to join the new rural pension system. Then, taking RMB¥100 divided by the balance of income and expenditure per capita is used as the lower limit.

Formula (1) and formula (2) can be changed into formula (3) and formula (4), where (4) is to measure the level of personal contribution burden in cash:

$$\upsilon_I = \frac{100}{y_t - o_t} \tag{3}$$

$$\upsilon_{\alpha\beta I} = \frac{100}{\alpha y_t - \beta o_t} \tag{4}$$

The constraint of the lower limit of individual contribution is presented as the level of basic pension meeting at least the level of the most basic survival needs, and the following is the formula:

$$p_t' + Q_t' \geq p_1 r_1 \tag{5}$$

where p_t' represents the average basic pension available by each rural resident of pension age in t-year, Q_t' is the average pension criteria of individual accounts each year for the one at the age of pension, p_1 is the average price of food, r_1 is the corresponding needs, $p_1 r_1$ is the basic need for food, that is the most basic level of survival needs in the first level.

3.4 The Definition and Constraints of Upper Limit of Moderate Individual Contribution

The definition of the upper limit of the individual contribution level depends on the level of personal affordability and pension.

When an individual has to pay more than the balance between income and the necessary expenses, it means that the individual's affordability has exceeded his or her ability to pay, and he or she may no longer be able to pay his or her pension. Therefore, the definition of the upper limit refers to the maximum ability of individual contributions. At this point, without debt, what can be paid is the spread between income and consumption. However, since premiums are paid in cash, this paper considers to take the spread between cash income and cash consumption as a better index of an individual's ability to contribute. From the formula, regardless of cash or not, the upper limit values of υ_I and $\upsilon_{\alpha\beta I}$ are 1.

From the point of view of pension level, social pension, taking into account fairness and efficiency, is different from commercial pension. Because there are incentive payment policies of the new rural pension system, people are encouraged to pay more, while they are not encouraged to gain more additional benefits from excessive personal contributions. Therefore, pension level is also not possible to exceed the total needs of elderly rural resident' s basic life.

The upper limit is constrained by the following condition:

$$p_t' + Q_t' \leq \sum_{i=1}^{8} p_i r_i \leq y_{t-1} \tag{6}$$

To sum up, the value range of the individual contribution level under the framework of the new rural pension system is:

$$\frac{100}{y_t - o_t} \leq \upsilon_I \leq 1 \tag{7}$$

$$\text{or} \quad \frac{100}{\alpha y_t - \beta o_t} \leq \upsilon_{\alpha\beta I} \leq 1 \tag{8}$$

The constraints are as follows:

$$p_1 r_1 \leq p_t' + Q_t' \leq \sum_{i=1}^{8} p_i r_i \leq y_{t-1} \tag{9}$$

where p_t' represents the average basic pension available by each rural resident of pension age in t-year, Q_t' is the average pension criteria of individual accounts each year for the one at the age of pension, p_i is the average price of food, r_i is the corresponding needs , $p_1 r_1$ is the basic need for food, that is the most basic level of survival needs in the first level, $p_2 r_2$ is the basic need for clothing, $p_3 r_3$ is the basic need for health care, $p_4 r_4$ is the basic need for housing, $p_5 r_5$ is the basic need for home equipment and services, $p_6 r_6$ is the basic need for education and entertainments, $p_7 r_7$ is the basic need for transportation and communications, $p_8 r_8$ is the basic need for the others.

It could be predicated that with the improvement of economy, the growth of national income and the reduction of Engel coefficient, rural residents will have more and more surplus money, therefore, if the minimum level RMB¥100 of individual contributions remains unchanged, it will rely on more basic pensions and government subsidies to meet the basic survival need for food for those who choose to pay the minimum contribution.

IV. EMPIRICAL ANALYSIS OF INDIVIDUAL CONTRIBUTION CAPACITY AND THE RELATIONSHIP WITH FINANCIAL SUBSIDIES

4.1 Empirical Analysis of Moderate Rural Individual Contribution Capacity

According to the formulas above and analysis of the individual contribution burden level with its upper and lower limits, the moderate individual contribution capacity can be obtained. Combined with previous tables, it is possible to analyze it by quintiles of income and by cash based on income and expenditure per capita of rural residents in China.

4.1.1 Data and assumptions

This study depends on the publication data from *China Statistical Yearbook* and *China Household Survey Yearbook* issues from 2004 to 2013. The researcher used the annual data for China's income, expenditure and living conditions. China Household Survey Yearbook is an informative Yearbook that comprehensively reflects the income, expenditure and living conditions of China's urban and rural residents. Its data comes from the urban household survey and rural household survey organized by the National Bureau of statistics, excluding the data of Hong Kong, Macao Special Administrative Regions and Taiwan Province. The income and expenditure data of urban and rural residents shall be collected and summarized according to the urban and rural household survey plan, and the editing process shall be consistent with the data in the previous Yearbook as far as possible. In addition, as there is no quintiles

income data of rural residents after 2013, this paper has to use the data from 2003-2012 [12].

The followings are the assumptions:

i. Pension is the only source of income for the rural elderly.

ii. All the living consumptions of the rural elderly are the eight basic consumptions listed in the statistical yearbook, including food, clothing, health care, housing, home equipment and services, education and entertainments, transportation and communications, and the others.

4.1.2 Analyzing the consumption surplus per capita and the cash consumption surplus per capita which could be obtained by the denominators of individual contribution burden model and its cash model

By analyzing the denominators $y_t - o_t$ and $\alpha y_t - \beta o_t$ of equation (3) and (4), the consumption surplus per capita and the cash consumption surplus per capita of rural residents in China are obtained, the specific results are shown in table II, where the surplus of consumption per capita is calculated using net income per capita of rural residents minus consumption per capita, cash consumption surplus is calculated using cash net income per capita of rural residents minus cash expenditure per capita, where cash net income per capita of rural residents is calculated according to China Household Survey Yearbook. Because the survey did not public the grouped data by quintiles of income after 2012, this paper has to use it currently. The followings are conclusions:

First, the level of cash consumption surplus is significantly lower than the level of consumption surplus, and the surplus of consumption increases as income improves over time.

This is obvious whether or not the rural residents are divided by income, according to the previous analysis, the balance of consumption surplus which is gained by using consumption surplus minus cash consumption surplus has been widened since 2006. The same conclusion could be obtained using the grouped data by quintiles of income, the surplus of consumption has increased with the improvement of income.

Second, low-income households and lower-middle income households have negative amount of cash consumption surplus, there is no excess cash used to pay pension premiums, but the consumption surplus of middle-income households is still positive, indicating that they can also reduce a part of non-essential consumption items, leaving cash to pay premiums.

Since 2005, low-income households have not only had a negative cash consumption surplus, but also

a negative consumption surplus. The consumption surplus of the lower-middle income households is positive, although the cash consumption surplus has been negative in some years, and the negative amounts of the last two years have begun to widen. Combined with the level of needs, the net income per capita of low-income households can only cover the basic living needs(I) (including food, clothing and health care expenditures) in cash, which have reached 100% of their net incomes since 2012. Taking non-cash needs into account, only the most basic survival needs (only food) can be maintained. This shows that low-income households, even at working age, are unable to pay for old-age insurance besides their basic living needs. The cash consumption surplus of the lower-middle income households also is negative, indicating that when the consumption is increasing year by year, these two years of cash net income is not enough to pay cash consumption. There is no doubt that the two income classes have no excess cash to pay for their pensions. However, because the consumption surplus of lower-middle income households is still positive, which means that they can also think of ways to save certain amounts of cash for payment through converting other non-cash net income, or reducing some non-essential consumption, such as entertainments, transportation, communications and other more flexible consumption items, leaving cash to pay pension premiums.

Third, the cash consumption surplus of middle-income households and above is positive, and the absolute amount increases with the improvement in income, they can not only pay pension premiums, but also choose a higher contribution grade.

In 2012, the cash consumption surplus of middle-income households, upper- middle income households and high income households reached RMB¥712, ¥2086 and ¥7007 respectively, indicating that after daily consumption, these income groups may have some savings. Moreover, as shown in figure 3, the balances between consumption surplus per capita and cash consumption surplus of middle-income groups and above are increasing, it indicates that cash consumption surplus does not increase so quickly as consumption surplus, to focus on cash is very important. However, as increasement incomes of these three income groups, this means that they can not only pay old-age insurance premiums, but also choose a higher level of contributions. In addition, especially for high-income households, they have the ability to purchase commercial pension. When they are old, besides supported by traditional rural elderly security system which is based on family and land, they can rely on personal savings, social pension, and even commercial pensions, thus they could be rural elderly secured by multi-pillar and multi-level old-age security system.

Table II. Consumption Surplus Per Capita and Cash Consumption Surplus Per Capita of Rural

Residents by Income Class and Cash (2005-2012)

Unit: RMB Yuan

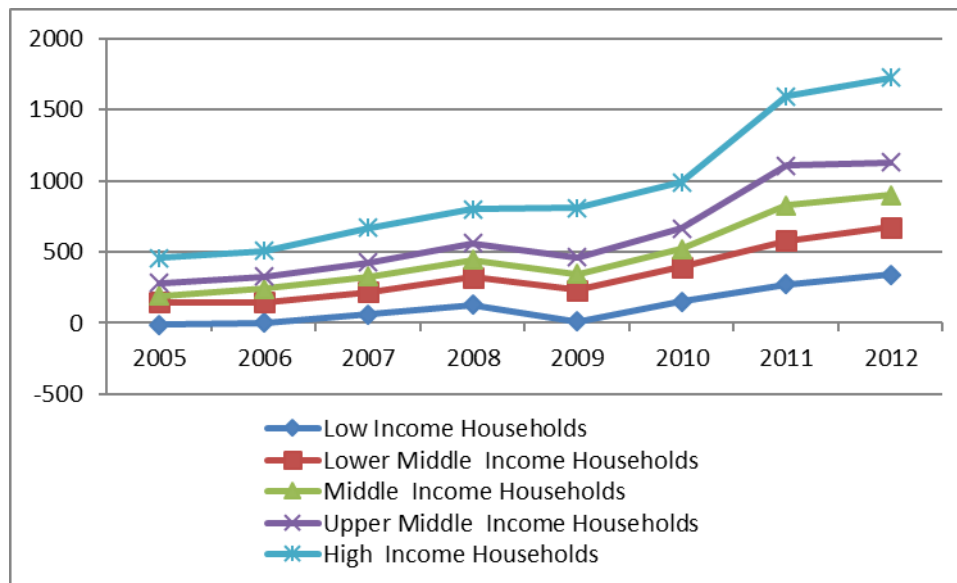| year	Low-Income Households		Lower-Middle Income Households		Middle Income Households		Upper-Middle Income Households		High-Income Households	
	Consumption Surplus	Cash Consumption Surplus	Consumption Surplus	Cash Consumption Surplus	Consumption Surplus	Cash Consumption Surplus	Consumption Surplus	Cash Consumption Surplus	Consumption Surplus	Cash Consumption Surplus
2005	-481	-469	105	-41	523	332	1124	843	3154	2698
2006	-442	-444	183	40	581	339	1216	889	3198	2690
2007	-504	-563	224	8	720	394	1447	1024	3796	3128
2008	-645	-773	282	-39	917	475	1737	1176	4437	3636
2009	-806	-816	239	9	956	614	1876	1413	4833	4026
2010	-666	-815	402	10	1258	738	2415	1749	5859	4870
2011	-1312	-1585	293	-286	1390	564	2891	1782	7634	6038
2012	-1426	-1765	343	-330	1611	712	3218	2086	8734	7007

Figure 3: The Balances between Consumption Surplus Per Capita and Cash Consumption Surplus Per Capita (2005-2012)

4.1.3 Analyzing the needed individual contributions based on the condition that the multi-level annual basic living needs are satisfied by the numerators of individual contribution burden model and its cash model

If the multi-level annual basic needs are to be met, how much individual should pay for contributions is the key issue. To analyze the numerators $C_I y_{t-1}$ and $C_{\alpha I} \alpha_y y_{t-1}$ of equation (1) and (2), there are the following assumptions:

i. Each basic consumption continues to grow on the existing basis;

ii. The parameters of the rural pension system do not change.

Then, the specific simulation processes are as follows, including the measurable steps, methods, and results:

The first step, the GM (1,1) gray forecast model can be used to predict the basic consumption amounts for 2013-2037, and to calculate the basic consumption at different levels, as detailed in table III.

The second step, according to the actuarial balance formula of individual accounts, it can be simulated reversely that how much required annual premiums are needed to achieve different levels of consumption level. The followings are the assumptions of forecasts: (1) Do not deduct the basic pension;

(2) Use "new person" scheme under the framework of the new rural pension system, and there are 15 years of contributions; (3) Annual rate of return is 2.5%. The detailed results are in table IV.

The third step, it is need to distinguish individual contributions and government subsidies in the framework of the rural pension system in China to calculate the premium to be paid.

Using the grouped data by quintiles of income, the following conclusions are drawn:

First, low-income households and lower-middle income households need to choose the lowest contribution grade of RMB¥100 if they want to be involved by the rural pension system according to the current policy.

If these two income groups have enough wills to enter the social pension system, they can only choose the lowest contribution grade, currently RMB¥100. However, the marginal consumption tendency of low-income households is greater than 1, indicating that they have not enough income to pay. Actually, low-income households should be the focus of the government's attention, because this group at a young age cannot afford to pay social pension premiums, they may need more social assistance to old-age, or the local government need pay the lowest level of premiums for them to solve their worries. For lower-middle income households, they still have possibility to save cash from non-basic living expenses to pay premiums, but they need to learn more about the existing pension system for urban and rural residents through publicity and other means, it could make them to improve the wills to join the social pension system.

Second, middle-income groups and above can choose the higher payment grades. According to calculation results (the results are shown in Table II), under RMB¥738, ¥1749 and ¥4870 respectively in 2010, they can pay contributions at will.

This means that middle-income group, upper-middle income group and high-income group have more choices than the other income groups when they choose different contribution grades.

Third, as the limited contribution capacity, middle-income households can choose the contribution grade below RMB¥738 in 2010 which the start year of new rural pension system in China, then after 15 years, the pension they could obtain can reach the first level of basic needs which include most basic survival needs and basic survival needs. This means if they have no other retirement income, their living standard after retirement will be lower than before which is only for food and clothing, even less.

In order to correspond to the year of needs in table III, the beginning years of the contribution are set by using the years of the pension in table III to subtract 15 years. While because the new social rural

system was piloted from 2009, if the year is below 2010, then it is assumed that they are allowed to make a supplementary payment in this year. The value in the parenthesis is the number of the years to make up. It should be noted that even if the payment is made up, the annual return on compound interest is calculated as 2.5%.

If the annual payment is made directly from 2010, the results in table IV indicate that the middle-income group will only be able to reach the most basic survival needs level and basic survival needs level by pension in 2025.This means that they have to choose RMB¥567 or RMB¥709 in 2010 (as detailed in table III and table IV). because the cash consumption surplus of middle-income group is only RMB¥738 (as detailed in table II). If this group begin to contribute from 2012, they will have only one choice RMB¥678 if they want to receive a pension which could satisfy the level of the most basic survival needs.

Fourth, upper-middle income households can choose the contribution grade below RMB¥1749, then after 15 years, the pension they could obtain can reach the second level of basic living needs. This means if they have no other retirement income, their living standard after retirement will only cover basic needs for food, clothing and healthcare.

If they choose to begin to pay RMB¥1335 in 2010, the results in table IV indicate that the upper-middle income group will be able to reach the basic living needs when they receive pension in 2025. Although the contribution level is higher than the level of middle-income group, what they could receive is still not enough to pay housing and other needs.

Fifth, high-income households can choose the contribution grade below RMB¥4870 in 2010, then after 15 years, the pension they could obtain can reach the third level of total needs of basic life. This means if they have no other retirement income, their living standard after retirement will cover basic needs for food, clothing, healthcare, housing, home equipment and services, education and entertainments, transportation and communications, etc. Moreover, they have savings for commercial pension and for the other expenditure before retirement.

With the same scheme to calculate, if they choose to begin to pay RMB¥2236 in 2010, the results in table IV indicate that the high-income group will be able to satisfy the total needs of basic living when they receive pension in 2025. As they have RMB¥2234 left, they can have more cash to pay premiums for commercial insurance and the other expenditures.

Table III. Forecasts of multi-level annual basic needs amount

Unit: RMB Yuan

year	The First Level		The Second Level		The Third Level	
	Most Basic Survival Needs	Basic Survival Needs	Basic Living Needs (I)	Basic Living Needs (II)	Basic Living and Development Needs	Total Needs of Basic Life
2013	1985	2291	2794	3660	3948	4720
2014	2170	2518	3140	4136	4476	5316
2015	2372	2769	3537	4683	5085	6001
2016	2593	3044	3994	5313	5788	6788
2017	2835	3349	4522	6040	6601	7695
2018	3099	3684	5134	6881	7543	8744
2019	3388	4053	5846	7856	8638	9957
2020	3704	4461	6676	8989	9913	11365
2021	4049	4911	7648	10309	11402	13003
2022	4427	5408	8790	11852	13142	14911
2023	4839	5956	10136	13659	15184	17139
2024	5290	6561	11727	15781	17582	19748
2025	5784	7230	13613	18279	20406	22808
2026	6323	7969	15857	21226	23738	26406
2027	6912	8786	18534	24712	27680	30644
2028	7556	9689	21735	28844	32350	35648
2029	8261	10689	25574	33754	37896	41569
2030	9031	11794	30188	39602	44495	48589
2031	9872	13018	35748	46581	52360	56928
2032	10792	14373	42462	54927	61755	66853
2033	11798	15874	50584	64928	72994	78689
2034	12898	17537	60430	76936	86464	92829
2035	14100	19380	72385	91378	102634	109753
2036	15415	21425	86925	108781	122077	130043
2037	16852	23692	104633	129783	145491	154408

Source: Calculated by the author of this article according to historical data.

Table IV. Forecasts of annual premium under multi-level annual basic needs amount

Unit: RMB Yuan

Year to Pay the Premium	The First level		The Second level		The Third level	
	Most Basic Survival Needs	Basic Survival Needs	Basic Living Needs (I)	Basic Living Needs (II)	Basic Living and Development Needs	Total Needs of Basic Life
2010 (12)	195	225	274	359	387	463
2010 (11)	213	247	308	406	439	521
2010 (10)	233	271	347	459	499	588
2010 (9)	254	298	392	521	568	666
2010 (8)	278	328	443	592	647	754
2010 (7)	304	361	503	675	740	857
2010 (6)	332	397	573	770	847	976
2010 (5)	363	437	655	881	972	1114
2010 (4)	397	482	750	1011	1118	1275
2010 (3)	434	530	862	1162	1289	1462
2010 (2)	474	584	994	1339	1489	1680
2010 (1)	519	643	1150	1547	1724	1936
2010	567	709	1335	1792	2001	2236
2011	620	781	1555	2081	2327	2589
2012	678	861	1817	2423	2714	3005
2013	741	950	2131	2828	3172	3495
2014	810	1048	2508	3310	3716	4076

2015	885	1156	2960	3883	4363	4764
2016	968	1276	3505	4567	5134	5582
2017	1058	1409	4163	5386	6055	6555
2018	1157	1556	4960	6366	7157	7715
2019	1265	1719	5925	7544	8478	9102
2020	1383	1900	7097	8960	10063	10761
2021	1511	2101	8523	10666	11970	12751
2022	1652	2323	10259	12725	14265	15140

Source: Measured in this article.

4.2 Analysis of the Relationship between Individual Contribution Capacity and Government Financial Subsidies

Then, after the analysis of moderate rural individual contribution capacity, it is very important to analyze the relationship between individual contribution capacity and government financial subsidies. Under the framework of the rural social pension system in China piloted from 2009, This paper analyzes different situations by different assumptions based on the upper and lower limits of multiple constraints.

4.2.1 Assuming the most basic survival needs at the first level is to be met without basic pension

The most basic survival needs are the lower limit under the multiple constraints.

If the first level of basic living needs is to be met, it is supposed that contributions starts in 2010, middle-income groups can only choose the maximum contribution grade of RMB¥500 without basic pension, and left amount of RMB¥67 (567-500=67) requires government subsidies for contribution, where RMB¥567 is the amount of contribution predicted for satisfying the most basic survival needs in 2010, as detailed in table IV. Under the framework of the new rural social pension system, the local government's subsidy for contribution is RMB¥30 a year, then there is spread of RMB¥37 (67-30=37). This gap needs to be covered by basic pension, which is estimated to be RMB¥66.7 each year at a yield of 2.5%. Therefore, under the existing system, the most basic survival needs can be met within the moderate level of supply replacement rate. But joint efforts by individuals and governments at all levels are needed.

4.2.2 Assuming the most basic survival needs at the first level is to be met with basic pension

It is supposed that if rural elderly could receive RMB¥660 each year, this is equivalent to an annual contribution of RMB¥64.71 at a yield of 2.5% after 15 years.

In this situation with basic pension, the middle-income groups only need to pay RMB¥502.29 (567-64.71=502.29), which is still RMB¥2.29 more than the highest grade of RMB¥500 in the new rural social pension system. Local government need to subside at least RMB¥2.29 each year to enable the most basic living needs to be met.

Of course, under this assumption, considering local government subsidies of RMB¥30 per year, individual contribution only needs RMB¥472.29 (502.29-30=472.29). If local governments could increase their annual subsidies for contribution, the premiums that individuals should pay will be reduced accordingly.

4.2.3 Assuming total needs of basic Life at the third level is to be met without basic pension

It is supposed that when contributions start in 2010, at a yield of 2.5%, the annual contribution needs to reach RMB¥2236 to meet the third level of basic living needs without basic pension.

In fact, only high-income rural residents are able to afford the contribution of RMB¥2236 in 2010. Although upper-middle income households hold RMB¥2086 of the consumption surplus, they still cannot reach RMB¥2236 added with RMB¥30 which is the contribution subsidy of local governments. It is indicated that to meet the third level of basic living needs should not rely on the government currently, but the individual income of rural residents. However, how to improve the individual income is a complex issue to discuss, it is possible to help rural residents get more supports from family, land and other sources.

4.2.4 Assuming "new people" scheme with 15-year contribution and 2.5% yield per year with net income per capita of middle-income rural residents to get the moderate rural social pension supply replacement rate with basic pension

The followings are the assumptions of forecasts in table V: (1) "New people" scheme of the rural social pension system is used. (2) The total number of contribution years is 15. (3) The yield is 2.5% per year. (4) Net income per capita of middle-income rural residents is the denominator.

In order to correspond to the year of needs in table III, the beginning years of the contribution are set by using the years of the pension in table III to subtract 15 years. It is the same as table IV. While because the new social rural system was piloted from 2009, if the year is below 2010, then it is assumed that they are allowed to make a supplementary payment in this year. The value in the parenthesis is the number of the years to make up. It should be noted that even if the payment is made up, the annual return on compound interest is calculated as 2.5%.

According to the results of table V, the moderate level of supply replacement rate changes differently under multi-level basic living needs. The supply replacement rates of the first level are declining continuously, while the others of the second and the third levels are increasing. In fact, it shows that with the increasement of net income per capita of rural residents, the improvement of economy, and the decline of the Engel coefficient, the expenditures for basic survival needs including food and clothing are decreasing. At the same time, the basic needs for health care, home equipment and services are increasing. Moreover, because the basic demands for cultural, educational, entertainment, transportation and communications are more elastic than food and clothing, the increasements of these needs are particularly large.

Table V. Forecasts of moderate rural social pension supply replacement rate under multi-level basic living needs

Year to Pay the Premium	The first level		The second level		The third level	
	Most Basic Survival Needs	Basic Survival Needs	Basic Living Needs (I)	Basic Living Needs (II)	Basic Living and Development Needs	Total Needs of Basic Life
2010	10.86%	13.58%	25.57%	34.32%	38.32%	42.82%
2011	9.99%	12.58%	25.05%	33.52%	37.49%	41.71%
2012	9.63%	12.23%	25.81%	34.41%	38.55%	42.68%
2013	9.34%	11.97%	26.86%	35.64%	39.98%	44.05%
2014	8.95%	11.58%	27.71%	36.57%	41.05%	45.03%
2015	8.57%	11.19%	28.66%	37.60%	42.24%	46.13%
2016	8.21%	10.83%	29.74%	38.76%	43.57%	47.37%
2017	7.87%	10.48%	30.96%	40.06%	45.04%	48.75%
2018	7.54%	10.14%	32.33%	41.50%	46.66%	50.29%
2019	7.23%	9.82%	33.85%	43.10%	48.44%	52.00%
2020	6.93%	9.51%	35.54%	44.87%	50.39%	53.89%
2021	6.63%	9.22%	37.41%	46.81%	52.54%	55.96%
2022	6.35%	8.94%	39.46%	48.95%	54.87%	58.24%

Source: Measured in this article.

V. CONCLUSION AND SUGGESTIONS FOR OPTIMIZATION OF INCENTIVE PAYMENT POLICY

5.1 Conclusion

In conclusion, there is a long way for China to go to achieve the goals provided by the world bank. Currently, it is difficult for China to let each rural elderly get to or above the basic living standard needs only by social pension because incomes of most rural residents are still very low, and they cannot afford the contributions or pay enough contributions to reach the pension aim of "adequacy" by themselves. At current economic stage in China, it is very necessary to rely on the multi-way strengths of individuals, families, society and the governments at all level in order to reach the multi-level basic living needs for rural residents. Without the consideration of the above, current incentive payment policies will be ineffective.

The specific conclusions are as follows:

Firstly, limited individual income capacity causes the low individual contribution in rural areas, especially for low-income and lower-middle income households. They need to choose the lowest contribution grade if they want to be involved by the rural pension system according to the current policy.

Secondly, rural middle-income groups and above can choose the higher payment grades. They have the abilities to pay contributions at will, therefore, actually, they are the focuses of incentive payment polies.

Thirdly, in order to reach the first level of basic living needs, not mention the second level and third level, rural low-income groups and lower-middle income groups need to rely on the joint strength of individuals, families and the governments at all levels, and lands.

Fourthly, although rural middle-income groups have more consumption surplus, if they have no other retirement income, the pension they could obtain can reach the first level of basic needs which include most basic survival needs and basic survival needs, and their living standard after retirement will be lower than before which is only for food and clothing, even less.

Fifthly, rural upper-middle income households can obtain the pensions which can reach the second level of basic living needs which only include food, clothing and healthcare. If they spend all their consumption surplus in cash to pay social pension contributions, they have no more consumption surplus to pay commercial pensions. However, they may choose to enter into the other social pension systems in

China if they find the other ones may have more benefits.

Sixthly, rural high-income households can obtain the pensions which can reach the third level of basic living needs, and they can have more cash to pay premiums for commercial insurance and the other expenditures. Actually, this group could have the opportunity to enjoy the multi-pillar pension system with commercial one.

5.2 Suggestions for Optimization of Incentive Payment Policy

Firstly, for rural low-income households, the incentive payment policy is no use but government should assist them more than pay the minimum contribution level.

Rural low-income households should be the focus of the government's attention, because this group at a young age cannot afford to pay social pension premiums, they may need more social assistance to old-age, or the local government need pay the lowest level of premiums for them to solve their worries. Although the Chinese government has already help to pay contributions for them, how to improve their abilities to get more incomes is very important as well.

Secondly, for rural lower-middle income households, the incentive payment policy needs to let them know the advantages of the social pension systems by communications, and give them more government subsidies for contributions if they will to pay longer than 15 years and choose higher contribution level.

For lower-middle income households, they still have possibility to save cash from non-basic living expenses to pay premiums, but they need to learn more about the existing pension system for urban and rural residents through publicity and other means, it could make them to improve the wills to join the social pension system and try to save more cash to pay contributions.

Thirdly, for rural middle-income households and upper-middle income households, the incentive payment policy should do the same as lower-middle income households to encourage them to pay longer and pay more.

Fourthly, for rural upper income households, the incentive payment policy should emphasis on the advantages of basic rural social pension system by communication, let them stay in the system, and pay the highest contribution. Social pension system could unite with some commercial companies, if they could pay the highest contribution, they could get commercial premium-discounts, not to get more government subsides, that could prevent new injustices.

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