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## International comparison of pension privatization and its financial interpretation: on the enlightenment to reform of individual account system in China

Yanxia Zhu\*<sup>1,2</sup>, Li Gong<sup>1</sup><sup>1</sup>School of Economics and Management of China University of Geosciences, Wuhan, (CHINA)<sup>2</sup>College of Public Administration of Zhejiang University, Hangzhou, (CHINA)

### ABSTRACT

The disclosure of government financial information has always been the weak line in the disclosure of financial information, thus have an impact on the quality of government financial information. It's urgent to accurately reflect the status of our government accounting information, establish a transparent government and enhance the transparency of government financial information. This article examines the problem of China local government financial information disclosures. According to the research, the results show that the government financial conditions, degree of punishment a series of other factors are significantly positively related with its disclosures. It is hoped that the research can provide an excellent practice guide to the online disclosure of government financial information.

### KEYWORDS

Government financial information; Disclosure quality; Factors; Consequences.



## INTRODUCTION

The concept of “social security privatization” differs from the one of “pension privatization”. The former refers in particular to the privatization of the social endowment insurance, namely the public program with mandatory individual savings account substituting for the one of pay-as-you-go (PAYG)<sup>[1]</sup>; the latter refers to the reform reducing PAYG benefits and strengthening the links between individual contribution and payment in the multi-level and multi-pillar pension system in a certain country<sup>[2]</sup>. It can be seen the pension privatization relative to the social security privatization is a concept with a wider scope. From 1981 to 2007, over 30 countries had launched the social security privatization reform, however, after the international financial crisis burst out in 2008, the progress of social security privatization has been bogged down, even some countries having implemented reform (such as Argentina and Hungary) have declared the cancellation of the individual account plan, some (such as Poland and Rumania) have reduced the payment proportion of the individual account and some (such as Slovenia) have changed the mandatory participation in the privatization program into the voluntary participation. On the other hand, the pension privatization is still underway in other forms. Some countries, such as New Zealand, Italy and the United Kingdom, adopt the automatic participation in the privatization program instead of mandatory participation. Due to the austerity of the public fiscal expenditure in some countries caused by the financial crisis, the substitution rate of the pension returns provided by PAYG public program drops down continuously, as will further improve the dependency on the privatization plan.

How to interpret the different trends appearing in the field of pension privatization after the financial crisis? If the institutional reform is targeted for improving the pension privatization in each country, could the social security privatization realize the pension privatization? Above all, what conditions should be possessed for the pension privatization reform in a country?

China has established the pension system with social pooling in combination with the individual account in 1997, however, the individual accounts have been in “empty account” for a long term, and the market investment has not carried out as yet. According to the estimate of China Pension Report 2011, the scale of the “empty accounts” in the individual accounts has reached up to RMB 0.22 billion Yuan up to now<sup>[3]</sup>. Whether should the individual account be funded? How to make it funded? Whether should the individual account exist or not? All of these questions have been in dispute. Therefore, it is of reference value to reform the social insurance system through comparing the gains and losses of the pension privatization in different countries and further making clear the specific conditions of developing private pension program in the context of quickening aging process.

There are voluminous literatures discussing the pension system choice, especially between PAYG and funded system. They typically focus on the comparison the influence different systems make on a country’s capital accumulation or labor supply. With the multi-pillar pension system (i.e. promoting pension privatization) has been gradually accepted by more and more countries, how to configure the two systems optimally from the structural perspective began to receive more attention. For example, Suo has used the analytical frame of “social preferences- cooperation capacity” to explore the formation mechanism of “strong government and weak market” in China’s pension system and explain the underdevelopment of private pension plans<sup>[4]</sup>.

Some attention is given on the association between the pension reform and the financial system in pension privatization studies. Traditional empirical researches mainly focused on the unidirectional effect the private pension plans make on the financial markets in the developed countries as well as Chile, who conducts social security privatization early<sup>[5]</sup>. It is important to confirm a positive correlation between the social security privatization and the development of capital market, treated as a basis for social security privatization. However, it failed to establish a reliable effect pension funds have on the capital market. It is manifested that the empirical testing in the emerging countries did not support the forward link. Furthermore, even if some researches show a positive correlation existing, it cannot explain the development of the capital market is a result of the growth of pension funds.

Other studies have concerned the specific conditions of the private pension plans to promote financial market development<sup>[6-7]</sup>. Bebczuk and Musalem hold that a more dynamic reaction by the capital markets to pension fund activity should be expected in countries that have already attained a certain threshold of capital market development<sup>[6]</sup>. And how financial markets react to the pension reform will be very different in different financial structures. The study has exceeded the previous research perspective, starting from the perspective of financial structure, to think about the privatization of pension reform in developing countries, which need strengthen the construction of financial markets to support the pension privatization, but not blindly believe that privatization will automatically promote financial market development.

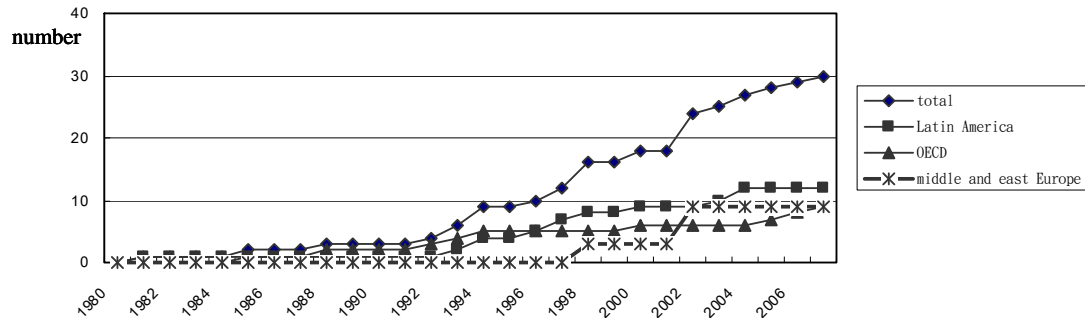
This paper compares the pension privatization between typical developed countries and developing countries, and further explores financial conditions to implement pension privatization from the perspective of financial structure. The remainder of this paper is organized as follows. The next section compares the pension privatization in developed and developing countries. In section 3, we analyze of financial conditions for raising pension privatization degree in structural perspective. In section 4 we draw enlightenment to reform of individual account system in China.

## COMPARISON OF PENSION PRIVATIZATION IN TYPICAL DEVELOPED COUNTRIES AND DEVELOPING COUNTRIES

The comparative objects mainly cover the reform of social security privatization based on the individual accounts in Latin American, Middle and East European countries and Sweden and the occupational pension program established in some developed countries.

## (1) Policy comparison: privatization strength

From 1980 to 2004, totally 28 Latin American, Middle and East European countries and OECD countries had established the mandatory funded DC (defined contribution) program (see Figure 1), of which 21 countries belong to emerging countries in Latin America, Middle and Eastern Europe.



**Figure 1 : The number of countries adopting mandatory funded DC program from 1980 to 2004**

As to the time point of reform, the social security privatization in Latin America has been relatively dense since 1994 while the one in Middle Europe and Eastern Europe has been centralized in 2002-2004. These countries uniformly select Chile's Mode based on individual account. It conforms to the time when World Bank proposed "three pillars" and vigorously recommending the individual account system in 1994. Different from the emerging countries, most of the mandatory DC plans were established in OECD countries before 1994. Regarding the privatization mode, only Sweden established the individual account system, while other OECD countries, such as Australia, Switzerland and Iceland, jointly selected the mandatory occupational pension plans.

In evaluating the effect of the social security privatization in Latin America, whether or not the reform process is accompanied with the rise in total contribution rate shall be taken into full consideration. Except Costa Rica and Estonia, the contribution rate of the individual account in other countries is between 7~13%. The contribution of the individual accounts in 8 countries among in Latin American countries accounts for over 30% of the total contribution of the mandatory program after reform and the one in Chile, Peru, Salvador and Dominica even reaches up to or exceeds 50%. In general, the individual accounts in the developing countries do not obviously differ from the mandatory occupational pension plans in the developed countries in the contribution rate; however, as to the contribution rate undertaken by the individuals, the one of the mandatory occupational pension program is relatively small. In other words, the income risks of the elderly persons in the developed countries after reform are jointly undertaken by the government, the employer and the employees while the ones from the individual account mode in the developing countries are basically undertaken by the individual.

## (2) Effect comparison: privatization degree

In the developed countries implementing the pension privatization reform including Sweden, Denmark, Australia and Switzerland and so on, the percentage of coverage exceeds 90%, however, the percentage of coverage of the individual accounts in the developing countries is not so high, and Chile with the top percentage of coverage only covers 59% of the laborer. After the privatization reform in the Latin American countries, the percentage of coverage even drops down as a whole, for example, the one in Argentina, Peru and Uruguay decreases by 24%, 19% and 14% respectively<sup>[8]</sup>. With regard to voluntary pension plan, the percentage of coverage of the laborers in Germany, Ireland and Norway exceeds 50% while the one in USA, UK, Japan and Belgium exceeds 40%.

In the other hand, the income substitution rate provided by the mandatory pension plans in the developed countries is relatively close to the one in the developing countries, about 55%. However, the mean of the income per capita in the developed countries are 2.9 times of the one in the developing countries. Although the strength of privatization reform of the pension program in the developed countries is lower than the one in the developing countries, in case that the private voluntary pension program is included, the overall privatization degree of the pension system in the developed countries is still higher than the one in the developing countries, appearing as the proportion of the pension fund in the developed countries to the GDP reaching up to 42.4% on average, obviously higher than 17.6%, the average level in the developing countries<sup>[9]</sup>.

It can be seen that "social security privatization" cannot realize "pension privatization". Due to higher contribution rate and lower percentage of coverage, the reform of the social security privatization in the emerging countries cannot raise the pension privatization degree; due to the development of the voluntary pension plan, although the reform of the social security privatization has not basically implemented in the developed countries, the pension privatization degree is still relatively high. Therefore, the social security privatization is neither the sufficient condition for increasing the social security privatization nor the necessary condition for increasing the pension privatization.

### ANALYSIS OF FINANCIAL CONDITIONS FOR RAISING SOCIAL PRIVATIZATION DEGREE

(1) A theoretical framework: convergence of risk management mode and demand of financial system and pension system Since PAYG pays the income of the retirees in the current period with the contribution of the laborers in the current

period, the intergenerational risk allocation is the basic function of PAYG; meanwhile, PAYG can also realize the allocation of risk in a generation through weakening the link between contribution and payment and adopting the annuitized payment mode. But the funded plan differs a little. The pension income ultimately obtained by the pension program participant depends on his/her contribution and the income of the contribution in the market investment. In this process, the individual risks are exchanged through the financial institutions in the financial market.

As a result, in these countries with the main retirement income provided by PAYG, in order to guarantee the stability of the pension system, the government establishes huge pension reserve funds step by step in the period of young population structure or rapid economic growth and then puts to use the reserve in the period of aged population structure or slow economic growth and regulates the contribution between the working generations and payments between retirement generations. Therefore, the risk management mode of the income of the aged population mainly appears as the inter-temporal risk smoothing. But in these countries with the main retirement income provided by the private pension plan, the horizontal exchange risk among individuals realized by the pension assets in the process of investment in the financial market becomes the main income risk management of the aged population. At this moment, the financial institutions, instead of the government, perform the income risk management of the aged population. Undoubtedly, the pension structure dominated by the private pension program has higher requirements on the capability of risk management of the financial market and financial institutions.

And this corresponds to the methods of risk management in different financial structure. In these countries with the financial system dominated by the banks, the financial institutions mainly help the customers to manage the risk by means of inter-temporal smoothing. The financial institutions establish the assets reserve in the period with relatively high market rate of return and then make up the insufficiency of the income with the reserve in the period with relatively low rate of return. In this process, the financial institutions act as the "buffer" to smooth the income in different periods so as to guarantee the stable income of the customers and avoid the risk impact. Just so, the demand of the investors for the risk management is not so strong. In these market-oriented countries, due to the intense competition with the financial market, the traditional risk management mode of inter-temporal smoothing is not practicable any more, thus the financial institutions often manage the risk through the cross-sectional diversification of risk, that is to say, the risk is diversified when the investors hold each risk with a certain relatively small proportion through the risk exchange among the individuals at a certain time point. Since the diversification of risk on the cross-section cannot eliminate the undiversifiable risks, therefore, the demand of the investors for the risk management is stronger and stronger.

In a word, in the bank-oriented financial structure, the risk management of inter-temporal smoothing can meet the need for risk diversification among generations which PAYG pension structure provides, and the demand of risk management of the investors in the financial market or the participants in the pension program is relatively low; while in the market-oriented financial market, the mode of risk exchange among the individuals on the cross-section can also basically satisfy the demand of the pension system dominated by the private pension program for the risk exchange in a generation, and the demand of the investors or the participants for the social risk management is relatively high. This structural coincidence relation has been verified in the developed countries and the developing countries observed in the foregoing.

Since the financial system develops earlier than the formal pension system, it can be supposed that the mode and efficiency of the risk management function executed by the financial system determines the risk management mode of income of the aged population by the pension system. Furthermore, the launching of pension privatization reform or the development of private pension program is restricted by the financial structure and its corresponding risk management characteristics of this country. In these market-oriented countries, the financial market can provide more tools to manage the income risk of the aged population and the cut-throat competition among the financial institutions in the pension assets management market can raise the efficiency of the income risk management of the aged population. With the combined effect of these factors, the financial institutions are provided with the relatively strong capability of income risk management of the aged population. At this moment, the will of pension privatization reform will be stronger; to say the least, even without the mandatory public pension privatization reform or the occupational pension program, the voluntary private pension programs can also obtain the spontaneous growth power.

## (2) Empirical analysis

In order to verify the correlativity of the pension privatization reform to the financial structure, the relationship of the development of the private pension program in OECD countries to the market capitalization degree is used as the representative to carry out the empirical analysis of the above-mentioned theoretical hypothesis.

The financial structure, financial efficiency, market capitalization degree and financing size of the financial system are selected as the explanatory variables to establish the regression model of the development of private pension program to the variables above mentioned. In order to review the effects of the mandatory privatization policy on the development of private pension program, whether the mandatory privatization is carried out and the duration of the mandatory policy implemented are also regarded as the explanatory variables to explain the pension privatization degree together with the above-mentioned variables of the financial system.

In order to narrow the differences in time scale among the variables, the multi-variable logarithm regression model is firstly established here:

$$\ln(asset)_i = \beta_1 + \beta_2 \ln(fstructure)_i + \beta_3 \ln(feffericiency)_i + \beta_4 \ln(fdevelopment)_i + \beta_5 \ln(mc)_i + \beta_6 \ln(mandatory)_i + \beta_7 \ln(year)_i + \mu_i \quad (1)$$

Where *asset*, *fstructure*, *feffericiency*, *fdevelopment*, *mc*, *mandatory* and *year* respectively refer to the variables including private pension assets size, financial structure, financial efficiency, financing size of the financial system, capitalization degree of the financial market, whether the private pension program is implemented in a mandatory manner (dummy -variable) and the duration of the mandatory implementation. As to the countries not implementing the mandatory privatization program, the duration of the mandatory implementation is valued as 0. The pension privatization degree in a certain country is measured with the pension size, indicated as pension assets divided by GDP. According to the definition of the indexes for the financial system by Allen et al, the ratio of market capitalization to the bank financing is regarded as the index for measuring the financial structure and the management cost of banks as the index for measuring the financial efficiency. The financing size of the financial system is indicated as the sum of the bank financing and the market capitalization<sup>[10]</sup>. The mean values of the indexes in the above-mentioned 28 OECD countries from 2001 to 2011 are selected for regression of Model (1), with the results shown as follows:

TABLE 1 : Regression results

Variable	Reg1	Reg2
Dependent Variable:ln (asset)		
Ln (fstructure)	0.75***	0.74***
Ln (feffericiency)	0.15	
Ln (fdevelopment)	0.99*	1.37***
mandatory	0.58	
year	0.00	
Ln (mc)	0.72***	
R squared	0.66	0.55

\*p<0.10; \*\*p<0.05; \*\*\* p<0.01.

It can be seen that the whether the private pension program is implemented in a mandatory manner and the duration of the mandatory implementation do not significantly affect the private pension program. Furthermore, through the bound test on the regression coefficients of *mandatory* and *year* as 0 synchronously, they do not pass the significance test, validating the mandatory privatization policy is not significant to raise the pension privatization degree once more. In addition, the financial efficiency measured with the management cost of banks has no significant effect on the development of the private pension program.

What is more, in order to analyze the significance of the financial structure and the financial development degree to the pension privatization, after the variables including *feffericiency*, *mandatory* and *year* are eliminated, the relatively complete data of 20 OECD countries from 2001 to 2011 are used to establish the following panel data model:

$$\ln(asset)_{it} = \alpha_1 + \alpha_2 \ln(fstructure)_{it} + \alpha_3 \ln(mc)_{it} + \alpha_4 \ln(fdevelopment)_{it} + A_i + L_t + \mu_{it} \quad (2)$$

Where  $A_i$  and  $L_t$  refer to regional effect and time effect respectively. Hausman test is carried out on Model (2), and the results indicate that the individual effect and time effect coexist in the panel data model, that's to say, the discrepancy in different countries and the fluctuation in times coexist. Since the data span 2008 in which the international financial crisis burst out, the data indicate that the above-mentioned indexes rose up to the peak value before the financial crisis and then dropped down rapidly and then were recovered step by step, so the self correlation in individual time series and the serial correlation among the individuals coexist in the model, where the time effect accounts for a relatively large proportion in the gross effect.

Based on the adaptability simulation of the panel data measurement model made by Liu et al, when the time effect is larger than the individual effect, the estimation deviation of Fama-MacBeth model is relatively small<sup>[11]</sup>. As a result, Fama - MacBeth model is adopted for regression. In addition, since the financing size of the financial system is highly correlated to the degree of market capitalization (correlation coefficient exceeding 0.85), therefore, collinearity exists in the regression and the regression is made on them individually. TABLE 2 shows the corresponding regression results.

TABLE 2 : Regression results of Fama-MacBeth model

Variable	Reg1	Reg2
Dependent Variable: ln (asset)		
Ln (fstructure)	0.8353 ***	0.0110
Ln (fdevelopment)	1.5301 ***	
Ln (mc)		1.4040 ***
R squared	0.5355	0.51

\*\*\*  $p < 0.01$ .

It can be seen that it is better to interpret the degree of development of the private pension program with the financing size and the financial structure of the financial system. On an average, when the financing size of the financial system increases by 1%, the size of the private pension will increase by 1.53%, meanwhile, when ratio of the financial market to the banks financing increases by 1%, the scale of the private pension will increase by 0.84%. It further validates the conclusions above mentioned, namely the pension privatization degree is mainly restricted by the financial structure and the financial development degree in a certain country.

### CONCLUSION

The main conclusions of this paper are described as follows:

(1) In case that the pension is targeted for privatization, the social security privatization is neither the necessary condition nor the sufficient condition for raising the pension privatization degree just because the more radical social security privatization reform in the developing countries does not enable the privatization degree of the pension system to be higher than the one in the developed countries; furthermore, the relatively higher pension privatization level in some developed countries is not related to whether or not the private pension program is implemented in a mandatory manner.

(2) From the demand for the income risk management of the aged population, since the social risks such as the fluctuation of macro-economy and change in population structure cannot be allocated in a generation, the design of the pension system must cover the intergenerational risk allocation function, and the pension privatization does not imply the privatization of the income risks of the aged population. But the social security privatization in the developing countries privatizes the income risks of the aged populations at the same time, which may be one of the main reasons why the social security privatization fails in some Latin American countries.

(3) The pension privatization degree depends on the financial structure and the development level of the financial market in a country, as conforms to the study made by Bebczuk and Musalem, namely the privatization reform is subject to a certain financial threshold. The bank-based financial systems in most of the developing countries play a limited role in the financing, and there financial markets are not so developed, so the financial institutions do not have strong capability conducting the cross-sectional risk exchange or strong capability carrying out income risk management of the aged population, all of which determine PAYG-dominated pension structure is more suitable for the developing countries.

To sum up, this paper interprets the differences in pension structures in different countries from the prospective of risk management and discusses the conditions for raising the pension privatization degree from the prospective of financial structure. These conclusions are of reference value to explore the present problems of "empty accounts" or "real accounts" in the individual accounts in China.

At present, the financial structure of China is still dominated by the banks. From 2001 to 2011, the financing size of the banks and the capitalization degree of the financial market was equivalent to 174.24% of GDP on average and the size of bank financing was 1.76 times of the market capitalization, both of which were superior to the ones in most emerging countries implementing the social security privatization. Generally speaking, the pension structure in China shall be dominated by the public PAYG program. In fact, the pension structure in China is just so, for example, 71.4% of the total contribution (contribution rate is 20%) enters the social pooling account of the social pension and the rest (contribution rate is 8%) enters the individual account. Even more, the individual account is always empty, so its effect is identical with the social pooling.

On the other hand, based on the regression results of Model (2), we forecast the pension assets size in China, it should reach up to 14.83% of GDP; however, the gross investment size of the pension assets in 2012 accounted for less than 1% of GDP<sup>[12]</sup>. In addition, since the contribution rate of the basic pension is relatively high, extruding the development space of the enterprise annuity and individual voluntary pension plan (commercial pension), as a result, the pension privatization degree in China is relatively low as a whole.

It is held by us that the pension structure in China should be dominated by the public PAYG program at present according to the present situation of the financial structure dominated by the banks. Currently, the main problem of the pension system in China lies in the relatively low development degree of the private pension plan; in addition, due to the insufficient development of the second and third pillar, in order to raise the pension privatization degree in China, the most effective approach is to make the individual account funded. It is suggested by us that the individual accounts in China can firstly

make them funded to a small extent (for example, contribution rate 2~4%), carry out the marketized investment and keep DB annuity payment mode unchanged at the same time. Viewed for a long-term, with the development and evolution of the financial system in China, the funded degree of individual account can be raised step by step, and it is necessary to quicken the development of the enterprise annuity and commercial pension market.

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