Topic 2.2.1

On the Construction of Multi - Pillar Pension System in China*

Assessment Report

Li Zhen, Professor and Director, Institute of Social Security, Renmin University of China

Zhao Qing, Social Security Department, Renmin University of China

* The original name of the project is “Notional Personal Account Reform in the Basic Pension Insurance System” but it was adjusted to be “On the Construction of Multipillar Pension System in China” as the following reasons. Firstly, there is no actual Notional Defined Contribution (NDC) personal account within the China’s Pension System although NDC was proposed by some minister in the past three years, it has never been put into practice. Secondly, NDC cannot be found in the "Thirteenth-Five Five-Year Plan" so that we can reasonably infer that the Notional personal account would never be put into effect in the predictable future in China. Lastly, we think a macro perspective using multi-pillar design for China’s pension system is essential to identify the problems of each pillar at present stage and we still give sufficient academic discussion on the pros and cons of the NDC by intensive literature review and comments.
Abstract

With great transformation of China’s society and economy, China’s pension system has transformed from traditional retirement system based on planned economy to modern public pension system based on market economy, protecting the old-age’s basic living standard in case of retirement. The public pension systems has established and gradually covered from employed population to unemployed population, from urban areas to rural areas.

This report first examines public pension system for urban employees based on a brief history review and analysis on current situation. Although the public pension for urban employees has been playing an increasingly important role in providing basic protection for over 80 million urban retirees in China, it faces challenges like coverage with loopholes, inadequacy of pension benefit, unsustainability under ageing society. This is mainly related to structural and parametric problems in the design of the pension system as well as moral hazard problems in management. Compared with first pillar pension system, voluntary second pillar is really underdeveloped regarding to coverage and pension fund.

Secondly, the report reviews the development of pension policy for urban and rural residents. Despite a short history, public pension for urban and rural residents has rapidly extended social security coverage to people who could not take part in the traditional public pension system for employees, which has largely improved equity of pension system. However, the pension system
depends heavily on financial subsidy, which may probably induce sustainability issue in the long run. Moreover, pension benefit is inadequate for the over 137 million pensioners.

Considering current unbalanced structure of pension system, proposal to establish multi-layer, multi-tier or multi-pillar pension system has reached an agreement. However, researchers have different opinions on how to reform current pension system to a multi-layer or multi-pillar pension system, especially for the most controversial part on “first-pillar” public pension reform. The feasibility of Notional Defined Contribution account in China is discussed then. Lastly, on the diagnosis of the problems embedded in current multi-layer pension system, we propose to establish the dual-basic urban employees’ pension system; to call-off the existing public pension system for urban & rural residents, and establish a new “zero-pillar” Pension System; and to establish, strengthen and encourage the national voluntary personal saving accounts (the Third-pillar).

1. The characteristics and problems of the current pension system in China ................................................. 6
2. Pension System for Urban employees ........................................................................................................ 9
   2.1 First Pillar Pension Scheme .................................................................................................................. 9
      2.1.1 History and Latest Reform .............................................................................................................. 9
      2.1.2 Contents of Public Pension System for Urban Employees ............................................................. 11
         2.1.2.1 Features of a hybrid System ......................................................................................................... 11
         2.1.2.2 Parameters of the Urban Pension System ................................................................................... 11
         2.1.2.3 Policy Expectations on Pension Level .......................................................................................... 11
         2.1.2.4 Determinants of Pension Benefit ............................................................................................... 11
         2.1.2.5 The Evolution of coverage and its implications .......................................................................... 12
      2.1.3 Current Situation ............................................................................................................................... 13
         2.1.3.1 Coverage expansion .................................................................................................................... 13
         2.1.3.2 Benefit Level ............................................................................................................................... 14
         2.1.3.3 Pension fund and financial subsidy .............................................................................................. 15
      2.1.4 Difficulties and Challenges ................................................................................................................. 16
         2.1.4.1 Coverage: many migrant workers are not included .................................................................... 17
         2.1.4.2 High contribution burden .......................................................................................................... 17

EU-China Social Protection Reform Project / 3
2.1.4.3 Inadequate pension benefit .......................................................... 18
2.1.4.4 Challenge: Ageing trend of the public pension system ..................... 20
2.1.4.5 Financial sustainability ................................................................... 22

2.1.5 Problem analysis .................................................................................. 26

2.1.5.1 Structural problems ......................................................................... 26
2.1.5.1.1 Inefficiency of current hybrid system ........................................... 26
2.1.5.1.2 Inefficient individual account ...................................................... 26

2.1.5.2 Parametric problems ......................................................................... 28
2.1.5.2.1 Very low contribution base .......................................................... 28
2.1.5.2.2 Short minimum contribution periods .......................................... 28
2.1.5.2.3 Low statutory retirement age ....................................................... 29

2.1.5.3 Moral hazard problems in management .......................................... 29

2.2 Voluntary Second Pillar Pension Scheme ................................................. 30

2.2.1 Policy development of China’s occupational pension scheme .............. 30

2.2.2 Current Situation .................................................................................. 32
2.2.2.1 Coverage ......................................................................................... 32

2.2.2.2 Pension fund .................................................................................... 33

2.2.2.3 Structural unbalance ......................................................................... 34

2.2.3 A brief summary .................................................................................. 36

3. Pension System for Rural and Urban Residents .......................................... 37

3.1 Policy Evolution ...................................................................................... 37

3.1.1 Pension policy for rural residents ........................................................ 37

3.1.2 Pension policy for urban residents ....................................................... 39

3.1.3 Policy integration ................................................................................ 40

3.2 Current situation and challenges ............................................................. 41

3.2.1 Increasing Coverage .......................................................................... 41

3.2.2 Pension fund and financial sustainability .......................................... 42

3.2.3 Insufficient pension benefit ............................................................... 43
3.2.4 A brief summary ........................................................................................................... 43

3.3 Problem analysis ........................................................................................................... 44

3.3.1 Essence: government subsidy plus individual account ............................................ 44

3.3.2 Inefficiency of individual account ............................................................................ 44

4. Literature Review on Improvements of Current Pension System .................................... 44

4.1 “Zero-pillar” pension system: specific or universal? ..................................................... 45

4.2 “First-pillar” pension system: key areas of reform ....................................................... 46

4.2.1 Separation of social pooling and individual account ................................................... 46

4.2.2 Reform path of individual account ............................................................................ 46

4.2.2.1 Fully funded pension scheme ................................................................................. 46

4.2.2.2 Notional Defined Contribution (NDC) account ....................................................... 47

4.2.2.2.1 What is NDC? .................................................................................................... 47

4.2.2.2.2 Necessity for Reform ......................................................................................... 47

4.2.2.2.3 Reform plan: reduce or cancel social pooling ...................................................... 48

4.2.2.2.4 Advantages of the design on “total account” ....................................................... 48

4.2.2.2.5 Comment: Will the NDC solve the problem? .................................................... 49

5. Authors’ road map on improving current pension system ............................................. 50

5.1 Diagnosis on problems of current pensions system ...................................................... 50

5.2 Policy recommendation: From the “Multi-layer” Pension System for Urban Employees to the “Multi-pillar” Pension System for Entire Population .............................................. 51

5.2.1 Government’s boundaries should be reasonably and clearly defined ....................... 51

5.2.2 To establish the dual-basic urban employees’ pension system after separating the individual account ........................................................................................................ 51

5.2.3 Towards a “zero-pillar” pension system for residents ............................................... 52

5.2.4 Establish, strengthen and encourage the national voluntary personal saving accounts as the “third-pillar” pension scheme ........................................................................ 52

5.2.5 Attach importance to the function of intergenerational support from family .......... 52

5.3 Proposal for the Design of Multi-pillar Pension System in China ............................... 52

References: .......................................................................................................................... 55
1. The characteristics and problems of the current pension system in China

With great transformation of China’s society and economy, China’s pension system has transformed from traditional retirement system based on planned economy to modern public pension system based on market economy, protecting the old-age’s basic living standard in case of retirement. The public pension systems has established and gradually covered from employed population to unemployed population, from urban areas to rural areas. Pension system for urban employees is a multi-level structure: the first level, “public pension system for urban employees” is a combination of social pooling and individual account, in which the individual account was designed to be fully funded, however actually most provinces do not have real pension fund, which rises the problem of so called “empty accounts”; the second level is voluntary occupational pension scheme and the third level is personal saving or commercial life insurances, which are both underdeveloped. For urban and rural residents, they only have one level pension system established for a short period of time, the “public pension system for urban and rural residents”, which consists of social pooling financed by government subsidies and individual account financed by personal contribution. By the end of 2014, public pension, containing two parallel pension systems, had covered about 80% of the total population (842 million people).
“Five-pillar” pension system was first put forward in one of the World Bank reports named “Old-age income support in the 21st century: an international perspective on pension systems and reform” in 2005. It is said to be especially suitable for developing countries’ situation which includes five basic elements for the design of pension systems: (a) a noncontributory or “zero pillar” (in the form of a demogrant or social pension) that provides a minimal level of protection; (b) a “first-pillar” contributory system that is linked to varying degrees to earnings and seeks to replace some portion of income (mandatory DB plan); (c) a mandatory “second pillar” that is essentially an individual savings account (DC plan); (d) voluntary “third-pillar” arrangements that can take many forms (individual, employer sponsored, defined benefit, defined contribution) but are essentially flexible and discretionary in nature; and (e) informal intrafamily or intergenerational sources of both financial and nonfinancial support to the elderly, including access to health care and housing.

In China, pension system is designed according to multi-level principle and we have four parallel public pension systems for urban employees working in enterprises, public-sector employees, civil servants and urban & rural employees. From the perspective of “five-pillar” arrangements, the current retirement income security system has the following characters and problems.

In the first place, the current situation in China is that the first pillar pension scheme is over developed while the other pillars are overly underdeveloped. No more than 10% of participants enrolled in the public pension for urban employees working in enterprises take part in the “second pillar” occupational pension schemes, not to mention the “third pillar” personal saving, which is only a concept without any policy. For urban and rural residents, however, the uni-pillar, basic pension scheme is only available so far.

In the second place, the combination of the social pooling and individual has blurred the boundary between society and individuals, and has also amplified government’s responsibility. In the design of the first-pillar, individual account as well as public account are created to pursue efficiency. However, the individual account is of low efficiency because the Aaron Condition is not met. The fund in social pooling will be used if the fund in individual account is not enough to pay for current retirees, thus the boundary between individuals and the society is no longer clear. Apart from that, there are four different designs on individual accounts for urban enterprise workers, public-sector
workers, civil servants and urban & rural residents in the way interest rates are calculated, as displayed in table 1, leading to unrealistic comparison among different group.

**Table 1. System structures among the parallel public pension schemes**

<table>
<thead>
<tr>
<th>Scheme</th>
<th>structure</th>
<th>funding</th>
<th>Interest rate</th>
<th>Rate of return</th>
<th>efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enterprise employees 1997</td>
<td>DB + DC</td>
<td>Empty account (10% funding)</td>
<td>Deposit rate</td>
<td>Low and stable</td>
<td>low</td>
</tr>
<tr>
<td>Urban &amp; rural residents 2009/2011</td>
<td>subsidies + DC</td>
<td>funding</td>
<td>Might invest in market</td>
<td>Volatile return</td>
<td>low</td>
</tr>
<tr>
<td>Public employees 2015</td>
<td>DB + DC</td>
<td>funding</td>
<td>Might invest in market</td>
<td>Volatile return</td>
<td>unknown</td>
</tr>
<tr>
<td>Civil servants 2015</td>
<td>DB + DC</td>
<td>Notional account</td>
<td>Set by the government</td>
<td>High and stable</td>
<td>unknown</td>
</tr>
</tbody>
</table>

In the next place, one pension scheme is set to cover both formal and informal employment within the public pension system for enterprise employees, thus creating unsustainability of the system. There is an obvious dual character of the urban employment. The policy is aimed to cover the most people by lowering the threshold for eligibility, which has led to “free riders” during contribution period and inadequate benefits during their retirement, thereby a large amount of financial subsidies and future unsustainability of the pension system would happen.

Moreover, the unrealistic comparison on pension benefits between different public pension schemes will probably arise public pressure and political risks. In the present, there are four parallel pension schemes in China. Public pension schemes for civil servants and public employees are beginning to merge into the basic pension system for urban employees, which in essence is a combination of Defined-Benefit (DB) social pooling and Defined- Contribution (DC) individual account, but they differ from each other in the way interest rate is calculated. Whereas the nature for residents’ public pension is government subsides plus individual accounts, which means it is not social insurance at all. The benefit is very low, with only 119 yuan per month per capita in 2015. More seriously, the lower benefit compared to urban employees lead to huge pressure for the government. Table 1 below describes system structures among the parallel pension schemes. The four parallel pension
schemes with different individual accounts have various rules for interest rates, which could lead to unequal benefits in the end.

Last but not the least, the government plays an unlimited financial role in the provision of public pension system for urban enterprise employees. The government has promised to ensure the basic pension benefits for retirees because of transitional cost borne by the system itself, leading to the unlimited financial role of the government. This is of course not a sustainable way for the development of the system. As is shown by Figure1, the financial input for the pension scheme goes up dramatically from 2002 to 2015, with 2.5571 trillion yuan accumulated in total.

![Figure1. Government financial subsidies for public pension system for urban employees (100 million yuan)](image_url)

2. **Pension System for Urban employees**

Pension system for urban employees has a longer history and more complete framework than the pension system for urban residents. Currently there are two pillar pension systems designed for urban employees: first pillar public pension scheme and second pillar occupational pension scheme.

2.1 **First Pillar Pension Scheme**

2.1.1 **History and Latest Reform**

With great transformation of China’s society, public pension system for urban employees has transformed from the “state-enterprise model” based on planned economy to “social security model” based on market economy.
• Traditional retirement system (1952-1991)

In the early 1950s of the 20th century, China established an urban pension system based on the Soviet model. China's urban enterprise workers followed the earliest retirement plan in February, 1952 after the State Council promulgated the “Labor Insurance Regulations”. The main features of the welfare system in China were “low-wage, high-employment, high subsidies and high welfare”. Enterprises had unlimited liabilities for their employees’ health, old age, sickness, death and disability. As almost all enterprises were state-owned, Chinese government was responsible for the final debt. The retirement system was an important part of the Labor Insurance System. The traditional retirement system had high coverage rate and high level of pension benefit (usually 80% of the last year personal wages). Also, there were strict conditions to obtain pensions: workers must work for 30 years; retirement age for female blue-collar workers was 50 years, for female cadres was 55 years, and 60 years for men. Relative to population life expectancy at that time, retirement age requirements were high.

In sum, in traditional retirement system, enterprises and individuals did not need to contribute; pensions were part of labors cost of enterprises, but at the final phase, government was responsible for retirement pension. As a result, we call the traditional public pension system “the state-enterprise model”.

• Transition to social security model (1991-1997)

With transformation of planned economy system into a market economy, central government retreaded from traditional pension system, which could not adapt to economic development. As a consequence, lots of problems were created: 1) the majority of state-owned enterprises operated in losses and could not afford the pension system; 2) risk pool was too small; 3) labors working in private firms and self-employees were excluded; 4) labor mobility between different ownership-type firms was hampered. Thus from 1991-1997, Chinese government began to pilot some cities for exploring public pension reform for urban employees.

• Establishment and development of old-age social insurance (1997-)

In 1997, Chinese government established the Urban Employee’s Basic Old-Age insurance and extended it throughout cities and towns nationally. Since 2005, self-employees and flexible working individuals have been covered by the public system. The other separating pension system in urban area, public pension for civil servants, has merged into the Public Pension for Urban Employees since January 2015.
2.1.2 Contents of Public Pension System for Urban Employees

2.1.2.1 Features of a hybrid System

In the 1990s, China reflected on "egalitarian" values in the planned economy era, while the values of the Bismarkian social insurance model, Neo-liberalism, the “three pillar scheme” proposal by World Bank as well as the success of the privatization of social security in Chile, Singapore funded system had influence on China's policy makers. It is a hybrid system, consisting of social pooling and individual account, designed to make a combination of “efficiency” and “equity”. Policymakers also hope the public pension system could achieve multiple goals such as wide coverage, basic protection and sustainability. The social pooling was designed as a defined benefit plan with pay-as-you-go financial system, while the individual account system was designed as a defined contribution plan with funded financial system.

2.1.2.2 Parameters of the Urban Pension System

Contribution rate for employer is 20% of employees’ wages and employee pay 8% of his or her wage which goes into the personal account, the total rate is 28% of wages; the lower and upper limits of the contribution wage base are 60 and 300 percent of the social average wage of the previous year respectively; the minimum contribution period is 15 years; retirement age is 60 years for men, 55 years for women cadres, and 50 years for female workers (blue collars). The pension system gives one-year deposit interest rate to assets of individual accounts.

2.1.2.3 Policy Expectations on Pension Level

Since the replacement rate of traditional retirement system was too high, the new system decided to offer basic protection only, which must comply with the "basic protection" principle. Under this principle, the pension level decreased by several adjustment. First, modify the final-wage replacement rate of workers into social-average-wage replacement rate. Second, decrease the replacement rate from 80% to 60%. The level and structure of pension under the new system are as follows: Target replacement rate: 59% of the social average wage, in which, 35% is paid by the social pooling system and 24% paid by the individual account system. Adjustment mechanism of pension is set up with linkage to inflation and average salary to ensure that pension income will not decline dramatically.

2.1.2.4 Determinants of Pension Benefit

Basic pensions are calculated and paid as follows: when the insured person reaches retirement age and the minimum 15-year-contribution period is satisfied, social pooling pension is calculated on
the basis of the previous year’s local average wage and the person’s record of monthly average contributory wage of life time; each full contribution year qualifies for 1% of the basis of social average wage and one’s average wage separately. Individual account pension: each month equals the total accumulated amount divided by planned payment months, which are determined by the average life expectancy, personal retirement age, interest rate and other factors. For those retiring at 50, 55 and 60-year-old, the planned payment months specified as 195, 170 and 139 months respectively.

2.1.2.5 The Evolution of coverage and its implications

Up to the 1990s, enterprises beyond the state-owned and collective ones had developed and more labor was employed. Under this context, the coverage extended to all enterprises with different ownership in 1997, including state-owned enterprises, collective enterprises, foreign-funded enterprises, joint ventures enterprises, private enterprises, joint-stock enterprises and so on. In 2005, coverage was extended further to self-employees and flexible employees (without long-term stable employment), who would be treated a favorable contribution rate/contribution base while enjoying the same calculation method with ordinary employees. Contribution rate for them was 20% of their wages, of which 12% goes into the social pool, and 8% into individual accounts.

Table 2 is a brief summary of the content on public pension system for urban employees.

Table 2 Main contents of the basic public pension system for urban employees (“First Pillar”)

<table>
<thead>
<tr>
<th>System Structure</th>
<th>Social Pooling</th>
<th>Individual Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of System</td>
<td>PAYG System, DB</td>
<td>Funded System (empty), DC</td>
</tr>
<tr>
<td>Protection Target</td>
<td>All urban enterprise workers, self-employees, flexible employees</td>
<td></td>
</tr>
<tr>
<td>Contributions of employees</td>
<td>20% of total wages (employer)</td>
<td>8% of personal wage (employee)</td>
</tr>
<tr>
<td>Contributions of self-employees, flexible employees</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>System Parameters</td>
<td>Retirement age</td>
<td>Male 60, female cadres 55, other female workers 50</td>
</tr>
<tr>
<td></td>
<td>Contribution base</td>
<td>60-300% of average social wage</td>
</tr>
</tbody>
</table>

1 No survivors’ pension.
### Minimum contribution period

<table>
<thead>
<tr>
<th>Rate of return on individual account</th>
<th>One-year bank interest rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monthly Pension</td>
<td>Basic pension = (indexation of the average monthly wage of local workers in the previous year + the insured person’s average monthly contribution wage) * 1/2 * n * 1%</td>
</tr>
<tr>
<td></td>
<td>Individual account accumulated amount (determined by the one-year bank rate) divided by 139,170,195 relative to the insured person’s retirement age</td>
</tr>
<tr>
<td>The expected replacement rate (%) of average wage</td>
<td>35%</td>
</tr>
</tbody>
</table>

#### 2.1.3 Current Situation

Public pension for urban employees has been playing a very important role in China. First, it has secured multi-ownership of economic structure during great transformation from planned economy to market economy. Second, it has played the role as a social stabilizer during the reforming period of state-owned enterprises. Third, it has created a multi-responsibility sharing mechanism to alleviate financial risk of government. Last but not the least, social insurance has important significance to free labor flow. Several indicators are listed as follows to reflect the status quo.

##### 2.1.3.1 Coverage expansion

China has achieved great progress towards the goal of “wide coverage”. In 2013, there were about 382.4 million urban employed populations, among which 241.77 million urban employees involved in the public pension system, whereas 80.41 million retirees began to claim pension benefit. Chinese governments at all levels made great efforts for this goal, not only by lowering the threshold to encourage the low-income earners, self-employees, flexible employees to participate in the system, but also by offering other favorable terms. For example, some local governments encourage the elderly employees who are not insured to pay lump-sum contributions with the lowest contribution base, lowest rate and shortest contribution period for pension eligibility. Since 1993, the number of insured employees and retirees has increased dramatically and the coverage rate has ascended from 40% to 63% in 2013 (see figure 2).
2.1.3.2 Benefit Level

From 1997 to 2013, total pension payments increased rapidly from 125 billion to 1847 billion, while replacement rate of public pension benefit to social average salary of urban employees dropped gradually from 76% in 1997 to less than 44% in 2013. Although Chinese government has adjusted benefit level year by year, replacement rate is still too low to sustain basic living standard for some urban employees.

Regardless of the wide gap between the actual level of protection and policy design level, the 44% of the average wage average replacement rate in 2013 is not enough to provide “basic protection” for the retirees. Some scholars argue that the U.S. pension replacement rate is only 40%, and, as a
developing country, there is still room for China to decrease the replacement rate. However, they ignore the fact that in the U.S the Engel Coefficient is 6%, that means if $100 per capita is spent only $6 is spent on food, while Engel coefficient is 37%\(^2\) for urban China today, which means the elderly in China will spend significant portion of their pension on food. Besides, the old-age income structure is quite different: basic public pension is usually the only source of income for retirees in China, while only 30% of retired population in the United States completely relies on public pension, and nearly half of the retirees have other systems to provide incomes, such as corporate pension plans and Individual Retirement Accounts\(^3\).

2.1.3.3 Pension fund and financial subsidy

From 1995 to 2013, pension revenue for urban employees grew from 95 billion to 2268 billion, and pension expenditure increased from 84.7 billion to about 1847 billion respectively, with over 2827 billion pension funds accumulated by the end of 2013, i.e. 4.8% of GDP (see Figure 4).

![Figure 4. Pension Balance of Urban Employees (1995-2013)](image)

Source: Statistical Yearbook of China, Social Security Bulletin

In the recent decade, gross revenue of public pension system, composed of contribution revenue, interest revenue & others, and financial subsidies(central and local government), increased continuously from 248.9 billion in 2001 to 2268 billion in 2013. Meanwhile, gross expenditure grew with high speed of around 20%, exceeding growth rate of total revenue in 2009, 2010, 2012 and 2013 (Table 3).


\(^3\) Zhen Li, An analysis on the Basic Old-age Insurance of China, People’s Press, 2013, p. 49
Table 3. Revenue and Expenditure of Public Pension Fund for Urban Employees

<table>
<thead>
<tr>
<th>Year</th>
<th>Gross revenue</th>
<th>Growth rate of gross revenue</th>
<th>Contribution revenue</th>
<th>Interest &amp; other revenue</th>
<th>Financial subsidies</th>
<th>Gross expenditure</th>
<th>Growth rate of gross expenditure</th>
<th>Cumulative balances</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>2489</td>
<td>9.26%</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>2321</td>
<td>9.74%</td>
<td>1054</td>
</tr>
<tr>
<td>200</td>
<td>3171.5</td>
<td>27.42%</td>
<td>2551.4</td>
<td>211.9</td>
<td>408.2</td>
<td>2842.9</td>
<td>22.49%</td>
<td>1608</td>
</tr>
<tr>
<td>200</td>
<td>3680</td>
<td>16.03%</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>3122</td>
<td>9.82%</td>
<td>2207</td>
</tr>
<tr>
<td>200</td>
<td>4258</td>
<td>15.71%</td>
<td>3585</td>
<td>59</td>
<td>614</td>
<td>3502</td>
<td>12.17%</td>
<td>2975</td>
</tr>
<tr>
<td>200</td>
<td>5093</td>
<td>19.61%</td>
<td>4312</td>
<td>130</td>
<td>651</td>
<td>4040</td>
<td>15.36%</td>
<td>4041</td>
</tr>
<tr>
<td>200</td>
<td>6310</td>
<td>23.90%</td>
<td>5215</td>
<td>124</td>
<td>971</td>
<td>4897</td>
<td>21.21%</td>
<td>5489</td>
</tr>
<tr>
<td>200</td>
<td>7834</td>
<td>24.15%</td>
<td>6494</td>
<td>183</td>
<td>1157</td>
<td>5965</td>
<td>21.81%</td>
<td>7391</td>
</tr>
<tr>
<td>200</td>
<td>9740</td>
<td>24.33%</td>
<td>8016</td>
<td>287</td>
<td>1437</td>
<td>7390</td>
<td>23.89%</td>
<td>9931</td>
</tr>
<tr>
<td>200</td>
<td>11491</td>
<td>17.98%</td>
<td>9534</td>
<td>311</td>
<td>1646</td>
<td>8894</td>
<td>20.35%</td>
<td>12526</td>
</tr>
<tr>
<td>201</td>
<td>13420</td>
<td>16.79%</td>
<td>11110</td>
<td>356</td>
<td>1954</td>
<td>10555</td>
<td>18.68%</td>
<td>15365</td>
</tr>
<tr>
<td>201</td>
<td>16895</td>
<td>25.89%</td>
<td>13956</td>
<td>667</td>
<td>2272</td>
<td>12765</td>
<td>20.94%</td>
<td>19497</td>
</tr>
<tr>
<td>201</td>
<td>20001</td>
<td>18.38%</td>
<td>16467</td>
<td>886</td>
<td>2648</td>
<td>15562</td>
<td>21.91%</td>
<td>23941</td>
</tr>
<tr>
<td>201</td>
<td>22680</td>
<td>13.4%</td>
<td>18634</td>
<td>1027</td>
<td>3019</td>
<td>18470</td>
<td>18.69%</td>
<td>28269</td>
</tr>
</tbody>
</table>

Source: Statistical Yearbook of China, MOHRSS Bulletins on Social Security Development

2.1.4 Difficulties and Challenges

Although the public pension for urban employees has been playing an increasingly important role in
providing basic protection for over 80 million urban retirees in China, it faces challenges like coverage with loopholes, inadequacy of pension benefit, unsustainability under ageing society.

2.1.4.1 Coverage: many migrant workers are not included

Although 63% of the employed urban population has taken part into public pension system, nearly 37% of the urban employees, most of whom are migrant workers\(^4\) in informal sectors, are excluded from the public pension system for urban employees. Among 269 million migrant workers in 2013, there were only 48.95 million migrant workers, constituting 18.2% of insured public pension system for urban employees\(^5\). As a result, the majority of migrant workers, especially those working in informal sectors have not been covered by the public pension system. Besides, there are quite a few people participating into the pension with low contribution density which will lead to long-term problems.

2.1.4.2 High contribution burden

Currently China’s social insurance system has five schemes: pension insurance, medical insurance, unemployment insurance, work injury insurance and maternity insurance.

According to the Ministry of Human Resources and Social Security statistics, among the world’s 173 countries and regions with social insurance systems, China's five social insurance contribution rate, altogether reaches 40% of total wages, ranks No.13 in terms of high contribution rate. Within 40% of payment, employers contribute 30% and employees bear 10% of their wages\(^6\). Contribution rate for public pension alone has reached 28 percent, which may be among the world’s highest. It is a big burden for the working generation. In a survey conducted by the Chinese Entrepreneur Survey System in March of 2013, 55.8% of the 1000 entrepreneurs selected "social security, the tax burden is too heavy" as the biggest obstacle to enterprise development; for three consecutive years for all twenty options it ranked second place; and western regions, small businesses, non-state-owned enterprises and foreign-funded enterprises select "social security, the tax burden is too heavy,” with an even higher proportion. As can be seen, there is no further space for companies to increase the theoretical contribution rate\(^7\).

\(^4\) Migrant workers here mean Chinese workers from other provinces. The reason why pension system does not have full mobility for workers because social pooling level is only in provincial level or county level.

\(^5\) http://www.mohrss.gov.cn


\(^7\) Such rates are only theoretical, indeed, as employers and workers have a large discretionarily in deciding their contributory base, and sometime there is also direct bargaining between companies and the administration that collects the revenues.
2.1.4.3 Inadequate pension benefit

The indicator of pension replacement rate has been widely employed by Chinese researchers to evaluate the adequacy of China’s Basic Old-Age Pension for Urban Employees (Zhu, 2002; Chu, 2004; Zheng, 2012; Li & Wang, 2013) because pension benefit of public pension for urban employees is mainly determined by contribution base, contribution years, retirement age and interest rate of individual account. Average replacement rate has been introduced in section 2.1.3.2 above to describe average level of pension adequacy, whereas in this section we will discuss pension adequacy of retirees belonging to different income groups with different contribution level.

- Quantitative analysis

Given current policy on minimum contribution base, minimum contribution years, statutory retirement age and interest rate of individual account set by the central bank, and empirical data collected since 1997, the assumptions are set as follows:

i. Employees contribute continuously before retiring for n years up to retirement (As 15 years contribution shall be 15 years prior to retirement or pre-retirement lump-sum payment of premium for 15 years).

ii. Employers contribute 20 per cent of total wage payment and employees contribute 8 per cent of individual wage payment. The former goes into social pooling part while the latter enters the individual accounts.

iii. Individual accounts yield about 2.9% of interest rate. According to the empirical data from 1997 to 2009, the average bank-deposit interest rate in one-year is 2.9%, which means $r = 2.9\%$.

iv. The individual account requires months divisor 195 (50-year-old retired), 170 (retirement age of 55) and 139 (retirement age of 60) respectively, meaning that $m=195,170$ and 139 respectively.

v. Growth rate of social average wage is 8%, that is $g = 8\%$. (This is a modest assumption, adapted to current economic environment). From 1997-2009, growth rate of average wage among insured workers was 16.1%).

Models for calculating replacement rate can be set below:

(1) Social pooling (basic pension)
Individual account is a Defined- Contribution (DC) funded system. Theoretically, funding asset is determined by contributions and return on investment. It is assumed that the growth rate of personal wage equals to that of local average wage $g$ ($e=1$); $c$ is contribution rate of individual account; $a$ is rate of contribution base. In theory, final value of the individual account for a participant contributing $n$ years continuously can be calculated according to the formula:

$$R_1 = (n \times (1 + g)^t + a \times (f \times \left( 1 - \frac{\left(\frac{1 + g}{1 + r}\right)^n}{1 + g} \right) \times \frac{1 + g}{g + a + g})) / (200 \times (1 + g)^t) \quad (e=1)$$

(2) Individual account

As it can be seen from table 5, given the same retirement age, total replacement rate of pension benefit to social average wage will increase around 1% when one more contribution year is added.
Second, replacement rate is a bit lower for female retirees, especially for female workers. Third, given the situation of current retirement age and contribution base, although male workers contribute continuously to 40 years and female cadres contribute continuously to 35 years, the total replacement rate for them is still far behind objected replacement rate of 58-60%.

Table 5. Replacement rate at different contribution years with 100% contribution base

<table>
<thead>
<tr>
<th>Retirement age</th>
<th>Contribution years</th>
<th>Social pooling (%)</th>
<th>Individual account (%)</th>
<th>Total (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>60</td>
<td>40</td>
<td>37.04</td>
<td>11.89</td>
<td>48.93</td>
</tr>
<tr>
<td></td>
<td>35</td>
<td>32.41</td>
<td>11.34</td>
<td>43.75</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>27.78</td>
<td>10.65</td>
<td>38.43</td>
</tr>
<tr>
<td>55</td>
<td>35</td>
<td>32.41</td>
<td>9.27</td>
<td>41.68</td>
</tr>
<tr>
<td></td>
<td>30</td>
<td>27.78</td>
<td>8.7</td>
<td>36.48</td>
</tr>
<tr>
<td>50</td>
<td>30</td>
<td>27.78</td>
<td>7.59</td>
<td>35.37</td>
</tr>
</tbody>
</table>

Note: Statutory retirement age for males, female cadres and female workers is 60, 55 and 50 respectively in China.

According to further calculations, in order to achieve the expected replacement rate goal (namely replacement rate of social pooling part reaches 35%, individual account reaches 24%), social pooling requires 100% of the average wage contribution base for at least 35 continuous years. Meanwhile individual account should offer targeted 24% replacement rate only when the following conditions are met: 1) Contributing 8% of 100% base to individual account for 40 years; 2) Interest rate of assets on individual account is equal to wage growth rate; 3) The retirement age should be 60, making the minimum divisor of individual accounts of 139 months.

However, as analyzed before, total replacement rate of public pension for urban retired employees could not meet the original goal (replacement rate of 58-60%) under the consideration of current policy design.

2.1.4.4 Challenge: Ageing trend of the public pension system

- Generally young but fast aging population

---


9 Zhen Li. An analysis on the Basic Old-age Insurance of China, People’s Press, 2013.
As is shown by figure 5, China is still at the stage of a young age population structure; especially the total dependency ratio is really low. In the 1990s when the Basic Old-Age Insurance was devised, China's elderly dependency ratio was only 15% (elderly dependency ratio = the population aged 60 and above / population aged 15-59), and this indicator is 18% now, which is still low. But the challenge is that China's population is aging fast. It is forecasted that China will experience rapid aging in the next 40 years, and by 2050 the elderly dependency ratio will reach 63%\(^\text{10}\).

\[\text{Figure 5. Development and future trends of China's population dependency ratio (1950-2100)}\]


- The dramatic change in support ratio

China's old age dependency ratio is not high, but the covered population in the public pension for urban employees is ageing fast. In 1978 the ratio of urban employees to retired population was 30:1, and then decreased rapidly to 3.4:1 in 1997 at the time of the establishment of the pension system. Since 1998 till now, it further decreased to around 3:1 (see figure 6). Compared with data in Figure 4, the same period the elderly dependency ratio of the total population increased from 8% to 11%, indicating that general population aging is not the only reason for aging in the pension system.

Statistically speaking, the ratio of insured employees to insured retirees is 3:1 in the current pension system. However, not all the three employees insured actually pay their contribution continuously. According to the Human Resources and Labor Protection survey, 23% of the insured employees suspended contribution in 2011. As a result, the actual contributing population to the retired

population (dependency ratio) is worse in reality.

![Support ratio of the Basic Old-Age Insurance (1989-2011)](image_url)

**Figure 6. Support ratio of the Basic Old-Age Insurance (1989-2011)**


2.1.4.5 Financial sustainability

The public pension system faced short-term financial difficulties and long-term challenge on financial sustainability in terms of pension debt.

- Current deficit regardless of financial subsidy

According to *Yearly Report of the Development on China’s Social Insurance* (2014), the deficit of public pension has increased year by year after removing financial subsidies. Currently 18 provinces face the problem that contribution revenue has exceeded pension expenditure, among which Heilongjiang province has the largest amount of this “deficit”. The “deficit” began to emerge from 2013, when it was 95.9 billion yuan regardless of financial subsidies. From then on, “deficit” of public pension has already ascended to 156.3 billion yuan in 2014 and 302.49 billion yuan in 201511.

- Empty individual account and enormous liabilities

According to the system design expectations, the accumulation of funded system of individual accounts is to cope with the peak of future population aging. However, owning to insufficient financial resources in the 1990s, the government was not committed like the Chilean government to

11 [http://sy101c3c105.dedeadmin.com/sy101c3c105b1x50702n416060247.html](http://sy101c3c105.dedeadmin.com/sy101c3c105b1x50702n416060247.html)
pay transition cost. Moreover, the contributions from employers are insufficient to pay pensions of retirees, so the contributions from employees were used on a PAYG base instead of accumulated on individual accounts in many regions. The local governments have been funding the system to compensate for the liabilities of individual accounts since 2002, but financial expenditure was far from enough. Table 6 shows that there is only a little bit more than one tenth of contributions paid on individual accounts funded, and about nine of ten had gone. Chinese describe this problem as “empty account problem”.

Although social pooling part has surplus funding in general, it is still less than the liabilities of individual accounts. As is shown by table 6, in 2013, all the surplus of social pooling (2826.9 billion) still cannot cover empty scale (3095.5 billion).

Table 6. Funding status of the individual accounts 2006-2013

<table>
<thead>
<tr>
<th>Year</th>
<th>Recorded scale</th>
<th>Real asset</th>
<th>Empty scale</th>
<th>Surplus of social pooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>2006</td>
<td>9994</td>
<td>—</td>
<td>—</td>
<td>5489</td>
</tr>
<tr>
<td>2007</td>
<td>11743</td>
<td>786</td>
<td>10957</td>
<td>7391</td>
</tr>
<tr>
<td>2008</td>
<td>13837</td>
<td>1100</td>
<td>12737</td>
<td>9931</td>
</tr>
<tr>
<td>2009</td>
<td>16557</td>
<td>1569</td>
<td>14988</td>
<td>12526</td>
</tr>
<tr>
<td>2010</td>
<td>19596</td>
<td>2039</td>
<td>17557</td>
<td>15365</td>
</tr>
<tr>
<td>2011</td>
<td>24859</td>
<td>2703</td>
<td>22156</td>
<td>19497</td>
</tr>
<tr>
<td>2012</td>
<td>29543</td>
<td>3495</td>
<td>26048</td>
<td>23941</td>
</tr>
<tr>
<td>2013</td>
<td>35109</td>
<td>4154</td>
<td>30955</td>
<td>28269</td>
</tr>
</tbody>
</table>


- Implicit pension debt and transformation cost

Implicit Pension Debt (IPD) is defined as the present value of total obligations on future pension benefits to current pensioners as well as current contributors if the PAYG system has to be terminated. It is measured by adding the present value of benefits that will have to be paid to current pensioners plus the present value of pension rights that current workers (future pensioners) have
already earned and would have to be paid if the original system were terminated today\textsuperscript{12}.

Transformation cost stems from IPD but it is not equal to IPD. Transformation cost relates to the financing gap created when payments to pensioners and future retirees must continue even though part of the contributions have been transformed into funded individual accounts. Thus transition cost comes from the need to pay off the debt of the old PAYG system over a period of time. If the new pension system follows a mixed model, such as China’s public pension for urban employees, then the present value of transition costs is smaller than IPD.

The size of IPD and transitional cost has been calculated by various institutes and researchers. However, there is no agreement on the result as different measurement usually relies on different assumptions on economic and demographic factors, eg. age structure of covered workers and pensioners, coverage, pension benefits, retirement age, replacement rate, indexation mechanism and discount rates.

In terms of transformation cost, Wang et al (2001)’s simulation resulting from a dynamic CGE model suggested that the transition cost is ranging from 0.5 to 0.6 percent of GDP during 2001-2035 to 0.3 percent of GDP in 2050. Dofman and Sin (2000) evaluated the transition cost of China’s pension reform by employing the World Bank actuarial model, PROST. They projected that if there would be no reform of the current pension system, the pension deficits would increase to 0.36 percent, 0.75 percent and 0.89 percent of GDP in the year of 2030, 2050 and 2075, respectively. Chen Fengyuan et al (2013), by the use of accrued-to-date liabilities method from a static perspective, proposed a new way for calculating the transitional costs and analyzed the mechanism of transitional cost payment according to pension reform practices during the past decade. They calculated transitional cost of distinguished group with different gender, character of employment and type of participation (“old” or “middle”), and the total amount was close to 6.832 trillion yuan under basic scenario. Sensitive analysis was followed to make further estimation on transition cost.

In terms of IPD, World Bank (1997) estimated China’s IPD at between 46 percent and 69 percent of GDP. A latter estimate puts the IPD at 94 percent of the 1998 GDP (Dorfman and Sin, 2000). Song Xiaowu’s report estimated ten different scale of implicit pension debt based on reform in 1997, setting three kinds of average wage-growth rate (5%, 4%, 3% in the next 5, 6 to 10, over 10 years), growth rate of pension benefit as 60% of average wage’s, average supporting ratio as 3.25:1 and two kinds of investment rate. One of the results showed that the standard IPD was equivalent to

145.4% of current GDP with 4% as investment rate\textsuperscript{13}. Wang Yan et al (2001) estimated China’s IPD is around 71 percent of GDP in 2000 based on the model of countable general equilibrium. According to calculation of Jia Kang et al (2007), the total debt (comprised of basic pension for “old” men and transitional pension for “middle” men) in 2007 is about 1080 billion yuan if the old pay-as-you-go system terminates, under the assumption that no new participants would join in the system. Taking new working generation into consideration, Wang Xiaojun (2002) estimated the pension liability at transition period and forecasts the trend of liability in the future 50 years based on the actuarial methods for IPD. As is shown below, IPD would reach by 160% of GDP between 2045 and 2050 (see figure 6).

With ageing process, implicit pension debt and financial sustainability has increasingly become a hot topic in current China. Estimation results on IPD by nationally renowned research teams in recent years using latest data are overwhelming than past prediction. In June 2012, Cao Zhengyuan (Chief economist of Bank of China) and presented their calculation result: IPD in 2013 would be as much as 18.3 trillion yuan (31.12% of GDP in 2013 (58.8 trillion yuan))\textsuperscript{14}. According to Ma Jun’s estimation in December 2012, financial subsidy being unchanged as the level of 2011, accumulated surplus of public pension for urban employees will be used up by 2022, thereafter the pension system will be in the status of liability. The cumulative gap between 2013 and 2050 is equal to 83% of GDP in 2011 (including 14% from public institutions), which amounts to the present value of 37 trillion yuan\textsuperscript{15}. In November 2013, Zheng Wei from Peking University evaluated that there would be a gap between pension revenue and expenditure by 2037 and surplus pension fund would be exhausted by 2048\textsuperscript{16}. In December 2013, the estimation conducted by Li Yang from Chinese Academy of Social Sciences reveals that the public pension will begin to face a gap in 2023 and the cumulative pension fund will run out in 2029. By the end of 2050, cumulative pension gap will reach 802 trillion yuan, constituting 91% of that year, which is higher than Ma Jun’s projection. The scale of IPD has reached 46.5 trillion yuan, constituting 98% of GDP in 2011\textsuperscript{17}. In June 2014, Wei Jizhang, also from Chinese Academy of Social Sciences, evaluated history debts of the public pension, finding that in 2012, the IPD of social pooling part was 83.6 trillion yuan while IPD of individual account was 2.6 trillion yuan, which amounted to 86.2 trillion yuan altogether, taking

166% of GDP in 2012\(^\text{18}\).

Despite existing different measuring results on IPD and financial status of public pension due to diversified actuarial models and assumptions adopted, an indisputable fact is that the scale of IPD in the future is enormous that policy makers should be aware of and necessary measures should be taken in advance.

2.1.5 Problem analysis

The reasons why current pension system faces above mentioned difficulties are mainly related to structural and parametric problems in the design of the pension system as well as moral hazard problems in management.

2.1.5.1 Structural problems

2.1.5.1.1 Inefficiency of current hybrid system

The original purpose of designing the hybrid system (social pooling plus individual account) is to combine function of equity/social solidarity and incentive/efficiency together. In the reality, however, neither of the function has been realized. Why? The hybrid system has mixed the border between government and individuals. Consequently beneficiaries do not care about how much pension their individual account have really accumulated, instead they are interested in the final pension benefit they could receive when retired, since they know the government will put financial fund to ensure their basic retirement living standard. As it can be seen that the individual accounts do not encourage beneficiaries to work longer and contribute more, thus it has not demonstrated efficient from micro perspective.

2.1.5.1.2 Inefficient individual account

Problems caused by the Individual Accounts: first, there is no real accumulation of funds in the individual accounts and there is no real gain on them, while an interest rate must be credited on the personal account, so the system's future liabilities increase. Second, both China’s economic growth rate and the average social wage growth rate are high, but interest rate of the accounts (one-year bank deposit rate) is far lower than the salary growth rate. According to “Aaron condition”, if return rate on funded pension plan were less than growth rate of average wages, funded pension would be less efficient than pay-as-you-go pension system. This was one important reason for the reduction in the level of pensions. As the system matures, this problem is even more evident. Table 6 shows that individual accounts are ineffectively functioned in China as return on individual

account is less than the growth rate of average wage, and it is even exceeded by inflation rate in certain years. Based on empirical data of one-year deposit rate, we find that a female participant, with average wage, 30 years of contributions, can only obtain her pensions from her individual account at the level of about 4% of social average wages\textsuperscript{19}. Thus the individual account has not demonstrated efficient from macro perspective.

Inefficient individual account has led to the decrease of pension replacement rate, thereby government has to use social pooling pension to offset shortage of individual account, and even adopt policy adjustment to guarantee basic pension benefit, which will probably do harm to fiscal sustainability in the long run.

### Table 7. Comparison of individual account related indicators

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth rate of average wages (%)</th>
<th>Inflation rate (%)</th>
<th>One-year bank deposit rate (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1998</td>
<td>15.60</td>
<td>-0.80</td>
<td>4.59</td>
</tr>
<tr>
<td>1999</td>
<td>11.59</td>
<td>-1.40</td>
<td>2.25</td>
</tr>
<tr>
<td>2000</td>
<td>12.28</td>
<td>0.40</td>
<td>2.25</td>
</tr>
<tr>
<td>2001</td>
<td>16.00</td>
<td>0.70</td>
<td>2.25</td>
</tr>
<tr>
<td>2002</td>
<td>14.28</td>
<td>-0.80</td>
<td>1.98</td>
</tr>
<tr>
<td>2003</td>
<td>13.03</td>
<td>1.20</td>
<td>1.98</td>
</tr>
<tr>
<td>2004</td>
<td>14.13</td>
<td>3.90</td>
<td>2.07</td>
</tr>
<tr>
<td>2005</td>
<td>14.60</td>
<td>1.80</td>
<td>2.07</td>
</tr>
<tr>
<td>2006</td>
<td>14.36</td>
<td>1.50</td>
<td>2.52</td>
</tr>
<tr>
<td>2007</td>
<td>18.72</td>
<td>4.80</td>
<td>3.47</td>
</tr>
<tr>
<td>2008</td>
<td>17.23</td>
<td>5.90</td>
<td>3.06</td>
</tr>
<tr>
<td>2009</td>
<td>12.00</td>
<td>-0.70</td>
<td>2.25</td>
</tr>
<tr>
<td>2010</td>
<td>13.47</td>
<td>3.29</td>
<td>2.5</td>
</tr>
<tr>
<td>2011</td>
<td>14.28</td>
<td>5.39</td>
<td>3.25</td>
</tr>
<tr>
<td>2012</td>
<td>12.11</td>
<td>2.60</td>
<td>3.25</td>
</tr>
<tr>
<td>2013</td>
<td>10.08</td>
<td>2.60</td>
<td>3.00</td>
</tr>
<tr>
<td>Mean</td>
<td>13.98</td>
<td>1.90</td>
<td>2.67</td>
</tr>
</tbody>
</table>

Source: China Statistical Yearbook 2012, People’s Bank of China website

Some may argue that investing the assets of the individual accounts on the capital market may gain higher returns. In June 2013, Ministry of Human Resources and Social Security has newly drafted a

\textsuperscript{19} Zhen Li, An analysis on the Basic Old-age Insurance of China, People’s Press, 2013, p. 95
regulation on investment of public pension fund. Approximately 2 trillion pension fund would be
invested and managed by professional market institutions. Nevertheless it is hard to ensure that
the return of the pension funds can be higher than growth rate of wage. Moreover, one question
should be asked: who should be responsible for the loss of investment during economic crisis or
failed investment?

2.1.5.2 Parametric problems

2.1.5.2.1 Very low contribution base

System with a minimum salary base is 60% of the social average wage, which is a relatively low
condition that helps to improve coverage rate. The lower contribution base means less current
premiums as well as lower pensions for future retirement. One more problem is that lower
contribution base provides some participants with the “free rider” opportunity. It means some
participants are not low income earners but pay the contributions with lower base. Wages in China
are not very transparent, and moral hazard in contribution base is prevailing. This problem damages
the fairness and long term balance of the system. In the formula for calculating pensions, those who
contribute on a smaller contribution base benefit more from the system. The truth is that not only
those with low wages paid contributions at a lower base, but also some working in formal sectors
with higher wages did so. In July 2013, the social security auditing department in Zhengzhou City
of Henan Province released a set of statistics showing that over 90% of Zhengzhou employers paid
social security illegally: employers did not pay contributions for their employees at all or
contributed at a lower contribution base.

2.1.5.2.2 Short minimum contribution periods

Policymakers took into account the large number of China’s non-regular employment, and in which
large numbers are migrant workers with unstable employment. In order to improve accessibility to
the public pension system for this part of the population, merely 15 years of contribution years is
required. This low threshold conditions are conducive for expanding coverage rate, however, lead to
a number of problems: it not only worsens real dependency ratio of pension system reducing the
system's revenue, but also reduces the individual's pension benefit because contribution year is an
important parameter for deciding pension level. According to the calculations mentioned before,
in order to fulfill the expected replacement rate of 59 percent of the social average wage, it requires

20 Ministry of Human Resources and Social Security: 2 trillion pension fund may be invested and operated by market institutions.
New Beijing Daily, 2015-07-01.
21 People's Daily, "Nearly nine out of ten employers in Zhengzhou social security payment illegal", People's Daily, March 27, 2013
continued contribution for 35 years for the social pooling part, and the individual account requires 40 years of continuous contribution. Fifteen years of contribution can offer only 15% of the average wage from the social pooling part, while individual account part is even less.

2.1.5.2.3 Low statutory retirement age

Retirement age is an important factor for the financial balance of old-age insurance. Its impact is in twofold: it affects the working population as well as the retired population. When retirement age is lower, working population is small while retired population is large. The trend toward the increase of dependency ratio is mainly due to China's very low retirement age. In the 1950s China set retirement age for men at 60, female worker at 50, female cadre at 55. At that time population life expectancy in China was only 50 years which reached 74 years in 2010, but we are still using the retirement policy that was introduced 60 years ago. Compared with life expectancy, China's retirement age is too low. All things being the same, the higher retirement age, the longer contribution period and the higher basic pension of Social pooling part. It is the same case for individual accounts: the higher retirement age, the more accumulated in individual account; the lower retirement age, the shorter contribution period, the lower the amount of accumulation in individual accounts, while the monthly divisor is larger, the average monthly pension is lower. The divisor of individual account accumulation for male is 139, for female retiring at age 55 is 175, and for female retiring at age 50 is 190, so women's individual accounts pension will be substantially less than men's. According to the life expectancy table for insurance industry, in the years of 2000-2003, the life expectancy of female at 50-year old was more 32 years; 27.5 years for female at age 55; 20.2 years for male at age 60. This means most retirees will outlive many years after their accounts are used up. If social pooling system continues to subsidize them; it will further harm long-term sustainability of the pension system.

2.1.5.3 Moral hazard problems in management

Moral hazard problem in management is the main reason for payment imbalance at present and in the future. Moral hazard comes from both individuals and local governments. Some of the insured take advantages of loopholes in policy and management system and claim their pension benefit only on the basis of minimum contribution basement, shortest contribution years and minimum retirement age. What they have contributed to the public pension system is far below what they have gained from the pension system. Therefore such action is imitated by more and more participants. Local governments’ behavior constitutes another source of moral hazard. In order to

---

increase current revenues and expand coverage rate of pension system, the local government usually encourages various non-agricultural employed population and even agricultural population to pay a lump sum of 15 years’ premium to get their pension benefit. It is obvious that these populations participate into public pension system with minimum threshold. The local government would have more motivation to encourage this action especially after the twelfth five-year plan when “social pooling in a national level” has been proposed.

2.2 Voluntary Second Pillar Pension Scheme

Compared with first pillar pension system, voluntary second pillar is really underdeveloped. The following will introduce policy development, status quo and obstacles of the second pillar pension scheme for urban employees.

2.2.1 Policy development of China’s occupational pension scheme

Second pillar pension scheme was first proposed in 1991 policy-file issued by state council: “Government encourages enterprises to establish complementary old-age pension scheme for employees”. In 2000, “complementary old-age pension scheme” was replaced by “occupational pension scheme” mentioned in the pilot policy of perfection on urban social security system. Liaoning province was the first to pilot occupational pension plan for urban employees. Trial Act of Occupational Pension Scheme was published in 2004, indicating that the framework of second pillar pension system had been established in China. Later on, ministry of finance and state administration of taxation launched several tax related regulations. Until 2011, newly revised act, Regulation on Fund Management of Occupational Pension Scheme, has been published. Issues such as governance structure, investment and supervision are further illustrated by the policy. More and more small and medium sized companies are encouraged to participate in occupational plans.

With regard to the features of China’s occupational pension scheme, it can be described as unprotected, defined-contribution, voluntary, employment related private pension plan, according to standard set by OECD (see figure 7). Its main goal is to provide supplementary income to the elderly. Besides, the occupational pension scheme has adopted the governance structure of “trust” model (see figure 8). Founders of such scheme (enterprises/employers and their employees), acting as clients, sign trust contract with trustees (corporate trustee institutions). Thereafter, trustees sign entrust management contract with investment manager, fund depositary and account manager separately. However, government set very strict rules on investment strategy and supervise fund management. According to the latest policy, the proportion of investment on stock must be no more
than 30% of total fund under quantitative supervision

Figure 7. Classification of Private Pension Plan: Perspective of Function

Private Pension Plan

Occupational Pension

Mandatory

DB

P

U-P

Personal Pension

Mandatory

DB

P

U-P

Voluntary

DC

P

Voluntary

DC

P

U-P

DB: Defined Benefit
DC: Defined Contribution
P (Protected) : Guarantee for return on investment or final pension benefit
U-P (Unprotected) : No guarantee for return on investment or final pension benefit

2.2.2 Current Situation

During the past decade, the absolute level of coverage and pension fund has grown gradually, but the relative level has been quite small compared with development speed of first pillar pension system and it has varied greatly within regions and different kinds of enterprises.

2.2.2.1 Coverage

Since pilot of occupational pension scheme in 2000, the number of participants has increased gradually from 5.6 million to 20.56 million in 2013. Meanwhile, the number of enterprises taking part in the 2nd pillar pension scheme increased from 162 hundred in 2000 to 661 hundred in 2013.

Relatively speaking, however, the number of 2nd pillar insured employees as a percentage of urban employees was 2.42% in 2000 and 5.38% in 2013, and the number of 2nd pillar insured employees as a percentage of 1st pillar insured employees was 5.36% and 8.5% correspondingly, which was far behind coverage rate of public pension for urban employees (1st pillar pension system) ranging from 44% to 63% (see figure 9).

![Governance Structure of China’s Occupational Pension Plan](image-url)
2.2.2.2 Pension fund

Although the accumulated pension fund of occupational scheme has grown rapidly from 19.2 billion (2000) to 603.5 billion (2013) over the past decade, the accumulation of per capita fund in 2000 and 2013 was merely 3427 yuan and 29,352 yuan (see figure 10), constituting about 36% and 56% of social average wage for urban employees. Concerning the return on investment, it fluctuated violently compared with inflation rate and one-year bank deposit rate, especially during the world economic crisis era. As is shown by figure 11, the return rate of occupational pension scheme on investment dropped dramatically from 41% in 2007 to -1.83% in 2008.

Figure 9. Coverage Rate of Second Voluntary Pension Scheme

Source: Statistical Yearbook (2001-2014)
2.2.2.3 Structural unbalance

There are structural unbalances in the development of China’s voluntary second pillar pension scheme.

From the perspective of enterprises’ property, it is obvious that the number of people from state-
owned monopoly industries participating in the 2nd pillar pension scheme is far higher than that of people from other industries; people from large enterprises involved in the scheme are more numerous than that of workers of small and medium sized companies; people from formal sectors are more than those from informal sectors or floating population. Enterprises involved in such pension schemes are concentrated on the monopolistic field of power, petroleum, telecommunication, civil aviation, etc. Among 11 industries establishing occupational pension schemes for urban employees, there are about 3891 state-owned enterprises, constituting 93% of the total number of participating enterprises. In the meantime, there is a huge gap among executives and ordinary staff in terms of occupational pension benefit. According to a research on 4000 employees in Shanghai, allocation of occupational pension scheme is becoming weird: the benefit gap between senior managers and ordinary staff had been 3 to 5 times and some occupational pension scheme only covered a small proportion of managers24.

From the perspective of regional distribution, coverage rate as well as the amount of pension fund’ accumulated assets are higher in developed regions, such as Shanghai, Guangdong, Zhejiang and Beijing, than in underdeveloped regions. Participation within various regions has developed unbalanced these years (table 8).

Table 8 Participation status of occupational pension scheme within regions in 2013

<table>
<thead>
<tr>
<th>Region</th>
<th>Number of enterprises</th>
<th>Number of participants</th>
<th>Pension funds’ assets (10 thousand yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beijing</td>
<td>2689</td>
<td>1,306,198</td>
<td>2,583,869.85</td>
</tr>
<tr>
<td>Tianjin</td>
<td>1222</td>
<td>234,103</td>
<td>356,470.20</td>
</tr>
<tr>
<td>Hebei</td>
<td>590</td>
<td>476,384</td>
<td>601,162.94</td>
</tr>
<tr>
<td>Shanxi(山西)</td>
<td>630</td>
<td>535,159</td>
<td>1,575,750.93</td>
</tr>
<tr>
<td>Inner Mongolia</td>
<td>379</td>
<td>284,957</td>
<td>281,744.39</td>
</tr>
<tr>
<td>Niaoning</td>
<td>1124</td>
<td>375,596</td>
<td>910,711.75</td>
</tr>
<tr>
<td>Jilin</td>
<td>325</td>
<td>151,855</td>
<td>318,521.06</td>
</tr>
<tr>
<td>Heilongjiang</td>
<td>658</td>
<td>186,343</td>
<td>361,615.05</td>
</tr>
<tr>
<td>Shanghai</td>
<td>8551</td>
<td>1,086,487</td>
<td>3,838,483.21</td>
</tr>
<tr>
<td>Jiangsu</td>
<td>3683</td>
<td>657,037</td>
<td>2,109,864.45</td>
</tr>
<tr>
<td>Zhejiang</td>
<td>2098</td>
<td>398,639</td>
<td>1,455,002.63</td>
</tr>
<tr>
<td>Anhui</td>
<td>972</td>
<td>501,702</td>
<td>1,545,381.48</td>
</tr>
</tbody>
</table>

2.2.3 A brief summary

Currently, the occupational pension scheme is developing slowly in China. It is very difficult for the voluntary second pillar to further extend coverage to small and medium sized companies. The obstacles the pension scheme is facing can be summarized as follows:

- External factors

Firstly, Lack of preferential tax policy makes occupational pension plan be short of favorable external environment (Pu, 2005; Long, 2006; Yue, 2009; Du, 2010, etc.). Tax policy is still not clearly stated during investment and payment phase, so the employers and employees do not have motivation to participate compared with countries adopting EET pension policies (Liu, 2011). Secondly, the burden for urban employers and employees to take part in the first pension scheme is still very high and they do not have enough capacity to contribute to the second pension plan (Pu,
2005; Yue et al. 2009). Currently, employers’ contribution rate on social insurance would be 30% in total (20% for public pension, 8% for health insurance, 1.5% for unemployment insurance, 2% for work injury insurance), which leaves little space for contribution on second pillar. Lastly, it is not transparently, professionally and efficiently functioned and regulated for the “trustee” construction of occupational pension scheme (Pu, 2005; Wu, 2006; Liu, 2011).

- Internal factors

For one thing, oversupply of labors on labor market determines that enterprises would have strong power in the negotiation between labors and enterprises, and this situation will be deteriorated by weak role of trade union in China. In that case labors will have little voice in bargaining with employers in respect of welfare including occupational pension plan. For another, most employees in formal sectors have formed an idea of “relying on children to support their old-age” for a long time, and not a few employees still depend heavily on first pillar public pension (Liu, 2005; Wen & Zhang, 2007; Liu, 2010). They have not formed a concept that they could look for supplementary old-age income from occupational pension system, which is regarded as a more reasonable way to ensure adequacy of pension benefit.  

3. Pension System for Rural and Urban Residents

Currently there is only first pillar pension system designed for rural and urban residents: public pension system for rural and urban residents, which has experienced policy integration. In the following, policy development, status quo and brief evaluation of the pension system will be discussed.

3.1 Policy Evolution

3.1.1 Pension policy for rural residents

Since 1986, Chinese government had run pilot program on old-age social insurance for rural residents in some areas. In 1992, Ministry of Civil Affairs issued basic plan for County-Rural Old-Age Social Insurance, which was regarded as a milestone for rural residents. Regulated by the plan, the source of finance mainly came from personal contribution and was supplemented by collective subsidy with policy support, which was regarded as the feature of “old rural pension system”. In reality, however, fewer and fewer take part in the pension plan because of their poor financial capacity and low benefit level it caused. Till July 1997, the policy of “old rural pension” was

---

stopped by state council.

With the importance of rural issues becoming increasingly highly valued, the establishment of social security in rural areas has been reconsidered by Chinese government since 2002. Cities like Baoji, Donghai, Beijing, Shanghai and Dongguan, etc. began to pilot “new rural pension system” driven by government subsidies. Under the background of population ageing, economic crisis and the process of urban-rural integration, New-Rural Old-Age Social Insurance was started up nationwide in 2009. The essential difference between “old rural pension system” and “new rural pension system” is that government subsidy is made up of the primary financial source of new-rural pension system.

Table 9. Contents of policy on “new-rural pension system”

<table>
<thead>
<tr>
<th>System Structure</th>
<th>Social Pooling</th>
<th>Individual Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of System</td>
<td>PAYG System, DB</td>
<td>Funded System, DC</td>
</tr>
<tr>
<td>Protection Target</td>
<td>Rural residents above 16 years old</td>
<td></td>
</tr>
</tbody>
</table>

**Contribution**

<table>
<thead>
<tr>
<th>Personal contribution</th>
<th>Rural residents above 16 years old</th>
<th>Five grades: 100, 200, 300, 400, 500 yuan/year (subjected to adjustment)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Collective subsidy</td>
<td>Subsidy standard determined by each village committee</td>
<td></td>
</tr>
<tr>
<td>Government Subsidy</td>
<td>Central government: West and middle regions: 100% basic pension benefit; East regions: 50% of basic pension benefit</td>
<td>Local government: no less than 30 yuan/year/person</td>
</tr>
</tbody>
</table>

Rate of return on individual account

<table>
<thead>
<tr>
<th>One-year bank deposit interest rate</th>
<th>Individual account accumulated amount divided</th>
</tr>
</thead>
</table>

Monthly Pension

| Basic pension = 55yuan + additional | Individual account accumulated amount divided |
3.1.2 Pension policy for urban residents

For quite a long period of time, urban residents without work have not had any public pension. In July 2011, public pension for urban residents was established and from then on the pension system was gradually extended nationwide. Policy contents are presented in the following table 10.

Table 10. Contents of policy on public pension system for urban residents

<table>
<thead>
<tr>
<th>System Structure</th>
<th>Social Pooling</th>
<th>Individual Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of System</td>
<td>PAYG System, DB</td>
<td>Funded System, DC</td>
</tr>
<tr>
<td>Protection Target</td>
<td>Urban residents above 16 years old without work</td>
<td></td>
</tr>
<tr>
<td>Contribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal contribution</td>
<td></td>
<td>Ten grades: 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000 yuan/year (subjected to adjustment)</td>
</tr>
<tr>
<td>Government Subsidy</td>
<td>Central government: West and middle regions: 100% basic pension benefit; East regions: 50% of basic pension benefit</td>
<td>Local government: no less than 30 yuan/year/person</td>
</tr>
<tr>
<td></td>
<td>Other</td>
<td>Other communities or social organizations</td>
</tr>
<tr>
<td>Rate of return on individual account</td>
<td>One-year bank deposit interest rate</td>
<td></td>
</tr>
<tr>
<td>Monthly Pension</td>
<td>Basic pension = 55yuan +</td>
<td>Individual account</td>
</tr>
</tbody>
</table>
### 3.1.3 Policy integration

In February 2014, the state council issued guidance on building unified public pension for urban and rural residents, putting forward a proposal that new-rural pension system and urban-residents pension system be merged into a unified system by the end of “the twelfth five-year plan”, and gradually construct a universal public pension system for all residents. According to the guidance, specific regulation can be generalized as table 11.

**Table 11. Contents of policy on public pension for urban & rural residents**

<table>
<thead>
<tr>
<th>System Structure</th>
<th>Social Pooling</th>
<th>Individual Account</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of System</td>
<td>PAYG System, DB</td>
<td>Funded System, DC</td>
</tr>
<tr>
<td>Protection Target</td>
<td>Urban &amp; rural residents above 16 years old without public pension</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Twelve grades: 100—2000 yuan/year</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(subjected to adjustment)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Central government: West and middle regions: 100% basic pension benefit; East regions: 50% of basic pension benefit</td>
<td></td>
</tr>
<tr>
<td>Government Subsidy</td>
<td>Local government: no less than 30 yuan/year/person (minimum contribution grade); no less than 60 yuan/year/person (contribution grade more than 500 yuan)</td>
<td></td>
</tr>
<tr>
<td>Collective</td>
<td>Village committee and other communities or social</td>
<td></td>
</tr>
</tbody>
</table>
3.2 Current situation and challenges

Coverage as well as pension financing are the two main aspects concerned with public pension for urban and rural residents.

3.2.1 Increasing Coverage

The number of people enrolled in the new-rural pension system increased quickly to 86.91 million in 2009 and then grew drastically to 326.43 million in 2011, with 15.56 million pensioners in 2009 ascending rapidly to around 85.25 million pensioners in 2011 in rural areas (see figure 12). As is show in figure 13, public pension system for urban and rural residents extended fast during the recent years. The number of participants increased from 331.82 million with 87.6 million pensioners in 2011, to 497.5 million with 137.68 million pensioners in 2013. The growth rate has slowed down since 2012.
3.2.2 Pension fund and financial sustainability

According to the statistic data of a short period, in 2013, total pension revenue of public pension for urban and rural residents was about 205.2 billion yuan, increased by 12.19% percent compared with that of 2012. Among the total revenue, personal contribution constituted 31% (63.6 billion),
whereas government subsidy comprised of the rest 69%. Meanwhile, total pension expenditure of the pension system was 134.8 billion yuan in 2013, increased by 17.27% of the previous year, exceeding the growth rate of pension revenue. This will add burden to financial sustainability in the future. The accumulated pension assets was up to 300.56 billion yuan, raised by 30.56% (see table 12).

Table12. Pension fund status of public pension for urban & rural residents

<table>
<thead>
<tr>
<th>Year</th>
<th>2012</th>
<th>2013</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pension revenue (billion yuan)</td>
<td>182.92</td>
<td>205.23</td>
</tr>
<tr>
<td>Growth rate (%)</td>
<td>29.6</td>
<td>12.19</td>
</tr>
<tr>
<td>Pension expenditure (billion yuan)</td>
<td>114.97</td>
<td>134.83</td>
</tr>
<tr>
<td>Growth rate (%)</td>
<td>79.84</td>
<td>17.27</td>
</tr>
<tr>
<td>Cumulative balances (billion yuan)</td>
<td>230.213</td>
<td>300.566</td>
</tr>
</tbody>
</table>


3.2.3 Insufficient pension benefit

According to official data, average monthly pension for urban and rural residents was 81 yuan per person in 2013 and 90 yuan in 2014, and it is projected to rise to approximately 100 yuan after increase of basic pension from 55 yuan to 70 yuan. Compared with monthly consuming expenditure on food, 90 yuan seems quite insufficient for food consumption (see table 13).

Table 13. Pension benefit level and comparison with living expenses (2013)

<table>
<thead>
<tr>
<th>Resident (per person)</th>
<th>Average monthly pension (yuan)</th>
<th>Average monthly Consumption expenditure (yuan)</th>
<th>Engel coefficient</th>
<th>Consumption expenditure on food * (yuan)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>81</td>
<td>1501.9</td>
<td>35%</td>
<td>525.6</td>
</tr>
<tr>
<td>Rural</td>
<td>81</td>
<td>552.1</td>
<td>37.7%</td>
<td>208.1</td>
</tr>
</tbody>
</table>

* Consumption expenditure on food = Average monthly Consumption expenditure * Engel coefficient

Source: Statistic yearbook (2014)

3.2.4 A brief summary

Despite a short history, public pension for urban and rural residents has rapidly extended social security coverage to people who could not take part in the traditional public pension system for

---

26 http://www.mohrss.gov.cn
27 http://money.163.com/15/0630/10/ATBQ6QMU00254TI5.html
employees, which has largely improved equity of pension system. However, the pension system depends heavily on financial subsidy, which may probably induce sustainability issue in the long run. Moreover, pension benefit is inadequate for the over 137 million pensioners.

3.3 Problem analysis

3.3.1 Essence: government subsidy plus individual account

Differently from public pension system for urban employees, the public pension system for urban & rural residents is, in essence, constituted by government subsidy plus individual accounts, rather than a social insurance system. As a result, the pension system cannot play the role as risk-diversification mechanism. Instead, government usually plays the major role in the finance of the pension. As revenue of local government becomes more and more limited, a large amount of pension subsidies will be given to urban & rural residents elderly at the sacrifice of future tax payers. This will also lead to potential threats on long-term fiscal sustainability.

3.3.2 Inefficiency of individual account

The policy has set several levels for individuals to contribute, from 100 yuan per year to 1200 yuan per year. In fact, most people tend to choose the minimum level (100 yuan per year) and minimum periods (15 years) to contribute. In addition, the accumulated pension fund of individual account is recorded with a low interest rate, merely the one-year bank deposit interest rate, which is below inflation rate in most years. The value of pension assets is hardly going to be even just maintained, not to mention increased, particularly when high management cost is taking into consideration. Generally speaking, minimum personal contributions, limited financial resources, low interest rates together with high management costs have resulted in insufficient pension benefits. Monthly pension benefit of 90 yuan in 2014 for urban and rural residents is far from enough to keep basic living.

4. Literature Review on Improvements of Current Pension System

As analyzed above, public pension system has played the major role in providing old-age income to urban and rural residents, although it has faced challenges like inadequate pension benefit and financial sustainability. Second voluntary pension scheme as well as third pillar voluntary saving or commercial insurance is underdeveloped in China. Considering current unbalanced structure of pension system, proposal to establish multi-layer, multi-tier or multi-pillar pension system has reached an agreement. However, researchers have different opinions on how to reform current pension system to a multi-layer or multi-pillar pension system. Improvement path can be
summarized as following figure.

![Diagram of pension system](image)

**Figure 14. Literature review on improvement of China’s pension system**

### 4.1 “Zero-pillar” pension system: specific or universal?

Currently, Chinese citizens do not have zero-pillar pension system as suggested by World Bank (2005). In order to cover the small proportion of people who cannot participate into any public pension systems because of short of money, the proposal on setting up “zero-pillar” pension scheme is put forwarded by many experts. There is nearly no doubt that “zero-pillar” pension scheme will be financed by government tax revenues but there is no consensus on whether the entire population or specific group of people should be covered by the system. Dong Keyong (2011) proposed that state pension scheme aimed at preventing old-age poverty be focused on rural residents and low-income group who could not contribute to “first pillar” public pension system. Li Zhen (2014) advised that old-age allowance based on means-test be given to agricultural population and unemployed urban residents and meanwhile the minimum subsistence guarantee system be strengthened. However, Yang Yansui’s proposal on building universal “zero-pillar” state basic pension is based on division of current social pooling and individual account in “first-pillar”

---

pension system. Finance of the state-basic-pension will come from social pooling part. Also, pension benefit of the universal “zero-pillar” will be equal from the prime minister to peasants\(^{31}\).

4.2 “First-pillar” pension system: key areas of reform

The most controversial part of reform is about the “first-pillar” public pension system. What the future reform-direction of social pooling and individual account would be is still of hot debate.

4.2.1 Separation of social pooling and individual account

Not a few experts propose that social pooling and individual account be split up and operated separately (Dong, 2011; Yang, 2012; Zheng, 2013; etc.), making the responsibility between government and market much clearer (Li, 2014). Dong (2011) suggested that the first pillar pension system should be focused on employed population and comprised of current social pooling part with Pay-As-You-Go, defined-benefit arrangement, in order to guarantee basic living standard and realize social redistribution. Zheng Gongcheng (2013) not only agree on the separation of social pooling and individual account in public pension systems, but also advise to compress the scale of current individual account while expand the scale of social pooling part. To be more specific, the contribution rate to individual account should be decreased from 8% to 3~5% and increase the relevant contribution to social pooling part, thus alleviating pressure of value increasing on fully funded individual account while promoting mutual aid and redistribution within social pooling\(^{32}\). Apart from Yang yansui (2012) who believes that separated social pooling should develop into universal state pension scheme, most experts maintain that social pooling should be strengthened and even play a much more significant role in the first pillar pension system.

4.2.2 Reform path of individual account

After the individual account’s separation from the social pooling part, there is more heated discussion concerning individual account.

4.2.2.1 fully funded pension scheme

Dong keyong (2011, 2013) suggested the separately operated individual account be merged into the “second-pillar” occupational pension scheme with fully funded and defined-contribution mechanism, which is also focused on employed population. This idea is supported by Yang yansui (2012) and others. Li Zhen (2014) proposed another possible way: current individual account run by government should be cancelled and the original contribution rate of 8% or less can be put into

---


voluntary personal saving account to stimulate the development of “third-pillar” pension system. This proposal could be feasible not only to public pension system for urban employees but also to urban & rural residents based on Chinese tradition on saving, and also would make current 8% of wages be used in a more efficient and flexible way.

However, Jin weigang (2014) pointed out that by the end of 2013, the actually accumulated pension fund of individual account in public pension for urban employees was only 415.4 billion yuan while the nominated pension fund had reached 3 trillion yuan (5.27% in 2013), so “empty account” is a serious problem. He also mentioned the dilemma that individual account faced: if it were designed to be fully funded, the transitional cost, which is not a small number (see detailed contents in 2.1.4.4), as well as investment issues must be taken into consideration in priority; if it were transformed to social pooling, it would be a great challenge to cope with huge pressure on pension expenditure at the peak of ageing society.

4.2.2.2 Notional Defined Contribution (NDC) account

4.2.2.2.1 What is NDC?

The NDC was first introduced to China in the beginning of 2000s and a series of report introducing best practices in Sweden, Poland, Italy has been brought in. The Notional Defined Contribution account is a combination of pay-as-you-go financial mechanism and defined-contribution benefit calculated mechanism. However, in current pension system, we do not have NDC account in public pension system. Instead, we have designed a fully-funded defined contribution individual account but it actually turns into “empty” account unfortunately.

4.2.2.2.2 Necessity for Reform

In 2014, Zheng published a report proposing reform action of current first pillar pension system to NDC pension system, which has strongly aroused the attention of Ministry of Finance. According to Theory of Mechanism Design, Zheng suggests that current “empty” individual account transform into NDC and then gradually expand the scale of NDC so as to solve the problem of incentive compatibility and achieve “actuarial equity”. The main goal of the proposal is to motivate people to contribute more to make pension system sound and sustainable. It has proved in practice that the combination of social pooling (PAYG, DB) and individual account (empty account) is unsuccessful and inefficient. Zheng (2014) points out that social pooling has led to low portability of pension right, low management level of pension fund, fragmented systems,

---

unsustainable finance because of free riders, difficulty in increasing retirement age, anti-redistribution between the rich and the poor, etc. As a consequence, it is high time that incentive factor (“equity”) was introduced into first pillar pension system to avoid a “tragedy of the commons”.

4.2.2.2.3 Reform plan: reduce or cancel social pooling

Zheng (2014) has provided three scenarios of NDC. They are small account, big account and total NDC account (see table 14), among which total NDC account is the ultimate goal while small and big account can be implemented during transition period. In this way, however, social pooling would be finally replaced by NDC account. Moreover, Zheng and his team suggested that government subsidies to social pooling part in public pension system could be used as finance source of state pension system (similar to “zero-pillar”), thus to realize function on poverty prevention and social redistribution of public finance.

Table 14. Three scenarios of NDC reform

<table>
<thead>
<tr>
<th>Proposal</th>
<th>Contribution distribution</th>
<th>Source of contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Individual account</td>
<td>Social pooling</td>
</tr>
<tr>
<td>Small account</td>
<td>8%</td>
<td>20%</td>
</tr>
<tr>
<td>Gig account</td>
<td>16%</td>
<td>12%</td>
</tr>
<tr>
<td>Total account</td>
<td>28%</td>
<td>0</td>
</tr>
</tbody>
</table>


4.2.2.2.4 Advantages of the design on “total account”

Theoretically, it has following advantages. Firstly, it could smooth fluctuation of population by “personal saving” mechanism and adapt to the transformation of population-ageing structure automatically. Secondly, it will facilitate the accumulated individual account transform into life-time annuity based on actuary, thus to adjust to the changing life-expectancy automatically. Thirdly, it would help replace the political adjustment on pension benefit randomly with regularly index-adjustment on pension benefit. Fourthly, it would make people choose retirement age in a more flexible way. Fifthly, contribution will be regarded as “saving”, thereby decreasing distortion of labor market. Lastly, it would make benefit decline implicitly, so as to realize financial and political sustainability.

Practically, the total NDC account will be suitable for China’s situation. First of all, it may defuse

---

“moral-risk” for local government, to realize national pooling in one step. In the next place, it is possible for China’s public pension system to obtain a higher return rate on pension fund under current economy with high growth rate. Finally, under the precondition of present limited coverage, NDC account, which seeks to realize longitudinal actuarial equity, is more likely to achieve financial sustainability.

4.2.2.2.5 Comment: Will the NDC solve the problem?

Li (2013) has pointed out that NDC would face the dilemma of whether to record a higher or lower interest rate in a notional defined-contribution account. On the one hand, as there is no real pension asset in the NDC account, there is no return on investment correspondingly and it is usually impossible to record a high interest rate. It is not hard to imagine that pensioners will suffer great loss when the record interest rate is far below growth rate of annual wages (return rate of PAYG). On the other hand, if a high interest rate were required to be recorded, it would mean a huge amount of debt to be paid in the future.

The NDC was first invented by the Swedish and the original goal was to solve the problem of early retirement by introducing incentive mechanism of NDC. The Swedish model has solved the problem of financial sustainability but forget to take pension adequacy into consideration. There is a very famous design in the NDC system, the Automatic Balance Mechanism, which is functioning through balance ratio. If the balance ratio is less than 1, the system is in a state of financial imbalance; the pension liability exceeds the assets which are to finance it. Meanwhile, the balance between assets and liabilities is to be restored by multiplying the income index by the balance ratio, thus creating a new index series, called a “balance index”, which is used instead of the income index. In 2008, 2009 and 2012, the balance ratio was calculated at less than 1, which means that the record rate of NDC is calculated by balance index, which is below the actual growth rate of annual income. In that case, pensioners suffered loss of their pension benefit. In sum, the role of Automatic Balance Mechanism is simply to make the system financially balanced, regardless of pensioners’ benefit adequacy.

In reality, NDC in Sweden has failed to motivate people to work long and contribute more. In 1999, the number of people began to draw their pensions before the age of 65 constituted 10.3% of the retired population, whereas the number of pensioners after 65 took the proportion of 77.3%.

36 Balance ratio=(contribution asset + buffer fund) / pension liability
2009, the indicators were 25.7% and 55.4% correspondingly\(^{37}\). In other words, from 1999 to 2009, more and more elderly began to retire at early ages. As a result, the Swedish NDC pension system have not showed incentive function as it supposed to be. In 1999, 3.6% of the elderly aged 61 began to claim their pension benefit; in 2013, however, this indicator increased to 6.9%.

One more thing should be mentioned is that the Swedish NDC pension system has inherited substantial pension assets from the previous pay-as-you-go pension system, and these assets could help NDC record a higher interest rate in sound economic environment. However, China is short of this condition on the way to NDC pension reform.

Although the Swedish government has provided minimum guaranteed pension, old-age poverty is still worsened.

5. **Authors’ road map on improving current pension system**

5.1 **Diagnosis on problems of current pensions system**

Problems of the current multi-layer structure can be summarized as follows:

(1) In the design of the first-layer pension system, we attempt to cover all the people with different income levels by using one universal system to pursue the principle of equity and unification, which demonstrates to be unrealistic. In China, there is an obvious dual urban-rural structure, with rural residents constituting 50% of the population, meanwhile there are formal and informal sectors-employed population in urban areas. To realize universal coverage, the system will decrease the threshold on participation, and the result is that working generation joins the system with the minimum requirement (so called “free riders”) and thereby they would probably get insufficient pension benefit during their retirement. Hence the government will subsidize the system, which leads to unsustainability in the long run. Nevertheless, there are one third of the urban employees not being able to participate in the basic pension system.

Pension system for urban and rural residents is not social insurance in essence, and it is merely a system with combination of government allowance and individual account. The individual account is designed to be in accordance with unification while the function of security is tiny, efficiency lose is huge and moreover, it has conducted comparison among citizens within different systems, which has exerted pressure on the government.

(2) The individual account becomes inefficient as it cannot meet “Aaron condition”. That

is also one of the reasons why contribution rates stand so high while pension benefit continues to decline.

(3) The multi-layer structural pension system is targeted to urban employees and only provides this group with diversified old-age income security, whilst for rural residents, self-employees and flexible employees, there is only first-layer pension instead of multi-pillar pension system providing to them. Even for employees, the development of occupational pension scheme is extremely limited and third pillar saving scheme is merely a concept because of lack in policy.

5.2 Policy recommendation: From the “Multi-layer” Pension System for Urban Employees to the “Multi-pillar” Pension System for Entire Population

5.2.1 Government’s boundaries should be reasonably and clearly defined

Within the multi-pillar pension system, the government should play three important roles. First of all, the government should calculate and pay the transitional cost of current pension system for urban enterprise employees explicitly. These include the early retirement caused by bankruptcy of the state-owned enterprises during the transformation from planned economy to market economy, and also the “empty account” brought by the transition from traditional Pay-As-You-Go DB pension system to the hybrid “DB plus DC” pension system. Next, the unlimited financial role of the government should be limited to specific program for specific group. That is to say the responsibility of the government should no longer be unlimited subsidies for basic pensions but navigate to the specific program, such as the “zero-pillar” pension for low-income group, so as to make government’s financial role restricted. Moreover, for the supplementary personal pension plans, the government ought to give tax credits in order to encourage the development of the second and the third pillar pensions.

5.2.2 To establish the dual-basic urban employees’ pension system after separating the individual account

(1) To establish the dual basic old-age social insurance for urban employees. On the one hand, public pension system for urban employees could be set to provide basic income security for urban employees working in formal sectors. Raise the current insured threshold, to realize the goal of “high threshold, high pension benefit”. On the other hand, national pension system should be provided for urban employees working in informal sectors. Lower the threshold for informal-sector workers, to realize “low threshold, low pension benefit and universal coverage”. In this way, we can achieve the goal of “universal coverage, sustainable finance, and income smooth within people.
from various income-level” by different arrangement of pension system.

(2) Separating individual account from basic public pension system and establishing voluntary personal-saving-account for retirement. Mandatory individual account will engender a series of problems and government will be the final payer of the loss. In comparison, voluntary personal-saving-account can be used much more flexible especially for low-income groups and young people: it can be merged into occupational pension plans, purchase life insurance or other financial assets.

5.2.3 Towards a “zero-pillar” pension system for residents

Individual accounts in the existing public pension system for urban & rural residents should be canceled, and the system should go back to “zero-pillar” Pension System for residents. The existing public pension system for urban & rural residents is a combination of government allowance and individual account rather than social insurance. It will arouse comparison among people in different pension systems, and generate political risks. In consequence, we should call off the individual account, and help it return to the nature of government allowance, namely “zero pillar” of pension scheme, so as to provide “safe net” (non-contributory pension system) for the poor or those without work.

5.2.4 Establish, strengthen and encourage the national voluntary personal saving accounts as the “third-pillar” pension scheme

In the background of population ageing, multi-pillar pension system should be set to make sure the sustainability of the first pillar scheme. And in the condition of continuous economic and income growth, there are feasibility for the development of other pillar pension schemes. The source of fund of other pillars is from individual accounts separated from public pension system for urban and rural pension system plus certain amount of household saving from urban and rural residents. Personal choice are given so that people would not focus on the pension gap. In that case, public opinion environment will be sound and health for the development of social security.

5.2.5 Attach importance to the function of intergenerational support from family

From historical perspective, the tradition of “informal security” is an important feature of China's traditional welfare culture. In China, the support responsibility from other family members is responsibility set by law. According to the Protection of Rights and Interests of Older Persons Act (2015 amended), the offspring of the elderly have the responsibility to support their elder parents in retirement income, elderly care and spiritual consolation.

5.3 Proposal for the Design of Multi-pillar Pension System in China
Figure 15. **Proposals for the design of multi-pillar pension system in China**

With regard to the road map, our “five-pillar” pension system can be described as: “Zero Pillar” is to realize the function of poverty alleviation. The function of the first pillar is to smooth lifetime income of labors, and provide the basic level of security. Employment based mandatory DC plan provide supplementary income security. Voluntary personal saving can not only be “fuel delivered in the snow” for employees working in informal sectors, extending coverage of pension system, but also be “flowers added to embroidery” for people who have first & second pillar. Fourth pillar, generational transformation within family members and re-employment of retirees, can provide further income security for the elderly, which is especially important for developing countries.

Compared with other road map of improvements, “five-pillar” pension system will be more suitable for China as a result of:

1. About half of rural residents under Small-scale peasant economy: no employment relationship, low income and unstable income. The saving rate of 20% rural residents is -60% (Figure 16).
2. A large number of employment in informal sectors and flexible employment in formal sectors exist in urban areas. The number of urban employees was 359million, in which 60.7% was informal sector employment.(Yan, 2013)
3. The traditional Confucian family culture
4. Strong saving preferences and value-added preference
(5) China’s economy is still growing at a fast speed (7%+), and the growth rate for population is also positive.

The first two points determine that employment related public pension plan cannot cover the entire population, so zero pillar is essential. Point 3&4 illustrate that household and personal saving could play a more important role. Point 5 shows that mandatory individual account is hard to be efficient in China.

![Figure 16. Saving Rate Distribution of Rural Households by Income Percentile](image)

Only in this way, could China build an adequate and sustainable multi-pillar pension system for the entire population in the ageing society.
References: