China's Social Security Pension System and its Reform*

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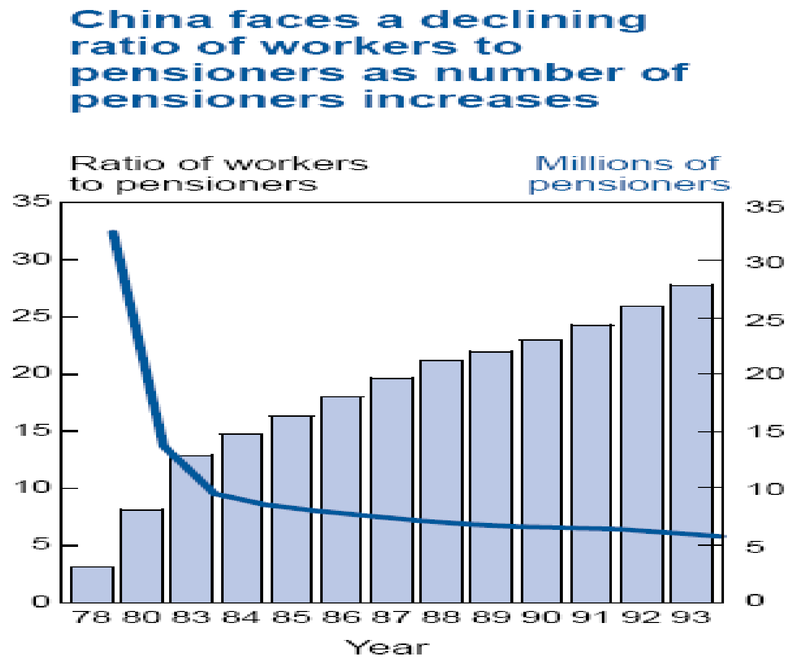
Why should we care about China's social security system and its reform?

- China's economy has a high growth rate.
- It is in transition to a market economy
  - growing inequality of income between occupational groups in cities, between urban and rural areas, between costal and interior provinces
  - the introduction of terminable employment, the erosion of the employment guarantee, and the possibility of enterprise bankruptcy.

*These notes are largely based on "Social Security Pension Reform in China" by martin Feldstein and "Social Security Reform in China: Issues and Options" by Peter Diamond et. al.

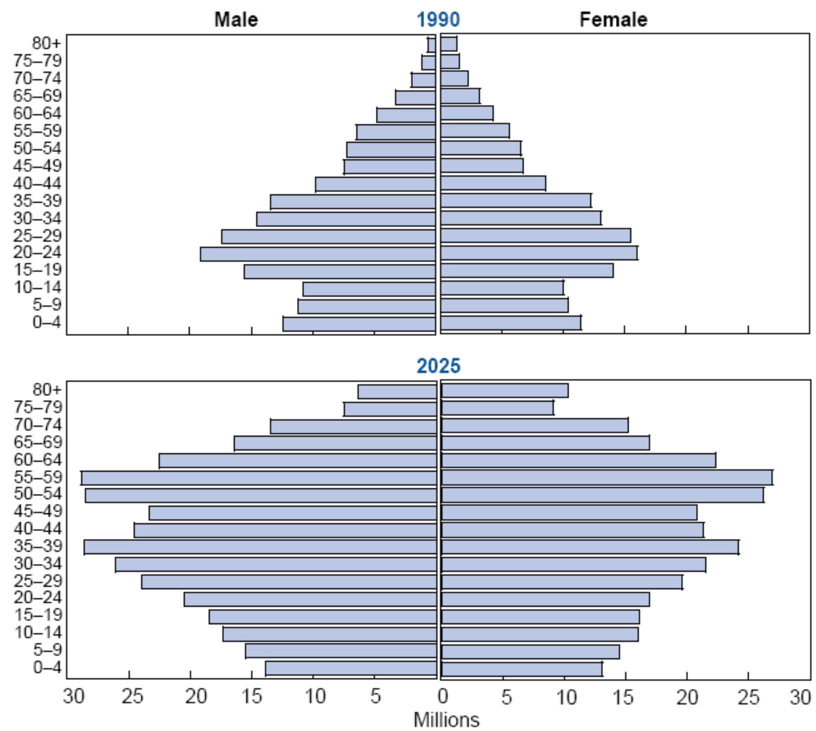
- China is a developing economy with two thirds of its population in rural areas.

- The proportion of the elderly in the population is rising.

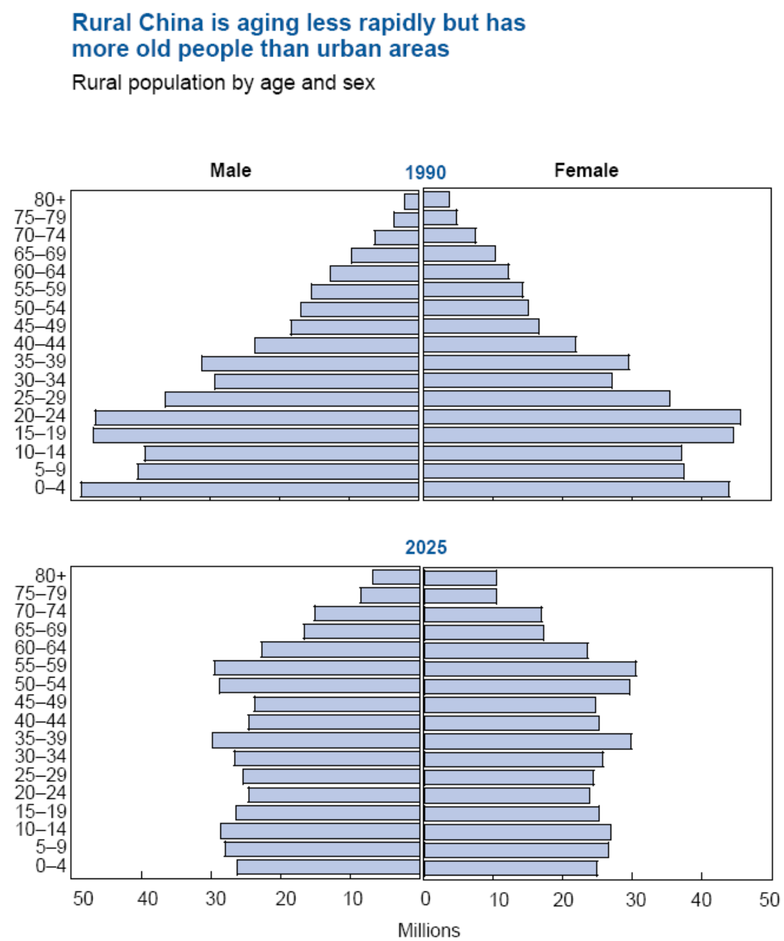

China faces a declining ratio of workers to pensioners as number of pensioners increases
Ratio of workers to pensioners
Millions of pensioners
35
30
25
20
15
10
5
0
78 80 83 84 85 86 87 88 89 90 91 92 93
Year

China's large cohort of young urban workers will be at or near retirement by 2025

Urban population by age and sex



Note: China's urban population is growing through natural population increase, in-migration, and reclassification of rural places as urban.


Rural China is aging less rapidly but has more old people than urban areas
Rural population by age and sex
Male
1990
Female
2025
80+
75–79
70–74
65–69
60–64
55–59
50–54
45–49
40–44
35–39
30–34
25–29
20–24
15–19
10–14
5–9
0–4
50 40 30 20 10 0 10 20 30 40 50
Millions

Road map today

- Background: mandatory pension system
- Rationales of pension systems
- How does the current social security pension system in China look like?
- What are the proposed reforms?

1 Mandatory Pension System: A Taxonomy

Pay-as-you-go (unfunded) versus Fully-funded System

- Unfunded system: pension benefits are financed by a tax on *currently* working generations,

- Fully funded system: pension benefits are financed by the return on *previously* accumulated pension funds.

Defined Contribution versus Defined Benefit System

- DC: contribution rate is exogenous while benefits are endogenous.

- DB: the benefit is either a fixed lump sum or an amount determined by the individual's previous earnings, implying that future contribution rates have to be endogenous for the pension budget to balance.

Example: PAYG and DB pension system

- Consider an economy with population growth $L_{t+1} = (1+n)\,L_t$ and productivity growth $(1+g)$

- Suppose payroll tax is proportional to labor income, an agent pays tax $\tau_t w_t$ when young, and gets benefits b_{t+1} when old.

- Endowment for an agent born at time t, $w_t = \left[(1+g)^t\,\varphi_h, 0\right]$, where φ_h reflect income heterogeneity

$$\varphi_h = \begin{cases} 1/2 \text{ if } h \text{ is } 1 \\ 3/2 \text{ if } h \text{ is } 2 \end{cases}$$

- For simplicity, assume that pension benefits in period t are given by a lump-sum b_t. Thus the pension system provides redistribution within cohort.

- Compute contribution rate in PAYG DB system

$$\begin{aligned} b_{t+1} L_t &= \tau_{t+1} L_{t+1} w_{t+1} \sum_{h=1}^{2} \varphi_h \\ &\rightarrow \\ \tau_{t+1} &= b_{t+1} \frac{L_t}{L_{t+1} w_{t+1}} = \frac{b_{t+1}}{(1+n)(1+g)^t} \end{aligned}$$

2 Principles of Pension Design

Returns on Saving in Pension System

- Budget balance of Pay-as-you-go social security system requires

$$L_t b_{t+1} = L_{t+1} \tau_{t+1} w_{t+1}$$

where L_t is the size of agents born at time t, which grows at a rate n.

- The implicit return of 'pay-as-you-go' pension system is

$$\frac{b_{t+1}}{\tau_t w_t} = \frac{\tau_{t+1} w_{t+1} L_{t+1}}{\tau_t w_t L_t}$$

which is $(1+n)(1+g)$, given $\tau_{t+1} = \tau_t$. n is population growth rate and g is productivity growth rate

- Whether it is more desirable to implement fully-funded or PAYG depends on

$$1 + r \lesseqgtr (1+n)(1+g)$$

where $1+r$ is the gross rate of return for savings in the private market.

A Numerical Example

- Assume that there are 3 workers per retiree. The benefits given to retirees are 60% of the average wage

- This implies that the tax rate must be 20 % of wages in PAYG system

- Real aggregate wages in China will grow at about 7 % or less per year.

- In the future, the real marginal return on capital will be only 12 %.

- Assume agents contribute to the system from age 25 to age 64 and receives benefits from age 65 to 85.

- For simplicity assume that the contributions are all made at the mid-point of the working years (age 45) and that the benefits are paid at the midpoint of the retirement years (age 75)

- In PAYG with a 7% implicit rate of return, one dollar saved at age 45 grows to \$7.6 at age 75.

- In a funded system with a 12% rate of return, one dollars saved at age 45 grows to \$30 at age 75, about fours times as much as in a PAYG system.

- This implies that the funded system can provide the same level of benefits with a saving rate equal to one fourth of the rate of tax required in PAYG system.

Longevity Insurance

- Insurance against the risk of living longer than expected.
- Pension benefits are paid as long as the person lives, so that people that live (unexpected) longer receive more over their life time than those die prematurely.

An illustrative example

- The household lives up to two periods, but may die after the first period with a probability of $1 - p$.

- The utility of being dead is 0

- No bequest motive

- No time discounting

- The household's problem with a pension system in place

$$
\begin{aligned}
& \max_{c_1, c_2} \log(c_1) + p \log(c_2) \\
& s.t. \\
c_1 + s &= (1 - \tau) y \\
c_2 &= (1 + r) s + b
\end{aligned}
$$

where y is income when the agent is young, b is pension benefit when he retires. τ is payroll tax rate.

- The budget constraint of the pension system for the government

$$pb = (1 + n)(1 + g)\,\tau y$$

- Pension benefits only need to be paid to a fraction p of the old cohort (because the rest has died)

- Household's intertemporal budget constraint

$$c_1 + \frac{c_2}{1+r} = y + \tau y \left(\frac{(1+n)(1+g)}{p(1+r)} - 1 \right)$$

- Still, if $1 + r > (1 + n)(1 + g)$, then a fully funded system is better. Vise versa.

- with survival probability $p < 1$, the implicit return on social security is $\frac{(1+n)(1+g)}{p} > (1 + n)(1 + g)$

  – the surviving individuals are implicitly insured by those who die at the end of first period.

  – If you survive, you get higher benefits; if you die you don't care about receiving nothing.

Redistribution of Income

- Intra-generational redistribution: benefit is not tightly linked to previous contributions.

- Inter-generational redistribution: for example, the establishment of US social security system in Great Depression.

Risk Sharing

- Inter-generational risk sharing
  - the workers could share the risk of the retirees on asset return, given wage and interest rate is not perfectly correlated.
  - the retirees could share some of the burden (gain) of a large fall (boost) in productivity if their pension is growing at the same rate as wages.
- Intra-generational risk sharing (e.g. contribution rate is progressive)

3 The Current Pension System in China

The Rural Old-Age Security System

- In rural areas, only local government employees, including state teachers and employees of state farmers are eligible for the pension program.

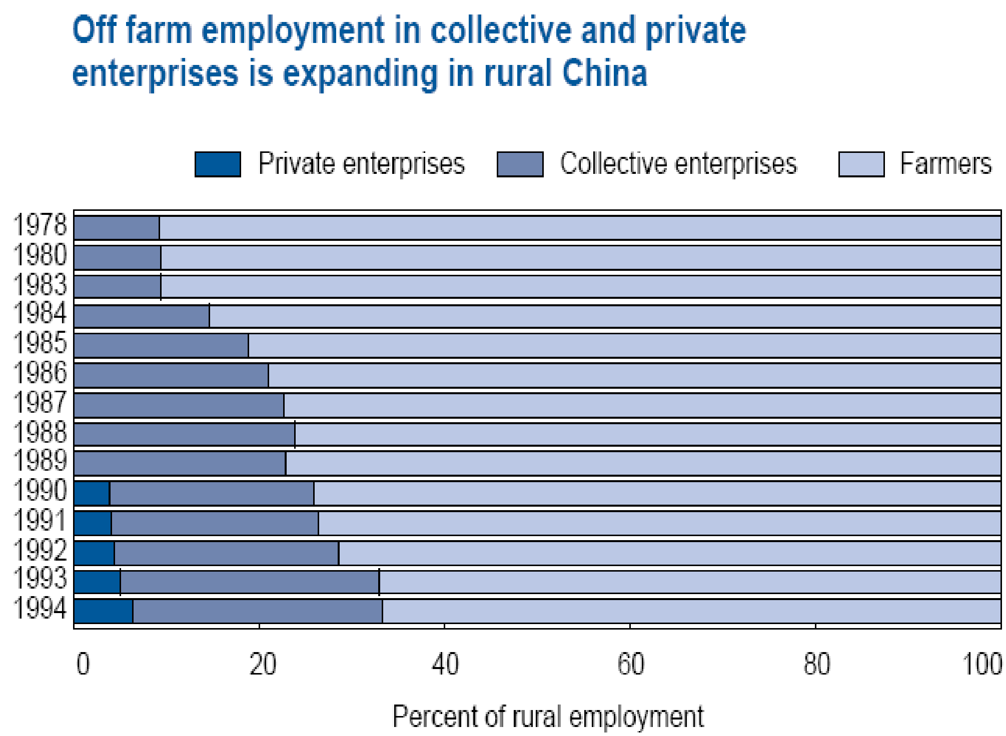
- The central government has designed and is promoting the special pension insurance program for rural areas: voluntary savings plan (defined contribution and fully funded) targeted at individuals with rural household registration (farmers, employees of rural enterprises, and the rural self-employed) between 20 and 60 years of age

- Pension payments begin at age 60 based on contribution and accrued interest.

Problems

- According to law, all rural households have a claim to a parcel of collectively owned land, providing a floor to household income. However, the cultivable land per rural household is a mere 0.4 hectare and keeps falling due to urbanization.

- The growth of non-agricultural employment in rural areas and the easing of restrictions on migrations to cities.
  - bring the risk of unemployment and retirement at a particular age
  - rising number of immigrants.



- In sum, rural social security provision rests on the increasingly questionable assumption that the rural population is self-employed.

The Urban System - A Three Part System

- The first part (basic pension plan) states that retirees in the future will receive a defined benefit financed by a PAYG system.
  - Employees who have worked for 40 years are scheduled to receive benefits equal to 25% of the regional average wage, with a proportional reduction for those with shorter work histories in these state-owned enterprises.

- The second part is a defined contribution funded system (started in 1997).
  - Current employees and their enterprises contribute 10% of wages to individual accounts managed by municipal or provincial authorities.

- The third part is voluntary pensions
  - enterprise annuity schemes, individual retirement plan and other pension schemes organized by industries or localities.

Rationales for the current plan

- The basic pension plays a key role in providing retirement benefit to those low earners, important for reducing poverty and providing insurance.

- In China, earnings are rising rapidly and the distribution of those earnings is widening. Therefore, an individual account, linking pension to earnings becomes increasingly important.

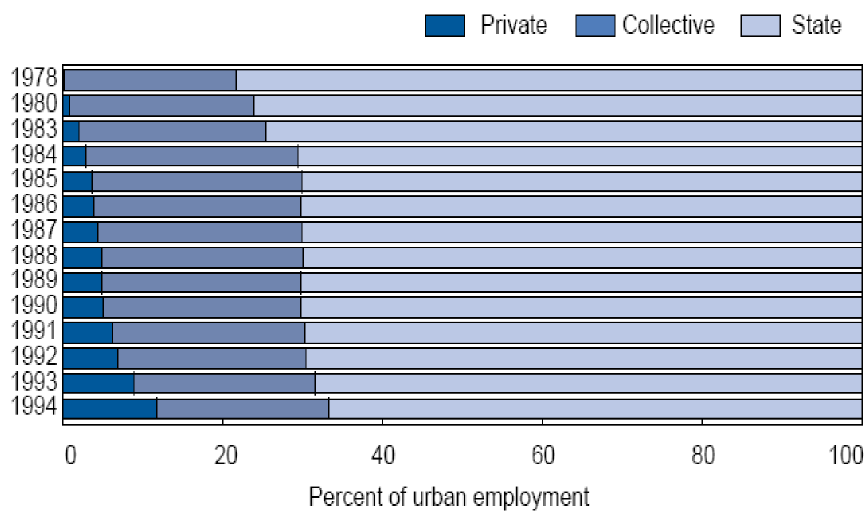
- Both part provide longevity insurance by paying benefits on a annuity basis.

- Voluntary pensions can accommodate the wide differences that exists in a country as large and diverse as China.

Emerging Problems

- Fragmentation
  - Fragmented organization. Organization in practice remains largely municipality based, and in some areas, still enterprise based.
  - Limited Coverage. Contributions from employers and workers outside the state-own-enterprise sector remain very limited.
- System deficit: pensions in most areas run a deficit, the result of pension spending exceeding the ability to collect contributions.

Employment in the private sector is growing in urban China



Note: Private includes foreign invested and self-employed.

- Empty individual accounts, because local governments often used the contributions of workers to their individual accounts to finance the pensions of the current retired generations on a PAYG basis.

4 What are the dimensions of future reform?

National Pensions Administration

- Currently, many workers do not participate in the system and many firms avoid some or all of their required contributions. This keeps current tax rates unnecessarily high (28% payroll tax).

- To improve payroll tax compliance, there should be a single set of regulations on mandatory pensions, preferably in the form of legislation that is enforceable. They should inclide room for regional variation in basic benefit levels.

- There should be a single national pensions administrations which receives all pension revenues and delivers pensions, to make income redistribution and risk sharing more effective.

- Payroll contributions should be collected by the tax authority, with the revenue delivered promptly to the pension administration.

- The contribution base should be changed to match a definition of earnings to be used also in determining income tax liability (say including housing benefits), with the contribution rate adjusted so that total contribution are broadly unaffected by the change.

4.1 Reforms of the Individual Account

Investment based individual account (Feldstein, 2006)

- Pros
  - investment-based accounts are needed to build worker confidence in the system.
  - keep long run tax rate much lower than would be possible in a PAYG system.
  - contribute to the development of the Chinese financial system

- Cons
  - Increase in saving is not the right objective in China now.
  - In China, financial markets are at an early stage of development. In the short run, funding individual accounts is likely to result in low returns or high risks.
  - Introducing funding will benefit a future generation at a higher cost of today's workers in China.

Notional defined contribution (NDC) system. (Diamond et. al, 2005)

- Pros
  - It offers consumption smooth to today's contributors in a similar way to funded DC schemes.
  - Because no fund is built up, it does not require today's (poorer) workers to make larger contributions so that future (richer) generations of workers can make smaller contributions.
  - It does not require the considerable private-sector financial capacity of funded schemes.

- It is less risky for workers, since the rate of return avoids the short run volatility of asset in the capital market.

- NDC can be the basis for future move to full or partial funding.

- Cons
  - Since the account will be permanently empty, workers and firms will not have confidence that the government will actually pay the benefits. Many will therefore continue to be reluctant to pay payroll taxes.
  - Because a notional defined contribution system is PAYG, tax rate in the long run will have to be very high.
  - While Chinese saving rates are currently very high, this may not be the case in the future. An Unfunded system like a notional defined contribution system reduces national savings.

Age for receiving full pension benefits

- The age for receiving full benefits from the basis pension should be slowly increased to 65 for both men and women.

- The earliest age at which a person is eligible for the pension from his individual account should be slowly increased as well.

The transition path - how to deal with the legacy obligation?

- The pensions of workers who retired before 1998, and the accrued pension entitlement of current workers for employment prior to 1998 represent China's legacy obligation, or implicit pension debt.

- The legacy costs of providing pension to these people should be separated from the new social security pension system. They should be treated as inherited national debt.
  - Since the benefits of this transition will be shared by many future generations, it is appropriate to share the costs over many generations as well.

- For example, the government decided in 2003 to transfer some of its shares in SOEs, particularly those that were being listed on stock markets to the national Social security Fund (NSSF).

  - This improves pension system financial balances.

  - NSSF as a long-term strategic shareholders can oversee the performance of the companies and improve corporate governance.

Coverage

- Priority for the future must be to extended coverage first to uncovered urban workers and eventually to the rural population.
- The povery-relief element in the pension system should be widened and deepened.
- Enhancing old-age security in rural areas should be a high priority.

Reducing payroll tax rate

- Payroll tax rate be reduced to 8%

- Future contribution in the basic pension part be financed with a broad-based tax such as value added tax.

- The basic pension part be redesigned by the time today's younger workers retire.
  - reducing expenditures by raising retirement ages
  - maintaining benefits at the age of retirement at 25% of the average provincial wage, but permitting benefits at later ages to grow more slowly.

– replacing the basic pension benefit with a better targeted supplement to the individual account benefits.