

# Construction of Public Pension in Developing Economies



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## Contents

1. Public Policy Making in Development Context
2. Social Security: Public Pension
  - 2.1 The case of Japan
  - 2.2 Discussions
3. The consequence of Japanese PAYG public pension
4. Important elements for designing social security policy

# 1. Public Policy Making in Development Context

- Development Syndrome

Making public policies depends on the stages of economic development. Along with economic growth, there comes a certain stage of economic development where policy makers will face “particular” problems both at expenditure and revenue sides.

- Expenditure side:

Policy makers feel pressed with offering better welfare packages to meet the expectation of the people; “we have worked hard enough, our economy has achieved development, and now is the time of more compensation.”

- Revenue side: Indirect taxes, most typically the value-added tax, and corporate-income taxes mostly on big firms alone cannot finance expenditures. Taxing personal income becomes necessary.

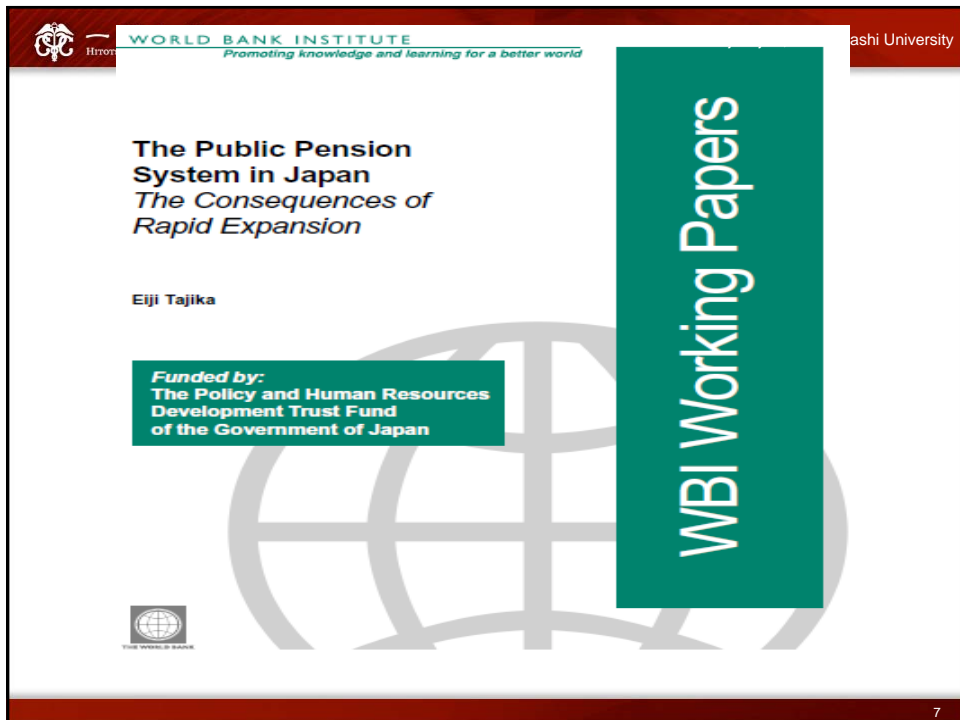
- Purpose of this lecture:
  - Focusing on the expenditure side, we will present the experiences of **Japan's development syndrome** and show the issues for making social security policies.
  - The importance of **separation of insurance and redistributive aspects of public pension** is stressed.
  - **Unfunded liability** (excess of benefits over contribution at the present value) should not be shouldered by younger generations.

## 2. Social Security: Public Pension

### 2.1 The Case of Japan

Tajika, Eiji, 2002, The Public Pension System in Japan: The Consequences of Rapid Expansion of Benefits, *World Bank Institute, Discussion Paper*,

- <http://siteresources.worldbank.org/WBI/Resources/wbi37203.pdf>



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## Three basic concepts of public pensions

- 1) **Coverage: universal or not**  
Coverage usually spreads from the government's employees and the workers in business sectors to the self-employed. When every person is enrolled in the pension system, it is called universal.
- 2) **Financing the benefits**  
**Funded system** is like an individual pension plan where he/she contributes and receives benefits based on actuarial calculations.  
**Unfunded or "PAYG (pay-as-you-go-financing)"** system finances benefits by transferring income of the young to the old.

8

### 3) Who takes the risks?

When benefits are fixed (with proper price indexing), future risks are taken by the insurer. This is called **Defined-Benefits** pension. On the other hand, when contributions are fixed first, risks about benefits are borne by contributors. This is called **Defined-Contribution** pension.

## Japanese experiences (1)

A characteristic of Japanese social security policy throughout its high growth period (1950–73) was that the government was not big. Social expenditure was focused mainly on education and basic health care, and thus it aimed more at social stabilization and economic growth than the establishment of a welfare state. Issues such as when the nation would be able to rebuild after the devastation of World War II, how to raise savings, and how to finance investment preoccupied the minds of those contemplating the future of the country. And the public was busy, too, in working their way to a better life.

However, a sharp change in social security policy took place at the beginning of the 1970s. Along with the increase in their incomes, people in Japan became more conscious of quality of life issues, exemplified most clearly by concerns about the environment. Social welfare was not an exception, and a call for better welfare was turning into a movement. Better welfare meant more government commitment to medical care and public pensions. In retrospect, these calls rested on an optimistic view that economic growth would continue and that the government would be able to expend considerable energy in the service of its people and the welfare system the public deserved.

The year 1973 was declared by the government to be “the inaugural year of welfare,” and extremely liberal provisions were offered in every aspect of social expenditure, including medical care and public pension. Overlooked in all this euphoric movement, however, was that the Japanese economy had turned a corner.<sup>1</sup>

## Japanese experiences (2)

- **Universal system:** Public Pensions was extended to the self-employed, mostly peasants and small businesses, **in 1961**.
- **Broadly two public pension systems with defined benefits:**  
First for the employed, both at private and public sectors.  
Second for the self-employed, National Pension System.

11

## Japanese experiences (3)

*Table 1. An Overview of the Public Pension System in Japan, 1995*

Types of the insured	Type I	Type II	Type III
	National pension plan	Employees' pension insurance	Mutual aid associations
Number of contributors (million people)	19.1	32.8	5.8
Number of beneficiaries (million people)	11.2	13.6	3.5
Total amount of benefits (billion yen)	7,745	16,355	7,451
Monthly average benefits (thousand yen)	44.7	170.1	219.3
			n.a.

n.a. Not applicable.

*Note:* The categories of the insured are as follows:

Type I: The self-employed—for example, small proprietors, farmers, and professionals.

Type II: Employees of both private and public institutions.

Type III: Dependent spouses of Type II individuals. This group was established in 1986. Before the reform, people in this category paid into the National Pension plan, or went uninsured when they did not. Starting in 1986, they were grouped under Type III. And while they were granted the right to receive pension, they were exempted totally from contributing to public pension plans.

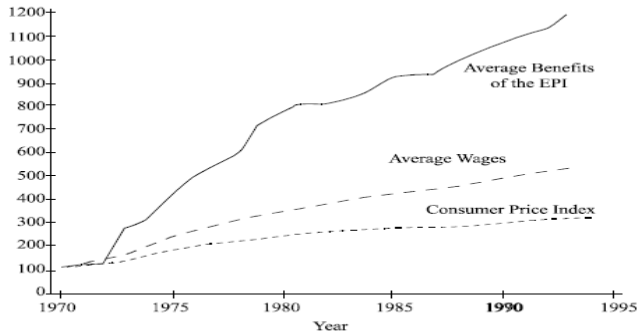
*Source:* Social Insurance Agency (1997).

12

## Japanese experiences (4)

- Expansion of Benefits of Employees' Pension

Figure 3. Average Benefits of the EPI, Average Wages and Consumer Price Index (1970 = 100)



Wages, too, increased greatly over the years, but pension benefits surpassed their ascent. The numbers in figure 3 show this: while pension benefits and wages started from 100 in 1970, they reached 1100.1 and 518.7, respectively, in 1993. One reason for this increase in benefits was the huge upsurge in the 1970s, but another

## Japanese experiences (5)

### Consequences of overpayments (Employees' Pension)

Table 6. Lifetime Benefit-To-Contribution Ratio

Year of birth	B/C	
	Male	Female
1901	14.07	7.17
1905	13.96	9.83
1910	11.59	13.57
1915	12.26	16.85
1920	7.70	13.16
1924	5.45	10.74
1925	5.07	10.17

Note: B: Lifetime discounted value of benefits. C: Contributions.

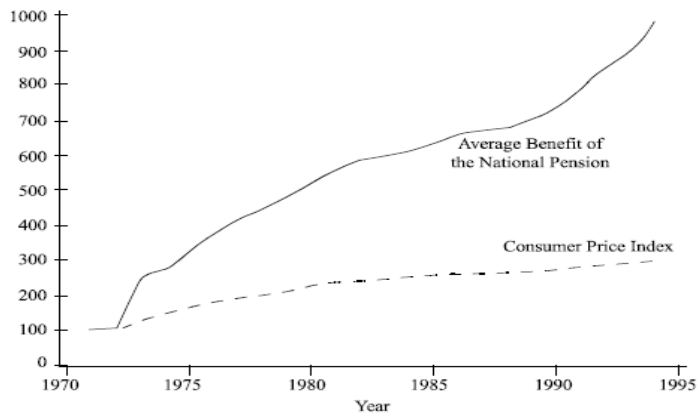
Source: Tajika, Kaneko, and Hayashi (1996: 67).

Table 7. Lifetime Benefit-To-Contribution Ratio

Year of birth	Married		Nonmarried
	B/C	(B-T)/C	B/C
1924	7.78	6.32	5.06
1934	3.78	3.07	2.46
1944	2.08	1.69	1.36
1954	1.40	1.14	0.91
1964	1.11	0.90	0.72
1974	0.94	0.76	0.61
1984	0.85	0.69	0.55
1994	0.81	0.66	0.53

## Japanese experiences (6) Expansion of Benefits of The Self-Employed

Figure 5. Average Benefits of the National Pension and Consumer Price Index



Source: Ministry of Health and Welfare (1995).

## Japanese experiences (7) Consequences of overpayments (The Self-Employed Pension):

Table 8. Lifetime Benefit-To-Contribution Ratio: The National Pension Plan

Year of birth	The ten-year pension: B/C		The five-year pension: B/C	
	Men	Women	Men	Women
1907	62.81	103.82	39.31	52.00
1908	67.33	105.30	45.18	54.40
1909	73.10	117.28	48.52	59.01
1910	76.24	123.17	51.80	60.52
1911	80.64	124.76	55.09	62.51

Table 9. Lifetime Benefit-To-Contribution Ratio: The National Pension Plan

Year of birth	B/C	(B-T)/C
1924	10.63	7.08
1934	4.93	3.29
1944	2.72	1.81
1954	1.70	1.13
1964	1.28	0.85
1974	1.11	0.74
1984	0.94	0.62
1994	0.94	0.62



## 2.2 Discussions

### 1) Attractions and Pitfalls of Pay-As-You-Go financing

A formula of contribution rate:

- Contribution rate=
$$\frac{\text{Benefits per receiver} \times \text{Number of beneficiaries}}{\text{Number of contribution payers}}$$
- Benefits per receiver = replacement ratio x average wages

- average wage of the presently young worker= $w$
- replacement ratio=60%
- the number of workers (contributors)=100
- the number of retired (pension receivers)=50

=>

$$\begin{aligned}\text{Contribution rate} &= 60\% \times w \times (50/100) \\ &= 30\% \times w\end{aligned}$$

=====

Formula of contribution rate:

$$\begin{aligned}\text{Contribution rate} &= \frac{\text{Benefits per receiver} \times \text{Number of beneficiaries}}{\text{Number of contribution payers}}\end{aligned}$$

$$\begin{aligned}\text{Benefits per receiver} &= \text{replacement ratio} \times \text{average wages}\end{aligned}$$

- **Rate of return**

Pay 30% of wages

Receive 60% of wages



Rate of return:  $60/30-1=100\%$  !

- What if the number of the retired increases to 100?

Pay  $60\% \times W \times (100/100) = 60\%$  of wages

Receive 60% of wages

=>

**Rate of return:**  $60/60-1=0\%$

- Hence, the rate of return depends on an aging factor. A caveat is that productivity growth mitigates this demographic downward pressure on the rate of return.

Rate of return of the Defined-Benefit PAYG pension :  
a formal explanation

**B=Benefits per receiver =  $a \times w$**

a: replacement ration; w: wages of working people

**C=Contribution paid by a worker=  $a \times w(-1) \times N(-1)/ N$**

$W(-1)$ ; wages of beneficiaries when they are young

$N(-1)$ : the number of beneficiaries

$N$ : the number of current workers (young people)

**Rate of return=  $B/C-1=(1+g)(1+n)-1$**

g: the rate of increase of wages

n: the rate of population growth

## Why does PAYG financing attract policy makers?

- When the people demand better social security benefits and there are many young people, PAYG financing enables to offer the benefits with “small” contributions.
- But the rate of return deteriorates as the rates of increase of wage and population decline.
- And the day of reckoning will soon come to the current developing countries.

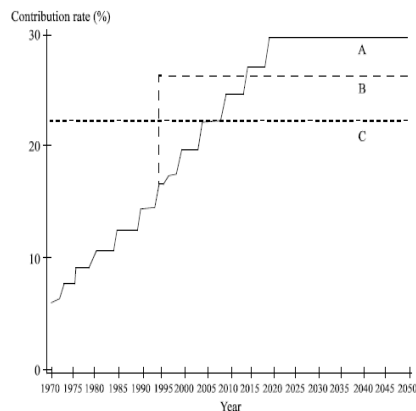
21

## Case of Japanese Employees' Pension

Table 5. The Effective Degree of Maturity of the EPI (percent)

Year	The 1992 estimate		The IFES estimate	
	Degree of maturity	Effective degree of maturity	Degree of maturity	Effective degree of maturity
1995	20.65	28.48	20.69	28.53
2000	24.55	34.92	24.61	35.00
2010	35.88	58.82	35.99	53.97
2020	42.98	68.79	43.68	69.90
2030	48.81	79.60	52.57	85.78
2040	58.10	94.36	67.10	108.98
2050	58.19	96.60	71.85	119.19

Figure 4. Contribution Rate of The EPI



Source: Ministry of Health and Welfare (1995).

22

2) Are the overpayments by PAYG the matters only of Japan?

Korea and Taiwan in the very late 1990s were stuck with the same problems. Will they manage better than Japan?

3) Pension issues are both economic and political. Political democratization and demand for improving welfare might occur at the same time.

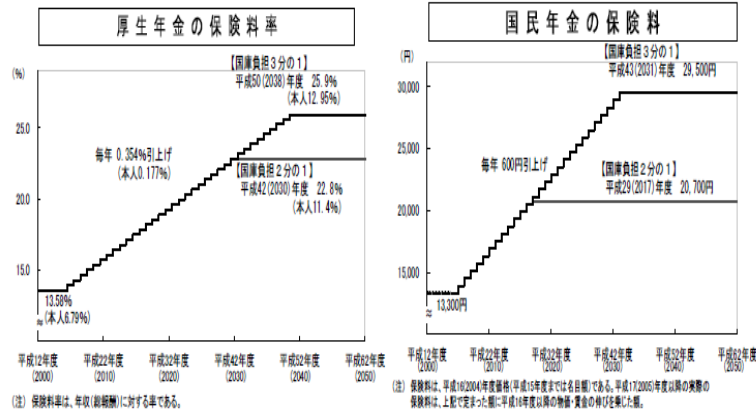
23

### 3. The consequence of Japanese PAYG public pension

- Cutting benefits  
Changes the gross wage-indexing to net wage-indexing and to the price indexing.
- Warnings from the government  
If things go ahead as they are now and not changed, you have to pay higher contribution rate. Would you pay for it?  
How high are they?  
Wage earners: 13.5% to 25.9%.  
Self-employed: 13,000JPY/month to 29,500JPY

24

第1-1-6図 現行の給付水準を維持した場合（給付水準維持）の  
最終保険料（率）



25

- Final solution? 2004-reform  
Why not fix the contribution rate to alleviate your and younger-generations' costs for sustaining our system?  
But, we have to cut your benefits further.
- This time, the benefit-cutting mechanism is called a "macro-economic" slide. Idea is like this:
  - The system is PAYG.
  - The number of younger people paying the contribution declines; and the period of receiving benefits gets longer, because beneficiaries live longer.
  - The rate of contribution will be capped at 18.3%.
  - Therefore, for sustaining the system, benefits have to be cut **automatically** according to the combined indexes of the rate of decline of contributors and the rate of prolongation of life expectancy of the beneficiaries.

26

- Benefits are now set as:  
They increase as much as prices increase,  
but will be slashed by the combined indexes of  
the rate of decline of contributors and  
the rate of prolongation of life expectancy of  
beneficiaries.

## Life-time benefits(B)/costs(C) under the “final” solutions

	Married couples		Singles
Year of Birth	Estimate: Ministry of Welfare and Labor	B/C: Premium totally paid by the insured	B/C Premium totally paid by the insured
1935	4.7	1.7	1.4
1945	2.6	0.9	0.8
1955	2.0	0.7	0.6
1965	1.9	0.7	0.6
1975	1.7	0.6	0.5
1985	1.6	0.6	0.5
1995	1.6	0.6	0.5
2005	1.6	0.6	0.5

## 4. Important elements for designing social security policy

- Sustainability of public pension

PAYG-financing public pension may not be a sustainable one when the rates of growth of productivity and population decline, and when beneficiaries tend to live much longer. That is, the costs for paying benefits cannot be shifted to the current young people forever.

- Pension as an insurance for longer life

As the “risk” of living longer is getting higher and the family care of the old is getting more difficult, the importance of pension increases.

- Separation of insurance and redistribution aspects of public pension

A sustainable pension will set a separate account for redistribution, and other resources than pension contribution should manage the redistribution account.

- Always be conscious about the unfunded liability

The excess of the present expected value of benefits over contribution payments is the unfunded liability of pension, and this must someday be financed by less benefits, more contribution and more taxes.

- PAYG is only one of the methods of financing the unfunded liabilities

Note also that PAYG may not always make explicit the amount of the unfunded liabilities.

31

- Collection of premium

Assessing the income of the self-employed is difficult. This makes the collection from them difficult, too. A simple way of collection like charging a lump-sum (fixed) amount instead of income-proportional premium is more practical.

32



## A note on privatizing public pension financed by PAYG to a Funded system

### What are the unfunded liabilities of a PAYG pension system?

The excess of the present expected value of benefits over contribution payments.

### What is privatizing the pension?

Making the unfunded pension liabilities funded.

### How can privatization be done?

Changing payroll financing to other ways of financing like increasing the consumption taxes and other taxes

### What changes will happen by privatizing pensions?

Making the burden of future generations smaller than at the time of PAYG financing.

## Your problems

- What are the problems of the social security system of your country?
- Where do they come from?
- How would you propose to reform them?