Public Pension

2024 Fall semester

Public Finance

Today's talk

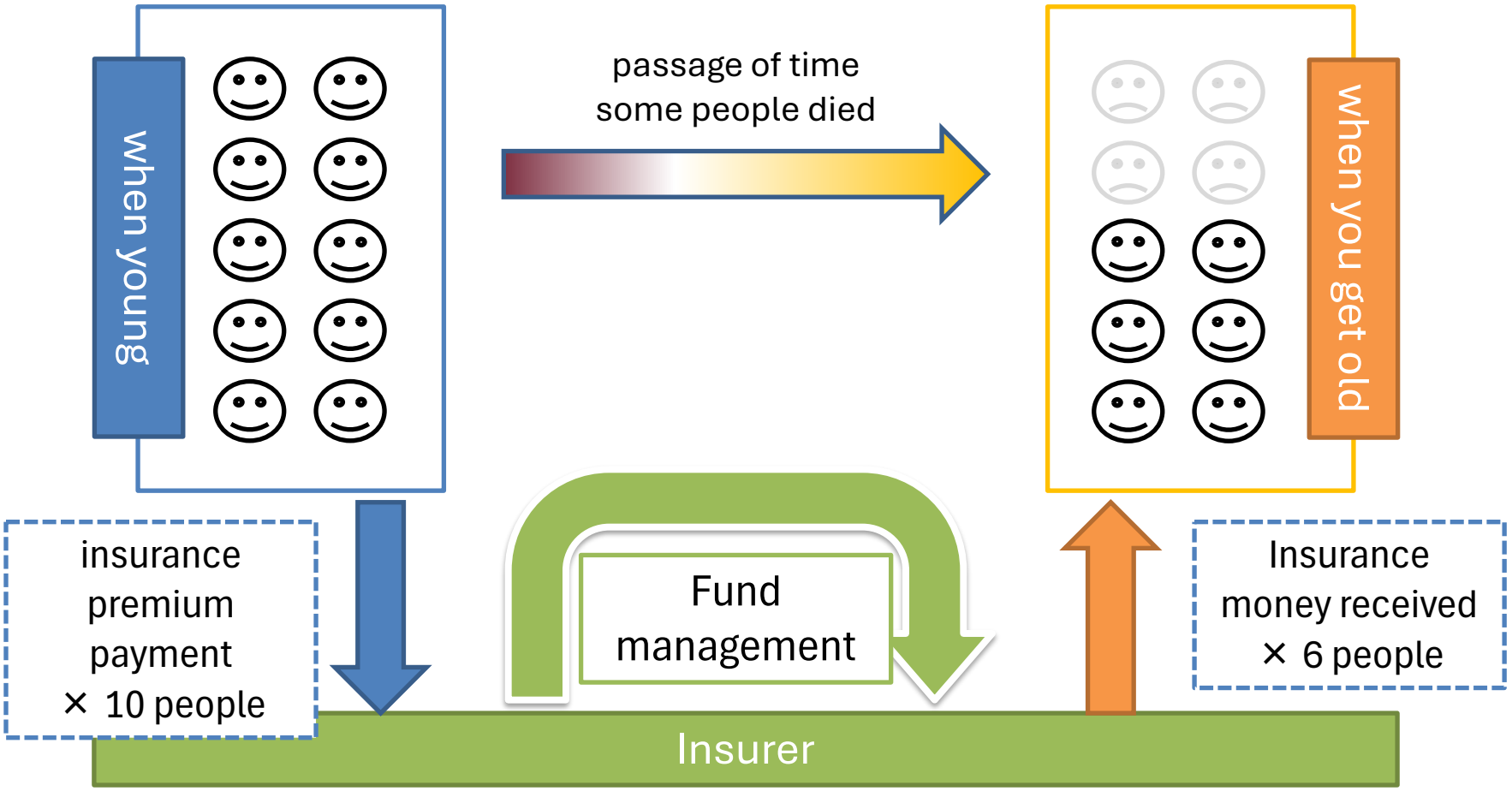
- What is a pension?
  - Types of old-age pension insurance
- Overview of the public pension system in Japan
  - 2 tiers system, contributions and benefits, indexation
  - Fiscal review
- Justification for government intervention
  - Backgrounds of pension development
- Economic research on public pensions
  - Effect on savings
  - Effect on labor supply
  - No pension/low pension problem

What is a pension?

- Annuity, pension
  - Money paid regularly and continuously
  - Benefits are usually provided if certain conditions are met.
    - Old-age pension: Conditional on age
    - Disability pension, survivor pension
  - Continuous but not necessarily lifelong: Fixed annuity
- Old-age pension insurance
  - Insurance that pays a pension when you reach a certain age
    - If you die before the eligibility age, you will not receive them.
    - Whether it is fixed term or lifelong depends on the design.
- Public old-age pension insurance
  - Old-age pension insurance stipulated by the law
    - Compulsory and lifelong in Japan
  - There are also private old-age pension insurances

Old-age pension insurance

- Insurance against the risk of long life (and income loss)
  - sold by private life insurance companies



Old-age pension insurance design

- Basic scheme
  - When you are young: Pay your insurance premiums
  - When you get old: If you are alive, you will receive benefits
  - Risk covered by insurance: live long and cannot earn income
- Insurer (compulsory or not): public /private
- Period: Fixed / lifelong
- Pension amount
  - DC: Defined Contribution
  - DB: Defined Benefit
  - Asset management risk tends to go to the insured in the case of a DC, and to the insurer in the case of DB
- Fiscal method (public insurance only)
  - FF: Fully Funded
  - PAYG: Pay As You Go

Fiscal method

- 2 major fiscal methods
  - Private pensions are always fully funded
  - Transitional or partially funded method is also possible.

	Pay-as-you-go	Fully funded
Funds to be paid	Funds that the young people at that time pay as premium	Funds that the old people paid as premium when young
Reserve fund	(almost) none	exist
Among generations	transfers	no transfer
Population risk	weak	strong
Risk of asset management and inflation	strong	weak

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Characteristics of Japan's public old age pension insurance

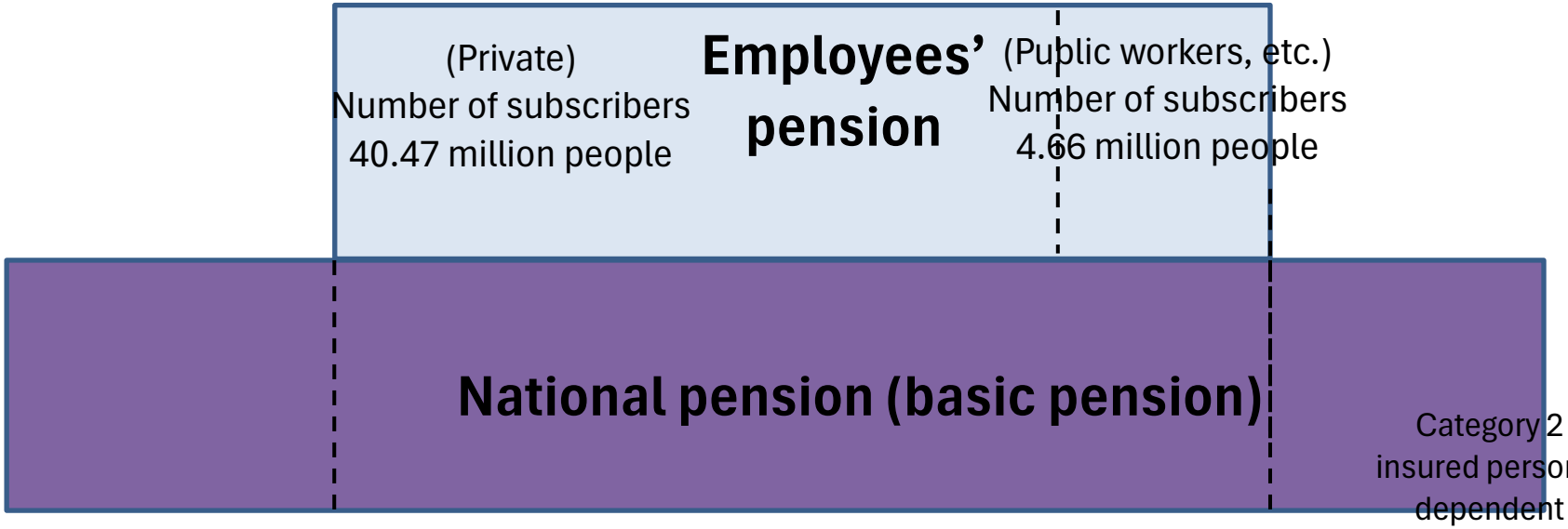
- Universal pension (compulsory)
  - All working-age people are covered by one of insurances
  - All people aged 20-60, with residences in Japan
    - Housewives (since 1985), students (since 1989)
  - National government is the only insurer, but which insurance depends on job and region.
  - Complicated: Long-term and many transitional measures
- 2 tiers
  - 1st tier: Basic pension
  - 2nd tier: proportional to income
    - Only for employees
    - intragenerational redistribution
  - 3 tiers: If corporate pension plans and iDeCo are included

Characteristics of Japan's public old age pension insurance

- Pay-as-you-go method
  - Although it started as fully funded
  - After the inflation during the oil crisis, it moved to partially funded
  - Now pay-as-you-go
  - A considerable amount of reserve funds
    - 150 trillion yen in GPIF (Government Pension Investment Fund)

Two-tiers system

- Public old-age pension



(Note) Figures are as of the end of March 2022
(Source) 2023 Annual Report on Health, Labor and Welfare

Categories

(note) 2023 Annual Report on Health, Labor and Welfare.
Figures are as of 2023 .

	Category 1	Category 2	Category 3
Target	The self-employed, farmers, the unemployed, etc.	Employees, public workers (Employees' pension)	Dependent spouses of category 2
Contributions	Fixed: 16,520 yen / month	18.3% of income	No contributions
	Fixed at the real amount of 16,900 yen from 2017 onwards.	Proportional to income Split btn employer and employee (50/50) Fixed at 18.3% since September 2017	
Benefits	Fixed: Basic pension (proportional to membership)	Fixed: Basic pension + Employees' Pension (proportional to contributions)	Fixed: Basic pension (proportional to membership)
	66,250 yen/month, for 40 years of membership.	224,482 yen/month: Employees' Pension (40 years participation at average wage) and Basic Pension for 2 people	

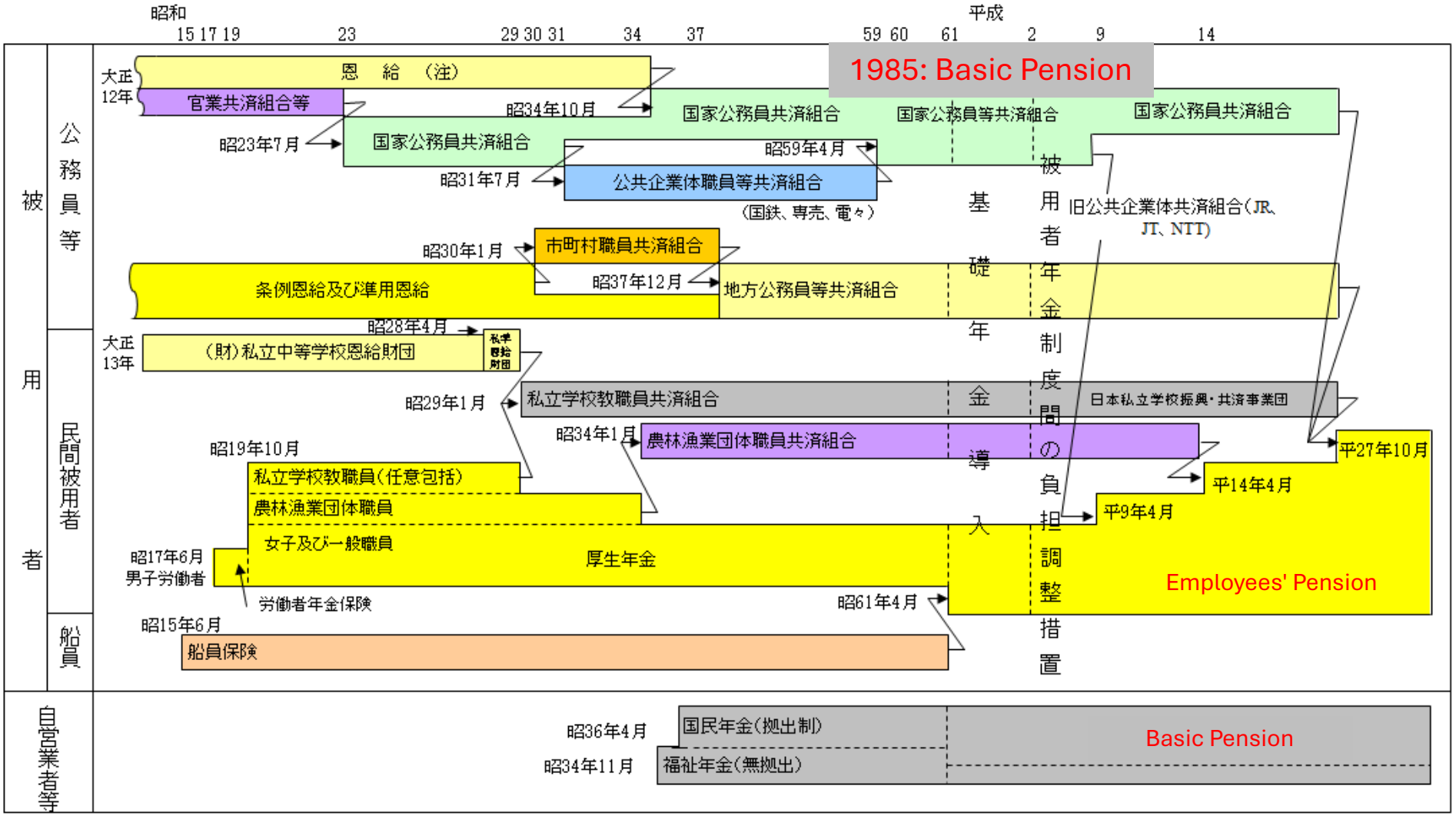
Remarks on Employees' Pension

- Intragenerational income redistribution (Category 2)
  - Benefits/contributions becomes lower as wage increases
  - Not actuarially fair
  - Redistribution from low-income to high-income
- Eligibility: some unregular workers are not eligible
  - Working hours are less than 3/4 of regular workers
  - Wage income criteria
- Unification
  - Public workers and private school teachers have been enrolled in the Employees' Pension system since October 2015

Why a 2-tiers?

- 2-tier system introduced in 1954 in Employees pension
  - Redistribution: increase benefits for the poor
  - Public pension was fragmented until 1985
- Lump-sum contributions for Category 1 since 1961
  - Covered the self-employed and those in the agriculture, forestry and fisheries industry
  - Difficulty of acquisition of their income information
- Before a major reform in 1985
  - “Unification” to make the system tough to changes in economic structure
  - Change to Basic Pension (1st tier) to all

History of the system



（注）明治8年に海軍退隠令、同9年陸軍恩給令、同17年に官吏恩給令が公布され、これが明治23年、軍人恩給法、官吏恩給法に集成され、これが大正12年恩給法に統一された。

Major reforms of public pension

- Introduction
  - 1942: Employees' pension insurance act
  - 1961: National pension act (universal pension)
- Improvement
  - 1973: Introduction of price level indexation
- Population aging and shrinking
  - 1985: Introduction of Basic Pension
    - Benefit "adjustment"
  - 2004: Macroeconomic slide, introduction of upper limit of contribution rate
  - 2012: Unification of employees' pension
  - Government supports private savings: iDeCo, NISA, …

As of the end of FY2022

(cf) International comparison

	Japan	US	UK	Germany	France	Sweden
System	2 tiers	1 tier	1 tier	1 tier	1 tier	1 tier
Compulsory enrollment	all residents	Resident Excluding unemployed	Residents with income above a certain level	Employees + some self-employed	Resident Excluding unemployed	Residents with income above a certain level
Contribution rate	18.3% Labor-management split	12.4% Labor-management split	25.8% Labor 12.0% Mgmt 13.8 %	18.6% Labor-management split	17.75% Labor 7.30% Mgmt 10.45%	17.21% Labor 7.0% Mgmt 10.21%
Start of payment	65 years old (EP, M64 F62)	66 years old	66 years old	65 years 11 months old	62 years old	After age 62
Enrollment period	10 years	10 years	10 years	5 years	none	none
Fiscal method	PAYG	PAYG	PAYG	PAYG	PAYG	PAYG + FF
Subsidy from Govt	Basic 1/2	No	No	26.4%	37.0%	Guaranteed pension

Various indexation

- Revision of pension benefits (“slide”)
  - Reviewing benefit levels in line with price levels and economic growth
  - Under PAYG
- Current system
  - Disposable income slide (since 1994)
    - Reevaluate the benefit level at the same rate as the growth in disposable income when starting to receive a pension.
  - Price slide (since 2000)
    - Make the benefit you receive (already awarded) fluctuate in line with price fluctuations
    - When the inflation rate is higher than the wage increase rate, the wage increase rate is used.

Various indexation

- Current system (cotd)
  - Macroeconomic slides (since 2004)
    - Reducing the revision rates of disposable income slide and price slide in line with the decrease in the number of insured persons (population) and increase in life expectancy.
    - To avoid too much burden (contributions) of young generations
  - (e.g.) The case of 2023 for those who already started to receive
    - Price slide (2.5%) is not applied
    - Income slide 2.8%: average wage growth (3yrs)
    - Macroeconomic slide -0.6%
    - Revision rate (indexation) 2.2% = 2.8% - 0.6%

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Fiscal review

- Adjustment of pension benefit levels
  - Until 2004: “Fiscal recalculation”
    - Every 5 years, forecasts of contribution rates, assuming the benefit level is fixed
  - Since 2004: “Fiscal review”
    - Long-term (100-year) forecasts every 5 years to check the fiscal health
    - If the replacement rate is expected to fall below 50% by the next Fiscal review, the necessary measures will be taken.
    - Replacement rate: Pension benefit amount relative to disposable income of working generation (model household)
      - (Basic pension for a couple + employees’ pension for husband) / Average disposable income for working men

2019 Fiscal review

- Even if economic assumptions are set more conservatively than in 2014
- If economic growth and labor participation progress, the replacement rate for FY2046-47 will be 50.8-51.9%
- If not, 50.0% in FY2043. Reserve fund to be zero in 2052, replacement rate will be 36 to 38%

	Real growth rate	TFP growth rate	Wage growth rate	Real interest rate	Replacement rate	Benefit level adjustment Ending year	Replacement rate w/ mechanical Benefit level adjustment
I	0.9%	1.3%	1.6%	3.0%	**51.9%**	FY2046	
II	0.6%	1.1%	1.4%	2.9%	**51.6%**	FY2047	
III	0.4%	0.9%	1.1%	2.8%	**50.8%**	FY2047	
IV	0.2%	0.8%	1.0%	2.1%	50.0%	FY2044	**46.5%**
V	0.0%	0.6%	0.8%	2.0%	50.0%	FY2043	**44.5%**
VI	-0.5%	0.3%	0.4%	0.8%	50.0%	FY2043	**36 to 38 %**

2024 Fiscal Review

- The situation appears better than 2019
  - Reserve fund to be zero in 2059 in a pessimistic case, replacement rate will be 33 to 37%

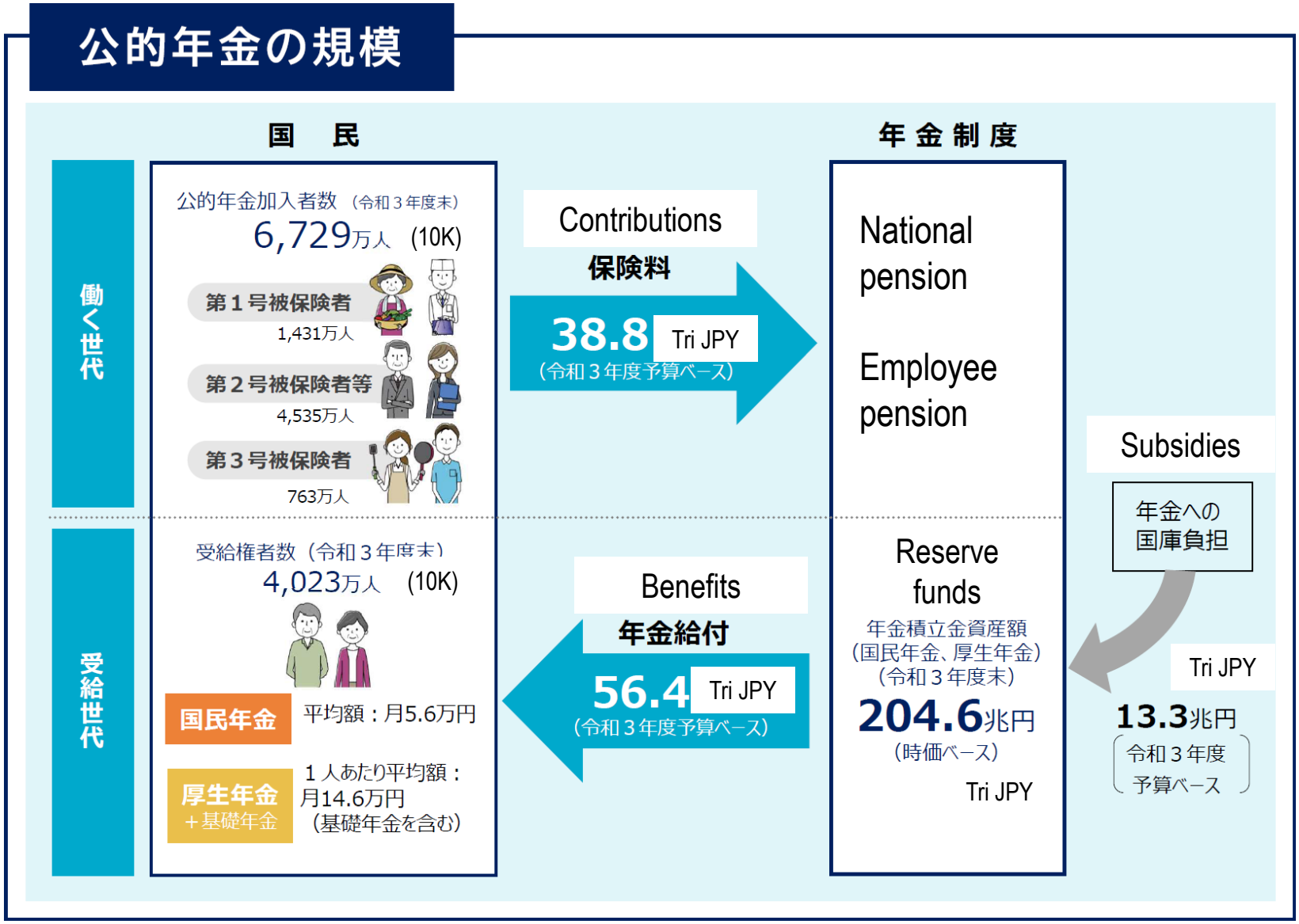
	Real growth rate	TFP growth rate	Wage growth rate	Real interest rate	Replacement rate	Benefit level adjustment Ending year
I	1.6%	1.4%	2.0%	3.4%	56.9%	2039
II	1.1%	1.1%	1.5%	3.2%	57.6%	2037
III	-0.1%	0.5%	0.5%	2.2%	50.4%	2057
IV	-0.7%	0.2%	0.1%	1.4%		2054

Fiscal balance (FY2020)

- Basic pension is separated
  - The total amount of benefits is 53 trillion yen, and the balance is almost flat right now.
  - Reserve fund balance is approximately 200 trillion yen

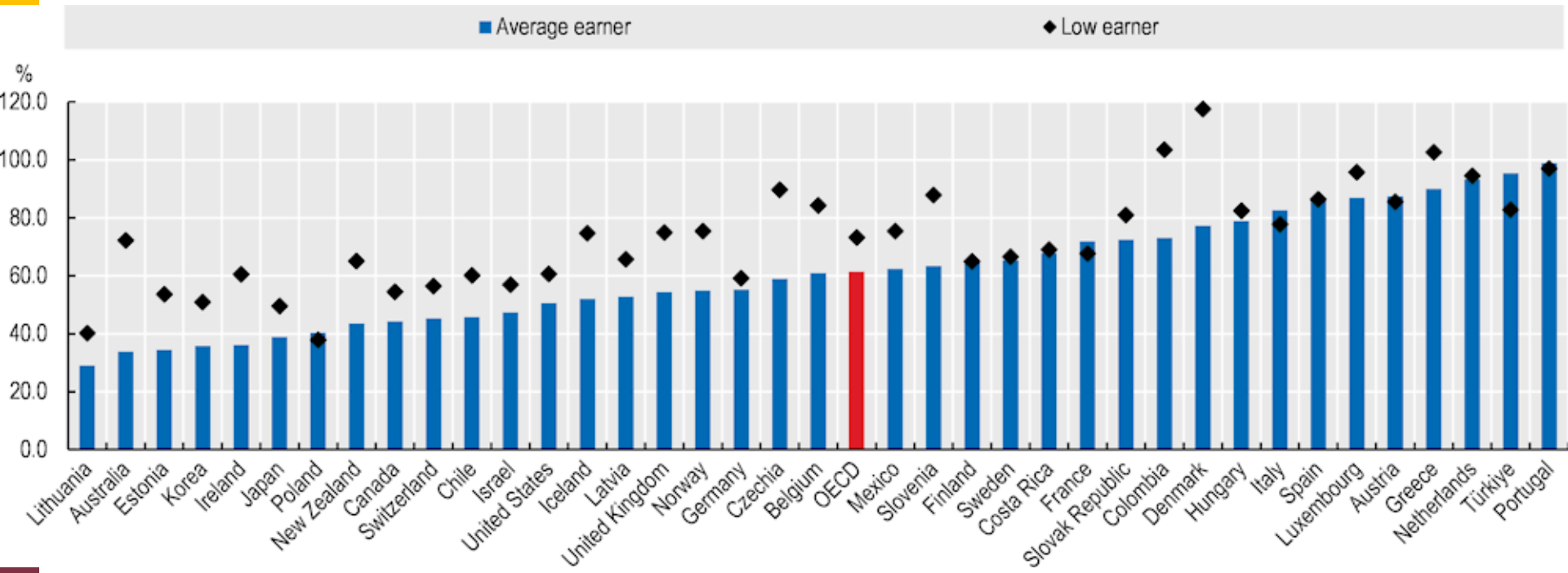
(Billions of yen)	Employees pension	National pension	Basic pension	Total net total
Start-of-year reserve fund	1,493,896	85,232	37,281	1,905,199
Total income	472,356	34,090	249,757	525,271
Contributions	320,612	13,365		386,168
Subsidies	101,335	18,308		131,613
Basic pension contributions			249,663	
others	50,409	2,417	94	7,490
Total expenditure	481,367	36,604	245,106	536,977
Benefit cost	239,047	3,491	238,053	533,612
Basic pension contributions	194,257	31,928		
others	48,063	1,185	7,053	3,365
single year balance	△ 9,011	△ 2,514	4,651	△ 11,706
Investment profit/loss	356,837	20,489	10	444,873
Year-end reserve fund	1,841,927	103,259	41,942	2,338,623

Fical balance (FY2021)



Replacement rates

- OECD evaluation
  - an average-wage worker who will retire at the normal retirement age after a full career from age 22 in 2022 will receive a net pension from mandatory schemes at what %?
  - Not very high in Japan



OECD, Pension at a Glance 2023, Figure 1.16

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Government intervention

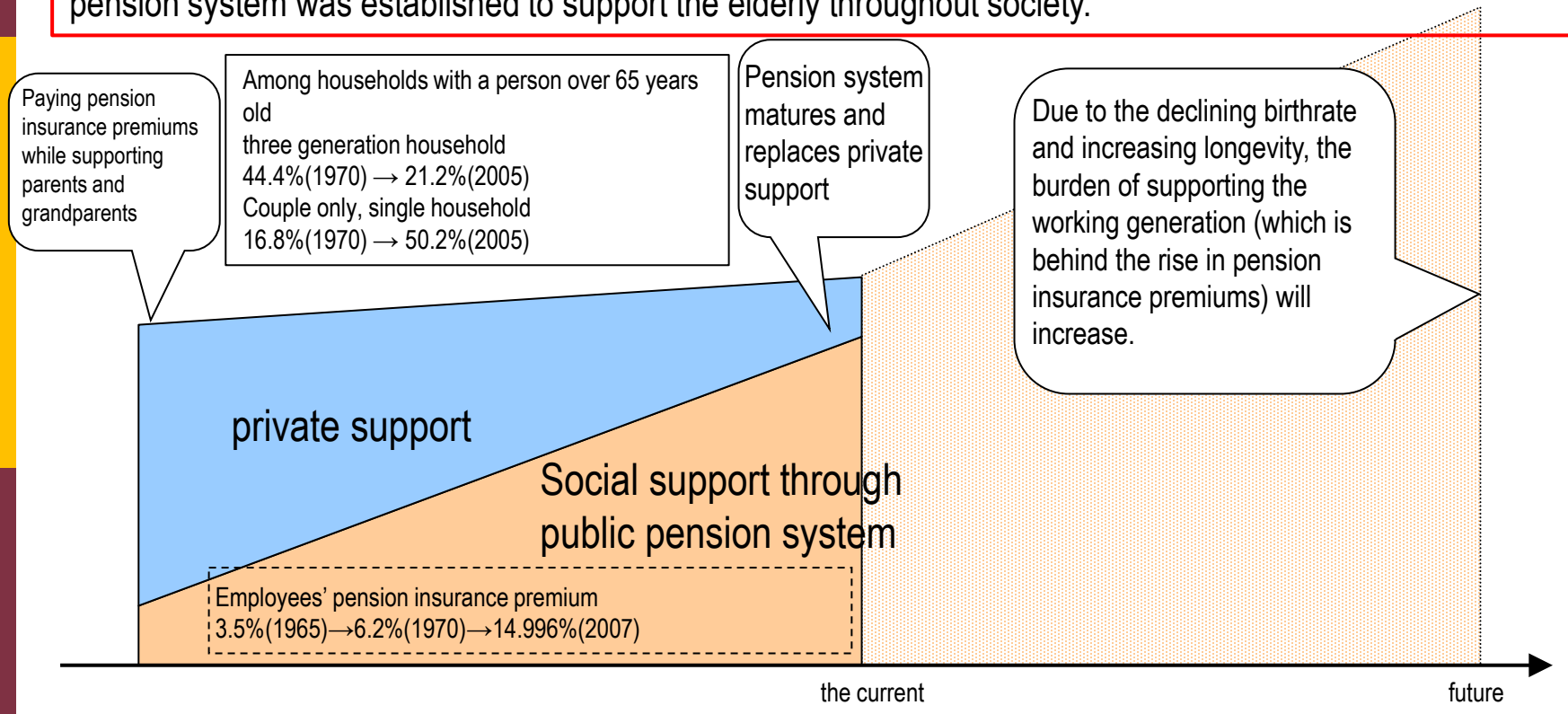
- Asymmetric information
  - Asymmetric btn the insurer and the insured regarding the health status of the insured.
  - Adverse selection: people with short lives don't want to buy insurance
- Merit goods: insurance as forced savings
  - If left to individuals, some people will not buy insurance/don't save money
  - Short-sighted (myopic) people receive welfare when they become poor in old age

Government intervention

- Income redistribution
  - Unable to pay insurance premiums (unable to save for retirement)
- Long-term insurance management
  - Private financial institutions are immature: record and fund management
  - Maintaining pension value: countering inflation, etc.
  - Lifetime pension: private pension is often fixed nominal and fixed term

Background of public pension development

In the past, many people lived with their parents, engaged in farming or self-employment, and supported their parents on their own. As the economy grew, more and more people separated from their parents and worked in cities, making it difficult for them to support their parents on their own. Amid these social changes, a public pension system was established to support the elderly throughout society.



Insurance premium burden is relatively small

The number of enrollment years is also relatively short.

→ Even if the pension benefits are the same, the burden will be higher.

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Public pension & savings

- Consider a simple 2-period model w/o risk
  - Individual decision making: 2-period, period 1 and 2
  - Consumption c_1 and labor h_1 in period 1, consumption c_2 in period 2. Time constraint $H = h_1 + l_1$
    - Utility function: $U = U(c_1, c_2, l_1)$
  - Public pension contribution rate t and benefit b
    - Budget constraints of period 1: $a = w_1 h_1 - t w_1 h_1 - c_1$
    - Budget constraints of period 2: $c_2 = (1 + r)a + b$
  - Rearranging: $c_1 + \frac{c_2}{1+r} + (1 - t)w_1 l_1 = (1 - t)w_1 H + \frac{b}{1+r}$
  - If public pensions have the same yield as savings (if they are perfect substitutes): $b = (1 + r)t w_1 h_1$
  - In this case, the budget constraint is

$$c_1 + \frac{c_2}{1 + r} + w_1 l_1 = w_1 H$$

  - (c_1, c_2, l_1) does not change if t changes. savings a decreases

Public pension & savings

- Assumptions of the simple model do not hold.
  - Public pension yield is different from savings
    - Public pensions have better yield: due to subsidies
    - Worse yield because of population aging
  - Contribution rate t is not linked to benefit amount b
    - Contribution is the same as tax in Period 1→ Distortion due to substitution effect
  - Liquidity constraints: Savings a cannot be negative
    - If contribution is more than the amount you want to save, the utility will decrease.
  - Interest rates r change due to general equilibrium effects
    - When pay-as-you-go
  - Labor supply in Period 2 is not zero but is decided endogenously.
  - In the first place, we do not solve this kind of utility maximization problem

Public pension & capital

- In a simple model, old-age pensions substitute savings
  - Pension increases, private saving decreases
- Effects on macro capital accumulation depends on design
  - Pay-As-You-Go
    - Private saving decrease, govt saving = 0
    - Total savings (=capital accumulation) decrease
  - Fully Funded
    - Private saving decrease = govt saving increase
    - Total savings (=capital accumulation) unchange
      - If govt saving (funds) are perfect substitute to the private
- Inflation-linked benefits
  - Reduced risk of future income: decrease in precautionary savings

Public pension & labor supply

- Effects on labor supply: Working generations
  - If contributions are considered a tax, the same effect as income tax.
    - Substitution effects generates deadweight loss
- Effects on labor supply: Retired generations
  - Labor restraint
    - Induced retirement
- Intra-generational and inter-generational inequality (later)