

Evaluation of the 2014 Quinquennial Valuations of SSPs in Japan

St. Johns Joint Colloquium

2016/6/27

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Contents

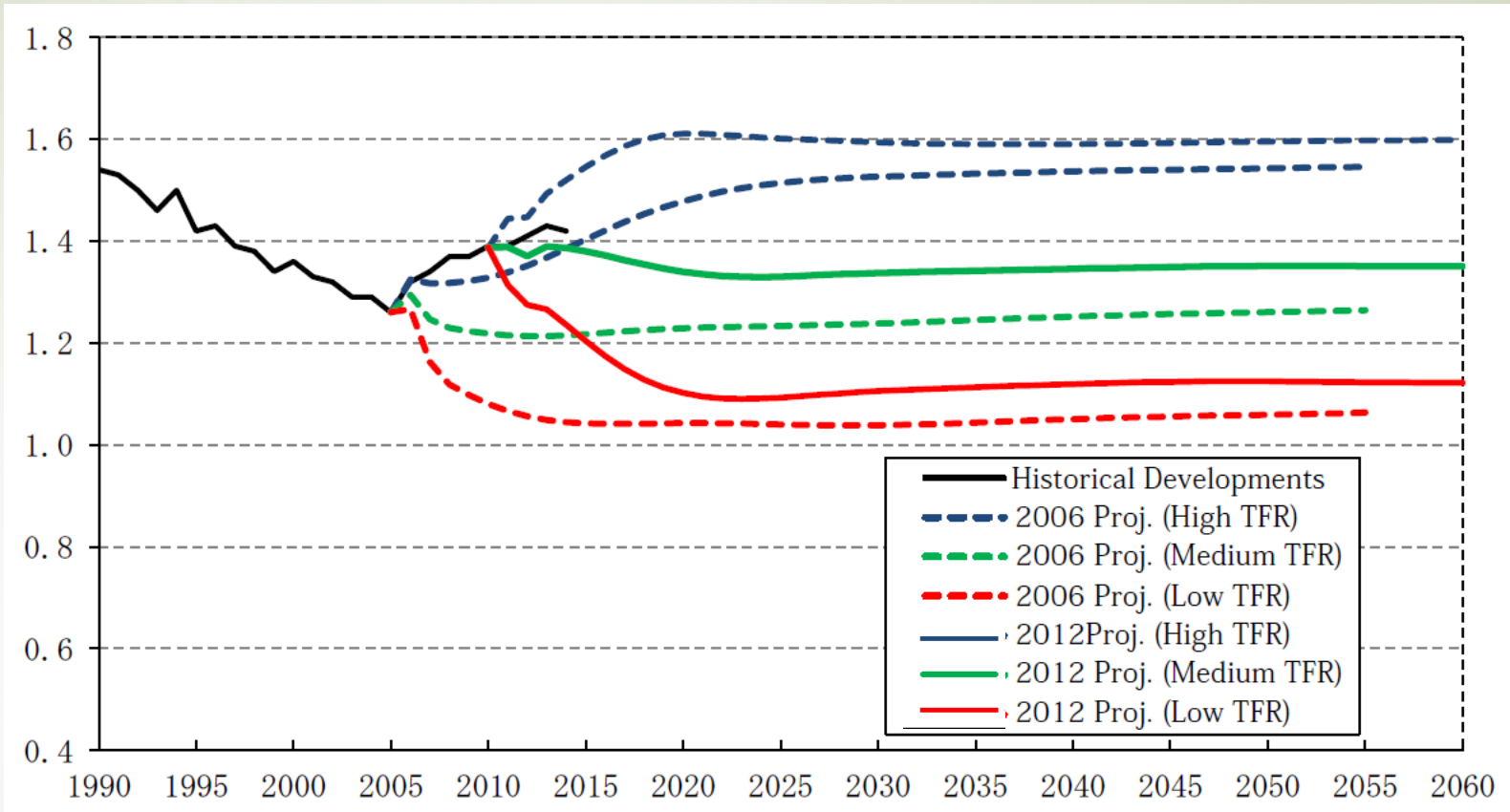
1. Outline of the 2014 Valuations
2. How we should line up the assumptions of a valuation?
3. To what extent and how we should keep consistency between the assumptions of a valuation and the investment policies?
4. How to encourage the actuarial staffs to obtain actuarial qualifications
5. What is the expected role of the actuary's opinion
6. The major vulnerability of the SSPs in Japan

Contents

1. Outline of the 2014 Valuations
2. How we should line up the assumptions of a valuation?
3. To what extent and how we should keep consistency between the assumptions of a valuation and the investment policies?
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Fertility Rate Assumptions

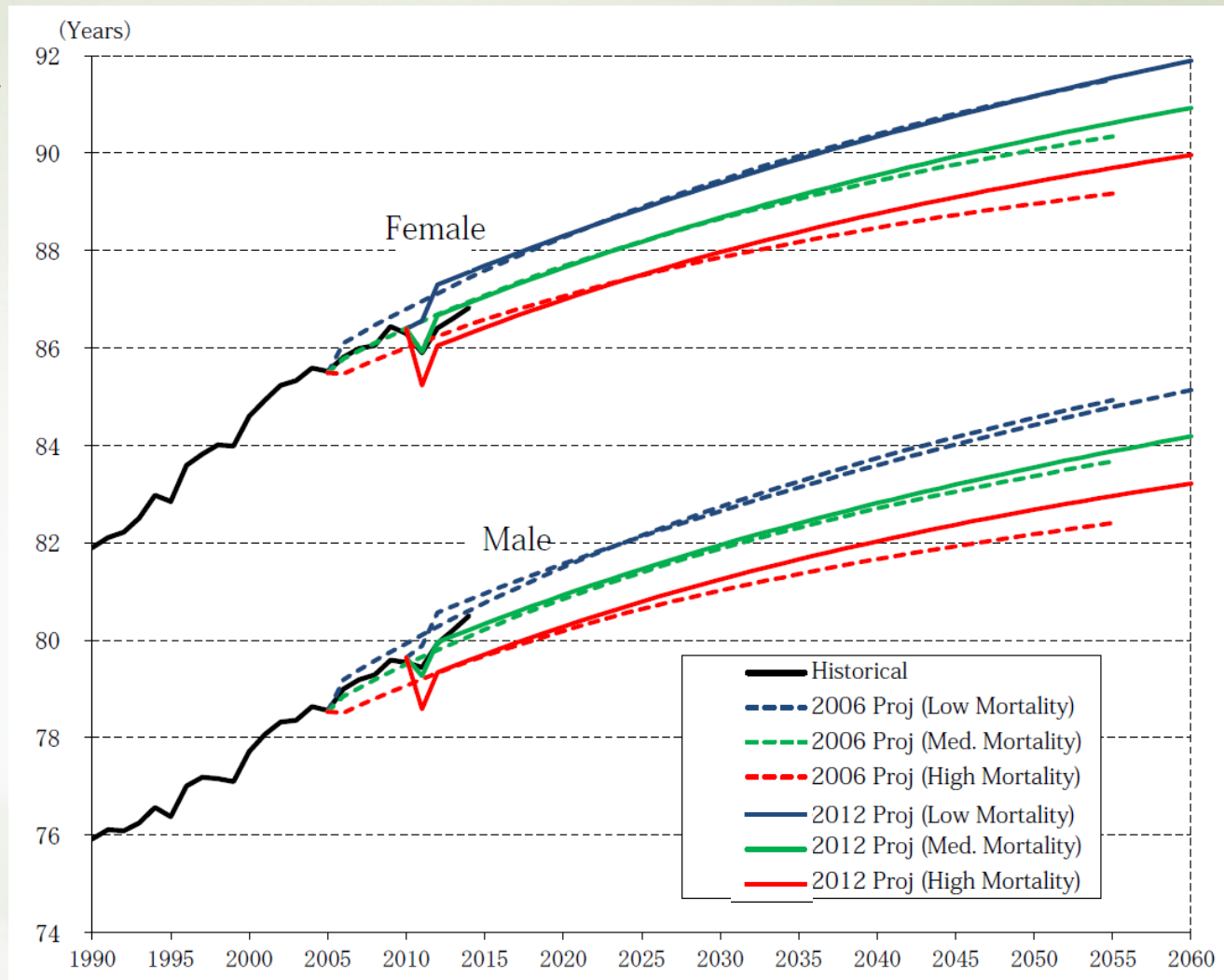
TFR



Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

Mortality Assumptions

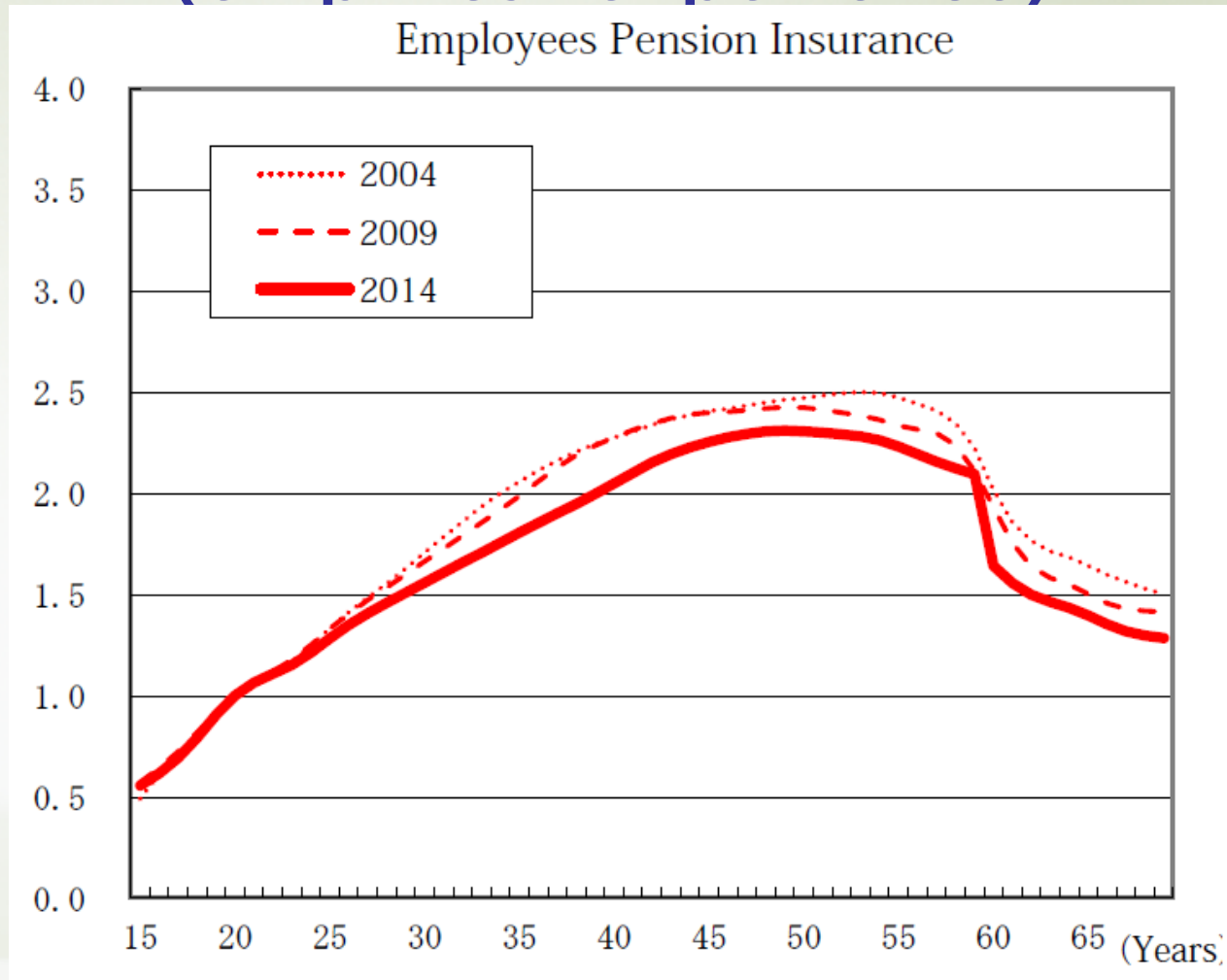
Life
Expectancy
at Birth



Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

Salary Scale (empirical experience)

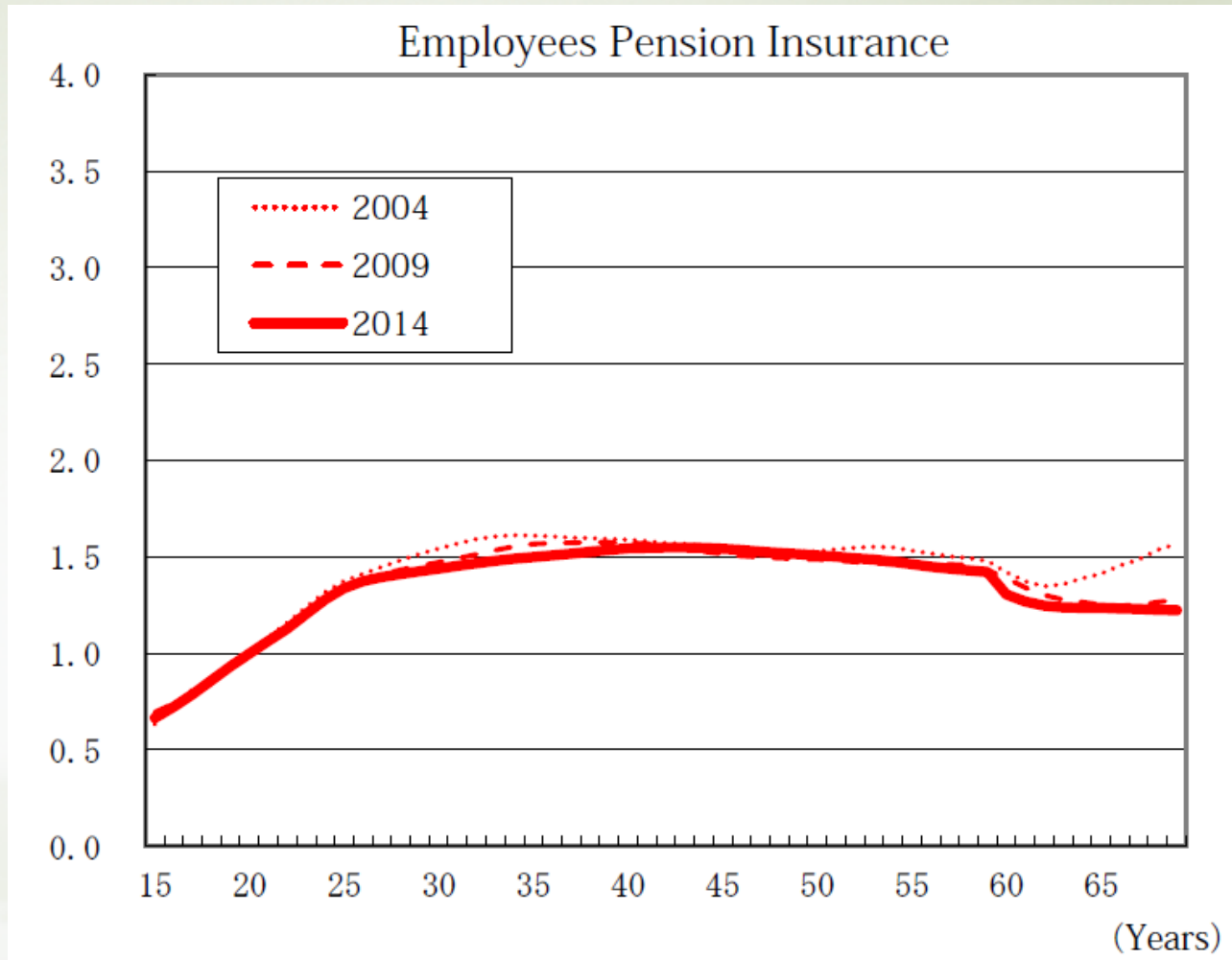
Males



Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

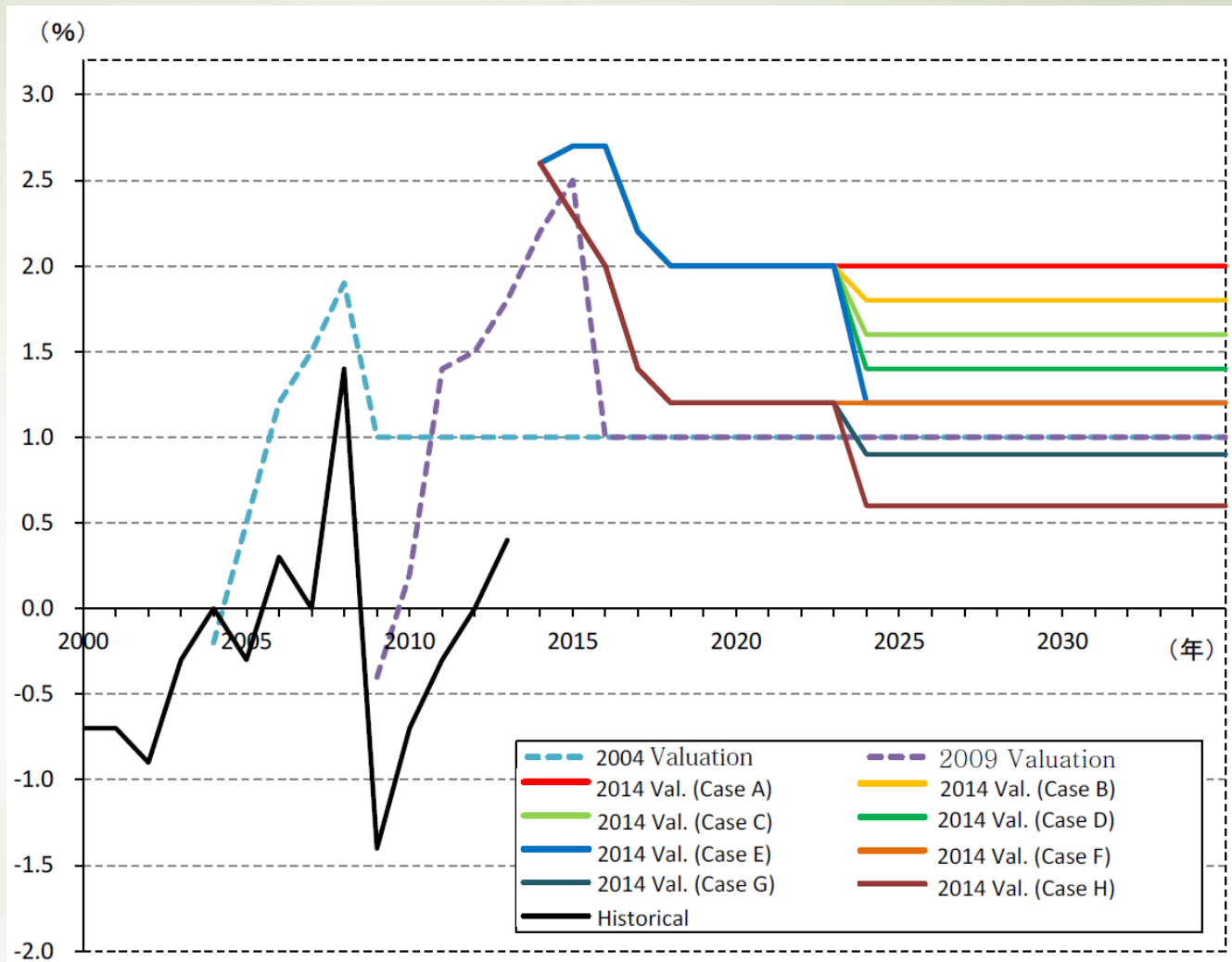
Salary Scale (empirical experience)

Females



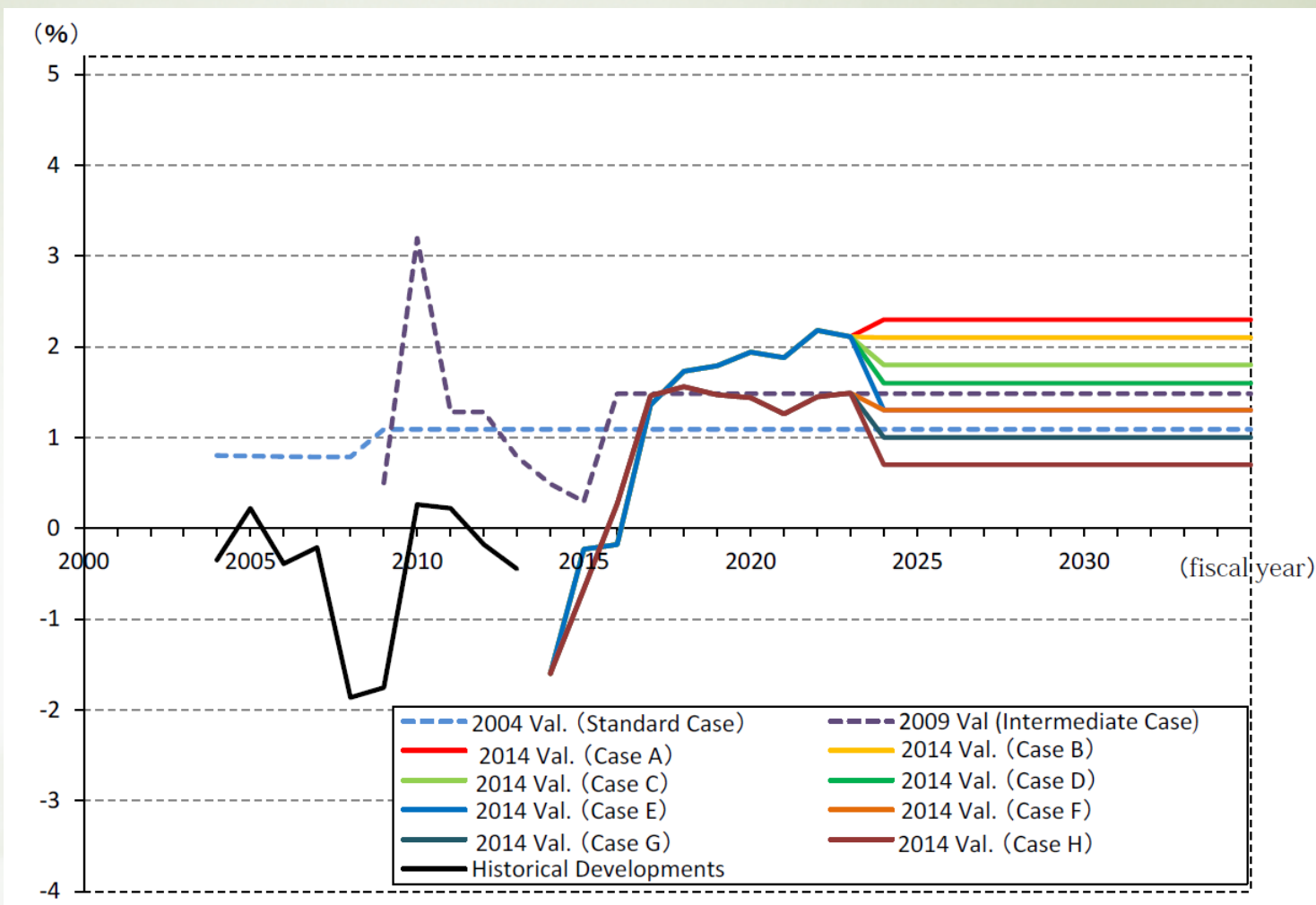
Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

Assumptions on Inflation



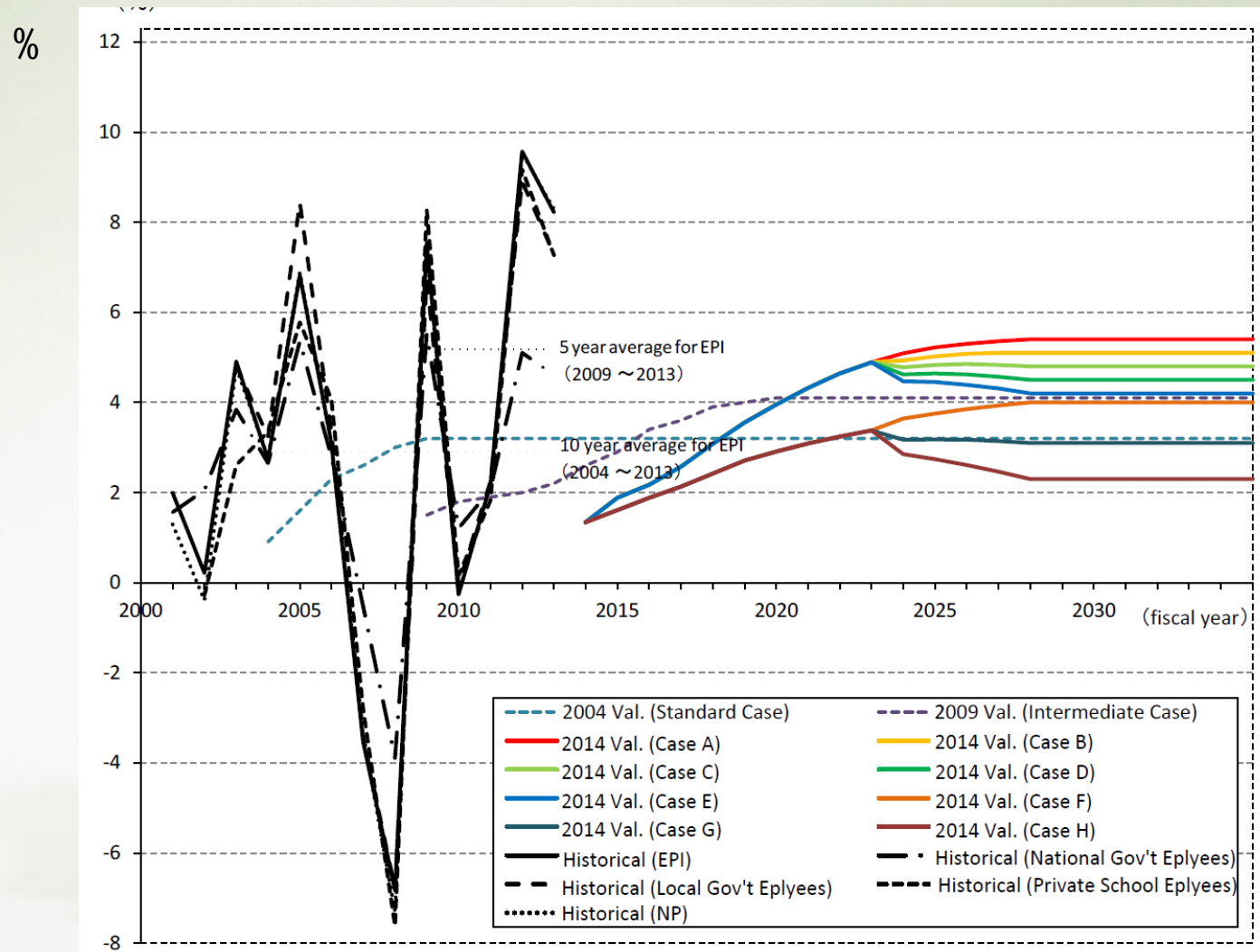
Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

Assumptions on Real Wage Growth Rates



Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese) 9

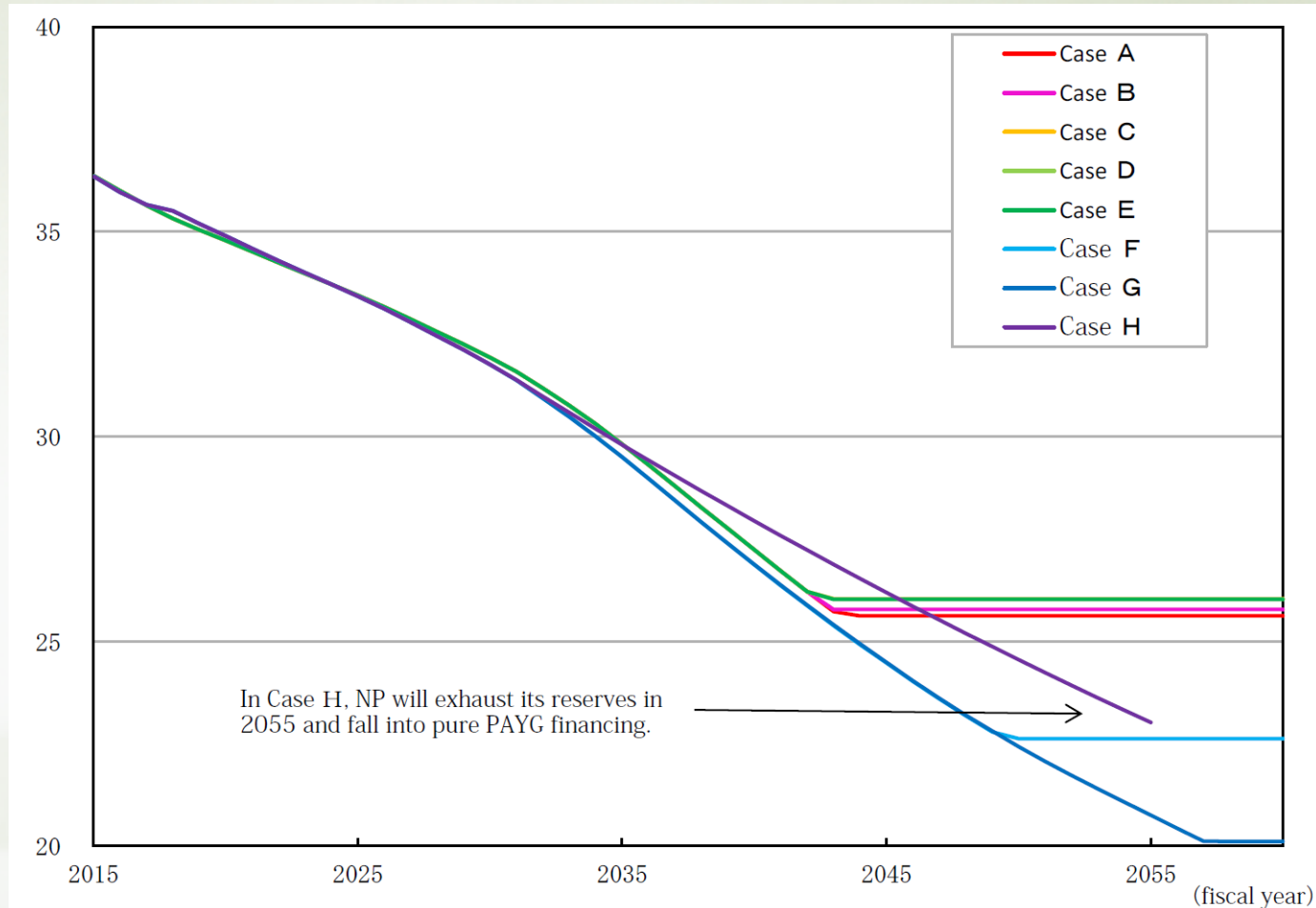
Assumptions on Investment Return



Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese) 10

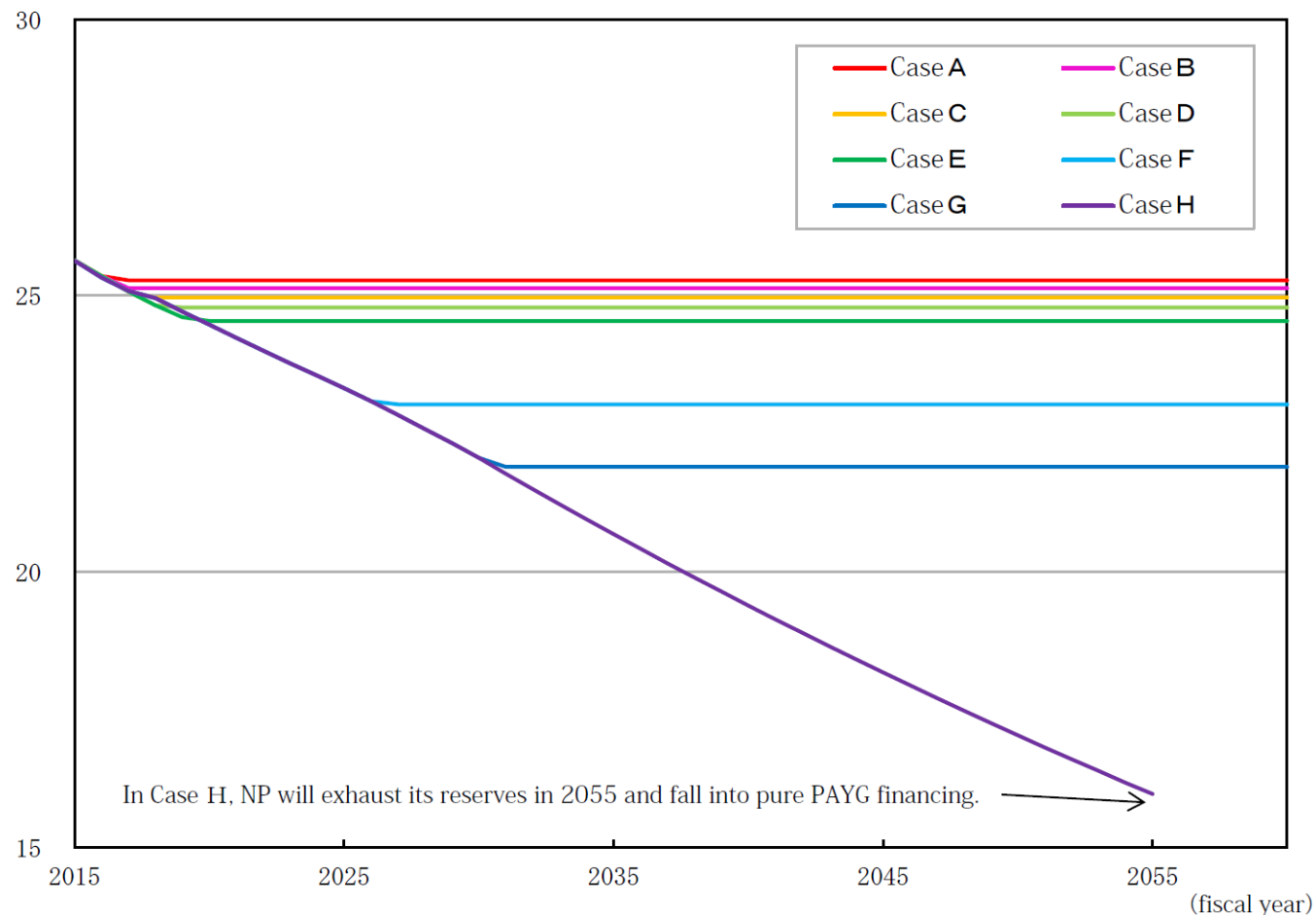
Projection of the Replacement Rates (EPI, Basic Pension-portion)

(Replacement rate, %)



Projection of the Replacement Rates (EPI, Earning related-portion)

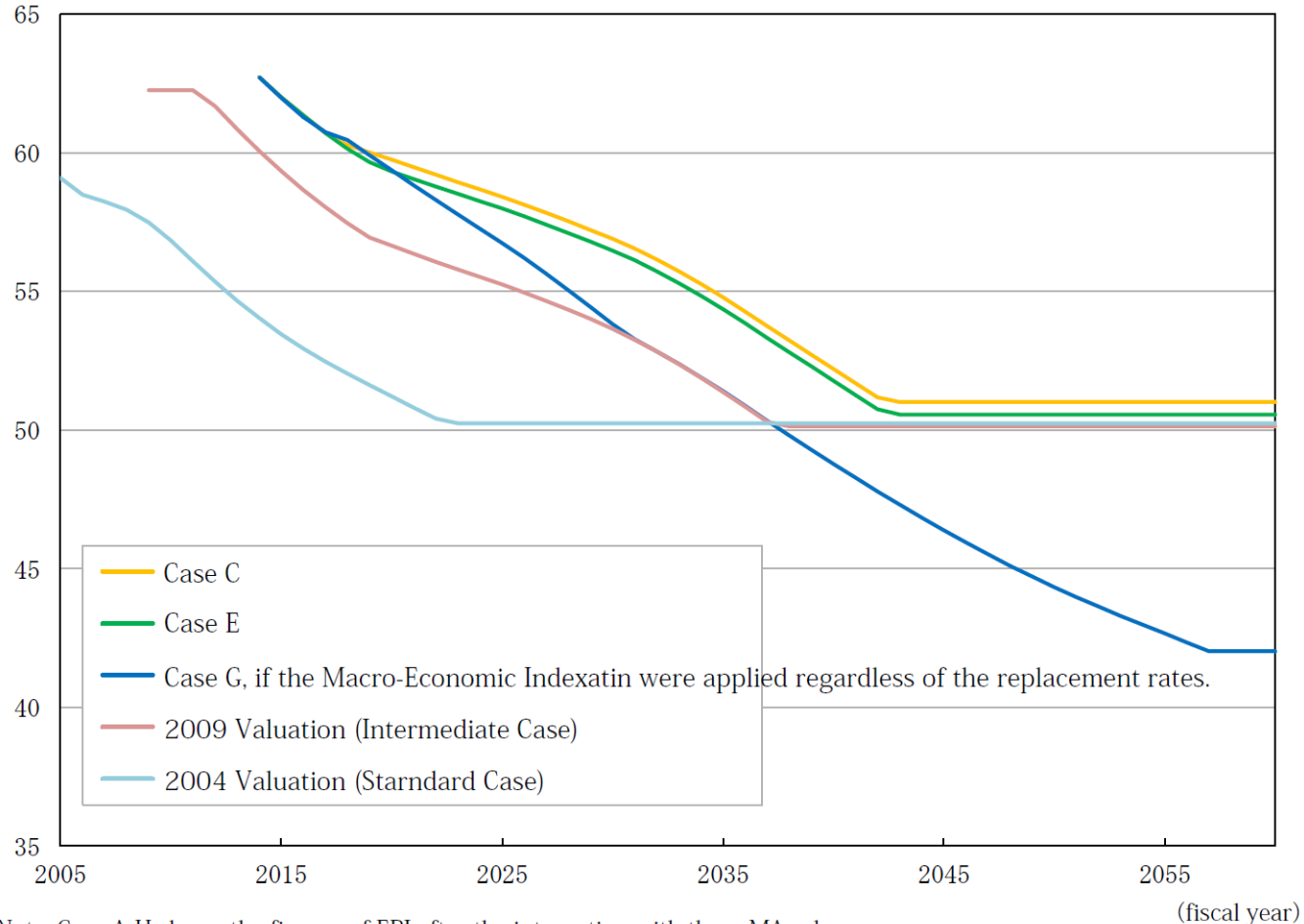
(Replacement rate, %)



Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

Projection of the Replacement Rates (EPI, total)

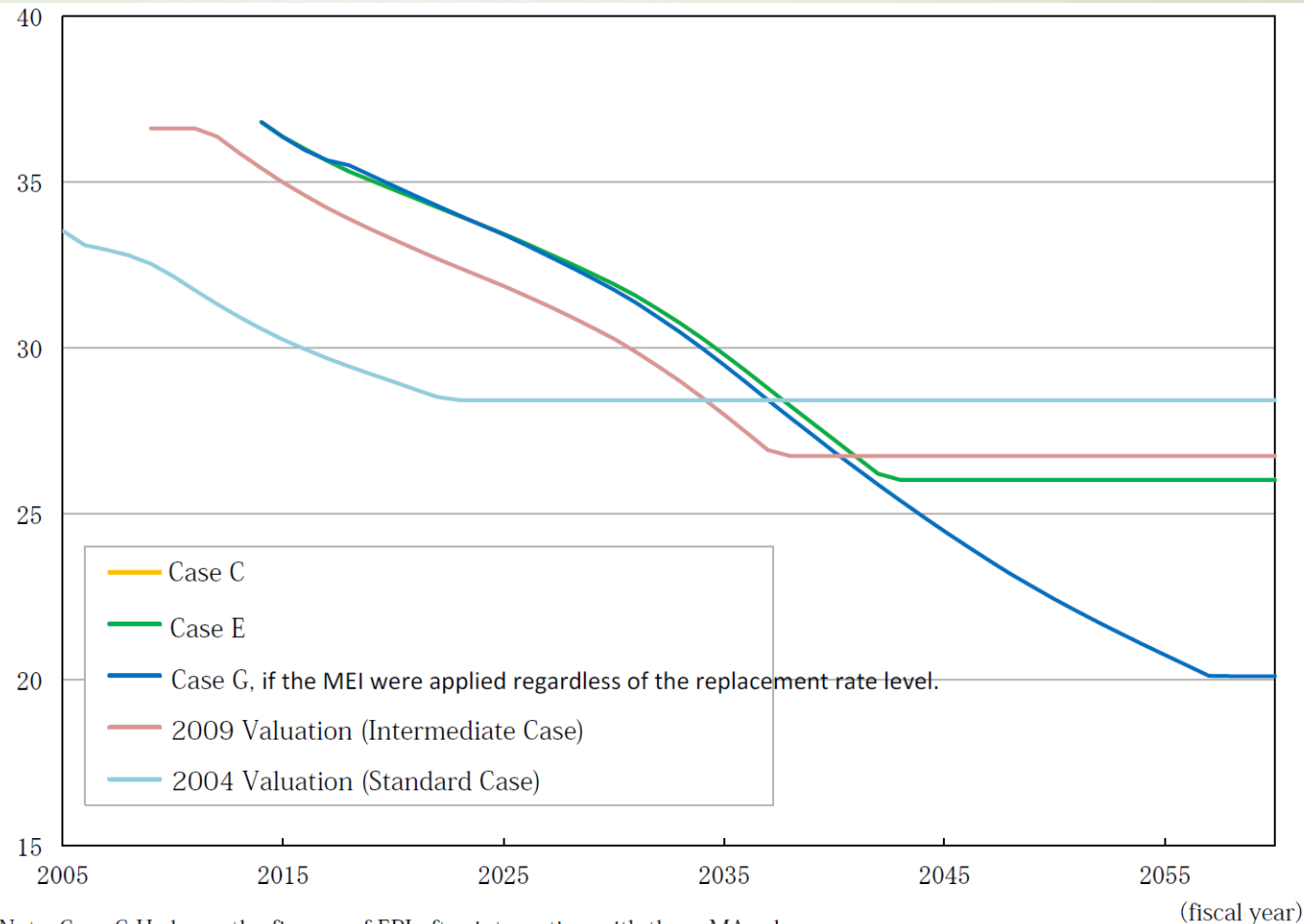
(Replacement rate, %)



Note: Case A-H shows the figures of EPI after the integration with three MA schemes.

Projection of Replacement Rates (EPI, BP-portion)

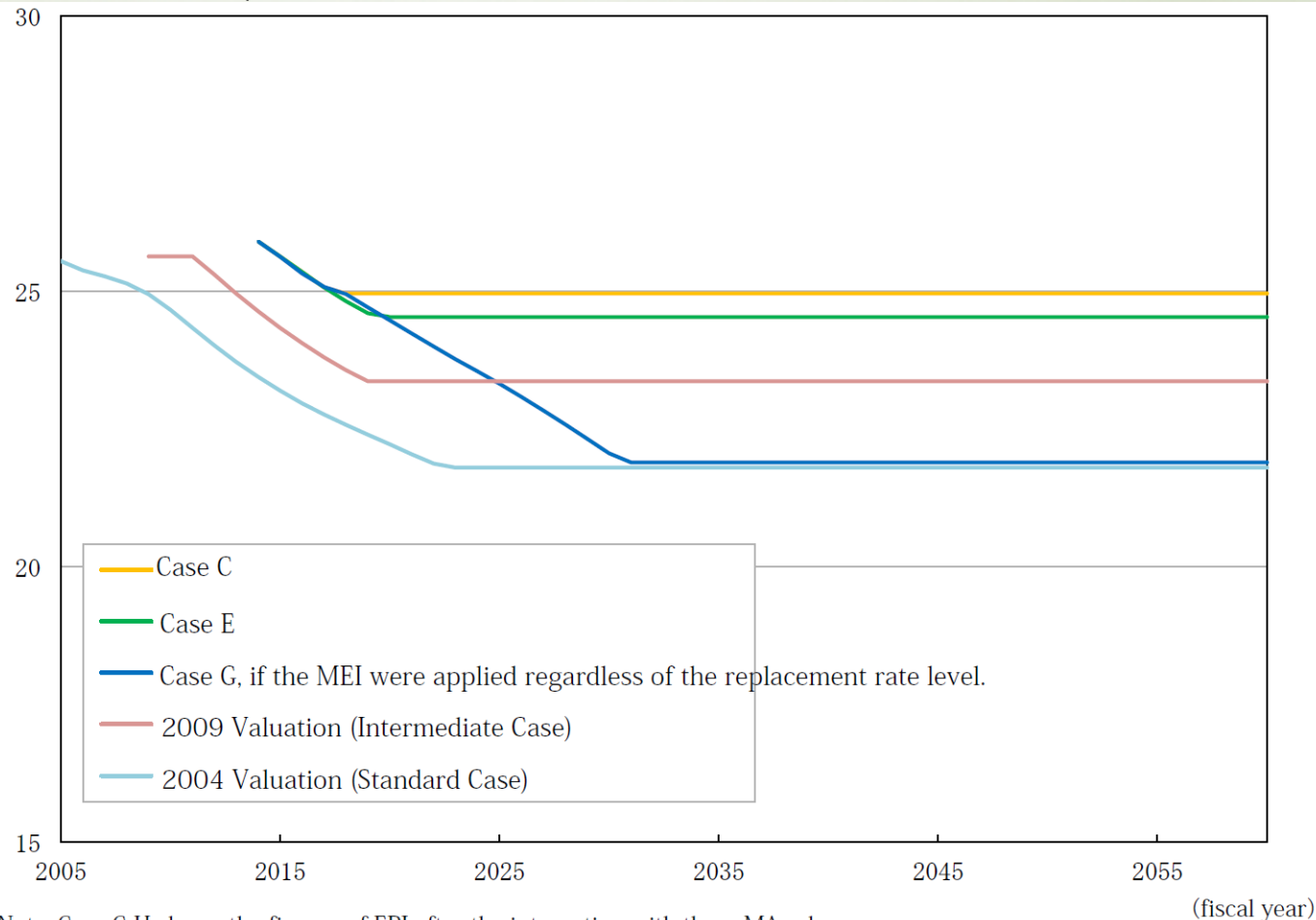
(Replacement rate, %)



Note: Case C-H shows the figures of EPI after integration with three MA schemes.

Projection of Replacement Rates (EPI, Earning related-portion)

(Replacement rate, %)



Note: Case C-H shows the figures of EPI after the integration with three MA schemes.

Contents

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Eight Sets of Economic Assumptions Put on an Equal Footing

		Factors of Production		Economic Assumptions for the 2014 Valuation				(For Reference)
		Labour Force Participation	Growth of Total Factor Productivity	Consumer Price Inflation Rates	Real Wage Growth Rates	Investment Yields		Real Economic Growth Rates (for 20-30 years after 2024)
						Real Yields	Spreads over Wage Growth	
Case A	Connecting to the 'main estimate of the Cabinet Office'	Significantly Improve	1.8%	2.0%	2.3%	3.4%	1.1%	1.4%
Case B			1.6%	1.8%	2.1%	3.3%	1.2%	1.1%
Case C			1.4%	1.6%	1.8%	3.2%	1.4%	0.9%
Case D			1.2%	1.4%	1.6%	3.1%	1.5%	0.6%
Case E			1.0%	1.2%	1.3%	3.0%	1.7%	0.4%
Case F	Connecting to the 'ref. estimate'	Not improve	1.0%	1.2%	1.3%	2.8%	1.5%	0.1%
Case G			0.7%	0.9%	1.0%	2.2%	1.2%	▲0.2%
Case H			0.5%	0.6%	0.7%	1.7%	1.0%	▲0.4%

With regard to Wage Growth Rates, we assumed that the male-female discrepancy will continue shrinking until 2030 (cumulatively by about 15%).

Government Explanation

- *The valuation results of a SSP are rather a projection of the present data sets to the long-distant future, not an exact forecast.*
- *From this point of view, we set up eight sets of economic assumptions spanning widely from an extremely pessimistic one to a very optimistic one.*
- *By showing how the financial situations of the plan will evolve respectively, we tried to provide an objective basis for discussions on various issues of pension reform.*

An Issue with Relation to the Statutory Task of a Valuation

- In Japan, one of the major tasks of a valuation is to determine the stopping year of applying the Macro-economic Indexation.
- If all the sets of assumptions are put on an equal footing and the main set of assumptions is not specified, then:
 - How should we should accomplish the purpose of determining the stopping year in a transparent manner?

Does ISAP2 Cover the Issue?

2.3 Assumptions --- *If the actuary sets the assumptions, the actuary should use neutral assumptions in a financial analysis of an SSP. Neutral assumptions are such that the actuary expects that the resulting projection of the SSP experience is not a material underestimate or overestimate.*

2.3.6 *The actuary should consider including in the analysis projections based on other sets of assumptions such as those that would result in high projected costs and those that would result in low projected costs (the rest is omitted).*

Do the ISSA-ILO Guidelines Cover the Issue?

Guideline 2. Assumptions

(Omitted) Social security institutions should assign major responsibilities to an actuary in the assumption setting process. An actuary should provide an opinion on the extent to which the assumptions used for work are reasonable and appropriate in the aggregate and individually.

Principles:

The social security institution should guarantee the independence of the actuary and, in particular, ensure that no parties exercise undue influence. In particular, if assumptions used do not represent the actuary's best estimates, the alternative results based on best-estimate assumptions should be presented. Further the justification for such deviation should be required if the impact is material.

Recommendation of the Actuarial Committee

- *Further consideration should be given to the issue and improve the way of showing the results, such as:*
 - *utilizing the approach of stochastic projection and expressing each results together with its probability of occurrence.*

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Recognition and Measurement of Investment Risk in the 2014 Valuation

- (Omitted) we derived the expected 'substantial' return from the assumption of economic growth. Here, 'substantial' return means the excess nominal return of the asset class relative to the nominal wage growth rate.
- Then, we calculated the expected variance-covariance matrix of the 'substantial' returns and drew the efficient frontier.
- We can calculate the expected 'substantial' return obtainable under the risk level of domestic bonds from the efficient frontier obtained above.
- Comparing the expected 'substantial' return of the portfolio and that of domestic bonds, we can obtain the effect of diversified investment.

Recommendation of the Subcommittee on Economic Assumptions and Investment (1/2)

- *In composing the policy asset mix, we have evaluated the possibility that the amount of reserves will fall short of the amount of reserves projected in the valuation (and the amount falling short of the projected amount). However, this approach is very technical and not easy to understand.*
- *Therefore, we recommend adopting, as the criteria of investment risk tolerance, that the probability of underperforming the target will not surpass a certain threshold.*
- *In this case, even if we invested the full amount of reserves in domestic bonds, there still exists the risk of underperforming the target of nominal wage growth rate.*
- *Therefore, we recommend adopting, as the criteria of investment risk tolerance, that the probability of underperforming the nominal wage growth rate will not surpass the said probability when investing the full amount of reserves in domestic bonds.*

Recommendation of the Subcommittee on Economic Assumptions and Investment (2/2)

- *In addition, proper consideration should be given to the efficiency of investment return per unit risk and the fact that equities etc. might have greater possibility of underperformance than ordinary assumed.*
- *Further, investment of pension reserves aims at stabilizing the financial situation of the SSP and therefore investigation of the risk of underperforming the projected amount of reserves is still important from the point of view of Asset Liability Management.*
- *Until now, the GPIF has been checking the possibility of falling short of the projected amount of reserves and the average amount of expected shortfalls on condition of underperformance (namely, Conditional Value at Risk).*
- *The subcommittee recommends that the government should instruct the GPIF to implement this verification of the policy asset mix as a prudent attitude toward the investment risk.*

Characteristics of the New Policy Asset Mix

	'Substantial' Return	Nominal Return	Standard Deviation	Probability of Underperforming Wage Growth	Rate of Conditional Average Shortage (Under Normal Dist.)	Rate of Conditional Average Shortage (Under Empirical Dist.)
Medium Economic Growth	1.77%	4.57%	12.8%	44.4%	9.45%	11.2%
Based on Current Market	1.98%	4.08%	12.8%	43.8%	9.38%	11.2%

(For Reference) Characteristics of the Portfolio Composed Only by Domestic Bonds

Medium Economic Growth	-0.20%	2.60%	4.7%	51.7%	3.86%	3.52%
Based on Current Market	-0.10%	2.00%	4.7%	50.8%	3.83%	3.48%

(Note 1) The target investment return is 1.7% per annum. However, taking account of the short-term assets composing 2% of the total, it is required to generate the return of 1.77% when assuming medium economic growth and 1.76% under current market conditions.

(Note 2) The rate of conditional average shortage under the empirical distribution was calculated by generating random numbers under the empirical distribution, considering that equities etc. might have the risk of underperformance (tail risk) larger than originally assumed.

Government's Instruction to GPIF

- (omitted) GPIF should formulate the policy asset mix from the long-term perspective, based on the forward-looking risk analysis and paying due considerations to the generally approved professional knowledges (omitted).
- In that case, the probability of falling short of the nominal wage growth rate should not surpass the said probability in the case of investing the full amount of reserves in domestic bonds.
- In addition, GPIF should pay sufficient attention to the empirical experience that equities' probability of underperformance is sometimes greater than ordinary supposed.
- Besides, GPIF should evaluate appropriately the probability that the amount of reserves will be smaller than the amount projected in the actuarial valuation. GPIF should also enhance the exercise of verifying the policy asset mix using the scenario analysis by, for instance, applying more depressed plural risk scenarios.

Do the ISSA-ILO Guidelines Cover the Issue?

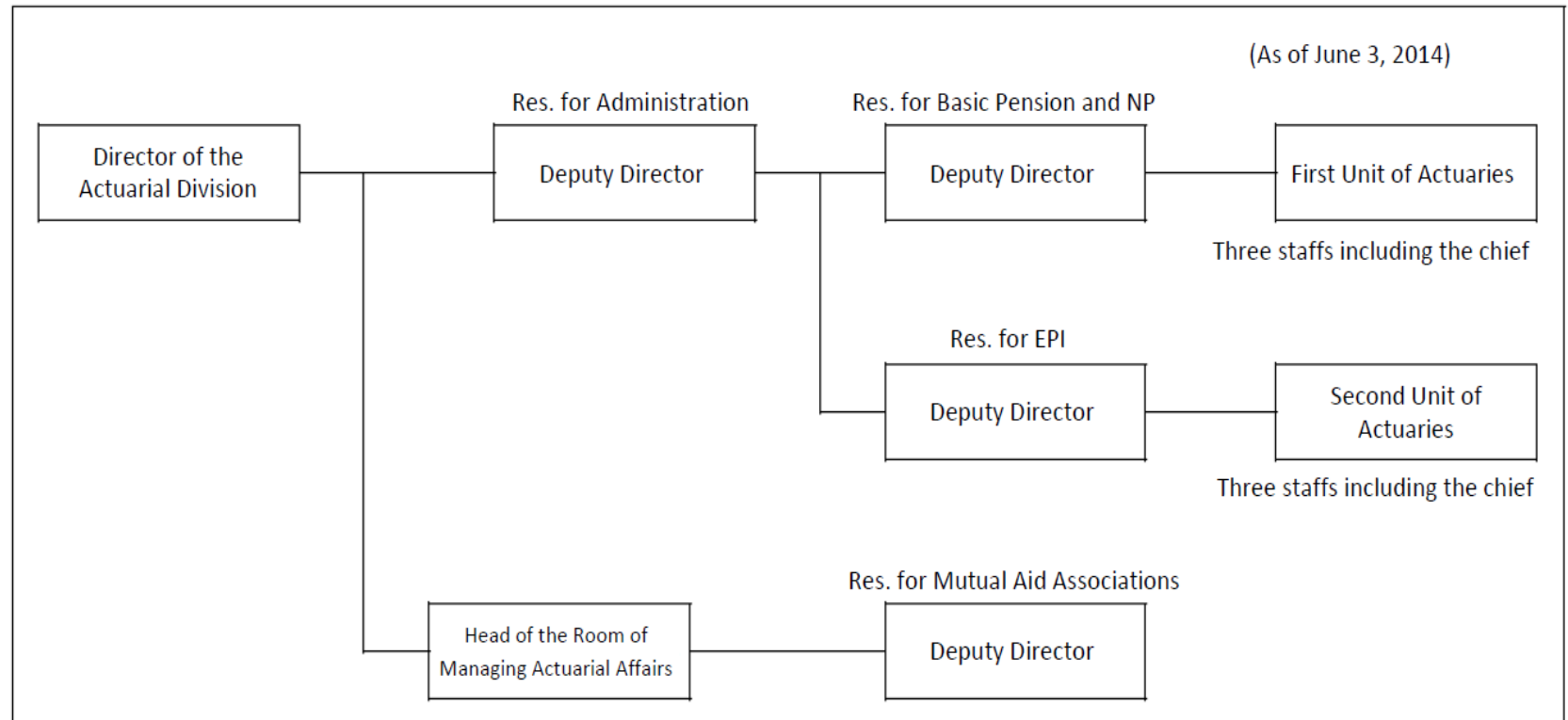
Guideline 19. Investment Governance

- *The requirement for actuarial input and the role of the actuary should be clearly defined in investment governance framework.*
- *(omitted) the requirement for actuarial input and/or the involvement of the actuarial department should be specified.*
- *(omitted) the actuary is likely to input into the overall investment governance structure of the institution given his or her overview of the different processes and appreciation of risk.*

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Organisation and Staffing of the Actuarial Division of MHLW



Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

Expertise of Actuarial Staffs

As of June 3, 2014

Organisational Positions	Carrier in the Govt	Experience in	
		Pensions	Exp. in Actuarial Div.
Director of the Actuarial Division	33 yrs 2mths	29 yrs 2mths	19 yrs 9mths
Responsible for Administration			
Deputy Director	18 yrs 2mths	9 yrs 1 mth	6 yrs 1 mth
Responsible for EPI			
Deputy Director	13 yrs 2mths	7 yrs 9mths	3 yrs 11mths
Chief of the First Unit	4 yrs 2mths	4 yrs 1 mth	4 yrs 1 mth
Unit Member	2 yrs 2mths	2 yrs 1 mth	2 yrs 1 mth
Unit Member	2mths	1 mth	1 mth
Responsible for Basic Pension & NP			
Deputy Director	10 yrs 2 mths	7 yrs 0 mth	2 yrs 10mths
Chief of the Second Unit	3 yrs 2 mths	11mths	11mths
Senior Unit Member	11 yrs 2 mths	11 yrs 2 mths	2mths
Head of the Room of Managing Act. Affairs	24 yrs 2 mths	15 yrs 10 mths	13 yrs 1 mth
Responsible for Mutual Aid Ass.			
Deputy Director	14 yrs 2 mths	11 yrs 11mths	8 yrs 8mths

※ 'Experience in Pensions' means the total length of experiences in the Pension Bureau of MHLW, Mutual Aid Division of the Budget Bureau of MoF, the Japan Pension Service, NPFA, PFA, the Research Institute for Policies on Pension and Aging, etc.

Material: Actuarial Committee of the Council on Social Security (2016), "Peer Review of the SSPs Based on the 2014 Actuarial Valuations" (in Japanese)

What the ISSA-ILO Guidelines Say?

Guideline 44. Qualifications

- *Actuaries and other social security professionals providing actuarial services for social security schemes should possess appropriate qualifications and expertise to fulfil their responsibilities.*
- *In particular, for a qualified actuary this means that he or she should be a member of a national (or international) professional actuarial association and follow appropriate professional standards, rules or professional conduct and continuing professional development requirements.*

Are Actuarial Qualifications not Relevant as far as the SSPs in Japan Are Concerned?

1. Difficult for a small group of actuarial staffs to develop and maintain proper professional standards and rules of professional conduct.
2. Difficult for a small group of actuarial staffs to provide its members with plenty of opportunities for CPD.
3. Internally defined qualification mechanisms, professional standards, or rules of professional conduct (if any) seem not sufficient for obtaining trust from the public.
4. Should consider extending opportunities of personnel exchanges among various governmental organisations and/or private financial institutions.

Contents

1. Outline of the 2014 Valuations
2. How we should line up the assumptions of a valuation?
3. To what extent and how we should keep consistency between the assumptions of a valuation and the investment policies?
4. Should the expression of uncertainty be subordinate to political considerations?
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7. The major vulnerability of the SSPs in Japan

Opinion of the Actuary (1/3)

In the 2014 Valuation, we showed how the financial situation would evolve depending on possible economic developments, by setting eight sets of economic scenarios spanning widely from high economic growth and very low economic growth.

By doing so, we provided objective basis for various discussions on pension reforms, such as what is the most important factor for social security pension plans (SSPs), what kind of measures we could take for enhancing the sustainability of the SSPs and ensuring benefit levels.

Opinion of the Actuary (2/3)

In the 2014 Valuation, we also made a projection under such a very depressed case where labour force participation of the elderly and females does not improve and negative economic growth continues.

In my opinion, it is essential to upgrade the environment friendly for giving birth and growing children, and upgrade the working environment friendly for the elderly and females in any case, thus resurrect Japan's economy and achieve sustainable growth.

Opinion of the Actuary (3/3)

As a result, we confirmed that it would be possible to ensure 50% level of the replacement rate for a long time to come under the current pension systems, if we succeed in resurrecting Japan's economy and improving labour market participation of the elderly and females.

No Signature

ISAP2

3.2.2 (excerpt) The opinion should include a statement with respect to the extent to which the SSP is financially sustainable over the period covered by the projections used for the financial analysis. Financial sustainability of an SSP relates to its continuous capacity to support the benefits offered by the SSP when considering the applicable financing rules and the future demographic and economic environment in which it will operate.

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A Singular Financial Structure of Japan's Social Security Pension Plans

- The costs of paying the Basic Pension are shared among the SSPs pro rata to the number of active participants of the SSPs. Almost all the costs of NP is the costs of Basic Pension assigned to NP.
- Therefore, the burden of NP becomes lesser if the number of its active participants decreases.

Three possible options to enhance the financial status of the National Pension

- A. Modifying the mechanism of sharing the burden of paying the Basic Pension between the SSPs and mitigating the burden of NP.
- B. Decreasing the active participants of NP by transferring them to EPI as many as possible.
- C. Directly transferring some of the reserves of EPI to NP.