

2004 Social Security Pension Reform in Japan

~ A Search for Automatic Balancing Mechanism to Be Applied to the Fastest Ageing Country ~

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1. Introduction

In spite of the drastic reform in 2000, Japan's social security pension schemes came to be forced to look for another reform when the National Institute of Population and Social Security Research (NIPSSR) published the new population projection in January 2002. It showed further graying of the Japanese population by assuming further declining birthrates and further improved mortality rates than what the 2000 reform assumed, destroying the long-term financial balance delicately acquired by the 2000 reform. On the other hand, the politicians of both government parties and opposition parties had already become fed up with the political battle on social security pension matters that was fought during the last decade. They knew and people felt the worthlessness of this sort of battle. Thus many politicians, scholars and other people concerned came to aspire after a mechanism that automatically restores financial balance even when another decline of birth rate or another improvement of life longevity occurs. They expected that such a mechanism would enable them to avoid frequently repeating reforms.

It was just when Sweden was about to finish its drastic reform of social security pension schemes that fixed the contribution rate and incorporated, under the fixed contribution rate, an automatic balancing mechanism into the scheme framework. It defines a certain ratio, and if it is less than 1, the scheme is judged to be financially imbalanced, and the benefit amount gained up to the time is reduced by being multiplied by the ratio. By doing so, the scheme is supposed to automatically recover its financial equilibrium. As a matter of course, we thoroughly studied the mechanism, and

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pondered over whether it was applicable to our case or not.

We concluded, however, that the Swedish instrument was not applicable to our case. It was partly because we found that the ratio would show a too optimistic result if applied to our case because our population was ageing much faster than that of Sweden. We, therefore, started to seek for another automatic balancing mechanism. In any case, the Swedish reform has given us a lot of hints as well as a momentum to seek for such an automatic mechanism for our reform.

In the end we have worked out a measure to modify the indexation to be applied to the benefit amount. Under the measure, we are to continue to modify the indexation until the financial equilibrium is attained. After the equilibrium is attained, we return to the current normal indexation. If the socio-economic environment worsens, we are to continue the modified indexation longer until the financial equilibrium is attained. Thus we can automatically obtain the financial balance even when another decline of birthrate or another improvement of mortality rate occurs. On the other hand, if the socio-economic environment improves, we can stop the modified indexation earlier than projected. In this case the ultimate benefit level is higher than projected.

First we proposed it in the consultation paper issued in December 2002, and, after refining upon it, we finalized the reform bill in February 2004. The bill passed the Diet on 5 June 2004.

It was a great coincidence that a very similar discussion went on in Germany just when we were occupied in preparing the reform bill in 2002-03. The German government also proposed a modified indexation under a contribution programme with the fixed upper limit, and the reform bill passed the Parliament in March 2004, three months earlier than our case.

In the following, we would like to explain the automatic balancing mechanism of Japanese version that forms the core of the 2004 reform². You will see that, contrary to the Swedish case, the Japanese version will start to reduce the benefit level from the outset. The ageing of Japanese population gives us little allowance to stay on in the current level of benefit.

2. Population Projection

The population projection forms the basis to project the future financial conditions of the social security pension schemes. If it projects less births and smaller mortality, it affects the future financial

² For the scheme as of the 2000 reform, please see Sakamoto (2000).

conditions of the social security pension schemes. In this section, we get a glimpse at population projections of the last two decades that motivated and directed the recent reforms including the 2004 reform.

(1) Population projection and period total fertility rate

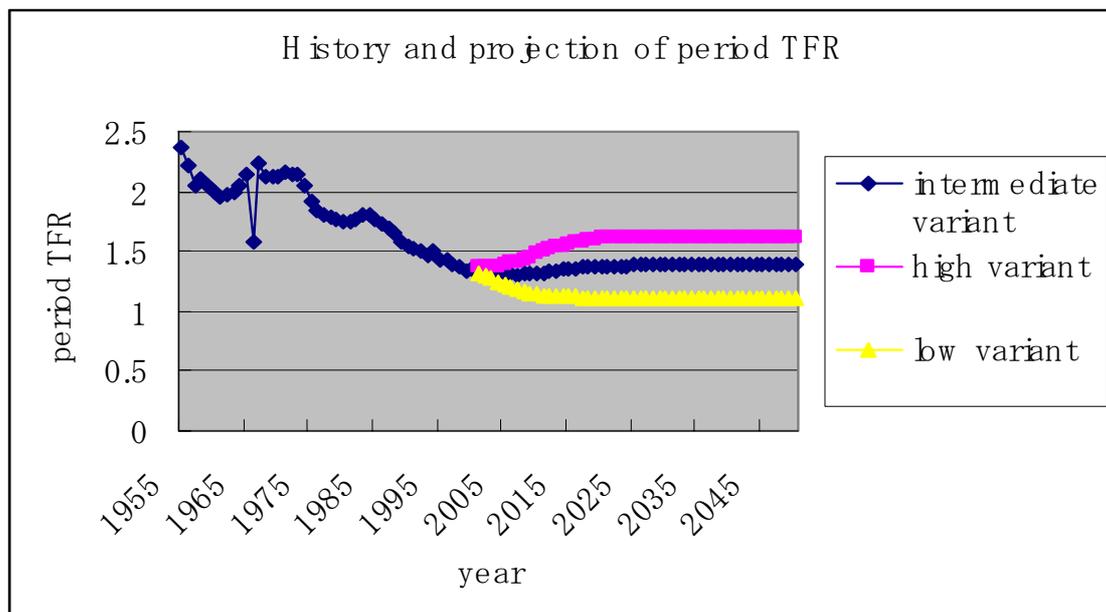
The NIPSSR reviews the population projection every five years on the basis of the results of the National Census that is also undertaken every five years. It also takes account of various statistics and surveys such as the vital statistics collected by the Ministry of Health, Labour and Welfare (MHLW).

Apart from the population projection, the MHLW publishes the period TFR³ every year, taking account of both the latest National Census and the vital statistics collected every year. As Figure 1 shows, the period TFR seemed to stay around the level of 1.80 in early 1980's. Furthermore, because it had not been more than ten years since it had dropped below 2.00, very few people then wondered whether the population projection assuming that the ultimate cohort TFR⁴ return to 2.00 was too optimistic. Thus, until the 1986 projection, the ultimate cohort TFR was assumed to be 2.00.

(Fig.1)

³ TFR denotes the total fertility rate. The period TFR of the year is the sum of the birth- rates of the females aged between 15 and 49 in the year.

⁴ The cohort TFR means how many children the females of the same birth year give birth to in average between the age of 15 and 49.



In the latter half of 1980's, however, the declining tendency of the period TFR became conspicuous. It never fluctuated but just decreased. The period TFR of 1.76 in 1985 dropped to 1.54 in 1990. The decline was attributed to the increase of the average age of initial marriage of females⁵. At the same time, it was perceived that the number of females who would not get married for life was threatening to increase. The 1992 projection naturally paid attention to this fact, and assumed the ultimate cohort TFR for the intermediate case to be 1.80 that was below 2.00 for the first time.

The period TFR, however, did not stop declining. It dropped to 1.42 in 1995. Under such circumstances the 1997 projection decreased the ultimate cohort TFR by 0.19 and assumed it to be 1.61. The decrease of the ultimate cohort TFR was attributed to the further increase of the assumed portion of females unmarried for life in the future.

Even after 1995, the period TFR showed a declining tendency. It dropped to 1.36 in 2000. The NIPSSR analyzed the statistical data in detail and concluded that the portion of the females unmarried for life would increase further and that the average number of children a married couple would give birth to was decreasing. The latter conclusion was perceived for the first time. It had been believed for a long time that couples would give birth to about 2 or more children in average. The 2002 projection reflected these tendencies and assumed the ultimate cohort TFR to be 1.39 for the intermediate case.

⁵ In Japan it is very rare for legally unmarried couples to have their children. It can, therefore, be said that, when the average age of initial marriage of females is rising, the period TFR goes down, and that the more there are females unmarried for life, the smaller the number of births will be.

(Table 1)

Comparison of the 2002 population projection with the 1997 projection

(intermediate case)

	2002 projection	1997 projection
average age of women's first marriage	24.4 (cohort born in 1950) >>> 27.8 (cohorts born in 1985 and later)	24.2 (cohort born in 1945) >>> 27.4 (cohorts born in 1980 and later)
average number of births per married couple	2.14 (cohorts born in 1948-52) >>> 1.72 (cohorts born in 1985 and later)	2.18 (cohorts born in 1943-47) >>> 1.96 (cohorts born in 1980 and later)
ratio of the number of women unmarried for life to the total number of women in the same cohort	4.9% (cohort born in 1950) >>> 16.8% (cohorts born in 1985 and later)	4.6% (cohorts born in 1941-45) >>> 13.8% (cohorts born in 1980 and later)
total fertility rate	1.36 (2000) >>> 1.31 (2007) >>> 1.39 (2050)	1.42 (1995) >>> 1.38 (2000) >>> 1.61 (2050)
life expectancy	male: 77.64 (2000) >>> 80.95 (2050) female: 84.62 (2000) >>> 89.22 (2050)	male: 76.36 (1995) >>> 79.43 (2050) female: 82.84 (1995) >>> 86.47 (2050)

(Table1)

Comparison of the 2002 population projection with the 1997 projection (continued)

(intermediate case)

	year	2002 projection	1997 projection
total population	2000	126,926 thousand	126,892 thousand
	2025	121,136	120,913
	2050	100,593	100,496
	2070	82,506	83,773
population aged 65 and over	2000	22,041 thousand	21,870 thousand
	2025	34,726	33,116
	2050	35,863	32,454
	2070	29,043	25,098
ratio of the population aged 65 and over to the total population	2000	17.4%	17.2%
	2025	28.7	27.4
	2050	35.7	32.3
	2070	35.2	30.0
ratio of the population aged 65 and over to the population aged between 20 and 64	2000	27.9%	27.7%
	2025	51.9	50.2
	2050	71.9	64.6
	2070	71.1	57.8

(2) Population projection and mortality rate

Every year, based on the vital statistics, we can obtain the death rate for each age. The NIPSSR compares it with the assumptions used for the latest population projection. Every time the NIPSSR

reviews the population projection, it finds that the experienced rate is, by and large, smaller than the assumed rate. This has continued for a very long time. In other words, each projection assumed the improved mortality rate in comparison with the previous one. In fact, as Table 1 shows, the ultimate life expectancy of the 2002 projection is 80.95 years for males that is 1.52 years longer than the 1997 projection and is 89.22 years for females that is 2.75 years longer than the 1997 projection.

3. Reforms in the Last Decade

As noted above, the 1992 population projection assumed the ultimate cohort TFR to be 1.80 that was below 2.00 for the first time. Together with the mortality improvement, it aggravated the financial basis of the social security pension schemes. The 1994 pension reform aimed at restoring their financial soundness. It raised the contribution rate and changed the indexation basis from the per-capita gross earnings to the per-capita net earnings. It raised the pensionable age of the flat-rate part of the Employees' Pension Insurance (EPI) scheme benefit from 60 to 65 as well. These changes were, in a sense, something that required pains on the part of the active participants as well as the pensioners. Anyway most of the knowledgeable people thought that the schemes had attained the financial sustainability and would not be changed for a fairly long time.

Contrary to their expectations, the 1997 population projection mercilessly worsened the future financial conditions of the schemes. It led to the 2000 reform. The 2000 reform changed the indexation basis for pensioners aged 65 and over from the net earnings to the Consumer Price Index (CPI) though it could not propose to raise the contribution rate due to the lingering economic recession. It also raised the pensionable age of the whole of the EPI scheme benefit from 60 to 65, lowered the level of the earnings-related benefits by 5% and extended the coverage of the EPI scheme to employees aged between 65 and 69. The reform law also stipulated the provision to raise the rate of national subsidy to the basic pensions from 1/3 to 1/2 by the year 2004 by securing the financial resources. These changes were thought to have narrowly attained the financial sustainability of the schemes if the raising of the national subsidy rate were to be realized in 2004 though securing the financial resources was a highly political problem and seemed tough to be realized.

In the 1994 reform, raising the pensionable age of the EPI scheme was a hotly debated issue. The trade unions strongly opposed it and demanded the connection of employment with pensions without break. In those days most of the companies set the mandatory retirement age at 60. The government eventually gave up raising the pensionable age of the total benefit and proposed to raise that of the

flat-rate part. The trade unions, however, never accepted the proposal. The bill passed the Diet by vote, but the conflict between the trade unions and the government lingered on even after the passage of the reform bill.

In the 2000 reform, the trade unions declared that they would never accept changing the benefit provisions nor raising the contribution rates. They insisted that the EPI contribution rate would remain as it was if we converted the basic pensions into a non-contributory scheme. They did not, however, elaborate the financial resources for the conversion. The government insisted that the benefit provisions should be changed in order to keep the ultimate contribution rate within a sustainable level and also warned them of the shortcomings of non-contributory schemes. The government was fiercely confronted with the trade unions. Likewise the government parties were also confronted with the opposition parties backed by the trade unions. In the end, the government parties decided to put the reform bill to the vote. The opposition parties resisted, but the bill passed the Diet.

4. 2002 Population Projection and Need for Reform

When the 2002 population projection was published, the Pension Bureau of the MHLW evaluated its cost effects on the EPI scheme and the National Pension (NP) scheme⁶. The result was that the EPI scheme would ultimately need to raise its contribution rate to as high as 25.9% and the NP scheme to ¥29,500 in FY 2004 value. These levels of contribution could not help being judged to be far from sustainable. Again the expectations that, through the 2000 reform, the schemes had financially been stabilized were smashed.

Although we had to work out measures to recover sustainability, we strongly felt that we would not be able to repeat what we had done in the former reforms. Since we repeated changes that would contain benefits, people's distrust of the schemes had grown bigger. Some people had come to feel anxiety about the future contribution level. Other people had started to have obscure fear that they would not be able to receive their pensions when they retired. To simply repeat raising the pensionable age or lowering the benefit level was sure to augment the distrust. We had to find out measures that would remove people's anxiety or fear and recover their trust of the schemes. In other words, we had to find out reasonable measures that would tenderly recover the sustainability without immediately imposing too much pain on particular generations, and, at the same time, would make it

⁶ Strictly speaking, it is the cost effect on the National Pension Account to which the 1st-kind insured people of the NP scheme pay contributions that are flat-rate.

unnecessary to repeat reforms every time the demographic conditions worsened.

It was just when we were seeking for such measures that we obtained the details of Swedish reform.

5. Swedish Reform

The Swedish reform undertaken in 1990's consists of several elements. From the financial and actuarial point of view, the introduction of automatic balancing mechanism with the fixed contribution rate is most conspicuous.

First, it declares that the contribution rate for the state pension scheme is fixed at 18.5%, which is supposed to eliminate the anxiety of younger generations that the contribution rate would go up to an unsustainable level in the future. The contributions corresponding to 2.5% out of the 18.5% goes to the mandatory state-run individual DC accounts, so the contributions corresponding to 16% goes to the pay-as-you-go earnings-related part⁷.

Then, it has incorporated an automatic balancing mechanism into the earnings-related part. It defines the concept of turnover duration as being the difference between the average age of pensioners and the average age of the active participants weighted respectively by the pension amount and by the salary amount. At the end of each fiscal year, the scheme calculates the turnover duration and compares the following two amounts:

- (i) (the yearly contribution income) x (the turnover duration) + (the amount of the reserve fund)
- (ii) the present value of the benefits corresponding to the period up to the end of the fiscal year

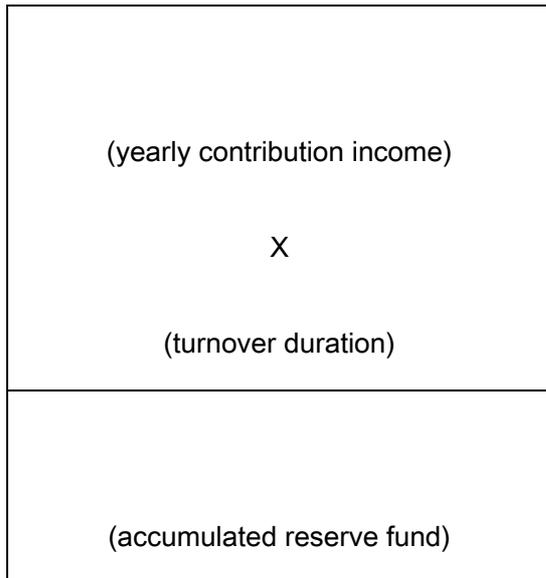
If the (i) is not less than (ii), the scheme is considered to be financially balanced. If the (i) is less than (ii), the scheme is considered to be financially imbalanced, and the amount of all of the benefits gained up to the end of the fiscal year is reduced by being multiplied by the ratio of (i)/(ii). The reduction obviously renders the scheme balanced according to the definition stated above. Thus this process automatically gives financial balance to the scheme, and so it is called the automatic balancing mechanism.

(Fig2)

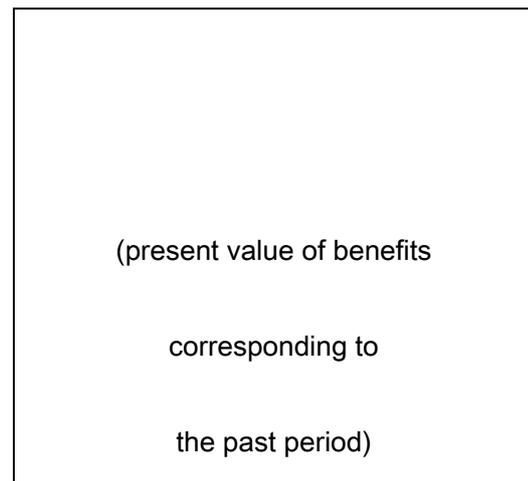
Automatic balancing in the Swedish reform

⁷ It is what they call the notional defined-contribution (NDC) part. It just provides old-age benefits, and does not provide disability benefits or survivors' benefits.

(i)



(ii)



The reason why the comparison of (i) with (ii) can be the indicator of the financial balance is that, under the scheme that only provides old-age benefits in the same manner as the NDC does, the present value of the benefits corresponding to the past period is equal to the yearly contribution income multiplied by the turnover duration if the demographic structure of the scheme is stationary⁸.

6. Application of the Swedish Automatic Balancing Mechanism to Japan's Case

Since we were looking for measures that would clearly indicate the future contribution level and, at the same time, automatically adjust the benefit level to the socio-economic environment to keep financial balance, the Swedish automatic balancing mechanism was an extremely attractive idea. We,

⁸ See Ole Settergren, Bogslaw D. Mikula (2001)

therefore, looked into the mechanism and tried to apply it to our case.

In the end, however, we have concluded that it is not applicable to our case. There are two reasons for it. One is that the EPI scheme provides not only old-age benefits but also disability and survivors' benefits. Furthermore it transfers the designated amount of money to the basic pension account that provides flat-rate basic pensions. This makes it very difficult to define the turnover duration. We are not sure to decide that it is impossible to define, but could not work out the definition suitable to a rather complicated benefit design of ours. The other is that, even if we could work out the definition of turnover duration, it would be too optimistic to compare (i) with (ii) as stated in chapter 5. Different from Swedish case, our population is ageing rapidly, and it would be too optimistic to consider the yearly contribution income multiplied by the turnover duration to be the future income to pay the benefits corresponding to the past period. Sometimes it would be even misleading. We would not be able to expect that amount of income during the turnover duration.

Although we have decided not to apply the Swedish instrument to our case, we could obtain ideas from it. Especially, it has given us the idea that is to fix the contribution rate first and to automatically adjust the benefit level to keep financial equilibrium under the fixed contribution rate. The traditional way of thinking has been that we fix the benefit level first and then we calculate the contribution rate. This necessitates changes of benefit design every time socio-economic conditions worsen. The Swedish idea would eliminate the anxiety that the contribution rate would go up to an unsustainable level and liberate us from repeating reforms.

Thus we started to seek for an automatic balancing mechanism suitable to our case.

7. Fixed Contribution Programme and Modification of Indexation (2002 Consultation)

Social security pension schemes provide benefits whose amount approximately keeps up with per-capita salary increase or price increase in order to attain income security objectives. They, therefore, depend on intergenerational income transfer that is almost equivalent to the pay-as-you-go (PAYGO) financing method. The PAYGO financing method goes well when the ratio of the number of the beneficiaries to that of the active participants is rather stable, but it bumps against a problem when the ratio goes up high because the contribution rate goes up accordingly in such a case.

Until the last reform, on preparing the proposals, we used to assume a set of changes in the scheme design including benefit provisions and calculate the ultimate contribution rate on the basis of the

assumed changes to confirm if the changes would render the ultimate contribution rate at a sustainable level. If they would not, we tried again until we found a set of changes that seemed feasible and would cause the ultimate contribution rate to be at a sustainable level. This set became the reform proposals. As stated in the chapter 4., however, we judged that it would be impossible to repeat the process this time.

What we first decided was to fix the contribution programme because it was one of the most important prerequisites for the reform to alleviate the anxiety that the contribution rate would go up to an unsustainable level.

Then we set about a search for a mechanism that automatically restores financial balance of the schemes when further ageing occurs. We came to pay attention to the fact that we will be able to keep the contribution rate level if the amount of benefits is indexed not to the increase of per-capita salary but to the increase of the total of the salary as long as the life expectancy at age 65 remains the same. The total amount of salary may, as it were, be the sustaining power of the scheme. Furthermore, the increase rate of the total of the salary is equal to the increase rate of the per-capita salary minus the decrease rate of the active participants. Thus we found that, if we index the amount of benefits of the newly awarded person to the increase rate of the per-capita salary minus the decrease rate of the active participants or of the beneficiaries aged 65 and over to the increase rate of the CPI minus the decrease rate of the active participants, we will be able to restore the financial equilibrium in the end because the number of beneficiaries will finally start to decrease by the same pace as the active participants. It is a method that modifies the indexation until the financial equilibrium is attained. We made simulations for various cases and proposed the modified indexation in the consultation document published on 5 December 2002.

The modified indexation bit by bit lowers the level of benefits as expressed in terms of replacement ratio. By replacement ratio we mean the ratio of the benefit amount that the household of the following conditions receives as a couple to the average disposable income of the active participants:

- The husband has been covered by the EPI scheme for 40 years with the salary always equal to the average salary of the active participants.
- The wife has always been a dependent, non-working housewife.

The current replacement ratio is about 59%. The modified indexation will reduce it slowly until the financial equilibrium is attained.

After the financial equilibrium is attained, the indexation is to return to the normal indexation based on the increase of the per-capita disposable income or on the CPI increase rate. It is the same

indexation as the one currently implemented and maintains the replacement ratio of the newly awarded person afterwards.

Table2 summarizes the main results of the simulations. The contribution programme was fixed in such a way as raising the rate by 0.354%⁹ every year from the current rate of 13.58% to 20% in 2022. It was also assumed that the rate of the national subsidy to the basic pensions would be raised from 1/3 to 1/2 in 2004. In the best estimate case, it was projected that it would take 27 years until the financial equilibrium is attained in 2032 and that the ultimate replacement ratio would be about 52%. It means that the modified indexation would lower the benefit level by 12%.

(Table2)

Ultimate Replacement Ratio and Period of Modification of the EPIScheme
(2002 consultation paper)

	present replacement ratio	ultimate replacement ratio	Modification lasts until:
(best estimate case) * population projection: intermediate variant * economic assumptions: intermediate case	59%	52%	FY 2032
(low-birthrate case) * population projection: low variant * economic assumptions: intermediate case	59%	45%	FY 2040
(high birthrate case) * population projection: high variant * economic assumptions: intermediate case	59%	57%	FY 2020
(low-growth case) * population projection: intermediate variant * economic assumptions: pessimistic case	59%	45%	FY 2048
(low-subsidy case) * population projection: intermediate variant * economic assumptions: intermediate case	59%	45%	FY 2043
(low-contribution case) * population projection: intermediate variant * economic assumptions: intermediate case	59%	45%	FY 2043
(modification by average) * population projection: intermediate variant * economic assumptions: intermediate case	59%	53%	FY 2023

1. Economic assumptions:

	wage increase	net earning increase	CPI increase	rate of investment return
* intermediate case:	2.0%	1.8% until 2020	1.0%	3.25%
* pessimistic case:	1.0%	0.8% until 2020	0.5%	2.00%

2. Low-subsidy case means that the rate of national subsidy to the basic pensions is to remain 1/3.

3. Low-contribution case means that the ultimate contribution rate is to be 18% while, in other cases, it is 20%.

4. Modification by average means that the average decrease rate of the number of active participants is used as the modifier instead of the rate of each year.

In the case where the national subsidy rate could not be raised and would remain at the current level of 1/3 all the time, it was projected that the modified indexation would last until 2043 and that the replacement ratio would go down to 45%.

⁹ On the 1999 actuarial valuation, it was proposed to raise the contribution rate by 1.77% every five years until it reaches the ultimate contribution rate. 0.354% is the one fifth of the step.

If the contribution programme was changed and the ultimate contribution rate was set at 18% instead of 20%, it was projected that the modified indexation would last until 2043 and that the replacement ratio goes down to 45% just like the case without the national subsidy raise.

In the case where the population projection was based on the pessimistic variant, the modified indexation was projected to last until 2040 and the ultimate replacement ratio was projected to be 45%.

In the case where the economic assumptions were severer than the best estimate, the modified indexation was projected to last until 2048 and the ultimate replacement ratio to be 45%.

8. National Subsidy

Raising the rate of the national subsidy to the basic pension benefits from the current 1/3 to 1/2 costs around ¥2.5 trillion¹⁰ a year at present in addition to the cost of 1/3 subsidy. In the future it will cost more. It has been a highly political issue and long been discussed. In the 2000 reform, it was stipulated in the law that the national subsidy rate should be raised to 1/2 by the year of 2004 by securing the financial resources. The Japan's economy was, however, still stagnant in 2003, and the Prime Minister declared that the government would not raise the rate of consumption tax as long as he remains in the post. The government parties discussed the issue very hard and, at the end of the year of 2003, they decided to raise the rate gradually to 1/2 by the year of 2009. What they decided has three steps.

The first step is the raising of the rate in FY 2004. It designates the FY2004 subsidy amount for each scheme. It is ¥20.6 billion for the EPI scheme and ¥5.8 billion for the NP scheme in addition to the cost of 1/3 subsidy. It is determined to be the amount corresponding to 11/1000 of the designated amount of money assigned to each scheme to be transferred to the basic pension accounts, taking account of the effective date of the new law (1 October 2004). The financial resources for this raising are the reduction of the tax-deductible amount of pension benefits for those with high income. For FY 2005 and 2006, the rate is likewise to be 1/3+11/1000.

The second step is to raise the subsidy rate from 1/3+11/1000 to the rate as near as possible to 1/2 by amending the taxation in two or three years' time. In this case, the reduction of the provisional tax

¹⁰ 1 trillion = 1,000,000,000,000

relief treatment¹¹ is the candidate for the new financial resources.

The third step is to raise the subsidy rate to 1/2 in FY 2009. In this case, the raising of the consumption tax rate is the most likely candidate for the new financial resources.

Although the raising of the national subsidy rate still necessitates the amendments of taxation, the distinct difference from the previous 2000 reform is that it concretely states the schedule of the raising. The government parties published, in December 2003, the document that refers to the amendment of taxation as well.

We have just digressed from the modified indexation, but the national subsidy rate affects the results so much that we cannot avoid referring to it. Now we go back to the issue of modified indexation.

9. Refining upon Modified Indexation

After the publication of the consultation document in December 2002, many people expressed their views on the modified indexation. Most of them were affirmative on its introduction, but stressed needs for improvement. They were stated at the committee meetings of the Pension Subcommittee of the Social Security Council¹², in the direct conversation with the Director-General of the Pension Bureau, or in other ways. Summing up, the following two opinions for improving the modified indexation were forwarded:

- In order to minimize the difference of benefits and contributions among generations, the modifying should be hastened as much as possible. The modification should also take account of the improvement of life expectancy at age 65 because it increases the cost unless adjusted. It helps hasten the modifying as well.
- The projected size of the accumulated reserve fund is too large. It should be reduced. The government should not control such a huge amount of money because the government is apt to make bad use of the fund.

Taking account of these opinions, we have polished up the modifying method.

(1) Finalized modified indexation

¹¹ From FY1999, the income tax is provisionally reduced by 20% (¥250,000 at maximum) to boost consumption and vitalize the economy.

¹² It is an advisory organ to the Minister of Health, Labour and Welfare.

As we have seen in the chapter 7., we proposed, in the 2002 consultation document, to modify the indexation by deducting the decrease rate of the number of covered employees from the increase rate of per-capita disposable income of the active covered employees until the financial equilibrium is attained. It was, however, pointed out that the number of employees will decrease more slowly than the number of the labour force because there is still the tendency that the portion of employees in the labour force is increasing. In other words, the proposed modifying process was slower than the case where the decrease rate of the labour force was used. The slower the modification is, the lower the benefit level of the future pensioners will be. Furthermore, if the proposed modified indexation was applied to the basic pensions, it meant that it would be applied to a group of people who were not employees. The usage of the number of employees would become baseless. It, therefore, became clear that the usage of the number of employees was a bit clumsy to the modified indexation. We, therefore, decided to change the modifying method and defined the modifier as follows:

$$\text{modifier} = (\text{the decrease rate of the number of the active participants of all the categories of the NP scheme}) + (\text{the increase rate of the life expectancy at age 65})$$

The modified index is obtained by subtracting the modifier from the normal index based on either the increase rate of per-capita disposable income for beneficiaries aged below 65 or the CPI increase rate for beneficiaries aged 65 and over.

(Table3)

Projected Decrease Rate of the Number of Active Participants
of All the Social Security Pension Schemes

Year	Active participants (in million)	Decrease rate (%)
2005	70.0	-0.4
2006	69.9	-0.3
2007	69.4	-0.2
2008	68.7	-0.2
2009	68.0	-0.5
2010	67.3	-0.8
2015	64.9	-0.8
2020	63.3	-0.5
2025	61.8	-0.5
2030	59.3	-0.8
2040	52.0	-1.3
2050	46.2	-1.1

The second term of the modifier has been added because many people insisted that the increase of life expectancy at age 65 should be taken account of because the longer the life expectancy is, the larger the total amount received will be if the amount remains unmodified. In the law, it is fixed at 0.3% based on the average of the projected annual increase rate of life expectancy at age 65 during

the period 2000-2025 of the 2002 population projection. Awareness of the necessity to speed up the modification for the purpose of minimizing the intergenerational difference has also boosted the inclusion.

We should here note that, even under the modified indexation, the nominal amount is guaranteed. In other words, if the modifier is larger than the increase rate of per-capita disposable income or of the CPI, then the modified index is considered to be zero. Moreover, if the increase rate of per-capita disposable income or the CPI itself is negative, then we do not apply the modification to the indexation.

(2) Period of financial equilibrium

The other opinion was that the size of the accumulated reserve fund was too large; it was several times as large as the annual expenditure. They said that the government should not have such a huge fund because it was apt to make bad use of it through poor investment or through political pressure.

Faced with the opinion, we examined the reason why such a size of fund would accumulate and found that it was attributable to the fact that, under the contribution programme, the ultimate contribution rate was to be reached much earlier than the ratio of the number of beneficiaries to the number of active participants got stable. The ultimate contribution rate was smaller than the future PAYGO rate because it was fixed at an early stage of the ageing process of the scheme. To compensate the gap between the ultimate contribution rate and the PAYGO rate in the future, the investment return was called upon and the requirement for financial equilibrium gave birth to the accumulation of the reserve fund under the fixed contribution programme.

Furthermore, the reason why the PAYGO rate in the future was larger than the ultimate contribution rate was that we assumed more aged demography of the scheme in the far distant future than the demography at around 2020 when the ultimate contribution rate was reached. The 2002 population projection of the NIPSSR extends to 2100, but, since we had taken it for granted that the financial equilibrium should be considered in perpetuity, we had to make assumptions for the years after 2100. So we assumed that the demography of the scheme in 2090's would be repeated after the year of 2100. The old-age dependency ratio¹³ of the 2002 population projection shows that 2090 is more aged than 2020. So the assumption had the facet of placing more emphasis on the aged stage of our country.

¹³ It is the ratio of the population aged 65 and over to the population aged between 15 and 64.

We could not help from reconsidering the method. It certainly expressed the government's sense of responsibility that it should consider the whole future period for the financial management of the schemes. It also had the merit that the financial management would be stable if everything went in line with the assumptions. The criticism that the government was apt to make bad use of the reserve fund was rather journalistically exaggerated. If we used up all or most part of the reserve fund, it would simply lower the ultimate level of benefits or augment the ultimate contribution rate.

At the same time, it was a reasonable criticism that the assumption that the demography of the scheme in 2090's would be repeated after 2100 was very rough and baseless. It was also reasonable to add that it might mislead the judgment of the financial status when too much emphasis was put on the period after 2100.

We looked for a method that would reconcile the good points of the current method with the criticisms, and, at this time, the US example gave us hints.

Every year in the United States the Board of Trustees of the OASI Trust Fund and the DI Trust Fund publishes its annual report and provides the basic information on the OASDI's financial status. Its financial projections cover the next 75 years, but not the longer period. To evaluate the financial adequacy of the OASDI programme, it essentially compares the adjusted summarized cost rate and the adjusted summarized income rate for the next 75 years¹⁴. Here, the adjusted summarized cost rate means the ratio of the present value of the cost of the programme for the next 75 years plus the present value of the one-year cost of the last year of the 75-year period to the present value of the taxable payroll for the next 75 years. The adjusted summarized income rate means the ratio of the present value of the scheduled tax income (payroll tax revenue plus taxation of benefits) for the next 75 years plus the amount of assets on hand at the beginning of the 75-year period to the present value of the taxable payroll for the next 75 years. If the adjusted summarized cost rate is larger than the adjusted summarized income rate (which is the usual case), the difference represents the rate by which the current contribution rate should be raised to attain financial equilibrium for the next 75 years.

We paid attention to the fact that the Board of Trustees, in principle, looks into the financial status of the OASDI programme not in perpetuity but for the period of the next 75 years. We also paid attention to the target trust fund level of one year's cost at the end of the projection period.

¹⁴ Strictly speaking, it calculates several other measurements to test the long-range financial adequacy of the programme.

What we thought was that, if we applied to our case this idea of finite period of financial equilibrium with the target fund at the end of the period being one year's cost, we would be able to get rid of the criticisms that the assumptions after 2100 were baseless and that the accumulated reserve fund would be too large.

Furthermore, as we would fix the length of period of financial equilibrium, we would, in the end, take any year in the future into account, so the government's sense of responsibility that all the years in the future should be taken into account for the financial management would be more or less maintained.

The only shortcoming of this method would be that the difference between the adjusted summarized cost and the adjusted summarized income could be different, or, under the modified indexation, the ultimate benefit level could be different on the next valuation even if the socio-economic conditions remained the same. It is because the years leaving out of the period can be of nature different from the years coming into the period. The fluctuation can, however, be smaller if we take the period long enough.

In the wake of these considerations, we have concluded that we should adopt finite period of financial equilibrium with target fund at the end of the period being one year's cost. We have also decided that the length of the period should be 95 years. It is the length of time during which almost all of the people already born at the beginning of the period will cease to receive benefits, and the current government can be said to have taken financial responsibility to take account of these people if the financial equilibrium is confirmed for the period.

10. Finalized Contribution Programme

When the MHLW published its proposals for reform in November 2003, the ultimate rate of the contribution programme was set at 20%. It was projected that the ultimate benefit level expressed as the replacement ratio under the contribution programme with the 95-year period of financial equilibrium would be 54.7% in the best estimate case.

The government parties, however, under the pressure by the employers, started to argue about the ultimate contribution rate. The employers insisted that such a high rate as 20% would undermine Japan's economy and be, in the end, harmful to the nation's life. After a long series of debate, the government parties finally decided it to be 18.3% in February 2004. It was the rate by which the

benefit level was narrowly kept above 50%. This came into the bill and has become the law. So the finalized contribution programme of the EPI scheme is:

- First, the current rate of 13.58% is to be raised to 13.934% in October 2004.
- Then it is to be raised by 0.354% in September every year.
- In September 2017 it is raised to the ultimate rate of 18.3% and the contribution rate is fixed at 18.3% afterwards.

11. Simulations

Now that the contribution programme has been fixed, modifying method of indexation has been decided, and the period of financial equilibrium has been defined, we can make projections for several cases.

(Table4)

Ultimate Replacement Ratio and Period of Modification of the EPI Scheme
(2004 reform)

	present replacement ratio	ultimate replacement ratio	Modification lasts until:
(best estimate case) * population projection: intermediate variant * economic assumptions: intermediate case	59.3%	50.2%	FY 2023
(low-birthrate & low-growth case) * population projection: low variant * economic assumptions: pessimistic case	59.3%	45.3%	FY 2033
(high-birthrate & optimistic-growth case) * population projection: 1.52 variant * economic assumptions: optimistic case	59.3%	52.4%	FY 2019

1. Economic assumptions:

	wage increase	net earning increase	CPI increase	rate of investment return
* intermediate case:	2.1%	1.9% until 2017	1.0%	3.2%
* pessimistic case:	1.8%	1.6% until 2017	1.0%	3.1%
* optimistic case:	2.5%	2.3% until 2017	1.0%	3.3%

2. The 1.52 variant means the population projection with the ultimate cohort TFR being 1.52 that is situated halfway between the high variant and the intermediate variant. It just corresponds to the case where the average number of children married couples would give birth to is assumed to be the same as before.

In the best estimate case, the ultimate benefit level is projected to be 50.2%. It is to be reached in 2023. In other words, if the benefit level is lowered to 50.2% through the modified indexation until 2023, the EPI scheme will be financially balanced for years until 2100 if we restart the normal indexation in 2024.

In the case where the economic conditions are better and the decline of the ultimate cohort TFR is milder to be 1.52, the ultimate benefit level is projected to be 52.4% and the period of modified indexation to end in 2019.

In the case where the economic conditions are worse and the ultimate cohort TFR drops to as low as

1.10, the modified indexation is projected to last until 2033 and the ultimate benefit level to be 45.3%.

12. The Minimum Benefit Level

As the modified indexation gave the impression that it would infinitely lower the benefit level until the financial equilibrium was attained, the MHLW proposals in November 2003 included the provision that the government should review the scheme drastically if the benefit level of the newly awarded people threatened to drop below 50% by the next actuarial valuation¹⁵. This sort of minimum benefit level should be added to the compulsory income security programme. Otherwise the scheme itself would lose its reason for existence. This was supported and has become a provision in the law.

Since the actual effect of the decline of birth rate on the labour force starts in about 20 years' time, such a situation as the benefit level of the newly awarded threatens to drop below 50% in a few years' time will not come out for the next 10 to 15 years as long as unusual things like death of a considerable portion of the labour force will not happen for a long period of time. This means that it is giving us time to work out comprehensive measures to tackle the aged society of small birth rate and long life expectancy.

The rate of 50% itself has been set by taking account of the ratio of the average consumption of the households of aged couples to the average amount of disposable income of the active labour force. It may change as the socio-economic environment changes. We have to continue to watch the environment carefully and to review the rate.

13. 2004 German Reform

In Germany the pension reform bill passed the Parliament in March 2004. It is to make the social security pension schemes sustainable by containing the indexation of the benefit amount. The method to realize it is surprisingly similar to our modified indexation. So it can be said that Germany and Japan were simultaneously discussing the same sort of reform by chance. In the following, we would like to compare the German method with our modified indexation.

¹⁵ The government parties' discussion on the level of the ultimate contribution rate was also conscious of this proposal though the meaning of 50% was different from the minimum benefit level provision.

The German indexation basis has been the average disposable income of the active workers. The new law has added a factor called the sustainability factor to contain the normal indexation. A beneficiary's benefit amount for a year is obtained by multiplying the amount for the last year by the disposable-income-based indexation and by the sustainability factor.

The sustainability factor is defined as follows:

$$(\text{sustainability factor}) = (1 - \text{ID})^\alpha + 1$$

where ID = the ratio of the dependency ratio 2 years ago to the dependency ratio 3 years ago,
and (dependency ratio) = (the number of pensioners¹⁶) / (the number of contributors plus the
number of the unemployed¹⁷)

and α is a positive number not greater than 1 and is to play an adjusting role to what extent the ageing degree is reflected in the modification of the indexation.

If we denote by b the increase rate of the number of pensioners from 3 years ago to 2 years ago and by c the decrease rate of the total of the number of contributors and the number of the unemployed, then we can rewrite the sustainability factor as follows:

$$\begin{aligned} (\text{sustainability factor}) &= (1 - \text{ID})^\alpha + 1 \\ &= \{1 - (1 + b)/(1 - c)\}^\alpha + 1 \\ &\doteq \{1 - (1 + b + c)\}^\alpha + 1 \\ &= 1 - \alpha(b + c) \end{aligned}$$

If $\alpha = 1$, then the sustainability factor is $1 - (b + c)$. When many years have already passed since the social security pension schemes were introduced and the only factor that increases the number of beneficiaries is the improvement of mortality, b represents the increase of life expectancy at the pensionable age. The c is, roughly speaking, the decrease rate of the labour force. It can, therefore, be said that b + c is almost equal to the modifier of the 2004 Japanese reform. What an interesting coincidence! The modified indexation is not an innovation peculiar to Japan but rather universal throughout the world.

The 2004 German reform has another factor of α that can adjust the degree to which the increase of life expectancy and the decrease of labour force are reflected in the modification of indexation. The 2004 German reform law has decided that $\alpha = 1/4$. With this sustainability factor it is

¹⁶ It is adjusted for beneficiaries with low benefit. The number of contributors is also adjusted for low earners.

¹⁷ The reason why the number of the unemployed has been added is that it is to exclude cyclical effects on the dependency ratio.

projected that the contribution rate is a little bit lower than 23% in 2030.

The 2001 German reform law stipulates that the contribution rate must be below 20% until 2020 and be below 22% until 2030 while the net replacement rate must stay above 67% with the DC pension added. The 2004 reform has not attained this target. In the 2003 reform proposals by the Rürup Commission, there was a proposal to raise the pensionable age from 65 to 67, but it has not been realized in the 2004 reform law. The German reform is still on the way as most of the countries' reforms are.

14. Concluding Remarks

The 2004 reform has brought the social security pension schemes an automatic balancing mechanism of Japanese version called the modified indexation that will flexibly deal with the fluctuation of birth rate and life expectancy for the financial stability under the fixed contribution programme. This will guarantee the financial stability for the next decade, but after that we cannot foresee what will happen. The most favourable scenario then would be the recovery of birth rates during the next decade and the early return to the normal indexation. The worst scenario would be the arrival of time when the benefit level threatens to drop below the minimum benefit level in a few years' time. On such an occasion, the conceivable drastic measures the government would take might be lowering the minimum benefit level, raising the pensionable age, etc.

It should, however, be pointed out that, if the socio-economic conditions worsen further, it is not the problem of the social security pension schemes but the problem of the whole society. The 2004 reform has given us time to cope with it by enabling the social security pension schemes to adapt themselves to such changes of environment.

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