Outline of 2004 actuarial valuation on Employees' Pension Insurance and National Pension in Japan

(tentative translation)

1   Outline of 2004 pension revision

2   Outline of 2004 actuarial valuation

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Ministry of Health, Labour and Welfare

1	Outline of 2004 pension revision

1. Functions and structure of public pensions in Japan

(1) Significance of the public pension system

The public pension system in Japan began with the establishment in 1942 of the Workers' Pension Insurance system, precursor of the Employees' Pension Insurance system. Universal coverage was achieved with the establishment of the contributory National Pension system in 1961. Benefits were subsequently improved as the economy developed, resulting ultimately in a fully developed public pension system.

When there was no pension system and while the pension system was still underdeveloped, the elderly were primarily supported "privately" within the family. However, as Japan's industrial structure evolved, and urbanization and the spread of the nuclear family took hold, it became increasingly difficult for families to take care of their older members by themselves, creating a crucial need for society as a whole to provide for the elderly. The public pension system forms the basis of this system of "social support" for the elderly.
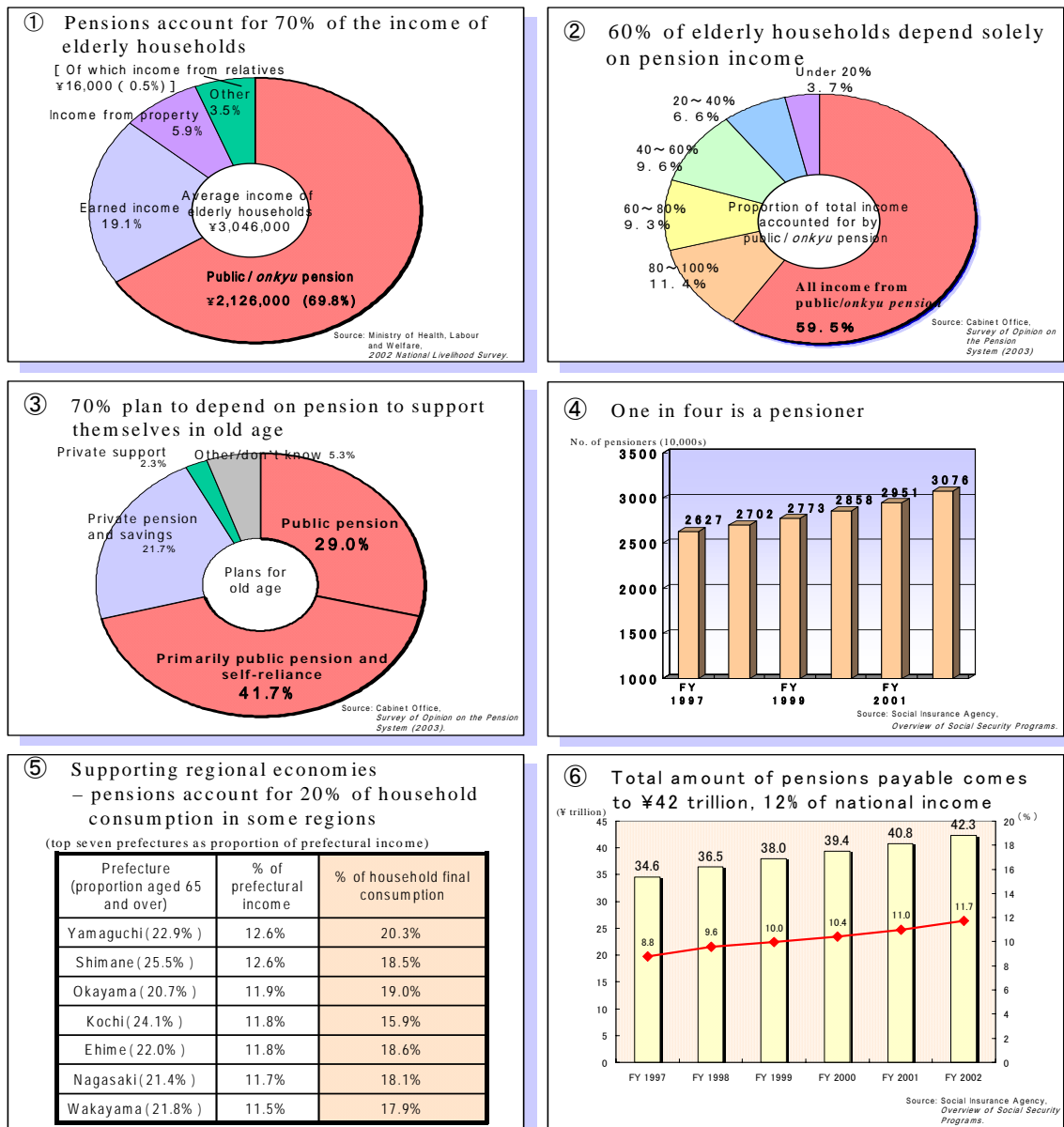
Figure 1-1
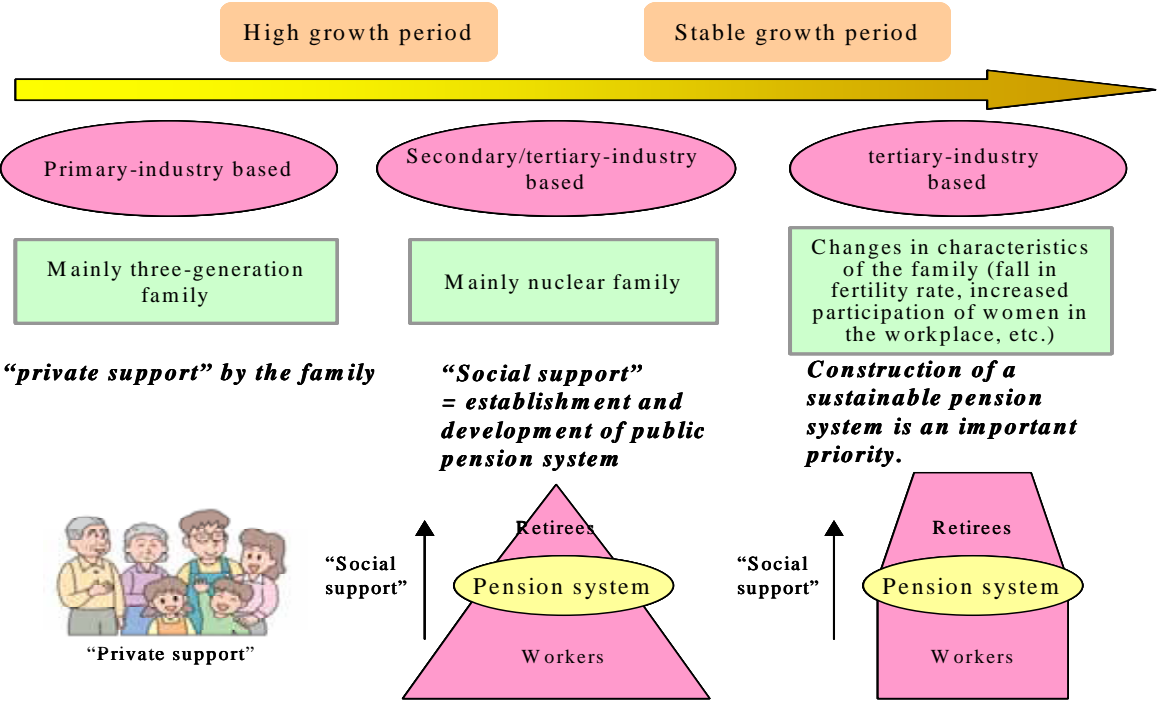
(2) Functions of the public pension system

According to surveys of the current situation of older persons, elderly households depend on public pensions and *onkyu* pensions (pensions for ex-military, etc.) for 70% of their income, and 60% of elderly households depend entirely on such pensions for their income. Moreover, 70% of those currently in employment expect to depend primarily on the public pension system in their old age.

The public pension system thus plays an extremely important role in supporting people in old age, and also offers reassurance to those currently in employment that they will not have to worry about the economic burden of supporting their parents.
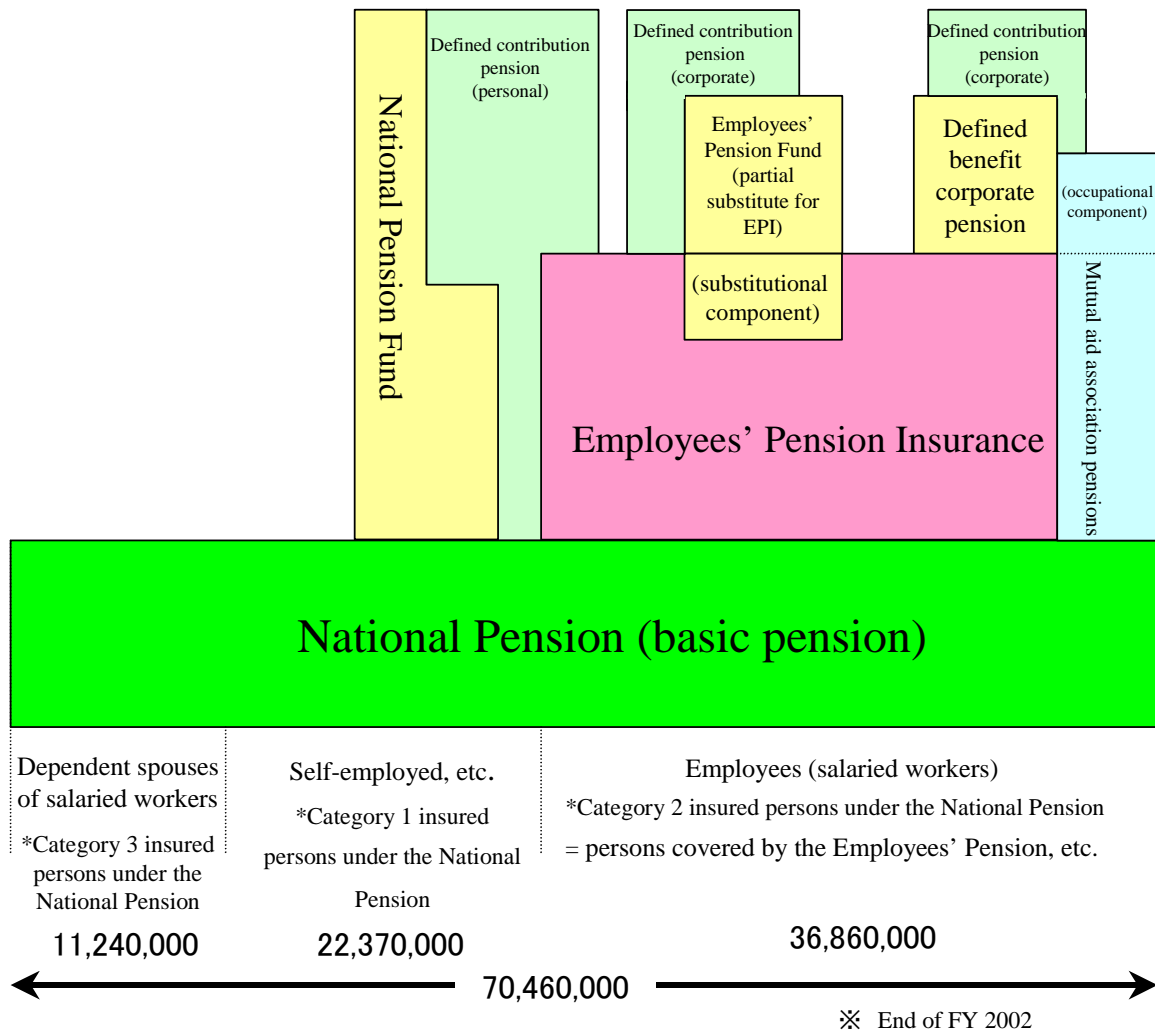
Figure 1-2

① Pensions account for 70% of the income of elderly households

Of which income from relatives
¥16,000 0.5%)

Income from property
5.9%

Other
3.5%

Earned income
19.1%

Average income of elderly households
¥3,046,000

Public/ *onkyu* pension
¥2,126,000 (69.8%)

Source: Ministry of Health, Labour and Welfare,
2002 National Livelihood Survey.

② 60% of elderly households depend solely on pension income

Under 20%
3.7%

20～40%
6.6%

40～60%
9.6%

60～80%
9.3%

80～100%
11.4%

Proportion of total income accounted for by public/ *onkyu* pension

**All income from
public/*onkyu* pension**
59.5%

Source: Cabinet Office,
Survey of Opinion on the Pension System (2003)

③ 70% plan to depend on pension to support themselves in old age

Private support
2.3%

Other/don't know 5.3%

Private pension and savings
21.7%

Plans for old age

**Public pension
29.0%**

**Primarily public pension and
self-reliance
41.7%**

Source: Cabinet Office,
Survey of Opinion on the Pension System (2003).

④ One in four is a pensioner

No. of pensioners (10,000s)

	FY 1997		FY 1999		FY 2001	
	2627	2702	2773	2858	2951	3076

Source: Social Insurance Agency,
Overview of Social Security Programs.

⑤ Supporting regional economies
– pensions account for 20% of household consumption in some regions

(top seven prefectures as proportion of prefectural income)

Prefecture (proportion aged 65 and over)	% of prefectural income	% of household final consumption
Yamaguchi 22.9%	12.6%	20.3%
Shimane 25.5%	12.6%	18.5%
Okayama 20.7%	11.9%	19.0%
Kochi 24.1%	11.8%	15.9%
Ehime 22.0%	11.8%	18.6%
Nagasaki 21.4%	11.7%	18.1%
Wakayama 21.8%	11.5%	17.9%

⑥ Total amount of pensions payable comes to ¥42 trillion, 12% of national income

(¥ trillion)

	FY 1997	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002
	34.6	36.5	38.0	39.4	40.8	42.3
	8.8	9.6	10.0	10.4	11.0	11.7

Source: Social Insurance Agency,
Overview of Social Security Programs.

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(3) System Structure

The pension system in Japan consists of a basic pension, in which everyone is enrolled, and an earnings-related component for employees. Individuals and enterprises may also opt to enroll in private pensions, such as corporate pensions.

Figure 1-3   Pension system structure

Defined contribution pension (personal)	Defined contribution pension (corporate)	Defined contribution pension (corporate)

National Pension Fund

Employees' Pension Fund (partial substitute for EPI)

Defined benefit corporate pension

(occupational component)

(substitutional component)

Employees' Pension Insurance

Mutual aid association pensions

National Pension (basic pension)

Dependent spouses of salaried workers	Self-employed, etc.	Employees (salaried workers)
*Category 3 insured persons under the National Pension	*Category 1 insured persons under the National Pension	*Category 2 insured persons under the National Pension = persons covered by the Employees' Pension, etc.
11,240,000	22,370,000	36,860,000

70,460,000

※ End of FY 2002

2.   Outstanding issues after the 2000 pension revision

At least once every five years, an actuarial valuation has been conducted of the public pension system, at which time the necessary revisions have been implemented. At the time of the previous actuarial valuation in 1999, the revisions proposed included progressively increasing the pensionable age and adjusting benefits downwards to a more reasonable level. These made up the 2000 revision of the pension system, under which the contribution rate for the Employees' Pension is to be progressively

increased to around 20% of annual income (assuming an increase in the national subsidy to the basic pension to one half), which is projected to enable pension finances to be kept in balance. However, two key issues remain to be addressed. These are:

1) raising the national subsidy to the basic pension; and
2) the recommencement of the raising of contributions (rates), which has been frozen.

Another issue that was left for future consideration was that of women and pensions. The most notable question is that of how to treat the dependent wives (spouses) of salaried workers, who are presently treated as Category 3 insured persons and so do not pay separate contributions. Instead, the cost burden is borne by Category 2 insured persons as a whole.

3. Socioeconomic conditions surrounding the pension system

Japan's public pension system is founded on a pay-as-you-go system of inter-generational support, which means that the cost of payment of pensions to current pensioners is borne by those currently in employment, combined with the holding and use of a certain amount of assets, whose management enables the burden on future generations to be eased.

Under such a system based on inter-generational support, a decline in the fertility rate and increase in the proportion of older persons create problems. This is because whereas the payment of pension benefits increases due to the rise in the number of older persons, the size of the working population that pays for these pensions shrinks. In order to maintain pensions at a certain level, therefore, a rise in the burden on those paying into the system is inevitable.
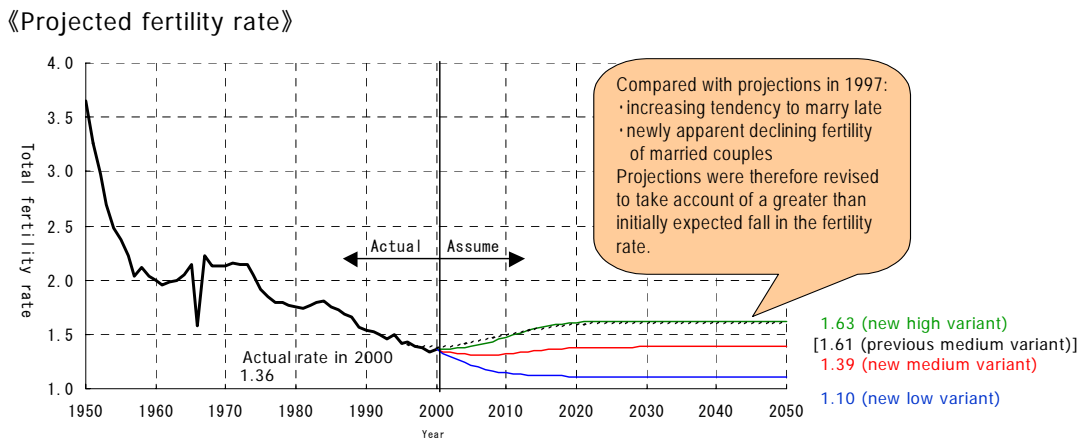
Accordingly, any consideration of pension benefits and contributions in the future will be significantly influenced by future projections of the fertility rate and population aging and how such trends affect the demographic structure.

The 1999 actuarial valuation took as a basis the medium variant of population projection in January 1997. However, demographic change is progressing more rapidly than anticipated, and the projections of the decline in the fertility rate and population aging were drastically revised in the population projection announced in January 2002.

Figure 1-4　Population trends by age group (medium variant in January 2002)

(1,000 persons)　　Actual population　　　　Projection as of Jan. 2002　→　Long-range projection associated with the 2002 projection

Peak of total population 2006 : 127,740,000

Year	Total	Age 65 and over	Age 20-64	Age 0-19
2000	126,930,000	22,040,000 / 17.4%	78,880,000 / 62.1%	26,010,000 / 20.5%
2025	121,140,000	34,730,000 / 28.7%	66,910,000 / 55.2%	19,500,000 / 16.1%
2050	100,600,000	35,860,000 / 35.7%	49,840,000 / 49.5%	14,890,000 / 14.8%
2100	64,140,000	20,870,000 / 32.5%	31,980,000 / 49.9%	11,290,000 / 17.6%

Age
- 65 and over
- 20-64
- 0-19

Years axis: 1950　1975　2000　2025　2050　2075　2100

| Proportion aged 20-64 to 65 and over | 3.6 : 1 | 1.9 : 1 | 1.4 : 1 | 1.5 : 1 |

Figure 1-5　Projected fertility rate and life expectancy at birth (projection as of January 2002)

《Projected fertility rate》

Total fertility rate

Actual | Assume

Actual rate in 2000
1.36

Compared with projections in 1997: increasing tendency to marry late newly apparent declining fertility of married couples
Projections were therefore revised to take account of a greater than initially expected fall in the fertility rate.

1.63 (new high variant)
[1.61 (previous medium variant)]
1.39 (new medium variant)
1.10 (new low variant)

Year axis: 1950　1960　1970　1980　1990　2000　2010　2020　2030　2040　2050

Note: In the long-range projection for 2050 onward (2050-2100), the fertility rate is hypothesized to return to the population replacement level (i.e. a total fertility rate of around 2.07) toward 2150.

《Projections of increasing longevity》

Life expectancy at birth	As of 2000	In 2050 as previously estimated (in 1997) (medium variant)	In 2050 as new estimated (in 2002) (medium variant)
Male	77.64 years	79.43 years	80.95 years
Female	84.62 years	86.47 years	89.22 years

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According to future projections of pension finances based on this new population projection, the contribution rate for the Employees' Pension will need to be raised to 25.9% of annual income, and the contribution rate for the National Pension will need to be raised to ¥29,500 per month (in FY2004 value) if benefit levels and the national subsidy to the basic pension (one third) are to be maintained at their level prior to the 2004 revision.

Figure 1-6 Final contribution (rate) necessary to maintain present benefit levels (benefit level maintenance)

Note: The contribution rate is indicated as a proportion of annual income (total remuneration).

Note: Contributions are in FY2004 value (nominal amount until FY2003). Actual contributions from FY2005 are calculated by multiplying the above amount by growth in wages from FY2004.
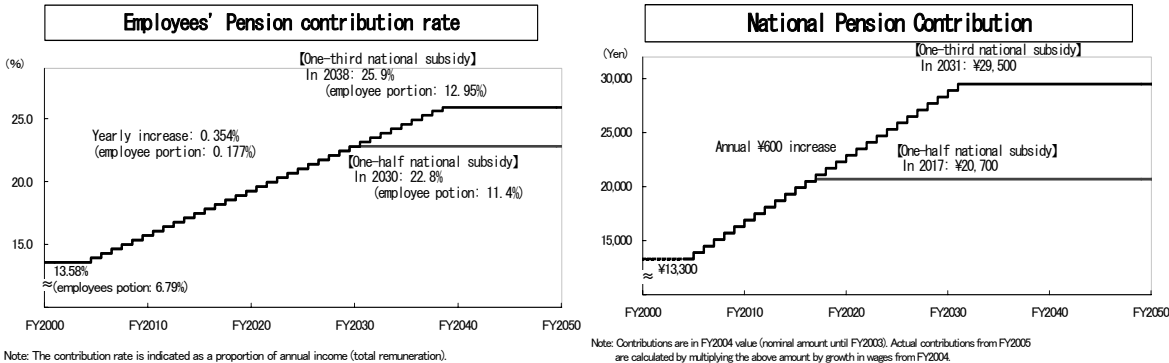
If benefit levels and the national subsidy to the basic pension (one third) were to be maintained and the contribution rate not increased, then Employees' Pension assets would be exhausted in 2021, and National Pension assets in 2017. Thereafter, the pension system would encounter a revenue shortfall hindering payment of pensions.

4. Summary of benefit and contribution projections for the 2004 pension revision

At least once every five years, an actuarial valuation is conducted of the public pension system, at which time the necessary revisions to the system are also made. Under this arrangement, greater than anticipated fertility rate decline and population aging have resulted in revisions of the balance between benefits and contributions on every occasion of actuarial valuation. On the contribution side, the approach adopted has been to progressively increase the contribution. However, as statutory contribution rates have been enacted only for the next five years in the light of the projected contribution level in the future, legal amendments have been inevitable every five years.

At the time of the 2004 pension revision, therefore, the following goals were adopted in line with a basic policy of adjusting contributions and benefits so as to "build a sustainable public pension system in harmony with socioeconomic conditions that ensures the reliability of the public pension system":

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- revision of benefits and contributions from the viewpoint of inter- and intra-generational fairness while paying attention to ensuring that an excessive burden is not placed on future generations;

- development of a stably operable system capable of responding flexibly to demographic and socioeconomic changes so as to produce a sustainable system that does not require frequent revision; and

- harmonization with socioeconomic conditions taking into account the impact of pension contributions and benefits on society as a whole.

(1) Introduction of a fixed contribution program

A key aspect of the present revision of benefits and contributions is the introduction of a fixed contribution program. This incorporates arrangements for the automatic adjustment of benefit levels according to changes in socioeconomic conditions, such as a fall in the fertility rate, based on the establishment by law of a "final" contribution (rate) level and payment of benefits within the scope of the cost burden.

In order to cope with the rapid decline in the fertility rate and population aging, a rise in contributions is inevitable. However, given the concerns among younger people in particular as to how far the burden may continue to be raised, the decision was made to fix the level of contributions in the future, and to set this down in law.
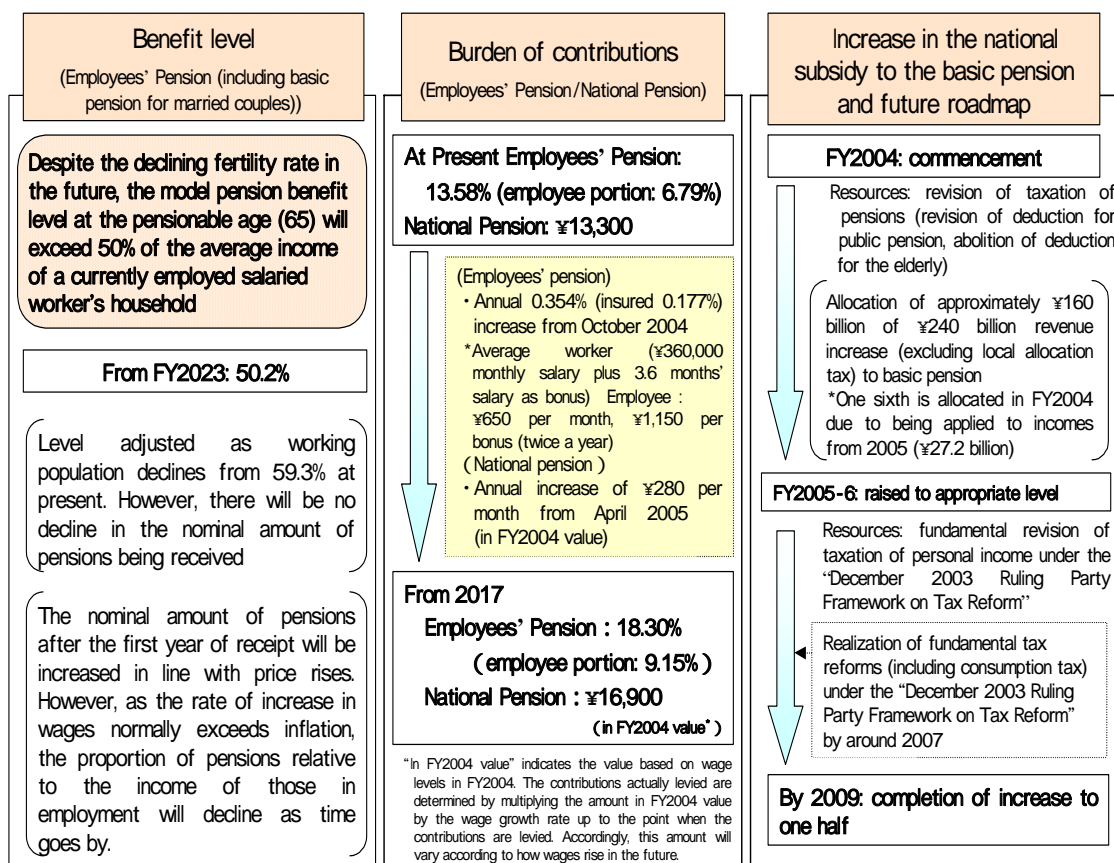
A roadmap for raising the national subsidy to the basic pension from one third to one half—a concern since the time of the previous revision—was also adopted, with the subsidy being progressively raised from FY2004 until it reaches one half no later than FY2009.

The plan adopted to finance the pension system was to balance benefits and contributions over a period of approximately 100 years (during which payment of pension benefits to those already born will cease), and to use the investment profit and the principal of pension assets over this period while leaving an amount equivalent to one year of expenditure at the end of this 100-year period.

Taking account of those elderly who are already primarily dependent on the public pension system and those who will soon become pensioners, it was decided not to lower the nominal amount in the automatic adjustment of benefit levels, but to adjust the value of pensions relative to the take-home pay of current workers (hereafter referred to as the replacement ratio) by limiting the scale of the revision of pensions when wage and price rises occur, taking into account the decline in number of those paying into the system and the improvement of life expectancy of older people.

Figure 1-7   Revision of benefits and contributions as a result of the 2004 pension revision

Benefit level	Burden of contributions	Increase in the national subsidy to the basic pension and future roadmap
(Employees' Pension (including basic pension for married couples))	(Employees' Pension/National Pension)	

Benefit level (Employees' Pension (including basic pension for married couples))

Despite the declining fertility rate in the future, the model pension benefit level at the pensionable age (65) will exceed 50% of the average income of a currently employed salaried worker's household

From FY2023: 50.2%

Level adjusted as working population declines from 59.3% at present. However, there will be no decline in the nominal amount of pensions being received

The nominal amount of pensions after the first year of receipt will be increased in line with price rises. However, as the rate of increase in wages normally exceeds inflation, the proportion of pensions relative to the income of those in employment will decline as time goes by.

Burden of contributions (Employees' Pension/National Pension)

At Present Employees' Pension: 13.58% (employee portion: 6.79%)
National Pension: ¥13,300

(Employees' pension)
Annual 0.354% (insured 0.177%) increase from October 2004
*Average worker (¥360,000 monthly salary plus 3.6 months' salary as bonus) Employee : ¥650 per month, ¥1,150 per bonus (twice a year)
National pension
Annual increase of ¥280 per month from April 2005 (in FY2004 value)

From 2017
Employees' Pension 18.30%
     employee portion: 9.15%
National Pension   ¥16,900
                            in FY2004 value*

*"In FY2004 value" indicates the value based on wage levels in FY2004. The contributions actually levied are determined by multiplying the amount in FY2004 value by the wage growth rate up to the point when the contributions are levied. Accordingly, this amount will vary according to how wages rise in the future.

Increase in the national subsidy to the basic pension and future roadmap

FY2004: commencement

Resources: revision of taxation of pensions (revision of deduction for public pension, abolition of deduction for the elderly)

Allocation of approximately ¥160 billion of ¥240 billion revenue increase (excluding local allocation tax) to basic pension
*One sixth is allocated in FY2004 due to being applied to incomes from 2005 (¥27.2 billion)

FY2005-6: raised to appropriate level

Resources: fundamental revision of taxation of personal income under the "December 2003 Ruling Party Framework on Tax Reform"

Realization of fundamental tax reforms (including consumption tax) under the "December 2003 Ruling Party Framework on Tax Reform" by around 2007

By 2009: completion of increase to one half

(2) Establishment of pension system that is robust to socioeconomic change

In order to minimize future revisions of benefits and contributions, it is necessary to build a sustainable pension system capable of flexible adaptation to social and economic changes. The 2004 pension revision therefore incorporated automatic adjustment of benefit levels into the system.

If the level of contributions and the national subsidy are fixed, then it becomes necessary to adjust pension benefits in order to keep pension finances in balance, as pension benefits must be funded from within the scope of this fixed level of funding. To what extent benefit levels should be adjusted will depend on future trends in social and economic conditions.

The 2004 pension revision therefore adopted an arrangement under which the system of adjusting benefit levels by adjusting the pension indexation rate is maintained, while the timing of the termination of benefit level adjustment is determined by projecting socioeconomic trends taking into account actual conditions at each actuarial valuation every five or fewer years, and assessing whether pension finances would be balanced if the adjustment of benefit levels were to be terminated at that point. Such an
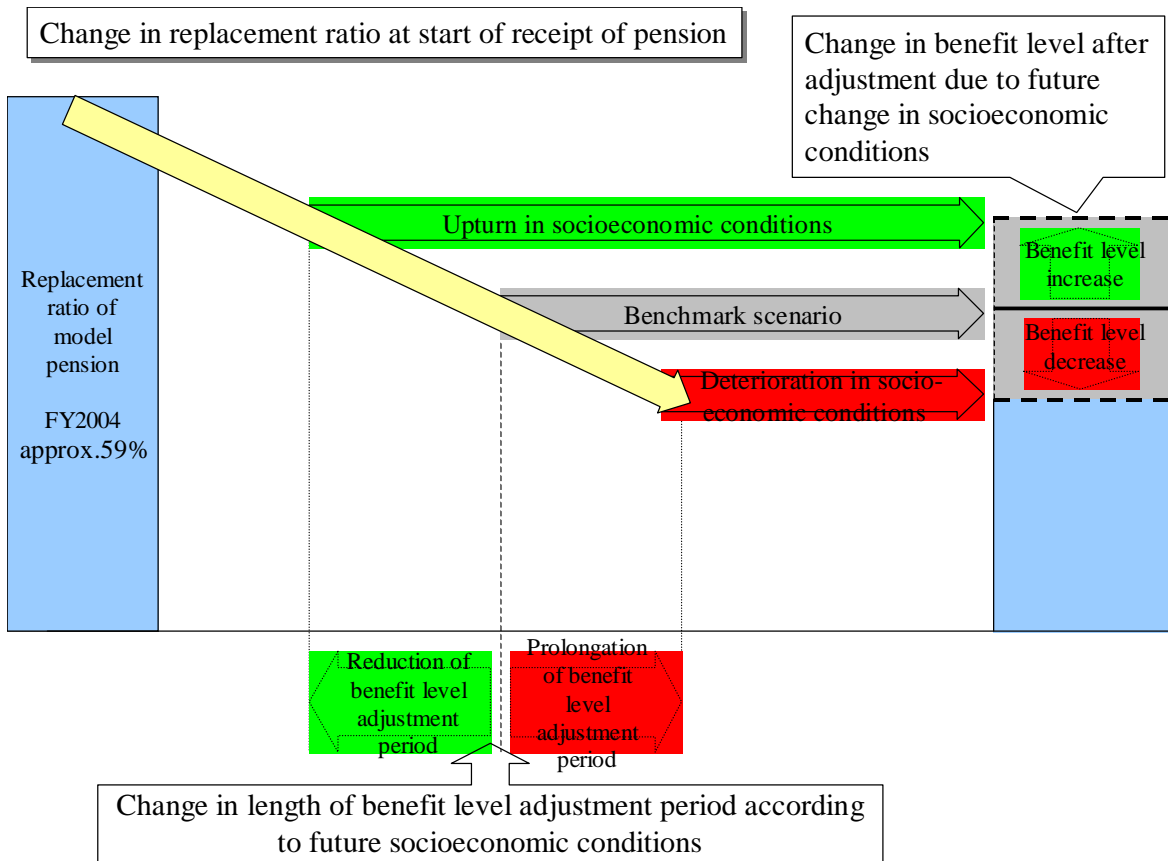
arrangement results in the automatic adjustment of benefit levels.

According to the benchmark scenario adopted for the 2004 pension revision, the adjustment of benefit levels will take around next 20 years.

If there is an upturn in socioeconomic conditions, then it will be possible to terminate benefit level adjustment earlier and maintain benefit levels at a higher level than anticipated at the present time. Conversely, if the situation deteriorates, adjustment will have to be continued longer than planned, and subsequent benefit levels will be lower.

A mechanism for automatically adjusting the benefit level according to future changes in social and economic conditions has thus been incorporated into the pension system.

Figure 1-8   Mechanism for automatic adjustment of benefit levels

Change in replacement ratio at start of receipt of pension

Change in benefit level after adjustment due to future change in socioeconomic conditions

Replacement ratio of model pension

FY2004 approx.59%

Upturn in socioeconomic conditions

Benchmark scenario

Deterioration in socio-economic conditions

Benefit level increase

Benefit level decrease

Reduction of benefit level adjustment period

Prolongation of benefit level adjustment period

Change in length of benefit level adjustment period according to future socioeconomic conditions

(3) Benefit level floor

While the 2004 pension revision incorporated a mechanism for automatic adjustment of benefits, one question that must be considered is the extent to which benefit levels should be allowed to fall, as given the role of public pensions, it is necessary to maintain at least a certain level of benefits.

Under the revision, the benefit level of a salaried worker, employed on an average salary for 40 years, and his wife, a full-time housewife for 40 years, under the Employees' Pension system (hereafter referred to as the "model pension") is set to exceed 50% of the average take-home pay (including bonuses) of persons in employment when they begin receiving their pension at the age of 65.

If we define the ratio of the pension benefit to the average take-home pay (including bonuses) at the pensionable age (65) as the replacement ratio, then the replacement ratio of the model pension under the Employees' Pension is presently (as of FY2004) 59%.

Although 59% at present, the replacement ratio of the model pension under the Employees' Pension will be automatically adjusted downward. Applying the demographic and economic assumptions used for the benchmark scenario, adjustment will be terminated when the replacement ratio reaches 50.2% in FY2023. Thereafter, a replacement ratio exceeding 50% will be maintained, and the financial balance of the pension system will be ensured for around 100 years up to FY2100.

However, if the socioeconomic situation deteriorates in relation to pension finances more than currently expected (e.g. due to a greater than anticipated fall in the fertility rate), then continued adjustment of benefit levels in order to maintain the balance of pension finances would lead the replacement ratio to fall below 50%.

In such a case, though, the automatic adjustment of benefit levels will be maintained while continuing to project the future state of pension finances at the time of each actuarial valuation at least every five years. At the point that the replacement ratio is projected to fall below 50% before the next actuarial valuation, termination of benefit level adjustment should be examined, and adjustment terminated or other measures adopted based on the findings. It is also stipulated in law that benefits and contributions as a whole should be reviewed and necessary measures should be taken in such a case.

As it is projected to take around 20 years for the replacement ratio to approach 50% as a result of benefit level adjustment, however, overall rethink of benefits and contributions will occur after around 20 years or so even if there is a greater-than-anticipated deterioration in the socioeconomic environment.

Figure 1-9   Automatic adjustment of benefit levels and benefit floor

Change in replacement ratio at start of receipt of pension

○Under Article 2 of the supplementary provisions to the 2004 amendment law, benefit level adjustment is to be terminated if the replacement ratio of the model pension under the Employees' Pension is projected to fall below 50% by the time of the next actuarial valuation.
○In conjunction with this, the appropriate future course of benefits and the cost burden is to be examined and necessary measures taken to keep pension finances in balance.

Replacement ratio for Employees' Pension model pension

FY 2004 approx. 59%

Benchmark scenario

Benefit floor 50% replacement ratio

Deterioration in socio-economic conditions

Benefit level decrease

If socioeconomic conditions deteriorate more than envisaged, the benefit level is projected to fall below the 50% replacement ratio assuming that adjustments are mechanically made until pension finances are balanced.

(4) Balancing pension finances: assets

For a pension system to operate successfully, its finances must be in balance, and the mechanism for automatic adjustment of benefit levels introduced by the 2004 pension revision is designed for just this purpose. However, in order to implement automatic adjustments, it is necessary to clarify exactly what it means to balance pension finances, and one of the most crucial questions in this respect is the scope of the length of time over which the balancing is to be achieved.

For an individual, the pension system spans an extremely long period that stretches from when he or she starts paying contributions to the end of receipt of benefits. For a person of average life expectancy, this is a period of around 60 years, starting from the age of 20. In the case of an exceptionally long-lived person who lives to the age of 100, contributions and benefits will be paid and received over a period of 80 years. The balancing of pension finances must therefore be considered over an extremely long period of time.

In addition, the changing relationship between pension system revenues and expenditures caused by a rapid decline in the fertility rate and population aging, as is occurring in Japan, also necessitates a long-term approach to balancing pension finances.

Approaches to balancing pension finances from a long-term perspective broadly fall into two camps: the

whole-future-balancing method, which seeks to balance finances over an indefinite future period as seen from the present, and the closed-period-balancing method, which balances finances over a finite fixed period , again as seen from the present.

Whole-future-balancing method

The whole-future-balancing method is a method of balancing finances into the indefinite future, and is the method that was adopted to balance pension finances at the time of the previous actuarial valuation in 1999. Regarding this valuation, certain assumptions about the distant future beyond the period of estimation of population projections were assumed to continue indefinitely, and calculations were performed on this basis so as to achieve a balance in pension finances into the infinite future.

This method takes into consideration the whole future at the present based on the belief that the public pension system is supposed to continue indefinitely into the future. In the distant future, however, it is impossible to rule out events that cannot presently be anticipated, making it debatable whether the indefinite future should be considered in calculations.

A further problem with this method is that if a high future level of population aging is anticipated, as in the case of Japan, the public pension system is projected to manage huge assets in order to be able to make use of the investment profit in the future. This projection, however, raises the question of whether public acceptance can be gained for adjustments in benefit levels.

Because of this situation, the FY2004 pension revision stipulated in law that fiscal management should be effected by the closed-period-balancing method described below.

Closed-period-balancing method

The closed-period-balancing method adopts a predetermined finite period from the present time over which a balance in pension finances is sought, and assets at the end of this financial balancing period will meet a payment reserve. Subsequent actuarial valuations conducted at least every five years then aim to balance pension finances over a period of around 100 years from the point in time of valuation.

The balancing period is stipulated by law as being a period of around 100 years until the completion of payment of pensions to those already born. For the actuarial valuation in 2004, future projections were drafted based on a 95-year balancing period up to 2100, with assets in 2100 equivalent to one year of expenditures.

Figure 1-10 Appropriate level of assets as dictated by the period for balancing of benefits and contributions

The balance of benefits and contributions under the public pension system must be maintained in the future.
When making an actuarial valuation at present, there are two methods of balancing classified according to whether finances are balanced over an indefinite or definite future.

<Maintaining a level of assets in order to balance finances into the indefinite future: the whole-future-balancing method>

The balancing period used for present actuarial valuations is the whole future, and benefits and contributions are balanced over an indefinite period of time.

If rapid population aging is projected, a certain level of assets must be maintained in order to use investment profit.

Indefinite balancing of benefits and contributions

Present

<Limitation of asset level with a view to balancing over a long finite period of around 100 years: the closed-period-balancing method>

The period until completion of payment of benefits to those already born is adopted as the period for fiscal balancing at the time of actuarial valuations (e.g. 95 years = until around 2100). This method is that presently used in the U.S.

The target asset level is set so as to maintain a payment reserve (around one year's worth of benefit expenditures) in the final year of the balancing period.

At each actuarial valuation (e.g. every 5 years), the balancing period is shifted forward so as to always balance benefits and contributions up to a certain point in the future.

Note: Regardless of whether the whole-future-balancing method or the closed-period-balancing method is used, the raising of contributions and indexation remain unchanged. The difference occurs in the extent of benefit level adjustment and the timing of the termination of adjustment.

At the time of the 2009 actuarial valuation, the benefit level is adjusted so that benefits and contributions are balanced over a period including the period not considered at the time of the 2004 actuarial valuation (FY2101-2105).
If, for example, a higher rate of population aging is projected for this period, the benefit level at which benefits and contributions are brought into balance will be lower than that calculated at the time of the 2004 actuarial valuation.

【Shift of balancing period (if 95 years)】

2004 actuarial valuation	Balancing period (benefits and contributions balanced until FY2100)
2009 actuarial valuation	Balancing period (benefits and contributions balanced until FY2105)
2014 actuarial valuation	
2019 actuarial valuation	

FY2005 FY2010 FY2015 FY2020   FY2100 FY2105 FY2110 FY2115
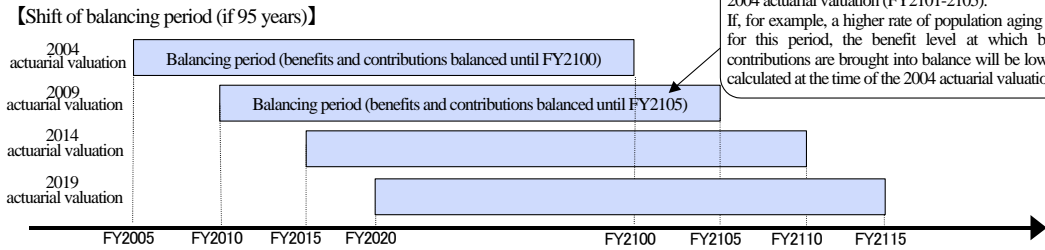
2	**Outline of 2004 actuarial valuation**

1. Principal assumptions for actuarial valuation

It is necessary to make certain assumptions on social and economic conditions to produce projections of future contribution revenues and pension benefit expenditures in the actuarial valuations.

For the 2004 actuarial valuation, basic assumptions (constituting the benchmark scenario) and several other sets of assumptions were made regarding demographic and economic conditions in the future. The principal assumptions of the benchmark scenario were as follows.

(1) Assumptions regarding population projections (fertility rate and population aging)

The medium variant in the *Population Projections for Japan* announced by the National Institute of Population and Social Security Research in January 2002 is adopted for the benchmark scenario.

Table 2-1 Total fertility rate and life expectancy at birth for the medium variant

Total fertility rate		Life expectancy at birth	
2000 (actual)	2050	2000 (actual)	2050
1.36	1.39	Male: 77.64 years Female: 84.62 years	80.95 89.22

(2) Assumptions regarding labor force participation rate

The assumptions regarding the future labor force participation rate were taken from *Labor Force Participation Rate Projections* estimated by the Employment Security Bureau in July 2002. As these estimates are for the period until 2025, the rate for 2025 is used for subsequent years.

Table 2-2 Assumptions regarding labor force participation rate

	2000 (actual)	2025
Males aged 60-64	72.0%	85.0%
Females aged 30-34	58.8%	65.0%

(3) Economic Assumptions

1) Inflation rate

The rate until 2008 is that projected in *Reform and Outlook: Fiscal 2003 Revision* (Cabinet Office). For 2009 onward, inflation is set at 1.0% based on the fact that (a) the average rate of increase in consumer prices over the past 20 years (1983-2002) is 1.0%, and (b) the average rate of increase in consumer prices projected in *Reform and Outlook: Fiscal 2003 Revision* for FY2004-2008 is 1.0%.

2) Wage growth rate and rate of investment return

The rates used for FY2004-2008 are based on the projection in *Reform and Outlook: Fiscal 2003 Revision*. From FY2009 onward, the rates are set based on the report of the Pension Fund Management Committee of the Social Security Council. This report provides medium and long-term estimates of real wage growth rates and rates of investment return based on projected increases in the productivity of the Japanese economy (according to the Cabinet Office's *Fiscal 2001 Annual Economic and Fiscal Report*) assuming the implementation of structural reforms.

Table 2-3   Economic assumptions for 2004 actuarial valuation

	2003	2004	2005	2006	2007	2008	From 2009
Price inflation	-0.3	-0.2	0.5	1.2	1.5	1.9	1.0
Wage growth rate [real]	0.0 [0.3]	0.6 [0.8]	1.3 [0.8]	2.0 [0.8]	2.3 [0.8]	2.7 [0.8]	2.1 [1.1]
Rate of investment return [difference from wage growth rate]	0.8 [0.8]	0.9 [0.3]	1.6 [0.3]	2.3 [0.3]	2.6 [0.3]	3.0 [0.3]	3.2 [1.1]

Note: The rate of investment return in the table is the assumed rate of return on the independently managed component. The total rate of investment return until FY2007 is the rate calculated taking into account the rate of return on deposits to the Fiscal Loan Fund (calculated based on performance as of the end of FY2002).

(4) Other assumptions

In addition to the above assumptions, several other assumptions were used based on the past performance of the system (such as the rate of occurrence of disability pensions). These assumptions were made based on the latest actual data on insured persons and pensioners, etc.
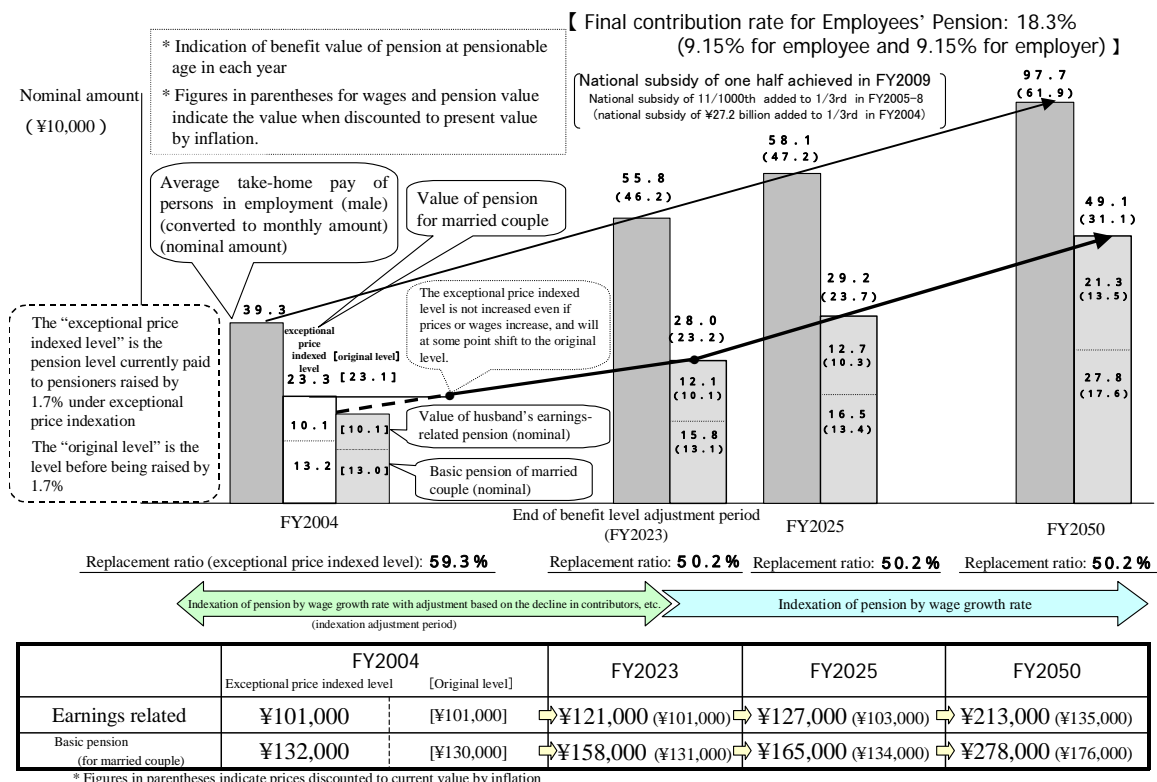
2. Projections of future benefit levels

(1) Projected replacement ratio for the Employees' Pension

Trends in the replacement ratio and value of the model pension under the Employees' Pension program at the pensionable age of 65 are shown in Figure 2-1. (These trends are based on the benchmark scenario of future social and economic conditions.)

Figure 2-1 Demographically-modified indexation based on fixed contribution: Employees' Pension (including basic pension for married couple)

	FY2004		FY2023	FY2025	FY2050
	Exceptional price indexed level	[Original level]			
Earnings related	¥101,000	[¥101,000]	¥121,000 (¥101,000)	¥127,000 (¥103,000)	¥213,000 (¥135,000)
Basic pension (for married couple)	¥132,000	[¥130,000]	¥158,000 (¥131,000)	¥165,000 (¥134,000)	¥278,000 (¥176,000)

* Figures in parentheses indicate prices discounted to current value by inflation

If the closed-period-balancing method is used for the period until FY2100, then the adjustment of benefit levels by demographically-modified indexation in order to balance pension finances will be applied until FY2023. During this time, the rate of pension indexation will be lower than that of the growth in wages (disposable income) of those in employment, and so the replacement ratio will fall from 59.3% as of FY2004 to 50.2% in FY2023. As indexation of the value of newly awarded pensions will revert to wage indexation following the termination of demographically-modified indexation, the replacement ratio at the pensionable age (65) will be maintained at the level when demographically-modified indexation is terminated.

As the purpose of demographically-modified indexation is solely to curb growth in pensions when wages

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and prices rise, although its implementation will cause a decline in the replacement ratio, the nominal value of pensions will increase.

In the benchmark scenario, the real wage growth rate is set at a long-term rate of 1.1%. Consequently, if real wages rise by around this amount, the value of the pension discounted to present value by inflation will remain almost even if the benefit level is adjusted by demographically-modified indexation, making it possible to maintain the present purchasing power of the pension.

(2) Projection of replacement ratio for the Employees' Pension in the event of changes in socioeconomic conditions

Under the 2004 amendment, contributions are capped and benefit levels adjusted until pension finances reach a balance within the range of fixed financial resources. In the event of a change in socioeconomic conditions, therefore, the projection of benefit levels will also be subject to change.

However, as the adjustment of benefit levels is effected by adding a fixed rate (0.3% per year) determined taking into account growth in the life expectancy of pensioners to the rate of decline in the number of insured persons under the public pension system, in which all residents of Japan aged 20-59 must in principle be enrolled, the adjustment rate is not significantly affected by changes in the fertility rate or economic conditions over the next two decades or so. This is because those who will reach the age of 20 in 20 years' time have already been born, and so they will be unaffected by future trends in the fertility rate. The impact of changes in socioeconomic conditions is therefore primarily manifested in the form of changes in the timing of termination of demographically-modified indexation, and therefore changes in the final level of benefits.

For the actuarial valuation in 2004, projections were made of the final benefit level in the case of changes in the fertility rate and economic conditions. The assumptions adopted are shown in Table 2-4.

Table 2-4 Assumptions in case of change in fertility rate and economic conditions

(1) Assumptions regarding trends in fertility rate

	Assumed total fertility rate (2050)
Higher fertility rate scenario	1.52
Benchmark scenario	1.39
Lower fertility rate scenario	1.10

(2) Economic assumptions (from FY2009)

	Wage growth rate [real]	Rate of investment return [difference from wage growth rate]
Improved economy scenario	2.5% [1.5%]	3.3% [0.8%]
Benchmark scenario	2.1% [1.1%]	3.2% [1.1%]
Worse economy scenario	1.8% [0.8%]	3.1% [1.3%]

Figure 2-2 shows the projected benefit level for the Employees' Pension (replacement ratio of the model pension at the pensionable age of 65) in the event of a change in socioeconomic conditions.

If there is an amelioration in both the fertility rate and economic trends, benefit level adjustment by demographically-modified indexation will be terminated in FY2019, and the replacement ratio will be 52.4%.

In case there is a deterioration in both the fertility rate and economic trends, pension finances are projected not to balance unless benefit level adjustment by demographically-modified indexation is continued even after the replacement ratio slips below 50% in FY2024. In such a case, adjustment by demographically-modified indexation should be terminated or other measures taken at the time of the last actuarial valuation before that point. It is also stipulated in law that benefits and contributions as a whole should be reviewed and necessary measures should be taken in such a case. If application of demographically-modified indexation were to be continued and assets worth one year of expenditures in FY2100 were to be accumulated, then projections indicate that such indexation would have to be continued until FY2033 and the replacement ratio would be 45.3%.

Figure 2-2   Projected replacement ratio in the event of a change in socioeconomic conditions: 2004 actuarial valuation

(%)

Replacement ratio (FY2004) 59.3%

Replacement ratio for Employees' Pension (including basic pension for married couple)

2009 Actuarial valuation

2014 Actuarial valuation

(52.4% from FY2019)   Improvement in fertility rate and economy   52.4%

2019 Actuarial valuation   (50.2% from FY2023)   Benchmark scenario   50.2%

(50% from FY2024)   Deterioration in fertility rate and economy   50%

FY2017 18.3% contribution rate reached

(45.3% from FY2033)   (45.3%)

・Under Article 2 of the supplementary provisions to the 2004 amendment law, if the replacement ratio is projected to fall below 50% by the time of the next actuarial valuation, benefit level adjustment is to be terminated. As a consequence, a benefit level in excess of 50% will presently be ensured from FY2024 onward as well.

(If application of demographically-modified indexation were to be mechanically continued, the replacement ratio would fall to 45.3%.)

・In order to balance pension finances while maintaining a replacement ratio of 50%, a review is to be made of the appropriate future course of benefits and the cost burden, and the necessary measures taken in the light of this review.

FY2000   FY2020   FY2040   FY2060

Note: The replacement ratio is that of a newly awarded pension.

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3. Future outlook regarding pension finances

Projections regarding the revenues, expenditures and assets of the Employees' Pension and National Pension under the benchmark scenario of socioeconomic conditions are as shown in Tables 2-5 and 2-6.

Taking into consideration a period of approximately 100 years from the present, the balancing method adopted is the closed-period-balancing method, with assets in FY2100 set at one year of expenditures.

The balance of revenues less expenditures is a deficit of ¥3.6 trillion under the Employees' Pension and a deficit of ¥0.2 trillion under the National Pension in FY2005. However, as a result of raising the contribution level and also progressively raising the national subsidy to one half, the deficits of the Employees' Pension and the National Pension are projected to be eliminated in FY2010 and FY2009 respectively.

In Japan, the fertility rate is in decline and the population is aging. Population aging, as measured based on the proportion of persons aged 65 and over to persons aged 20-64, will progress rapidly from the 2040s, when the children of the baby-boomer generation become pensioners, by which time Japan will have become a "super-aged society."

In order to balance pension finances from the 2040s, therefore, when contribution revenues from those in employment will be exceeded by pension benefits paid to older persons, allocation of asset resources to benefits will begin in earnest through the use of principal as well as investment profits.

Table 2-5 Financial projections for Employees' Pension (2004 actuarial valuation)

Final contribution rate: 18.3%

National subsidy: raised to one half by FY2009
National subsidy of 11/1000th added to 1/3rd in FY2005-2008
(national subsidy of ¥27.2 billion added to 1/3rd in FY2004)

Adjustment period (year of termination)	2023
Replacement ratio (in year of termination)	50.2%

Year	Contribution rate (% of annual earnings)	Total revenue			Total expenditure		Balance of revenues and expenditures	Year-end assets	Year-end assets (in FY2004 value)	Reserve ratio
			Contribution revenue	Investment profits		Basic pension contribution				
FY	%	¥ trillion	¥ trillion	¥ trillion	¥ trillion	¥ trillion	¥ trillion	¥ trillion	¥ trillion	
2005	14.288	28.3	20.8	3.0	31.9	11.1	-3.6	163.9	163.9	5.2
2006	14.642	29.8	21.6	3.5	32.9	11.3	-3.1	160.8	161.1	5.0
2007	14.996	31.2	22.6	4.0	33.8	11.5	-2.5	158.3	157.8	4.8
2008	15.350	33.0	23.5	4.7	34.9	12.0	-1.9	156.4	153.1	4.5
2009	15.704	36.1	24.5	4.9	36.5	12.6	-0.4	156.0	149.2	4.3
2010	16.058	37.6	25.5	4.9	37.5	13.0	0.0	156.0	145.3	4.2
2015	17.828	44.0	30.8	5.1	41.4	15.1	2.6	162.5	137.3	3.9
2020	18.30	49.2	34.8	5.8	43.3	16.5	5.9	186.3	141.8	4.2
2025	18.30	53.7	37.7	6.9	45.5	17.7	8.2	223.1	153.1	4.7
2030	18.30	58.2	40.0	8.3	49.5	19.4	8.7	266.6	164.9	5.2
2040	18.30	66.2	43.1	10.3	62.9	25.4	3.3	330.1	165.8	5.2
2050	18.30	73.5	47.2	10.6	74.8	31.4	-1.3	335.0	136.7	4.5
2060	18.30	80.6	52.8	9.9	82.9	35.5	-2.4	314.4	104.2	3.8
2070	18.30	87.0	58.4	9.0	90.8	39.3	-3.7	284.4	76.6	3.2
2080	18.30	94.2	65.0	7.6	99.6	43.4	-5.4	237.9	52.1	2.4
2090	18.30	103.6	73.9	5.7	109.8	48.0	-6.2	178.4	31.7	1.7
2100	18.30	115.1	84.8	3.7	121.5	53.3	-6.4	115.1	16.6	1.0

Notes: 1. Long-term economic assumptions (from FY2009) are as follows:
Wage growth rate   2.1%
Price inflation   1.0%
Rate of investment return   3.2%
Disposable income growth rate   2.1% (1.9% until FY2017)

2. The "reserve ratio" is the ratio of assets at the end of the previous fiscal year to total expenditure in the current year.

3. "In FY2004 value" indicates the value converted to FY2004 value by adjusting for the wage growth rate.

4. Projected overall finances of the Employees' Pension including the Employees' Pension Fund substitutional component.

Table 2-6   Financial projections for National Pension (2004 actuarial valuation)

Final contribution: ¥16,900 (in FY2004 value)

National subsidy: raised to one half by FY2009
National subsidy of 11/1000th added to 1/3rd in FY2005-2008
(national subsidy of ¥27.2 billion added to 1/3rd in FY2004)

| Year | Monthly contribution (in FY2004 value) | Total revenue | | | Total expenditure | Balance of revenues and expenditures | Year-end assets | Year-end assets (in FY2004 value) | Reserve ratio |
			Contribution revenue	Investment profits					
FY	¥	¥ trillion	¥ trillion	¥ trillion	¥ trillion	¥ trillion	¥ trillion	¥ trillion	
2005	13,580	4.0	2.1	0.2	4.2	-0.2	10.8	10.8	2.6
2006	13,860	4.3	2.2	0.2	4.5	-0.2	10.6	10.6	2.4
2007	14,140	4.6	2.4	0.3	4.8	-0.2	10.4	10.3	2.2
2008	14,420	4.8	2.5	0.3	5.0	-0.2	10.1	9.9	2.1
2009	14,700	5.4	2.5	0.3	5.0	0.3	10.5	10.0	2.0
2010	14,980	5.6	2.6	0.3	5.1	0.5	11.0	10.2	2.1
2015	16,380	6.5	3.0	0.4	5.9	0.7	13.8	11.7	2.2
2020	16,900	7.3	3.4	0.6	6.4	0.9	17.9	13.6	2.6
2025	16,900	8.1	3.7	0.7	7.0	1.1	23.2	15.9	3.2
2030	16,900	9.2	4.0	0.9	8.0	1.2	29.2	18.1	3.5
2040	16,900	11.2	4.3	1.2	10.6	0.6	38.7	19.4	3.6
2050	16,900	13.1	4.7	1.3	13.0	0.1	42.0	17.2	3.2
2060	16,900	14.7	5.3	1.3	14.8	-0.1	41.9	13.9	2.8
2070	16,900	16.1	5.8	1.3	16.5	-0.3	39.7	10.7	2.4
2080	16,900	17.7	6.5	1.1	18.2	-0.5	35.2	7.7	2.0
2090	16,900	19.5	7.5	0.9	20.2	-0.7	29.0	5.2	1.5
2100	16,900	21.6	8.6	0.7	22.4	-0.8	21.6	3.1	1.0

Notes: 1. Long-term economic assumptions (from FY2009) are as follows:
Wage growth rate   2.1%
Price inflation   1.0%
Rate of investment return   3.2%
Disposable income growth rate   2.1% (1.9% until FY2017)

2. The "reserve ratio" is the ratio of assets at the end of the previous fiscal year to total expenditure in the current year.

3. "In FY2004 value" indicates the value converted to FY2004 value by adjusting for the wage growth rate.