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Thirty-year Outlook for a Super-aged Japan (Summary)

Japan endeavoring to achieve a sustainable social security system: Responsibilities to future generations

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Summary

- In our very long-term view of Japan, we anticipate that the growth rate of real GDP will be 1.5% in the 2010s and 2020s, and 1.0% in the 2030s. This will be an economy where man-hour productivity rises 1.7% in the 2010s, 1.8% in the 2020s, and 2.0% in the 2030s. Over the next 30 years or so, nominal wages will on average grow around 2.5%, and the annual inflation rate will rise to around 1.5%. The current account balance as a percentage of GDP is expected to be 1.3% in the 2010s, 0.7% in the 2020s, and -0.2% in the 2030s. As trade deficits become a recurring feature, Japan's trade structure will shift to one where such deficits are offset by a positive income account balance. For Japan with a considerable and rising population of long-lived people, how well it invests its external assets will be put to the test.

- In our outlook for the world economy, the presence of China will diminish as its society rapidly ages, but the US will continue to hold center stage. Taking a conservative view of the US economy, we predict that the world economy will grow 3.8% in the 2010s, 3.6% in the 2020s, and 2.6% in the 2030s. Turning to Japan, the M-shaped curve of the labor force participation rate for women should disappear and the participation rate of older people should increase. Given the need for the stable supply of electricity, the diversification of energy sources will be an important consideration. A realistic scenario regarding the mix of electric power sources will be to reduce the use of nuclear power at a pace that is not overly hasty.

- What will be needed in growth strategies is the strengthening of mutual relationships with foreign economies in trade, investments, and human resources. Equally needed in such strategies is a really good market system where the market mechanism can work to its full potential. The government and the market have a complementary relationship. The issue is not whether the government is large or small but whether it functions well. Japan now has an administration that is firmly focused on growth with the aim of drawing out private-sector

initiatives and rebuilding a strong economy. We place great hopes in the further development of policies by this administration. The global economy is improving, even if a step at a time, and positive developments are becoming manifest in the domestic economy. This is precisely the moment for promoting structural reforms that generally tend to be put off to the future.

- The government's social security benefit expenditures are predicted to be flat in the 2020s but to grow again in the 2030s. If the current system continues as is, nominal government debt will expand to about Y2,700 trillion, or about 280% of GDP, by end-FY40. Thus, under the present system, government finances will travel a path toward effective bankruptcy, and a watchful eye will need to be constantly directed toward the JGB market. It will be extremely important to steadily raise the consumption tax rate as planned and to build a social security system suitable for a super-aged society within the 2020s at the latest. A further strengthening of the prospects for reforming the social security system and government finances is desired.

- We performed a simulation of how Japan's economy would be affected by such developments as the starting age for receiving pension benefits being pushed back, pension benefits being adjusted based on certain demographic factors and macroeconomic conditions, an increase in the proportion of medical expenses being paid out of pocket, and the spread of generic drugs, factoring in how these changes would reciprocally interact with the macroeconomy. In our "structural reform scenario", we assumed that the implementation of growth strategies would be accompanied by the above policies to reduce pension benefits and by an increase in the consumption tax rate. In this scenario, the growth rate of the economy would decline about 0.2 percentage points compared to our base scenario, but bankruptcy of the social security system and government finances would be avoided. If required reforms are undertaken, it will be possible to achieve economic growth and to maintain the social security system in the coming super-aged society.

- It is, however, no easy matter to present a scenario where a positive primary balance is attained in structural terms just by reducing benefits and by increasing the taxpayer burden. There is a need to urgently reaffirm that failing to deal properly with the challenges of a super-aged society will risk ruining the lives of citizens. To reduce the ratio of government debt to GDP, benefits paid by the government should be limited further, and the wisdom of the private sector should be unleashed to set the stage for invigorating the private sector economy. The feasibility of individual policies and desirable choices will need to be examined separately. Since the social security of the elderly cannot be supported by the government in its entirety in a super-aged society, a "radical reform scenario" that expands the role of the private sector should be envisioned. It is our responsibility to future generations that we do not allow ambitions for reforms to be stifled.

Forecast Tables (Base scenario)

Main Economic Indicators

DIR estimate

(FY)	1981-85	1986-90	1991-95	1996-00	2001-05	2006-10	2011-15	2016-20	2021-25	2026-30	2031-35	2036-40
Nominal GDP (Y tril)	297.4	397.0	491.6	513.1	501.9	493.1	487.3	548.3	629.3	722.1	813.7	917.2
(Y/y %)	5.9	6.5	2.0	0.2	-0.2	-1.0	1.2	2.5	3.0	2.6	2.4	2.5
Nominal GNI (Y tril)	297.9	399.4	495.6	519.8	511.5	508.0	502.6	565.9	646.3	737.4	828.0	929.5
(Y/y %)	6.0	6.5	2.0	0.3	0.0	-1.0	1.3	2.4	2.9	2.5	2.3	2.4
Real GDP (chained [2005]; Y tril)	305.8	385.4	445.8	470.5	490.1	511.0	528.2	574.1	626.4	673.8	715.1	751.6
(Y/y %)	4.3	5.0	1.3	0.8	1.2	0.2	1.3	1.7	1.8	1.3	1.1	0.9
Real GNI (chained [2005]; Y tril)	307.3	395.6	458.9	485.9	504.6	516.1	525.2	571.0	620.1	663.2	701.3	734.1
(Y/y %)	4.5	5.3	1.5	0.8	1.1	-0.2	1.1	1.6	1.6	1.2	1.1	0.8
Per capita real GNI (chained [2005]; Y mil)	2.6	3.2	3.7	3.8	4.0	4.0	4.1	4.5	5.0	5.5	6.0	6.6
(Y/y %)	3.8	4.8	1.2	0.6	0.9	-0.2	1.3	2.0	2.1	1.8	1.8	1.6
Consumer Price Index (2010 = 100)	85.3	91.2	100.2	102.9	100.8	100.8	101.1	108.3	116.2	125.7	135.2	146.5
(Y/y %)	2.5	1.4	1.2	0.3	-0.4	-0.1	0.8	1.3	1.5	1.6	1.5	1.7
Yield on 10-yr JGBs (%)	7.5	5.4	4.4	2.0	1.3	1.5	1.2	2.1	2.4	2.7	2.5	2.8
Y/$	236	142	112	117	116	102	81	80	75	68	68	67
Current balance (Y tril)	6.2	10.1	12.5	12.3	16.0	18.3	5.4	5.1	5.7	2.4	-0.8	-3.8
(% of nominal GDP)	2.0	2.7	2.5	2.4	3.2	3.7	1.1	0.9	0.9	0.3	-0.1	-0.4
Central & local government fiscal balance (Y tril)	-13.3	-2.8	-20.3	-35.0	-32.4	-26.9	-37.9	-30.9	-34.8	-46.2	-62.4	-83.6
(% of nominal GDP)	-4.6	-0.8	-4.1	-6.8	-6.5	-5.5	-7.8	-5.6	-5.5	-6.4	-7.7	-9.1
Primary balance (% of nominal GDP)	-1.3	2.4	-1.3	-4.0	-4.4	-4.0	-6.0	-3.9	-3.6	-4.2	-5.2	-6.3
Central & local government debt (Y tril)	202	295	384	621	838	955	1,169	1,353	1,540	1,770	2,077	2,480
(% of nominal GDP)	67.4	74.9	78.0	121.2	166.9	194.1	239.8	246.7	244.9	245.1	255.1	270.2

Assumptions

(FY)	1981-85	1986-90	1991-95	1996-00	2001-05	2006-10	2011-15	2016-20	2021-25	2026-30	2031-35	2036-40
World economic growth (PPP; y/y %)	3.0	3.7	2.7	3.7	3.8	3.5	3.6	3.7	3.7	3.3	2.8	2.3
Oil price (WTI; $/bbl)	30.6	19.1	19.1	21.8	37.9	77.4	98.7	113.4	123.6	131.6	137.8	142.1
(Y/y %)	-7.7	-0.7	-5.3	10.1	14.7	6.8	5.0	2.1	1.5	1.1	0.8	0.5
Population (mil)	119.5	122.7	124.8	126.4	127.6	127.8	127.3	125.8	123.2	119.8	116.0	111.7
(Y/y %)	0.7	0.4	0.3	0.2	0.1	0.0	-0.2	-0.3	-0.5	-0.6	-0.7	-0.8
Population 15-64 (mil)	80.9	84.9	86.8	86.8	85.3	82.6	79.1	74.7	71.8	69.0	65.4	60.2
Population over 65 (mil)	11.7	13.9	17.0	20.5	24.3	28.2	31.9	35.7	36.8	37.2	37.7	39.0
(% of total population)	9.8	11.3	13.6	16.2	19.0	22.1	25.0	28.4	29.9	31.1	32.5	35.0
Labor force participation rate (%)	63.4	62.9	63.7	63.1	60.9	60.1	58.8	57.9	57.6	57.6	57.1	56.0
Consumption tax rate (end 5-yr period)	0.0	3.0	3.0	5.0	5.0	5.0	10.0	10.0	10.0	10.0	10.0	10.0

Source: Compiled by DIR.
Note: Fiscal and primary balance excl. ad-hoc factors.

Introduction: DIR 30-year project

The Shinzo Abe Cabinet that took office after a change in political party that lasted three years and three months has made ending prolonged deflation a pillar of its economic policies. Japan, the setting for these policies, has a high and rising proportion of long-lived people and is well on the road to becoming a super-aged society. As seen in the debate of regulatory reform and the strengthening of industrial competitiveness, what the current administration is likely aiming for is a near-term economic recovery and the rebuilding of a strong Japanese economy. Promising signs are currently being seen regarding the numerous problems burdening the global economy and indeed the domestic economy. This is an opportune moment for promoting measures that would bolster the underlying strength of Japan and secure sustainable and high living standards for Japanese citizens.

Based on such an awareness of the issues, DIR embarked on a project to research and examine the long-term challenges Japan is facing (hereafter, the DIR 30-year project). This project will analyze the outlook for Japan's economy over the next 30 years, an endeavor entitled "Thirty-year Outlook for a Super-aged Japan," and examine from the perspective of a private-sector think tank the desired reforms needed to strengthen and evolve policies for rebuilding a strong Japanese economy. If the DIR 30-year project is to be differentiated from other similar analyses, it is in its detailed incorporation of the social security system and public finances in its macroeconomic model of the real economy so as to factor in reciprocal interactions between the macroeconomy and systemic reforms in its simulations.

Our paper consists of two parts. Part I (chapters 1 to 4) discusses the world economy along with energy, electricity problems, and growth strategies and presents our outlook for the world economy and Japan's economy for the next 30 years. Part II (chapters 5 to 8) examines the reform needed of the social security system and public finances to achieve a sustainable super-aged society.

Part 1: World Economy and Japan's Economy over the Next 30 Years

Chapter 1: Structural Changes and Long-term Outlook for the World Economy

When viewed in the medium to long term, the aging of society is not a prospect limited to Japan but one that is shared by the whole world. A nation that is rapidly following Japan is China. One of the reasons why Chinese society is expected to rapidly age is the one-child policy introduced in 1979. While its economy is in a development stage, China's population structure is growing more mature. The burden placed on the working-age population is expected to rapidly mount in China in future years.

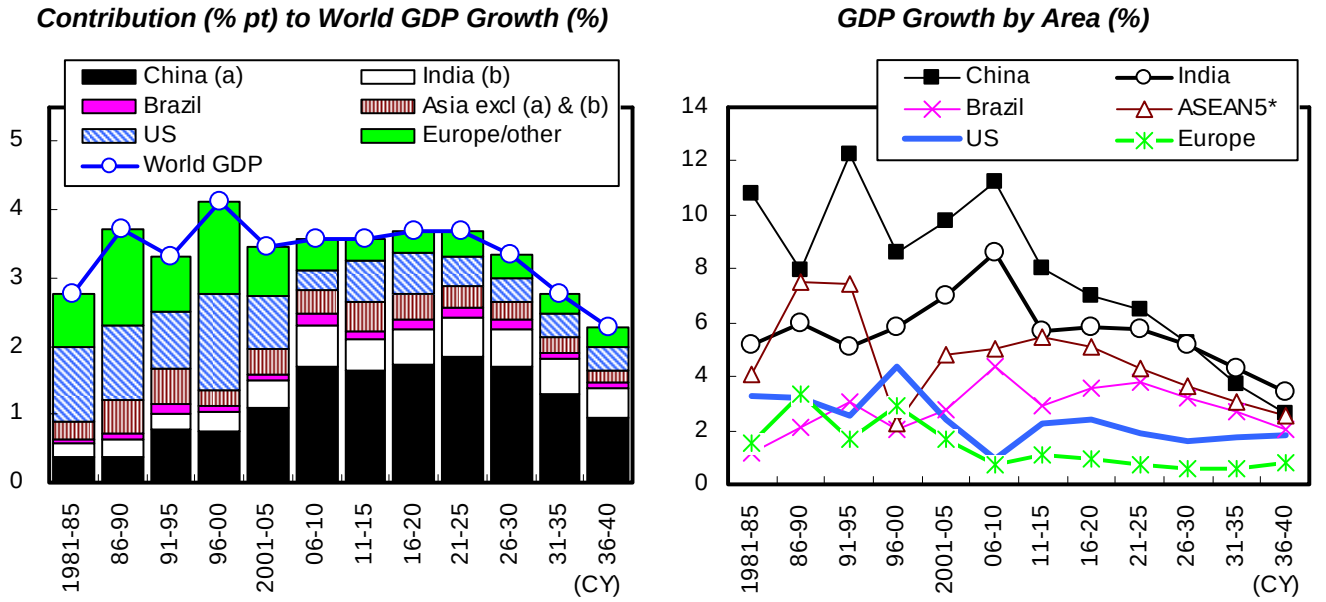
The population structure of the US contrasts greatly with that of China. The positive performance of the US economy is helping to maintain the birth rate and immigration at a certain level, which is supporting economic performance in turn. A key point to bear in mind is this mutually reinforcing virtuous cycle that exists in the US. In the medium to long term, the US and China are expected to remain at the center of the world economy, but in terms of the aging of society these two nations will find themselves in strikingly different circumstances.

The 2000s were distinguished by the unification of the global economy and economic adjustments ensuing from the Lehman crisis. Turning to the present, global production activity is believed to be heading in a positive direction at the very least. We anticipate that the world economy will expand firmly at an average rate of 3.7% over the next 10 years (2013-22). The growth rate that the IMF predicts for the same period is about 0.5 percentage points higher. This difference arises from the IMF forecasting a growth rate of 3.0% for the US economy, while we believe the US economy will expand at a considerably slower rate of 2.4%. In addition, there are differences in our outlooks for emerging-

market and developing economies (hereafter, emerging economies). Emerging economies have leveraged low wages and undervalued currency rates to achieve economic growth to date. If they are to realize relatively high growth rates over the medium to long term, they will need to convert their industrial structures and improve productivity to break through barriers to growth. In the DIR 30-year project's assumptions for the world economy, we have adopted a conservative stance regarding the US economy and emerging economies.

Based on an analysis of current conditions, medium-term outlooks, and demographic trends, the long-term portrait the DIR 30-year project has developed for the world economy to 2040 is one where annualized growth averages 3.8% in the 2010s and 3.6% in the 2020s. In both these decades, the growth rate of the world economy will hold to the 3% level. The US economy that greatly shrank in the second half of the 2000s will be restored to some degree in the 2010s. European economies will remain sluggish, and there will be no change to a structure where emerging economies command a central presence in the world economy by contributing about three-quarters of its growth. Starting in the second half of the 2020s, however, while emerging economies' degree of contribution will not diminish, their growth will slow. As a result, the growth rate of the world economy as a whole is forecast to decelerate to 2.6% in the 2030s. If we limit ourselves to the second half of the 2030s, this growth rate will fall to the low end of the 2% level, a low rate of growth not seen in about 50 years. In the case of China, its double-digit growth will recede to the 7% level in the 2010s, to around 6% in the 2020s, and to the 3% level in the 2030s (and to less than 3% in the second half of the 2030s). The changes overtaking emerging economies (incl. India and other Asian nations) will be driven by demographic trends, such as shrinking populations and aging societies.

World Economy to Slow to 2% Growth **Chart 1**



*Indonesia, Malaysia, Philippines, Thailand, and Singapore.

Source: Compiled by DIR.
Note: Growth rate=period avg.

The US may come to have a broad impact on the world economy through the shale gas revolution. Should foreign investments or energy exports from the US undergo structural changes, this may usher in a new equilibrium for the world economy. The shale gas business, however, is still in its initial stages, and the long-term uncertainties of this business, such as regarding profitability and negative environmental effects, will need to be kept in mind.

Chapter 2: Assumptions behind Our Outlook for Japan's Economy

Chart 2 presents a summary of the assumptions and premises we made regarding various domestic conditions in the process of developing our outlook for Japan's economy to 2040.

Major Premises of the DIR 30-year Project Regarding Domestic Factors **Chart 2**

Demographic trends	* Demographic trends were formulated based on separate birth rates estimated for men and women in increments of one year and based on the survival rates published by the National Institute of Population and Social Security Research. * The total fertility rate is estimated to be 1.50 in 2030 and 1.55 in 2040. * Regarding the labor force participation rate, the M-shaped curve for women will gradually disappear and the participation rate will rise centering on older people reflecting the starting age for receiving pension benefits being pushed back.
Crude oil prices	* Crude oil prices (WTI) that were $94/bbl in 2012 will rise to about $120/bbl in FY20, to about $135/bbl in FY30, and to about $145/bbl in FY40.
Energy policies	* Nuclear power plants determined to be safe by the Nuclear Regulation Authority will be restarted in succession over the next three years and will then be retired in succession in conformance with the rule to decommission such plants after 40 years of operation. The Shimane No. 3 nuclear power plant and the Oma No. 1 nuclear power plant under construction will begin operating in FY16, but no new nuclear power plants will be built. * Renewable energy's share of power generation will increase to 25% in FY30, and this share will be maintained going forward. Also, to secure backup power sources, new and replacement investments will be made in LNG power generation. * Regarding the power generation costs of various power sources, we adopted the figures of a 19 Dec 2011 report published by a government committee commissioned with making electricity generation cost projections. * Electricity demand will grow along with the expansion of the economy, but conservation effects are also anticipated to some degree. Electricity demand in FY30 and beyond is assumed to be 10% lower compared to a situation with no power conservation.

Source: Compiled by DIR.

The DIR 30-year project assumes that, as the birth rate gradually increases, government and private sector efforts will enable the labor force participation rate of women to rise. This means the so-called M-shaped curve in the participation rate for women will disappear. Also, as the phased pushing back of the starting age for receiving pension benefits that is already under way continues, we assume that the labor force participation rate of older people will rise.

We assume that crude oil prices (WTI) will climb from $94/bbl in 2012 to about $120/bbl in FY20, about $135/bbl in FY30, and about $145/bbl in FY40. This is thought to be a reasonable assumption in view of growing global production, the advance of energy-efficient fossil fuel technology, the shift to non-petroleum resources, and the maintenance of supply capacity through improvements in the potential for recovering the costs of oil field development and drilling allowed by higher crude oil prices.

With respect to domestic energy policies, it is worth underscoring as the basic thinking of the DIR 30-year project that the structure of power sources will likely require diversification. We anticipate that nuclear power plants will be restarted in succession over the next three years or so, beginning with those judged to have achieved a high level of safety based on sufficiently stringent criteria set by the newly established Nuclear Regulation Authority.

While restraint will continue to be the basic stance toward government expenditures for public works projects, such spending is predicted to increase somewhat in the 2020s and 2030s owing to the need to respond to the increasing vintage of social overhead capital. What will be important going forward is to undertake public works spending efficiently. This can be done by endeavoring to reduce costs by making use of the funds and know-how of the private sector and by establishing an order of priority for projects so as to make selective and focused investments.

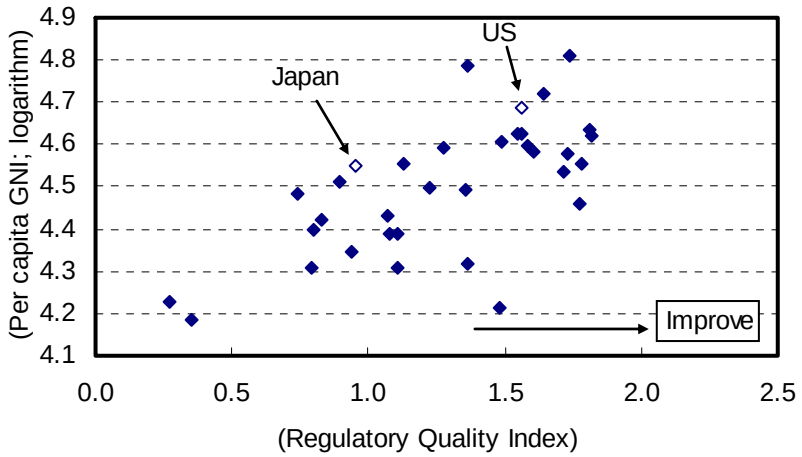
Regarding the increase in the consumption tax, as specified by existing law, we assume that the rate will rise to 10% in two stages, first in April 2014 and then in October 2015. Also, in our thinking about the budget deficit problem, we assume in our basic scenario for the moment that a consumption tax rate of 10% will be maintained beyond October 2015. The main reason for the budget deficit problem is growing social security expenditures. With this in mind, Part II will provide a detailed discussion of how to ensure the sustainability of both the social security system and public finances through reform of the social security system and a certain increase in the taxpayer burden.

Chapter 3: Our View on Growth Strategies and Electricity Supply and Demand Problems

Growth strategies can be understood in a number of ways. When an economy is expanding, there is greater latitude to redistribute income. While economic growth in itself may not solve many of Japan's problems, it would still greatly ease them or offer an approach to their solution. The DIR 30-year project, which surveys Japan from an extremely long-term perspective, is one that attaches great importance to economic growth.

The improvement of productivity is the most important element in realizing sustainable economic growth. Particularly in the case of Japan, there is still ample room for productivity to improve. Productivity (measured by total factor productivity) is thought to be determined by the two factors of technological progress and efficiency. For sustainable economic growth to be possible in an advanced economy, growth strategies must be established and implemented. This should be done from the perspectives of idea-based technological progress (innovation) and efficiency where valuable human capital and resources are allocated to the most essential sectors in economic and social terms.

Regulatory Quality and Per Capita Income (OECD 34 nations) **Chart 3**



Source: World Bank, *Worldwide Governance Indicators*; compiled by DIR.
Notes: 1) Per capita GNI (logarithm) on the basis of 2011 purchasing power parity; GNI=gross national income.
2) Regulatory Quality Index set at 0.0 for average of 153 nations.

What is drawing attention as a root factor influencing productivity in recent years is the existence (or not) of appropriate economic institutions/systems that promote innovation and facilitate the transfer of

human resources and funds to productive activities. In the case of Japan, there will be a need to strengthen mutual relationships with foreign economies not only in trade but in investments and human resources as well. Equally needed is a really good market system where the market mechanism can work to its full potential. The government and the market have a complementary relationship. The issue is not whether the government is large or small. What should be aimed for is a government that functions well, one that is able to strategically and appropriately implement necessary systemic reforms that accommodate changes in the domestic and foreign environments.

Given the need for the stable supply of electricity, a realistic scenario is the diversification of energy sources and the reduction of nuclear power at a pace that is not overly hasty. While there is concern that energy prices centering on crude oil will rise in the medium to long term, this will not necessarily constrain economic growth. Higher energy prices present an incentive to pursue innovation in the development and use of energy-efficient technology and alternative energy. Should the government engage in deregulation and systemic design in the areas of energy and electricity in a manner that draws out corporate creativity, higher electricity prices will have the potential of ushering in long-term economic growth.

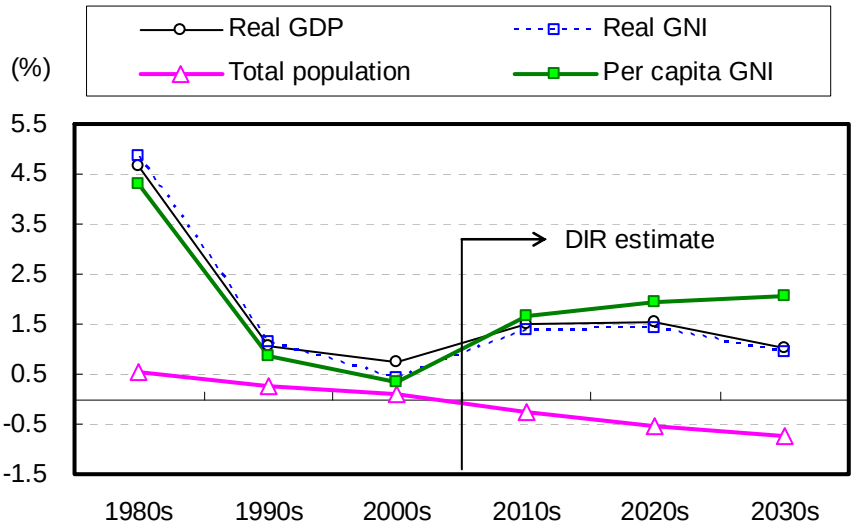
Specifically, innovation that increases the efficiency of the electric power system from both the demand and supply sides and diversifies power sources and the sourcing of fossil fuels will not only contribute to energy security and lower costs but will also result in lower carbon usage by curbing the use of fossil fuels. To connect this with economic growth, a virtuous circle that efficiently solves various problems must be created where private sector companies are encouraged to innovate by means of price and cost incentives.

Trade policies, such as the consideration currently being given to participation in the Trans-Pacific Partnership (TPP), are not limited to eliminating tariffs accompanying trade as much as possible but also include those to energize the economy through the market system, such as the harmonization of various trade rules, the simplification of customs procedures, and greater introduction of rules for protecting intellectual property rights. The government should endeavor to form a national consensus regarding domestic market deregulation, intellectual property rights, and other trade rules growing out of such developments as participation in TPP. Moreover, with the expansion of trade policies, there will be a need domestically to strengthen policies for increasing the competitiveness of industries such as agriculture and services. Growth strategies in their essence should be directed toward the development of a really good market system where the vitality of private sector companies can be fully expressed.

Chapter 4: Japan’s Economy over the Next 30 Years

In our forecast of Japan’s economy to FY40, real GDP is predicted to increase at an annualized average of 1.5% in the 2010s and 2020s, and 1.0% in the 2030s. Production volume per employee per hour (man-hour productivity) is expected to rise 1.7% in the 2000s, 1.8% in the 2020s, and 2.0% in the 2030s.

Real GDP, Total Population, and Per Capita Real GNI in Japan (Growth rate by decade) **Chart 4**



Source: Cabinet Office, Ministry of Internal Affairs and Communications; compiled by DIR.
Note: DIR estimate of real GNI calculated by deflating nominal GNI by GDP deflator.

As averages for the next 30 years or so, nominal wages will grow around 2.5%, the annual inflation rate will rise to around 1.5%, and the long-term interest rate (yield on 10-year JGBs) as an annualized average is predicted to be 1.5% in the 2010s, 2.5% in the 2020s, and 2.6% in the 2030s. An exchange rate that was Y79/$ in FY11 will shift to less than Y70/$ in FY40. We anticipate that the rate of inflation will be lower in Japan than in the US to the mid-2020s. Then, with inflation ebbing in the US, the rate of inflation will be on the high side in Japan, which will become a factor that shifts the yen toward depreciation. However, the spread in interest rates will gradually narrow between Japan and the US in the 2020s and beyond, and this will be a factor that will shift the yen toward appreciation.

The current account balance as a percentage of GDP is expected to be 1.3% in the 2010s, 0.7% in the 2020s, and -0.2% in the 2030s. The composition of this ratio, however, will differ greatly from the past. As trade deficits become a recurring feature, Japan's trade structure will shift to one where such deficits are offset by a positive income account balance, which is foreseen to rise with the growth of net external assets. This will reflect the advance overseas by Japanese companies as globalization progresses and the balance of direct investments growing at a faster pace than the balance of portfolio investments. Japan's external assets, however, are currently strongly weighted toward assets with low rates of return, such as foreign government bonds and the Japanese government's foreign currency reserves. As a mature creditor nation, it would be desirable to further increase the proportion of external direct investments as well as to increase that of equities rather than fixed income securities in external portfolio investments.

We simulated how the nominal trade balance and the current account balance would be affected by the case where the upward trend of imported crude oil prices and the downward trend of export prices diverge from our base scenario. In a scenario where WTI is fixed and export prices remain flat, representing an improvement in the terms of trade, the trade balance would return to a surplus in the first half of the 2020s. As a result, the income account balance would trend on the positive side at a high level, and the current account surplus would gradually expand from the second half of the 2010s. In this scenario, the current account balance as a percentage of GDP would average 2.7% between FY36 and FY40, which is 3 percentage points higher than our base scenario. In contrast, in a scenario where WTI surges upward and export prices decline, the trade deficit would continue to expand, and the current account balance would turn negative in the second half of the 2020s. In this scenario, the current account balance's percentage share of GDP would average -4.9% between FY36 and FY40, or

4.5 percentage points less than our base scenario. What we learn from these simulations is that changes in the terms of trade will greatly influence the trade balance, the service balance, and the current account balance in nominal terms.

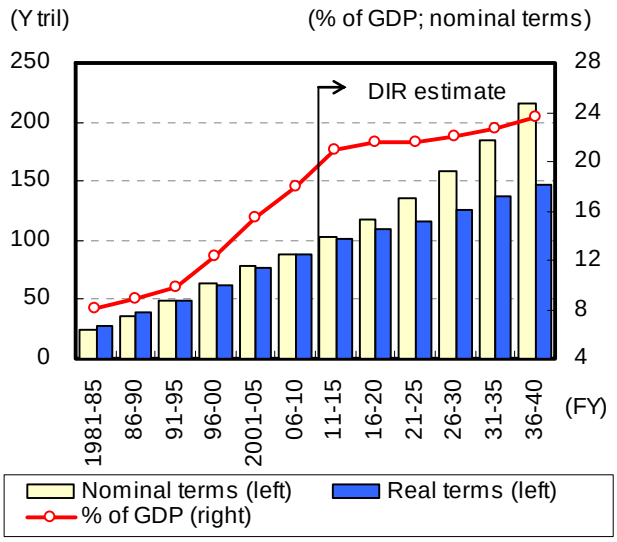
We also simulated how electricity prices and CO2 emissions would be influenced if we replaced the assumptions in a report released by the government on options for energy and the environment with more realistic assumptions. In our simulation, electricity prices would be largely fixed or rise gradually in the second half of the 2020s and beyond. As of 2030, electricity prices in our base scenario would be about 20% less for household-use electricity and 40% less for industrial-use electricity compared to a scenario of zero nuclear power. While our base scenario also assumes that progress will be made in the installation of renewable energy capacity that produces less CO2 emissions, since nuclear power plants that are also a source of low carbon emissions will gradually be decommissioned, the reduction in CO2 emissions will be held to 15% less than the 1990 level in FY30. And, in the scenario of zero nuclear power, while the share of alternative energy will rise, the operation of oil-fired power plants will increase with the decommission of nuclear power plants and the growth of electricity demand, and CO2 emissions will not fall below their 1990 level until the mid-2020s. Thus, it will be extremely difficult to achieve the government's FY20 target of reducing CO2 emissions by 25% compared with 1990.

Part II: Reform of Social Security and Government Finances to Realize a Sustainable Super-Aged Society

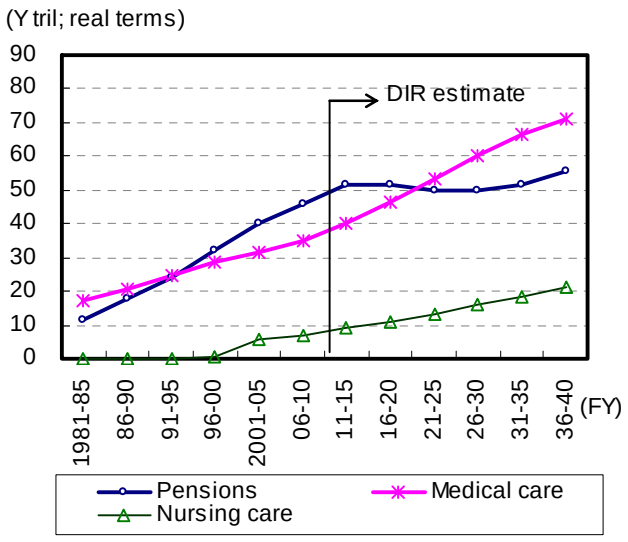
Chapter 5: Outlook for Social Security Finances

In the DIR 30-year project, we have factored in demographic changes like the aging of society and have made variables endogenous as much as possible to develop a macroeconomic forecasting model that portrays the dynamic interactions between the macroeconomy, government finances, and the social security system. This approach is quite different, for example, from the government's long-term budget calculations for public pensions, where wages, prices, and interest rates are treated as exogenous factors.

Outlook for Social Security Benefit Expenditure Chart 5.1



Breakdown of Social Security Benefit Expenditure Chart 5.2



Source: Compiled by DIR based on various statistics.
Note: DIR estimate of real expenditure deflated by 2010 benchmark CPI.

When social security benefits as a whole are viewed in real terms based on current prices or as a share of GDP, they are expected to trend upward through the first half of the 2010s as the baby boomer generation born in the second half of the 1940s enters its elderly years. In the years that follow, however, they are expected to trend generally flat through the 2020s. Then, they are expected to return to upward momentum in the 2030s as the downtrend seen in pension benefits will likely alter course reflecting an end to macroeconomic adjustment (adjustment of benefits based on certain demographic factors and macroeconomic conditions) together with an increasing number of beneficiaries.

With respect to pension benefits, in addition to the number of beneficiaries growing at a slower pace, the macroeconomic adjustment of benefits will curb the growth of per capita real benefit amounts in the second half of the 2010s and beyond when prices and wages are foreseen to rise to a certain degree. In the DIR 30-year project, we anticipate that the annualized growth rate of prices will average 1.5% in the long term, meaning that an environment will finally materialize where the macroeconomic adjustment of benefits will be implemented. On the revenue side of pension finances, premium income is foreseen to increase on a real basis with the growth of wages. On the other hand, forecast results indicate that investment income will trend at a low level compared to the period to the first half of the 2000s. The outlook for investment income from pension assets, together with degree of macroeconomic adjustment, will be points of contention in envisioning the future of pension finances.

Medical insurance and nursing care insurance do not have a mechanism like the macroeconomic adjustment of pension benefits, and an issue in policy terms is what to do about the ease with which medical and nursing care benefits increase. The reason medical and nursing care costs readily rise stems from the high share of labor costs in such expenditures. The DIR 30-year project, based on actual figures for medical and nursing care benefit expenditures per person by age, has estimated future medical and nursing care benefit expenditures by allowing for such factors as the outlook for prices, wages, and demographic changes.

With respect to medical expenditures, we have factored in the spread of generic drugs in our assumptions. In our base scenario, we assume that the proportion of generic drugs to overall prescribed drugs will gradually rise in volume terms and will reach 35% in FY20 (growth will be flat beyond FY20). Should the proportion of generic drugs expand, the average unit price of pharmaceutical expenditures will decline, helping to brake the growth of nominal medical expenditures to the same degree.

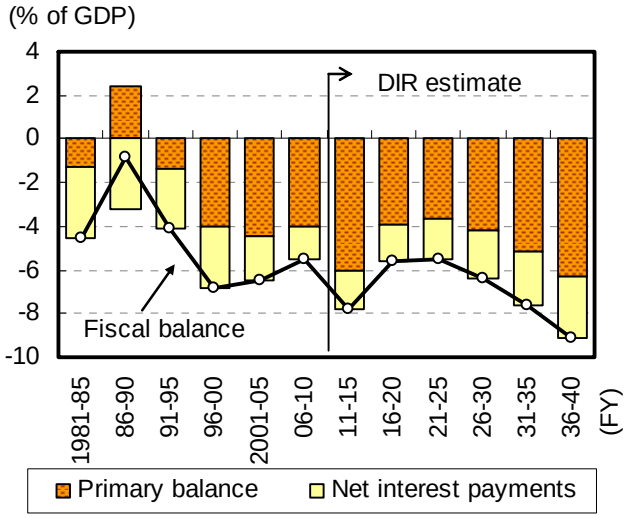
Chapter 6: Problems Associated with Government Finances

Government expenditure on social security was 6.0% of GDP in FY10, a figure that is expected to exceed 8% in FY40. If we assume the continuation of the current system and the current level of tax revenues, budget deficits will not be eliminated even in the very long term, meaning that the deficits recorded during this period will accumulate as government debt. In order to maintain the social security system going forward, government finances will need to be placed on a sound footing so as to avoid their collapse. The social security system is supported by the working-age population, and its capacity to do so should be augmented through economic growth. In addition, the curbing of social security benefit expenditures and the reform of the tax system, including increase in the consumption tax rate, are steps that will likely prove unavoidable.

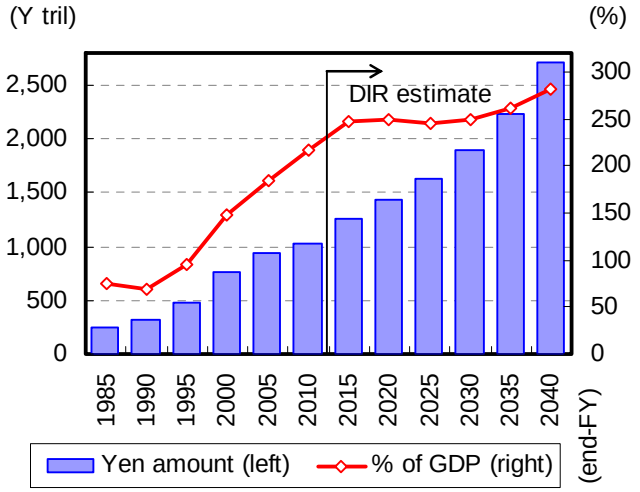
The primary balance will improve in the first half of the 2020s owing to the increase in the consumption tax rate by 5 percentage points in the mid-2010s and owing to the macroeconomic adjustment of pension benefits. Even so, deficits are expected to continue through our forecasting period. The fiscal balance consists of the sum of the primary balance and net interest payments. Since net interest payments will also grow due to the accumulation of debt from primary balance deficits of past years and due to the increase in long-term interest rates, the fiscal balance will average -9% of

GDP between FY36 and FY40. This is a worse figure than the corresponding figure for the period between FY96 and FY05 (-6.6%).

Fiscal Balance **Chart 6.1**



Outstanding Balance of Government Debt **Chart 6.2**



Source: Cabinet Office; compiled by DIR.
Note: Central and local government basis.

Budget deficits will continue in response to the two factors of primary balance deficits and interest payments, and the outstanding balance of government debt will trend upward. Government debt that has risen gradually to date will continue to accumulate without any slowdown in the tempo and will reach about Y2,700 trillion on a nominal basis at end-FY40 (about 280% of GDP). Moreover, given the prospect for a premium occurring from the fiscal factor (increase in interest rates that cannot be explained by the real economy), the results of our base scenario portray a situation that should be described as the effective bankruptcy of government finances. The growth rate of the economy is predicted to be around 1% in the 2030s, and far-reaching reforms will likely be impossible once the 2030s are entered.

In the base scenario of the DIR 30-year project, we do not assume a “bad” increase in interest rates where market participants demand a premium. This is because of the difficulty of forecasting the probable occurrence of a fiscal premium in view of the characteristics of a time-series model derived from historical data (economic structure). However, if the government and Japanese citizens appear unconcerned about rebuilding government finances and about reforming the social security system, the possibility is not remote that a “bad” surge in interest rates (plunge in JGB prices) will occur.

As Japan endeavors to manage a super-aged society that is the most extreme in the world, the greatest problem with government finances is the combination of an extremely low taxpayer burden and generous social security benefits directed toward retirees. Shrinking the budget deficit will not be achieved unless the implementation of needed tax hikes and expenditure cuts are made an issue for the government itself and unless household consumption and corporate investments are revived at the same time. If the current account balance turns negative from budget deficits while these structural problems remain unresolved, this will represent the worst possible scenario that will likely give way to a “bad” increase in interest rates.

Chapter 7: Direction of Social Security Reform

The government made some progress in its plan for the integrated reform of social security and taxes in the summer of 2012. The reform of the social security system, however, is only halfway done, and there is a pressing need to rebuild the overall system.

The DIR 30-year project believes that necessary reforms must be completed as early as possible—that is to say, during the 2020s at the very latest. This urgency is explained by the growth rate of the elderly population (people aged 65 or older). This growth rate is expected to be quite high to the mid-2010s, then settle down in the 2020s, but rise again in the 2030s.

Japan becoming a super-aged society and the social security system being on a pay-as-you-go (PAYG) basis are the principal reasons for concluding that the sustainability of the social security system has greatly diminished. Whether advanced or emerging, nations that have succeeded in developing their economies exhibit a clear tendency for their societies to age in demographic terms. Being a front runner in this process, Japan succeeding in developing the measures needed to manage a super-aged society would likely become a model for the world.

The primary reason for the budget deficit problem is growing social security expenditures. The key issue is not whether the growth rate of the economy or of wages is high or low in absolute terms. Rather, it is the degree to which the growth rate of wages, which determines the living standards of the working-age population, is reflected in the benefits of retirees. In the reform of social security, what can be reliably controlled in policy terms is the adjustment of the income replacement ratio.

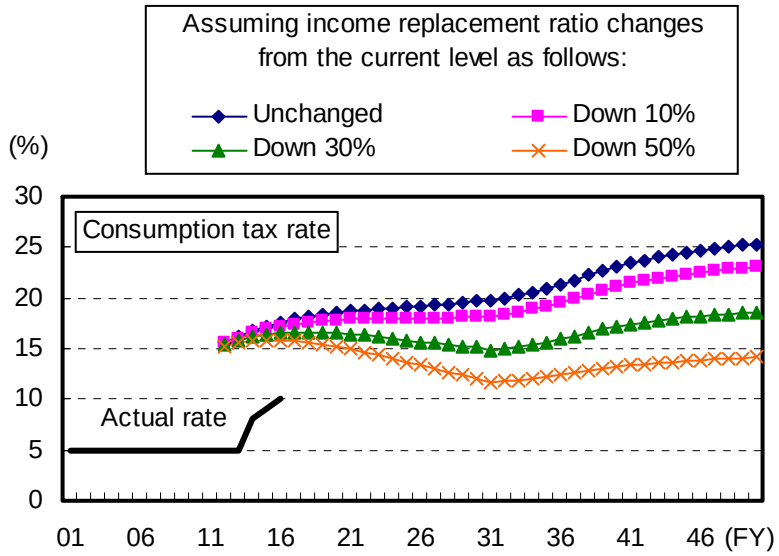
If we assume that the ratio of government expenditures to financial resources of the social security system as a whole is unchanged at its current level, should an income replacement ratio (per capita social security benefits for those over 65 / per capita income of those in their productive age) of 82.4% be maintained going forward, unless the consumption tax rate is raised to 20% or so by around 2030, the primary balance of central and local governments will no longer be in equilibrium, and a social insurance premium rate 1.5 times higher than its current level will be required. Should the current conditions be extended to around 2050, the consumption tax rate will need to exceed 25%, and the social insurance premium rate will be about two times its current level. This would be equivalent to increasing the national burden ratio (share of taxes and social security contributions as percentage of national income) that is currently less than 40% to more than 70%. In Sweden, a leading welfare state, the national burden ratio is currently 62.5% (a government share of national income [share of taxes, social security contributions, and budget deficit in national income] of 63.9% in 2009). However, it is difficult to imagine Japan traveling a path toward a national burden ratio of 70% given the current national consensus regarding the social security system.

Trimming the income replacement ratio by around 10% will not have a significant effect. However, if real benefits measured by wages related to pensions, old-age medical care, and nursing care are reduced by 30%, the average income replacement ratio would become 57.7%. If this is the case, the consumption tax rate can be held to the mid-10% level until around 2030, and even in 2050 it can be held to around 70% of what it would be in the case of the replacement ratio being unchanged. Reducing the income replacement ratio by 30% is not an unrealistic prospect in view of the current high level of pensions and the low share of medical expenses paid out of pocket for old-age medical care.

Japan’s economy is expected to grow at an annual average of around 1% over the long term. Given this outlook, to secure the sustainability of the social security system and to work toward restoring government finances to health at the same time, there is an urgent need to raise the capacity of the working-age population to support taxes and social security premiums and to undertake systemic

reforms to curtail benefit costs. The aging of society will continue even after FY20. What will be important is to build a sustainable system for social security and government finances based on a perspective that extends to the 2030s.

Consumption Tax Rate That Will Satisfy Equilibrium Conditions for Primary Balance **Chart 7**



Source: Cabinet Office; compiled by DIR.
Notes: 1) Government contributions (fiscal transfers from central and local governments) to social security funds assumed to be flat from the current level (34.4%).
2) Income replacement ratio= per capita social security benefits for those over 65 / per capita income of those in their productive age.

Chapter 8: Policy Options for Social Security Reform and Increasing the Taxpayer Burden

To translate our simulation of curbing benefits and increasing the taxpayer burden discussed above into specific systemic reforms, in this chapter we use a macroeconomic forecasting model incorporating the reciprocal relationships between the macroeconomy and government finances, including social security system, to perform a comprehensive simulation of how the economy would be affected by benefit cuts and higher taxes as well as how these changes would influence government finances in terms of premium income, tax revenues, and benefit payments.

In the base scenario of the DIR 30-year project, with nominal government debt rising to Y2,700 trillion at end-FY40, the economy is predicted to grow at an annual average of more than 1% over the long term. The economy portrayed by our base scenario, however, is actually quite fragile. It should be viewed as a scenario of effective bankruptcy even if such a situation has little chance of materializing.

This being the case, to investigate what sorts of reforms are needed to avoid systemic bankruptcy and the degree of economic growth that must be sacrificed in the process, we consider a “structural reform scenario” in the paragraphs to follow that maintains a realistic balance with the adverse impact on the economy ensuing from benefit cuts and a higher taxpayer burden.

With regard to the social security system, first, implementation of pushing back the starting age for receiving pension benefits to 65 is brought forward 10 years to FY20, and then further pushed back one year every two years starting in FY25 until it reaches 69. Second, a more stringent macroeconomic adjustment of benefits is adopted immediately where nominal benefits can be reduced even under conditions of deflation or low inflation. Third, the share of medical expenses paid out of pocket by people aged 70 or older is increased from 10% to 20%. Fourth, the share of generic drugs is increased

to 50% on a volume basis and 20% on a value basis by FY30. Fifth, the indexing of pension benefits will not reflect higher prices resulting from future increases in the consumption tax.

With regard to the real economy, there will naturally be a need for the government and the private sector to engage in a range of growth strategies. From the perspective of strengthening the supply side of the economy, in the structural reform scenario, the effective rate of the corporation tax (35.64% in FY15) is reduced by 5 percentage points in FY20 and 5 points in FY25 to bring the rate down to about 25%. On the demand side, capital expenditures are promoted through tax breaks for such expenditures and through the avoidance of an excessively strong yen by quelling deflation. We also assume higher productivity for the economy as a whole through economic policies such as participation in TPP and through a more efficient and slimmed-down social security system.

Regarding the increase in the taxpayer burden, by factoring in the increase in the consumption tax rate by 2 percentage points every three years beginning in FY20, the consumption tax will be around 20% at the start of the 2030s. In the 2030s, medical expenditures and pension benefits will gradually expand, and the tax rate will need to be raised at a somewhat faster pace compared to the 2020s. We therefore assume that the consumption tax will be 25% in FY36 and beyond.

In the structural reform scenario incorporating all of the above assumptions, the macroeconomy that is portrayed is one where GDP grows 1.3% in the 2010s (difference of -0.2 percentage points with the base scenario), 1.3% in the 2020s (difference of -0.3 points), and 0.9% in the 2030s (difference of -0.1 points). Regarding public finances, the primary balance of central and local governments will clearly improve and, with respect to the finances of social security funds, the sustainability of social security will recover by a considerable degree. Also, a national burden ratio that is currently somewhat less than 40% will rise to 59% in the second half of the 2030s. A national burden ratio of around 60% is similar to the current ratios for continental European nations.

What these results suggest is that, even if the growth rate of the economy becomes somewhat less than the base scenario, the structural reform scenario that ensures the sustainability of public finances and the social security system is not only realistic but also presents a more desirable portrait of the future. To avoid systemic bankruptcy, about 0.2 percentage points in growth must be sacrificed each year. That is to say, if efforts are made to implement appropriate systemic reforms and this degree of sacrifice is made, the likelihood is high that Japan will be able to overcome the challenges of a society with the highest share of elderly in the world.

However, the primary balance will not return to a structural surplus even in the above structural reform scenario, and the ratio of government debt to GDP will be flat for the most part and will not decrease. The structural reform scenario suggests that, depending on the policies that are implemented, systemic bankruptcy can be avoided (it is not the case that Japan is already bankrupt whatever measures are taken). The structural reform scenario, however, will not be sufficient to overcome future challenges in full, underscoring how intractable a problem the coming aging of society represents.

We therefore investigated a “radical reform scenario” by considering what sorts of reforms and what sorts of economic conditions would be needed to create a situation where the primary balance comes into equilibrium in structural terms and the ratio of government debt to GDP is reliably reduced. In doing so, we sought to develop a scenario along a different dimension that is not merely an extension of the structural reform scenario.

The radical reform scenario assumes that it will be difficult for the government to support the social security of the elderly in its entirety in an unprecedented super-aged society. In this scenario, while a system of pensions and medical care insurance for all is maintained, direct benefit payments by the government are limited to a national minimum. In addition, the social security of the elderly provided

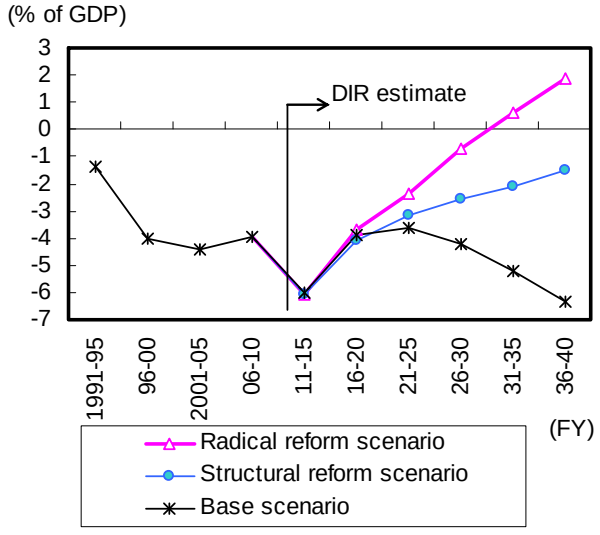
by the government is slimmed down, and the role of the private sector is expanded in its place. The role of the government shifts to the development of a national identification number for citizens and systemic design to enable the accumulation of assets for old age through personal self-efforts.

Regarding changes to the social security system, first, macroeconomic adjustment is made to pension benefits to reduce the income replacement ratio to 40% on a model pension basis from the current replacement ratio of 50% that is the lower limit under current law. Second, with regard to public medical care insurance benefits, the share of medical expenses paid out of pocket is increased to 30% regardless of age from FY17 onward. Third, the share of expenses paid out of pocket for nursing care insurance benefits is increased from 10% to 20%. Next, with respect to policies for the real economy, in response to the shrinking of the public pension, an individual pension (such as a defined contribution pension) is rapidly instituted to enable the accumulation of retirement assets through personal self-efforts; the broadly defined medical and health care industry is assumed to become a growth sector, including the expansion of the market for private medical care insurance; and government expenditures for social overhead capital and general administrative services are relentlessly overhauled. Finally, the increase in the growth rate of total factor productivity from the above assumptions is factored in relative to the structural reform scenario.

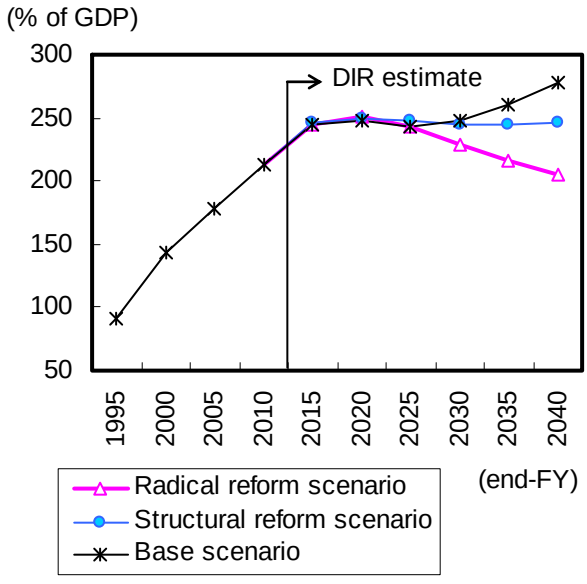
Real GDP Growth by Scenario (Decade avg) **Chart 8.1**

	Base scenario	Structural reform scenario	Radical reform scenario
2010s	1.5%	1.3%	1.2%
2020s	1.5%	1.3%	1.4%
2030s	1.0%	0.9%	0.9%

Central/local Government Primary Balance **Chart 8.2**



Outstanding Balance of Central/local Government Debt **Chart 8.3**



Source: Compiled by DIR based on various statistics.

In the radical reform scenario, without sacrificing economic growth, the primary balance of central and local governments will attain a sustainable surplus trend in the 2030s and beyond, the ratio of government debt to GDP will decrease, and social security finances will greatly stabilize. An average income replacement ratio (real benefits measured by wages; overall social security incl. pension, medical care, nursing care) that was 68.6% in FY10 will decline to 57.3% in FY40 in the structural reform scenario and will fall to 51.3% in the radical reform scenario. In other words, in the radical

reform scenario, the average income replacement ratio will decline 17 percentage points (a decrease of 25% in percentage terms) from the first half of the 2010s.

Naturally, there will be a need to separately examine the feasibility in policy terms of the specific measures in the radical reform scenario. It also bears noting that the possible choices for reform are not limited to those presented here. Even if immediate realization is difficult, it will not be possible to transform the challenges facing Japan into a vision of a bright future unless an ambition for reform is firmly maintained where the invigoration of the private sector occurs together with the curtailment of benefits and a higher taxpayer burden since private sector investment and consumption will need to be expanding as the government's budget deficit shrinks. There is a need to urgently reaffirm that a weakening resolve to reform social security and government finances or the failure to deal properly with the challenges of a super-aged society will risk ruining the lives of citizens. It is our responsibility to future generations to see that reforms are implemented to the utmost degree at each stage along the way in keeping with changes in the domestic and foreign environments.