II Labor Supply and Demand Estimates— Policy Simulations Based on the Labor Supply and Demand Model (FY2013)

Section 1　Introduction

This study uses an economic model to simulate changes in the labor force and the number of persons in employment up to the year 2030, in line with assumed market scale in growth sectors as well as measures to promote women's employment and other employment policies envisioned in the "Japan Revitalization Strategy (Japan Is Back)", the government's New Growth Strategy (decided by the Cabinet on June 14, 2013). Simulations are based on "Population Projections for Japan" by the National Institute of Population and Social Security Research in Japan (IPSS) in January 2012 (Medium Fertility and Mortality Projections), and are designed to contribute to the planning and proposal of future employment policies. Simulations were conducted by gender and age group, as well as by industry for employed persons. They also assume a second scenario in which the market scale, women's employment promotion measures and others envisioned in the "Japan Revitalization Strategy" are not achieved, and one other scenario (totaling 3 scenarios).

The Japan Institute for Labour Policy and Training (JILPT) has conducted similar simulations several times since 2004. The last one was based on the "New Growth Strategy" (decided by the Cabinet on June 18, 2010) and the "Strategy for the Rebirth of Japan" (decided by the Cabinet on July 31, 2012), the results being published in JILPT Research Material Series No.110 "Labor Supply and Demand Estimates – Policy Simulations Based on the Labor Supply and Demand Model (2012)". This time, as well as reconsidering the conventional estimation method, the latest actual data have been incorporated in simulations based on the government's New Growth Strategy.

This study is part of "Research on Labor Supply and Demand Estimates", a subtheme of the JILPT Project Research "Survey Research on Directions for Employment and Labor in Response to Changes in Japan's Economic and Social Environments". It was conducted in response to a request from the Employment Policy Division of the Employment Security Bureau, Ministry of Health, Labour and Welfare (MHLW).

Section 2　Labor Supply and Demand Model

In this study, simulations based on the attainment targets (KPIs: Key Performance Indicators) of the "Japan Revitalization Strategy" (decided by the Cabinet on June 14, 2013) are used to estimate the labor force by gender and age group, the number of employees by gender and age group, and the number of employees by industry, up to the year 2030. Simulations are conducted using an economic model (the Labor Supply and Demand Model) consisting of a labor demand block, a labor supply block and a labor supply and demand adjustment block. The relationship between the blocks is shown in the flowchart in Figure II-1.

To obtain labor demand in the labor demand block, the nominal output, hourly wage and working hours in a given industry are combined with a labor demand function based on an error correction model estimated for each industry. Of these, the nominal output is calculated by exogenously giving the economic growth rate, the item composition of final demand and composition of goods and services by item, the input coefficient and import coefficient of input-output tables, and the output deflator. Working hours are calculated by applying full- and part-time working hours and the rate of change in all industry working hours (calculated from future assumptions of the part-time worker ratio) to each industry. Hourly wages are calculated by applying rates of change estimated in each labor supply and demand adjustment block to each industry. The labor demand function used in the estimation is as follows.

$$\Delta \ln L(t) = const. + a\,\Delta \ln Z(t) + b \ln Z(t-1) + c \ln L(t-1) + \varepsilon(t)$$

where, L: employed persons,
$$Z = \frac{pX}{wH}$$
(p: output deflator, X: real output, w: hourly wage and H: total actual working hours), and ε: error term.

In the labor supply block, the labor force participation rate is sought by giving the educational advancement rate, fertility rate, part-time worker ratio, nursery and kindergarten enrollment rate, the ratio of companies offering all employees employment to age 65, and other factors thought to contribute to the labor force participation rate, to the labor force participation rate function estimated by gender and age group. For females, these are further divided into two subcategories ("with spouse" and "without spouse and others") depending on the spousal situation. Next, the size of the labor force is calculated by multiplying the obtained labor force participation rate by the projected future population. Factors determining the labor force participation rate vary by gender and age group. Future assumptions for these are given exogenously, with the exception of the unemployment rate and real wages. The unemployment rate is the rate estimated in the previous term. Real wages are taken as one of the determinants for the labor force participation rate of females without spouse and others, but their value is calculated using the rate of change in wages determined in the labor supply and demand adjustment block. The labor force participation rate function used for the estimation is as follows.

$$r(t) = const. + \sum_{i=1} d_i V_i(t) + \varepsilon(t)$$
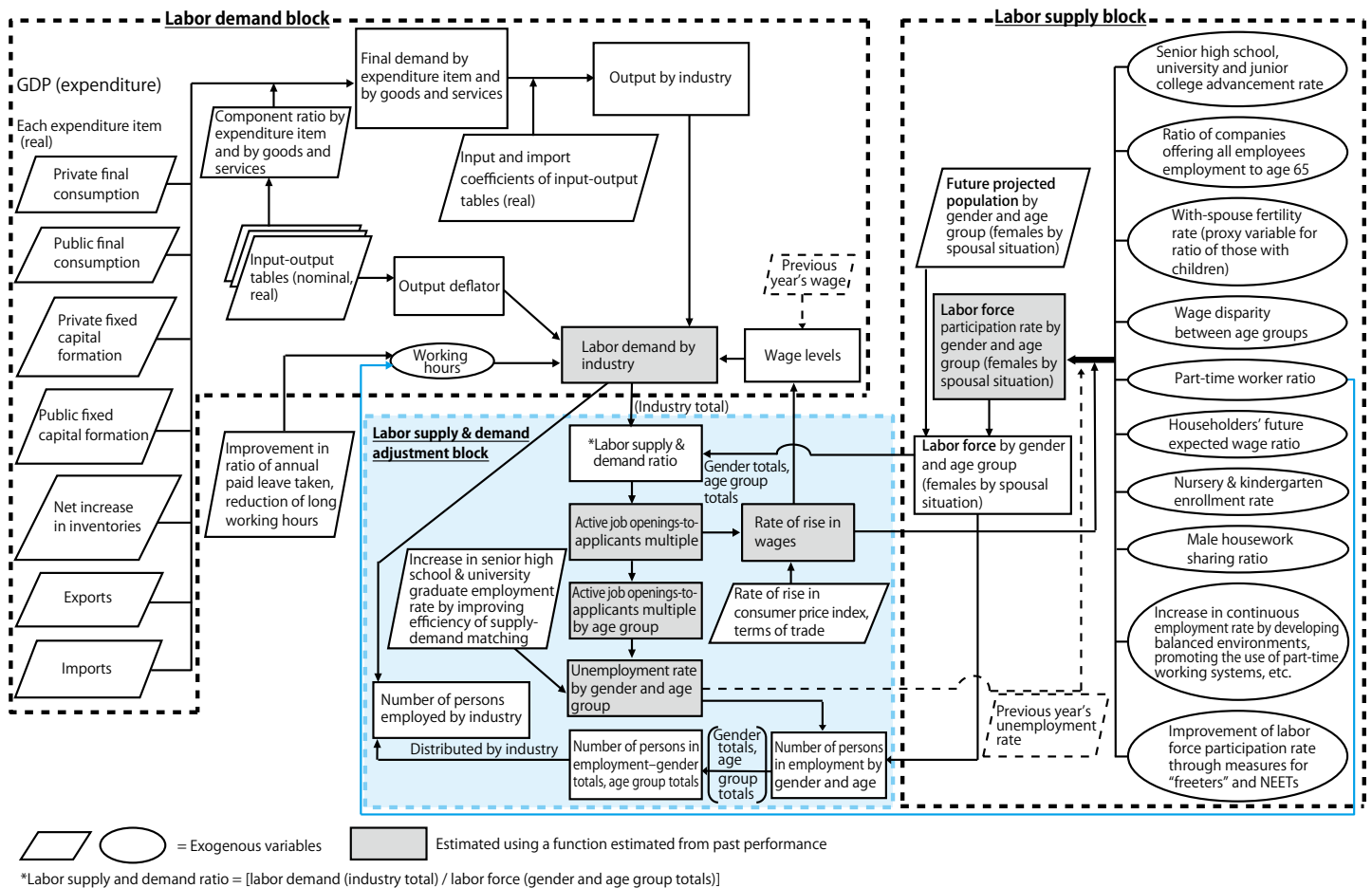
where, $r = \ln(R/(100-R))$
(R: labor force participation rate (%)), V: explanatory variable of behavioral factors, policy factors and others determining the labor force participation rate, and ε: error term.

In the labor supply and demand adjustment block, the rationale of the Phillips curve is applied to calculate the rate of rise in wages from the active job openings-to-applicants ratio, the rate of change in the consumer price index, and terms of trade (the ratio of the export price index to the import price index).

Meanwhile, the conversion equation for calculating the unemployment rate by gender and age group from the active job openings-to-applicants ratio is estimated based on past performance, and the unemployment rate by gender and age group thus obtained. The active job openings-to-applicants ratio is obtained by using a conversion equation estimated from past performance and the ratio of the total labor demand, calculated in the labor demand block, and the total labor force, calculated in the labor supply block (labor supply and demand ratio). The rate of change in the consumer price index and terms of trade are given exogenously.

The rate of change in wages in the labor supply and demand adjustment block is calculated from the labor demand and labor force calculated in the labor demand and labor supply blocks. This is fed back to the labor demand and labor supply blocks (the future rate of change in wages by industry is collectively based on the industry total), and the labor demand and labor force are calculated using a new wage standard. The figures before and after feeding back are compared, and the model calculation is judged complete (labor demand, labor force and various other estimates determined) at the point when the rates of change in wages appear to converge. Numbers of employed persons by gender and age group are calculated from the unemployment rate and labor force at the point of convergence. Next, the gender and age group totals for these employed persons are divided by industry, based on the industry composition of labor demand, and the resultant figure is taken as the number of employees by industry.

Figure II-1   Flowchart of the Labor Supply and Demand Model

= Exogenous variables   Estimated using a function estimated from past performance

*Labor supply and demand ratio = [labor demand (industry total) / labor force (gender and age group totals)]

Section 3   Simulation Scenarios

1. Outline of Scenarios

In this study, simulations will be made to show how the future image of labor supply and demand would appear until the year 2030 if economic and employment policies indicated in the "Japan Revitalization Strategy" and elsewhere are properly implemented and the economic growth rate targets cited in the "Japan Revitalization Strategy" are met. In this study, this shall be called the "economic revival / progressive labor participation scenario". The "Japan Revitalization Strategy" not only specifies

numerical targets for new market scale in sectors where growth is anticipated in future, but also sets the aim of average macroeconomic growth of about 2% in real terms over the next 10 years.[1] These points are incorporated in the assumption of labor demand in the economic revival/ progressive labor participation scenario. On the other hand, to achieve a real growth rate of around 2%, demand for goods would have to be stimulated, participation in the labor market promoted and constraints on the supply of goods eased. Thus, the case in which economic and employment policies are properly implemented and participation in the labor market progresses will be

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1   The Cabinet Office "Calculations concerning Medium- to Long-term Economic and Fiscal Administration" (submitted by the Council on Economic and Fiscal Policy, Jan. 20, 2014) calculate an average growth rate of around 2% in real terms over the next 10 years (FY2013-2022) in the event of an economic revival. From this, the period in which the real growth rate outcome target is cited in "Japan Revitalization Strategy" is assumed to be 2012-2022.

assumed as the economic revival/ progressive labor participation scenario on the labor supply side.

To compare and contrast with this scenario, in which economic and employment policies are properly implemented, i.e. the economic revival/ progressive labor participation scenario, the following two scenarios have been prepared in this study. The first is a scenario in which the necessary economic and employment policies are not implemented and risks of a downturn materialize, causing an economic situation close to zero growth in real terms (lower than the average growth rate over the last ten years or so) to be assumed, while participation in the labor market does not improve from present levels (2012). In this study, this will be called the zero growth/ unchanged labor participation scenario. The other is a scenario in which economic and employment policies assumed in the economic revival/ progressive labor participation scenario are partially implemented, a real growth rate of about 1% is achieved (i.e. about half the growth rate target stated in the "Japan Revitalization Strategy"), and labor market participation progresses to a degree. In this study, this will be called the reference/ gradual labor participation scenario. Incidentally, a real growth rate of around 1% would be about the same as the average growth rate over the last 10 years. The last 10 years was a period in which the economy was gradually recovering, notwithstanding major shocks such as the global financial crisis and the Great East Japan Earthquake. However, it was also a period when no rise in wages was observed, prompting some to call it a hollow economic boom.

The characteristics of the economic revival/ progressive labor participation, reference/ gradual labor participation, and zero growth/ unchanged labor participation scenarios are as follows. Assumptions on the labor demand side will be called the economic revival scenario, the reference scenario, and the zero growth scenario, respectively. Meanwhile, assumptions regarding labor market participation on the labor supply side will be called the progressive labor participation case, the gradual labor participation case, and the unchanged labor participation case, respectively.

1) The economic revival/ progressive labor participation scenario

In this scenario, economic growth and labor market participation by young people, women, the elderly and others progress through proper implementation of various economic and employment policies (the case in which economic growth and labor participation progress properly).

(1) Annual economic growth of around 2% in real terms is achieved (in the "Japan Revitalization Strategy", the target is real growth of around 2% in 10 years' time).

(2) Additional demand based on growth sector attainment targets (KPIs) in the "Japan Revitalization Strategy" is taken into account.

(3) Medical and nursing care costs after reforms in "Revised Future Estimate of Costs Related to Social Security" (March 2012) are taken into account.

(4) The labor force participation rate and employment rate of young people are raised through measures for freeters and NEETs, as well as improved matching efficiency for senior high school and university graduate employment rates.

(5) Labor market participation by young people progresses by reducing wage disparity among young people compared to the all-age average.

(6) The ratio of companies offering all employees employment to age 65 rises to 100% by 2025, and working environments for the elderly are developed.

(7) Nursery and kindergarten enrollment rates rise, and female participation in the labor market progresses.

(8) The continuous employment rate for women is improved by developing the WLB environment.

(9) The continuous employment rate for the elderly is improved by promoting the use of part-time working systems, among other measures.

(10) The ratio of housework sharing by men increases.

(11) While the part-time worker ratio rises as channels for diverse forms of employment are developed, average working hours decrease with the reduction of long working hours, etc.

2) The reference/ gradual labor participation scenario

In this scenario, economic growth and labor market participation by young people, women, the elderly and others progress to a degree through partial implementation of various economic and employment policies (the case in which economic growth and labor participation progress to a degree).

(1) Annual economic growth of around 1% in real terms is achieved (about half the growth rate targeted in the "Japan Revitalization Strategy").

(2) About half the additional demand based on growth sector attainment targets (KPIs) in the "Japan Revitalization Strategy" is taken into account.

(3) Medical and nursing care costs after reforms in "Revised Future Estimate of Costs Related to Social Security" are taken into account.

(4) Shrinkage of wage disparity among age groups is about half that in the economic revival/ progressive labor participation scenario.

(5) The ratio of companies offering all employees employment to age 65 rises to 100% by 2025, and working environments for the elderly are developed.

(6) Nursery and kindergarten enrollment rates grow by about half compared to those in the economic revival/ progressive labor participation scenario.

3) The zero growth/ unchanged labor participation scenario

In this scenario, economic growth is posited close to zero growth, and the labor force participation rates by gender and age group remain at the same level as at present (2012) (the case in which economic growth and labor participation do not progress properly).

(1) An economic situation close to zero growth is assumed (same economic growth rate as in the reference/ gradual labor participation scenario until 2015, zero growth from 2016 onwards).

(2) Additional demand based on growth sector attainment targets (KPIs) in the "Japan Revitalization Strategy" is not taken into account.

(3) Medical and nursing care costs after reforms in "Revised Future Estimate of Costs Related to Social Security" are taken into account in line with an economic situation close to zero growth.

(4) Current (2012) labor force participation rates by gender and age group do not change in future. This means that the current labor force participation rate is applied to the estimated future population. The female labor force ratio is seen in terms of the spousal situation (i.e. with spouse or without spouse).

2. Assumptions in the Labor Demand Block

1) Numbers of employees

Numbers of employees by industry are defined by taking data from the Ministry of Internal Affairs and Communications (MIC) "Labour Force Survey" and reclassifying them under the industrial category notation used for the Labor Supply and Demand Model. Basically, industrial categories are reclassified using simple aggregation, but for reclassifications up to 2002, the "Population Census" is used. In the Labor Supply and Demand Model, meanwhile, dispatched workers from temporary labor agencies are classified under "Miscellaneous business services", the industry to which the agencies belong; they are not included in other industries. The rate of change in numbers of employees is obtained from the labor demand function and future numbers of employees are determined.

2) Real outputs

Future real outputs by industry are estimated using the input-output model. That is, an inverse matrix is calculated from the future input and import coefficients assumed in e. below, and this is multiplied by the final demand estimated in a. to d. to obtain the real output by industry for each scenario.

A. Assumptions of macroeconomic growth rate and rate of change in commodity prices

The macroeconomic growth rate and rate of change in commodity prices are assumed for each scenario (divided into the two periods 2012-2015 and 2015-2023, annual average values applied for each period). The assumptions use estimates for the real economic growth rate, the rate of change in the corporate goods price index and the rate of change in the consumer price index in the economic revival and reference scenario of the Cabinet Office "Calculations concerning Medium- to Long-term Economic and Fiscal Administration" (submitted by

the Council on Economic and Fiscal Policy, January 20th, 2014), as shown in Table II-2.[2,3]

As Cabinet Office calculations for both economic revival and the reference scenario cover the period until FY2023, figures from 2024 are assumptions by this study. As for the macroeconomic growth rate for 2024-2030, it is assumed that the per capita economic growth rate (annual average) in 2012-2023 based on Cabinet Office calculations for 2024-2030 will be maintained, and that the macroeconomic growth rate (annual average) will only decrease to the extent of population decline, compared to that for 2012-2023.

On the rate of change in prices in 2024-2030, it is assumed that the annual average rate of change for 2012-2023 based on Cabinet Office calculations will also be maintained in 2024-2030.

Finally, the zero growth scenario is an assumption unique to this study. In anticipation of reconstruction demand, the same macroeconomic growth rate and rate of change in prices as in the reference scenario are assumed until 2015. From 2016 on, however, the macroeconomic growth rate and rate of change in prices are assumed to be zero.

Table II-2   Assumptions of Macroeconomic Growth Rate & Rate of Change in Prices

Real economic growth rate (%, annual average)

	Actual	Period covered by Cabinet Office calculations			JILPT assumption	2012-20	2020-30	2012-30
	2005-12	2012-15	2015-23	2012-23	2023-30			
Economic revival scenario		1.9	2.2	2.1	1.8	2.1	1.9	2.0
Reference scenario	0.3	1.6	1.2	1.3	1.1	1.4	1.1	1.2
Zero growth scenario			0.0	0.4	0.0	0.6	0.0	0.3

Per capita real economic growth rate (%, annual average)

	Actual	Period covered by Cabinet Office calculations			JILPT assumption	2012-20	2020-30	2012-30
	2005-12	2012-15	2015-23	2012-23	2023-30			
Economic revival scenario		2.1	2.6	2.5	2.5	2.4	2.6	2.5
Reference scenario	0.3	1.9	1.7	1.7	1.7	1.7	1.7	1.7
Zero growth scenario			0.5	0.7	0.7	0.9	0.6	0.8

Rate of change in the consumer price index (%, annual average)

	Actual	Period covered by Cabinet Office calculations			JILPT assumption	2012-20	2020-30	2012-30
	2005-12	2012-15	2015-23	2012-23	2023-30			
Economic revival scenario		2.2	2.1	2.1	2.1	2.1	2.1	2.1
Reference scenario	-0.1	1.9	1.3	1.5	1.5	1.5	1.4	1.5
Zero growth scenario			0.0	0.4	0.0	0.7	0.0	0.3

Rate of change in the corporate goods price index (%, annual average)

	Actual	Period covered by Cabinet Office calculations			JILPT assumption	2012-20	2020-30	2012-30
	2005-12	2012-15	2015-23	2012-23	2023-30			
Economic revival scenario		2.6	1.2	1.6	1.6	1.7	1.5	1.6
Reference scenario	0.4	2.4	0.5	1.0	1.0	1.2	0.9	1.0
Zero growth scenario			0.0	0.6	0.0	0.9	0.0	0.4

Note: Actual values and Cabinet Office calculations (economic revival/ reference scenario) are computed from the Cabinet Office "Calculations concerning Medium- to Long-term Economic and Fiscal Administration" (submitted by the Council on Economic and Fiscal Policy, January 20, 2014), the MIC (Ministry of Internal Affairs and Communications) "Population Estimates", and the IPSS "Population Projections for Japan (January 2012 Medium Fertility and Mortality Projections)". For 2024 onwards, it is assumed that the per capita real economic growth rate, the rate of change in the consumer price index and the rate of change in the corporate goods price index in 2012-2023 will all trend in accordance with their annual average values. The zero growth scenario presents figures assumed for this study.

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2   The real economic growth rate is based on the chain-linking method.

3   The Cabinet Office calculations are based on fiscal years, but in this study, fiscal years are replaced by calendar years. Also, the growth rate in fiscal year *t* in the Cabinet Office calculations is assumed as the growth rate from year *t − 1* to year *t* in this study. As such, the average growth rate for FY2013-2023 in the Cabinet Office calculations is assumed as the annual average growth rate for 2012-2023 in this study.

B. Assumptions of final demand component ratio by expenditure item

Although results for the macroeconomic growth rate are shown in the Cabinet Office calculations, the final demand composition by expenditure item is not published. Therefore, the annual average rate of change in estimates for 2005-2020 and 2020-2025 in the Japan Center for Economic Research (March 2013) "39th Medium-term Economic Forecast" is used for the final demand composition by GDP expenditure item (expenditure side), and real values converted from the 2007 "SNA Input-output Tables" are extended by using the rate of change.

C. Assumptions of the final demand composition of goods and services by expenditure item

On the future final demand composition of goods and services by expenditure item, as with the final demand composition by GDP expenditure item (expenditure side), the average rate of change in estimates until 2025 in the Japan Center for Economic Research (March 2013) "39th Medium-term Economic Forecast" is used, and real values converted from the 2007 "SNA Input-output Tables" are extended by using the rate of change.

D. Additional demand in growth sectors in the "Japan Revitalization Strategy" and addition of medical and nursing care costs in "Revised Future Estimate of Costs Related to Social Security"

In this study, real GDP assumed for each scenario in a. is divided by the final demand composition of GDP (expenditure side) calculated from the Japan Center for Economic Research "Medium-term Economic Forecast" in b., and this further divided by goods and services, using the composition of final demand by expenditure item and by goods and

services in c., to obtain the final demand. By factoring in additional demand by growth sector to this final demand, the final demand corresponding to attainment targets (KPIs) in the "Japan Revitalization Strategy" and medical and nursing care costs in "Revised Future Estimate of Costs Related to Social Security" is produced.

In the main text of the "Japan Revitalization Strategy", attainment targets (KPIs) for each main policy are indicated in I. Overview 5. Examples of Necessary Key Measures in Line with the "Roadmap to Growth". As attainment targets (KPIs) related to future market scale by industry, the following will be used in this study:

Of "(1) Unleashing the power of the private sector to the fullest extent", the figures included in "4. Creating and developing a good health and longevity industry", "5. Turning agriculture, forestry and fishery industries into growth industries" and "6. Developing the energy industry and acquiring global market share"; and of "(3) Creating new frontiers", those included in "3. Through public-private sector joint efforts, capturing a share of the world's infrastructure market that is expected to grow" and "4. Promoting globalization by advancing Cool Japan and increasing the number of foreign visitors to Japan and encouraging foreign direct investment in Japan".[4]

In the debate on comprehensive reform of tax and social security, the "Future Estimate of Costs Related to Social Security" has been revised (March 2012) and estimates of social security costs estimated using new assumptions. Assumptions of additional medical and nursing care costs will be based on these estimates.

The attainment targets (KPIs) and medical and nursing care costs in the "Japan Revitalization

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4   In "(1) Unleashing the power of the private sector to the fullest extent", the attainment target (KPI) of expanding the PPP/PFI program scale from the current 4.1 trillion yen to 12 trillion yen over the next 10 years is stated in "7. Establishing, managing, and updating social infrastructure by making use of private funds and know-how (PPP/PFI)". In this study, however, this is seen as a means of attaining targets in other sectors (such as stimulating infrastructure investment markets), and is not directly included in the calculation of final demand.

Strategy" taken into account in this study are as follows [5] (below, in the case of the economic revival scenario).

(1) Expand markets for health promotion, preventive care and living assistance industries to 10 trillion yen by 2020 (6 trillion yen up from 2011).

(2) Expand markets for pharmaceuticals, medical devices, and regenerative medicine-related industries to 16 trillion yen by 2020 (4 trillion yen up from 2011).

(3) Japanese companies to capture domestic and international market shares of energy-related industries amounting to 26 trillion yen by 2020 (18 trillion yen up from 2012). Of which, domestic share 10 trillion yen (6 trillion yen up from 2012), overseas share 16 trillion yen (12 trillion yen up from 2012). Domestic market scale 11 trillion yen in 2030 (7 trillion yen up from 2012).

(4) Expand overseas orders for infrastructure sales to 19.5 trillion yen by 2020 (13.6 trillion yen up from 2010). Of which, orders in the medical sector 1.5 trillion yen (1 trillion yen up from 2010). Domestic market scale 16 trillion yen in 2020 (14 trillion yen up from 2010), 33 trillion yen in 2030 (31 trillion yen up from 2010).

(5) Expand markets for "6th industries" to 10 trillion yen by 2020 (9 trillion yen up from 2010), 3 trillion yen by 2015 (2 trillion yen up from 2010).

(6) Expand total exports by agricultural and food manufacturing industries to 1 trillion yen by 2020.

(7) Increase the number of foreign visitors to Japan to 10 million by 2013 and 30 million or more by 2030.

(8) Increase total medical and nursing care costs borne by households and government contributions to 57.1 trillion yen after reform by 2015, 69.9 trillion yen after reform by 2020, and 83.1 trillion yen after reform by 2025.[6]

*1 As detailed attainment targets (KPIs) for 2030 are not necessarily shown by sector, some are estimated.

*2 Overseas orders for infrastructure sales in 2020 consist of the target of 30 trillion yen minus amounts for energy and medical costs.

E. Assumptions of input and import coefficients

The future industry and technology composition (input coefficient) and import ratio (import coefficient) are assumed as constants, based on real converted values in the 2007 "SNA Input-output Tables". This means that the 2007 industry and technology composition and import coefficient will also be assumed in future. However, the import coefficient is adjusted to be consistent with the gross import value, obtained by dividing the real GDP assumed for each scenario by the final demand composition of GDP (expenditure side) calculated from the Japan Center for Economic Research "Medium-term Economic Forecast".

3) Output deflator

The future value of the output deflator by industry is basically obtained by means of an extended estimate based on trends using the 2000-2007 "SNA Input-output Tables".

4) Wages and working hours

Working hours by industry are based on total actual working hours, obtained by adding the actual number of scheduled hours worked by full-time workers in the Ministry of Health, Labour and Welfare (MHLW) "Basic Survey on Wage Structure" to the actual number of overtime hours worked. Wages by industry are obtained by dividing the contractual cash earnings of full-time workers in the MHLW "Basic Survey on Wage Structure" by total actual working hours. In both cases, the figures refer to private businesses with 10 or more workers. As no data for agriculture, forestry and fisheries can be obtained from the "Basic Survey on Wage Structure", industry total figures are used for these.

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5   Although the "Japan Revitalization Strategy" sets specific targets (KPIs), it should be noted that some sectors have no targets in this study. For example, by promoting "Cool Japan", overseas sales of broadcast contents are to be tripled from the current level (6.3 billion yen) by 2018. Such targets are not explicitly mentioned in this study, as it would have been difficult to estimate the portion of additional demand arising from policy implementation.

6   Medical and nursing care costs are calculated by combining amounts in the Future Estimate of Costs Related to Social Security with individual contributions.

Again, no data can be obtained for "government" and "industries unable to classify", and so figures for other service industries are used for government, compound services, and industries unable to classify.

Future values for wages by industry are sought by multiplying the rate of rise in wages determined in the labor supply and demand adjustment block for each industry by the previous term's hourly wage. The rate of rise in wages function is estimated from the rate of change in hourly wages, obtained by dividing the contractual cash earnings (monthly) of full-time workers (industry total) by working hours (monthly). For each industry, working hours are obtained from the weighted average (industry total) of full-time workers and part-time workers, and assumed for each case in line with the degree of future labor market participation. Future estimates of working hours in the progressive labor participation case take account of the rising ratio of part-time workers and reduction due to improvement in the ratio of annual paid leave taken and reduction of long working hours, based on policy targets deliberated by the working groups and subcommittees of the Labour Policy Council.

3. Assumptions in the Labor Supply Block

1) 3 cases in line with progress in labor market participation

Future assumptions of explanatory variables for the labor force participation rate function are divided into the following three cases, depending on the degree of progress in labor market participation. Future assumptions of each explanatory variable in the progressive labor participation case and the gradual labor participation case are as shown in Table 2. The labor force ratio in the unchanged labor participation case is unchanged from the situation in 2012.

(1) Progressive labor participation case: Various employment policies are properly implemented and labor market participation progresses (the case in which labor market participation progresses).

(2) Gradual labor participation case: Various employment policies are partially implemented and labor market participation progresses to a degree (the case in which labor market participation progresses to a degree).

(3) Unchanged labor participation case: The 2012 labor force participation rates by gender and age group remain constant in future (the case in which labor market participation does not progress).

Of the explanatory variables, the previous term's unemployment rate and real wages are not included in Table II-3, but these are determined endogenously within the model. Future values for real wages (contractual cash earnings (industry total, full-time workers) / consumer price index (General Index)) are obtained from the rate of change in full-time workers' contractual cash earnings (male-female total), as determined in the labor supply and demand adjustment block. However, the consumer price index as the denominator of real wages is based on the assumptions in Table II-2.

2) Labor force participation rate and population aged 15 and over

The source for the labor force participation rate by age group (labor force/ population aged 15 and over) is the MIC "Labour Force Survey" (for both the labor force and the population aged 15 and over). However, data by spousal situation for the over 65s are not published in the Labour Force Survey, and so figures obtained by estimating in this study are used as actual figures.[7] Meanwhile, figures for 2005-2010 are

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7   Concerning the elderly portion of the female population, information on the labor force ratio by 5-year age groups cannot be obtained by spousal situation from the "Labour Force Survey". Instead, the population aged 15 and over and the labor force composition by 5-year age group and by spousal situation obtained from the "Population Census" are taken as initial values, and the RAS method is used to estimate the population aged 15 and over and the labor force by 5-year age group and by spousal situation. This is to ensure consistency with the population aged 15 and over and labor force by 5-year age group and the population aged 15 and over and labor force by spousal situation in the "Labour Force Survey". The labor force participation rate is calculated from the estimated population aged 15 and over as well as the labor force by 5-year age group and by spousal situation.

Table II-3   Settings in Cases of Labor Market Participation

			Progressive labor participation	Gradual labor participation	Unchanged labor participation
			Case in which participation in the labor market progresses	Case in which participation in the labor market progresses to a degree	Case in which participation in the labor market does not progress (2012 labor force participation rate fixed case)
Basic trend change variables	Senior high school advancement rate (males)		Logistic curve applied to extend until 2030		
	Senior high school advancement rate (females)				
	University and junior college advancement rate (males)				
	University and junior college advancement rate (females)				
	With-spouse fertility rate		For 2013 onwards, the fertility rate (medium, 5-yearly) in the IPSS "Population Projections for Japan (January 2012 Estimates)" is used (linear interpolation for intermediate years).		
Measures for young persons	Improvement of the labor force participation rate by freeter measures and employment or other career decisions by NEETs		On the assumption that labor market participation by younger age groups will be encouraged by freeter measures and employment or other career decisions by NEETs, the labor force participation rate for males and females aged 15-19, 20-24, 25-29, and 30-34 is assumed to be 0.01-0.12 points higher in 2020 (linear interpolation for intermediate years; from 2021 onwards, linear extrapolated estimates).	None	
	Increase in senior high school & university graduate employment rates by improving the efficiency of supply-demand matching		On the assumption that employment in younger age groups will be encouraged by the improvement in supply and demand matching efficiency, the employment rate for those aged 15-19 is assumed to rise by 0.27 points (males) and 0.47 points (females) in 2020, and by 0.28 points (males) and 0.47 points (females) in 2030. The employment rate for those aged 20-24 is assumed to rise by 0.41 points (males) and 0.11 points (females) in 2020, and by 0.43 points (males) and 0.12 points (females) in 2030.	None	
M-curve measures for women	Improvement of continuous employment rate by developing WLB environment Ratio of housework sharing by men		On the assumption that job leaving on grounds of childbirth and childcare will decrease with the development of the WLB environment, a rise in the continuous employment rate is assumed to result in the labor force participation rate of females (with spouse) aged 30-34 rising by 2.0 points in 2020 and 1.5 points in 2030.	None	
	Ratio of housework sharing by men		With an increase in the share of housework by men due to a reduction of working hours, wives' conversion to regular employment, changes in husbands' awareness, and other factors, the share of housework by men is set to rise from 13.2% in 2011 to around 37.2% in 2030 via linear interpolation. By contrast, the wife's share of housework is assumed to decrease commensurately with this effect.	Fixed at the 2012 value (14.5%) in the assumption for the progressive labor participation case	
	Nursery and kindergarten enrollment rate		Trend extension from 53.1% in 2012 (65.6% in 2030), taking account of the reduction in waiting lists by expanding childcare arrangements until 2017.	Set at about half the rate of increase from the actual figure in 2012 to the progressive labor participation case in 2030	
Measures for the elderly	Improvement of continuous employment rate by promoting the use of part-time working systems, etc.		The labor force participation rate for both males and females aged 65-69 is assumed to rise by 0.8 points (males) and 0.4 points (females) in 2030, due to promoting the use of part-time working systems, among others (linear interpolation for intermediate years).	None	
	Ratio of companies offering employment to age 65		Extended at a constant rate until the ratio of companies rises to 100% in 2025.	As on left	
Work-life balance related measures and other explanatory variables	Average working hours	Weighted average of full-time and part-time workers	To decrease from 157.2 hours per month in 2012 to 152.2 hours in 2030.	Fixed in future at the 2012 monthly figure of 157.2 hours	As on left
		Full-time	To decrease from 178 hours per month in 2012 to 175.5 hours in 2020 and 172.0 hours in 2030 (linear interpolation for intermediate years).	Fixed at the 2012 monthly figure of 178 hours	As on left
		Part-time	To increase from 89.6 hours per month in 2012 to 111.7 hours in 2030 (linear interpolation for intermediate years).	Fixed in future at the 2012 monthly figure of 89.6 hours	As on left
	Part-time worker ratio		To reach 34.7% (obtained by applying a logistic curve to the part-time worker ratio) in 2030 by linear interpolation.	Fixed at the 2012 part-time worker ratio (26.4%)	As on left
	Reduction of age group wage disparity (in relation to age group totals) by conversion to regular employment, etc.		Disparity to shrink to 10% by 2030 for ages 15-19, 20-24, 25-29 and 30-34, by year-on-year linear interpolation.	Disparity to shrink to 10% by 2030 for ages 15-19 and by 5% for ages 20-24, 25-29 and 30-34, by year-on-year linear interpolation.	
	Householders' future expected wage ratio (male age 45-49 wage / male age 20-24 wage)		Fixed at 2012 value (1.925).	As on left	

Notes: 1) In the progressive labor participation case, the improvement of the labor force participation rate through measures for freeters and NEETs takes account of targets (KPIs) in the "Japan Revitalization Strategy" (decided by the Cabinet on June 14, 2013) and policy targets deliberated by working groups and subcommittees of the Labour Policy Council. There are to be 1.24 million young freeters by 2020. The number of NEETs who will decide their career paths with help from the Local Youth-Support Station Project is to be 15,000 per year by 2020 (in the estimates, about 80% of these "career path deciders" are assumed to actually find employment).
2) In the progressive labor participation case, improvement of the continuous employment rate by developing the WLB environment takes account of the target (KPI) stated in the "Japan Revitalization Strategy" of increasing the rate of continuous employment before and after the birth of the first child to 55%.
3) In the progressive labor participation case, the nursery and kindergarten enrollment rate takes account of the target (KPI) stated in the "Japan Revitalization Strategy" of providing additional childcare arrangements for about 200,000 children in FY2013 and FY2014, and for about 400,000 more in FY2013-2017.
4) In the progressive labor participation case, the reduction of average working hours takes account of policy targets deliberated by working groups and subcommittees of the Labour Policy Council. The ratio of annual paid leave taken is to be increased to 70% by 2020 (ratio assumed by JILPT to reach 100% by 2030). The ratio of workers working 60 or more hours per week is to be cut to half the 2008 figure by 2020 (in 2008, about 10%).

compatible time-series data based on the (revised) Census-based population for 2010 in the "Labour Force Survey", while those for 2011 are supplementary estimates affected by the Great East Japan Earthquake (based on the (revised) Census-based population for 2010). For those aged 70 and over in 2005-2011, similarly, no Census-based population figures have been published. Instead, this study uses figures estimated in reference to the method of interpolation correction accompanying the switch in the basis for benchmark population by the Ministry of Internal Affairs and Communications. As for the data by spousal situation, for which supplementary estimates have not been published, figures obtained by dividing the post-supplement data for females based on the pre-supplement component ratio by spousal situation are used.

Future values for the labor force participation rate are obtained using the labor force participation rate function, but there are exceptions in some age groups. That is, for males aged 70 and over, females (with spouse) aged 60 and over, and females (without spouse and others) aged 55 and over, estimates are not made using the labor force participation rate function, but future estimates are made on the assumption that they will trend in accordance with a fixed survival rate (cohort [8] survival rate) from the closest age group.[9] Specifically, the labor force participation rate for each relevant age group is estimated from the 2012 actual figure for the rate at which it decreased from the labor force participation rate for the age group 5 years younger at a point 5 years previously (1– survival rate), or from the average of actual figures for 2008-2012. Also, since the absolute number of "females (with spouse)" aged 15-19 in the labor force is small and the 2012 labor force participation rate would be calculated as zero, the average labor force participation rate for 2000-

2012 is adopted. For the "females (with spouse)" 20-24 age group, similarly, the absolute number of the labor force is small, and so the 2012 labor force participation rate is simply extended.

Future values for the population aged 15 and over are obtained from "Population Projections for Japan (January 2012 Medium Fertility and Mortality Projections)" by the National Institute of Population and Social Security Research in Japan (IPSS). As future values for the population aged 15 and over by spousal situation, ratios by spousal situation are calculated from "Household Projections for Japan (Whole Country Estimate) (January 2013 Estimate)", and the future values are obtained by multiplying these by the population in "Population Projections for Japan (January 2012 Estimate)".

3) Explanatory variables in the labor force participation rate function

A. Assumptions of senior high school, university and junior college advancement rates

As those enrolled in education have a lower labor force participation rate than those not enrolled in education, the educational advancement rate is seen as a factor that reduces the labor force participation rate. Although the university and junior college advancement rate is an explanatory variable of the labor force participation rate function in the 20-24 age group, data going back two years are used, as advancement usually takes place at around age 18. In other words, the rise in the university and junior college advancement rate 2 terms previously (2 years previously) is seen as reducing the labor force participation rate in the 20-24 age group in the term in question (year in question). Data are sourced from the Ministry of Education, Culture, Sports, Science and Technology (MEXT) "School Basic Survey". The senior high school advancement rate in 2012 was

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8　A cohort (age group population) is a single collection of people belonging to a given age group at a given point in time.

9　According to the 2010 Population Census, non-marriage accounted for a higher ratio than widowhood among women (no spouse and others) in age groups up to 55-59 compared to the population of each age group, but the opposite was true in age groups 60-64 or higher. Therefore, changes in the labor force participation rate in ages 60-64 and over are thought to be impacted relatively strongly not only by the same cohort but also by the change from females (with spouse). Because of this, no survival rate by spousal situation is assumed for women aged 60 and over, but the total female survival rate is used equally for those with spouse, without spouse and others.

96.2% for males and 96.8% for females, while the university and junior college advancement rate was 51.6% for males and 55.5% for females.

Future estimates of the advancement rate are based on past trends. Since the high rate of increase in recent years is thought unlikely to continue in future, future assumptions are basically estimated in accordance with a logistic curve based on past trends. Moreover, this assumption applies equally to the progressive labor participation and gradual labor participation cases.

B. Assumptions of the with-spouse fertility rate

The birth of a child is seen as a factor that reduces the labor force participation rate until the start of compulsory education, in that it increases women's burden of childcare. Sources for the with-spouse fertility rate (fertility rate of same cohort 5 years previously/ with-spouse ratio of same cohort 5 years previously = number of births/ population of females with spouse for same cohort 5 years previously) are the MHLW "Vital Statistics" and the MIC "Labour Force Survey". The with-spouse fertility rate in 2012 was 237.1 in ages 25-29 and 159.3 in ages 30-34.

The fertility rate, as a numerator of the future with-spouse fertility rate, is based on estimates in the IPSS "Population Projection for Japan" (January 2012 Medium Fertility and Mortality Projections). However, since the fertility rate is published every 5 years, interpolation estimates are made linearly for the intermediate years. Meanwhile, a value calculated from the IPSS "Household Projections for Japan (Whole Country Estimates, January 2013 Estimates)" is used for the denominator, i.e. the with-spouse female ratio. This assumption also applies equally to the progressive labor participation and gradual labor participation cases.

C. Assumptions of the ratio of housework sharing by men

An increase in housework hours by men is seen as

a factor that raises the labor force participation rate, in that it reduces women's burden of housework and increases the female labor force. The source for the ratio of housework sharing by men (total average weekly hours spent on housework, caring and nursing, childcare and shopping by husbands as a whole, divided by the total average weekly hours spent on housework, caring and nursing, childcare and shopping by husbands as a whole and wives as a whole) is the MIC "Survey on Time Use and Leisure Activities", with the intermediate years between surveys estimated by linear interpolation. The ratio of housework sharing by men in 2011 was 13.2%.

In the progressive labor participation case, the ratio of housework sharing by men is assumed to rise as a result of reduced working hours, wives' conversion to regular employment, changes in husbands' awareness, etc. The assumed value for the ratio of housework sharing by men in 2030 is taken as 37.2%. This assumption is at the same level as Sweden (37.7%), as found by an international comparison of the ratio of housework sharing by men in "International Comparison of the Social Environment regarding Declining Birthrates and Gender Equality" by the Special Committee on the Declining Birthrate and Gender Equality of the Council for Gender Equality (2005). This figure for the ratio of housework sharing by men in Sweden (calculated from housework and childcare hours by wives in full-time employment and total housework and childcare hours by husbands in couples with children under the age of 5) is from 1991.[10]

D. Assumptions of the nursery and kindergarten enrollment rate

If the ratio of children enrolled in nurseries and kindergartens increases, it leads to a reduced burden of childcare for women, and is therefore seen as a factor that raises the labor force ratio. Sources for the nursery and kindergarten enrollment rate (nursery and kindergarten enrollees/ population aged 0-6) are, for

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10 A direct comparison is not possible as the figures and subjects are different. However, according to the "Swedish Time Use Survey 2010/2011" by Statistics Sweden, among married males and females aged 20-64 with children aged less than 7, the husband's share of housework was 38.8% in 1990/91 but had risen to 44.7% in 2010/11 (whole week, participant average, from September to the following May).

nursery enrollees, the MHLW "Report on Social Welfare Administration and Services", and for kindergarten enrollees, the MEXT "School Basic Survey". The population aged 0-6 is from the MIC "Population Estimates". The nursery and kindergarten enrollment rate in 2012 was 53.1%.

The nursery and kindergarten enrollment rate in the progressive labor participation case is estimated on the basis of past trends, etc., on the assumption that nurseries and kindergartens will be developed. However, in the "Japan Revitalization Strategy", the stated target (KPI) is to provide additional childcare arrangements for about 200,000 children in FY2013 and FY2014, and for about 400,000 more in FY2013-2017. As such, until 2017 the numerator of the nursery and kindergarten enrollment rate is increased to the extent that waiting lists are reduced. Taking the reduction in waiting lists into account, the level of a simple trend extension estimate will be surpassed as of 2030. As a result, the nursery and kindergarten enrollment rate for 2030 in the progressive labor participation case is 65.6%. In the gradual labor participation case, the rate of rise in the fixed rate estimate is assumed to be half that in the progressive labor participation case.

E. Assumptions of the ratio of companies offering all employees employment to age 65

An increase in companies guaranteeing employment until age 65 leads to factors that expand the labor force, and is therefore seen as a factor that will raise the labor force participation rate. The ratio of companies offering all employees employment to age 65 is in fact the total of three ratios: (1) the ratio of companies with no specified retirement age system, (2) the ratio of companies specifying a fixed retirement age of 65 and above, and (3) of companies specifying a fixed retirement age of less than 65, the ratio of those that have an employment extension system or re-employment system for those aged 65 and over or with no specified age, and which in principle offer these systems to all employees. Data are sourced from ratios of companies with a scale of 31 (or 30) or more employees in the MHLW "Status of Employment of Elderly Persons", "Survey on Employment Management" and "General Survey on Working Conditions". For years with no published data, however, the estimates in this study are used. In 2012, the ratio of companies offering all employees employment to age 65 was 48.8%.

The 2000 Amendment to the Employees Pension Insurance Act provides that, over the space of 12 years from FY2013 (i.e. by FY2025), the starting age for receiving old-age employees' pension (earnings-related component) is to be raised from 60 to 65, with an increase of one year every three years.[11] In 2004, the Act on Stabilization of Employment of Elderly Persons was amended in response to this, and the age for obligatory measures to guarantee employment for the elderly [raising the fixed retirement age, introducing systems of continuous employment (although, when standards have been specified by labor-management agreements, this need not be offered to all employees), and abolishing stipulations of a fixed retirement age] was to be raised to 65 from FY2013. Further, in the 2012 Amendment of the same Act, the arrangement allowing elderly persons subject to continuous employment systems to be limited based on standards specified by labor-management agreements was abolished. However, the transitional period in which standards may continue to be applied to those who have already reached the starting age for receiving old-age employees' pension (earnings-related component) is set at 12 years (until April 1st, 2025). Based on these trends in legal amendments, the ratio of companies offering all employees employment to age 65 is assumed to reach 100% in 2025. For intermediate years, the rate is estimated to grow at a fixed rate from the actual figure in 2012 until it reaches 100%. This assumption also applies equally to the progressive labor participation and gradual labor participation cases.

F. Assumptions of the rate of reduction in age group wage disparity

A relative rise in wages for males in a given age group compared to wages for males in age group total could be expected to cause an increase in the labor

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11 This timing will be used to raise the payment age for men; for women, the change will be delayed by five years.

force. As such, this is seen as a factor that increases the labor force participation rate in young male age groups. The source for data on age group wage disparity (wages for males in a given age group/ wages for males in age group total) is the MHLW "Basic Survey on Wage Structure". Here, contractual cash earnings of full-time workers by age group in male and industry totals are used. Meanwhile, the wages and working hours in the "Basic Survey on Wage Structure" used for the labor supply block are figures referring to private businesses with 10 or more workers.

The wage disparity for age group totals in younger age groups is assumed to shrink in future. The rate of reduction in ages 20-34 in the gradual labor participation case is assumed to be half that of the progressive labor participation case.

G. Assumptions of householders' future expected wage ratio

The expectation by a core earner in a household that wages will rise in future is seen as a factor that reduces the labor force participation rate among non-core earners. Normally, this explanation is made for the labor force participation rate of non-core earners already sharing the same household, but here, the expectation that wages will rise by males who will become core earners in future is seen as reducing the labor force participation rate among unmarried females who will become non-core earners in future. The source for this householders' future expected wage ratio (male age 45-49 wage/ male age 20-24 wage) is the MHLW "Basic Survey on Wage Structure", using contractual cash earnings of full-time workers by age group in male and industry totals. The wage ratio in 2012 was 1.925.

No clear trend can be seen in the householders' future expected wage ratio in recent years, and the closest actual figure (in this study, 2012) is assumed to remain constant in future. This assumption also applies equally to the progressive labor participation and gradual labor participation cases.

H. Assumptions of the part-time worker ratio

An increase in part-time workers leads to an expansion of employment opportunities, and is therefore seen as a factor that increases the labor force participation rate. The source for the part-time worker ratio [employed persons working less than 35 hours a week (industry total) / total employed persons (industry total)] is the MIC "Labour Force Survey".[12] In 2012, the part-time worker ratio was 26.4%.

In the progressive labor participation case, the part-time worker ratio is assumed to rise in future as channels for employment diversify. However, since the ratio is thought unlikely to grow linearly in future, figures obtained in accordance with a logistic curve based on past trends are taken as future values. As a result, the 2030 value in the progressive labor participation case is 34.7%, while for intermediate years, it is estimated by linear interpolation from the actual figure for 2012. Meanwhile, the part-time worker ratio in the gradual labor participation and unchanged labor participation case is fixed at the actual figure for 2012.

I. Assumptions of working hours

The future values for working hours listed in Table II-3 are used as explanatory variables of the labor demand function. When estimating the labor demand function, the working hours of full-time workers by industry (monthly) are used. However, future values of working hours in each industry are estimated as extensions, based on the rate of change in weighted averages for full-time workers and part-time workers as industry totals.[13]

In the gradual labor participation and unchanged labor participation cases, working hours are assumed to remain constant from the situation in 2012. On the

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12　The figure for 2011 is estimated by interpolation as the average of 2010 and 2012.

13　The reason why the working hours of full-time workers are estimated as extensions based on the rate of change in weighted averages for full-time workers and part-time workers is that ways of working by full-time workers (of whom the majority are regular employees) are expected to change in future. In future, it is assumed that some part-time workers will work like part-time regular employees and that these will increase to a degree.

other hand, the assumption of working hours in the progressive labor participation case takes account of policy targets deliberated by working groups and subcommittees of the Labour Policy Council, and is assumed to change as follows in future.

Future assumptions of monthly working hours by full-time workers (progressive labor participation case) take into account, firstly, the reduction in working hours due to the increase in the ratio of annual paid leave taken. In the policy targets deliberated by working groups and subcommittees of the Labour Policy Council, the aim is to raise the ratio of annual paid leave taken to 70% by 2020. Thus, the assumption here is that the ratio will rise to 70% in 2020 and to 100% in 2030, as an independent assumption by this study. This includes linear interpolation for intermediate years. The reduction in working hours due to the increased ratio of annual paid leave taken is calculated using the number of scheduled working hours per day (industry total, company scale total, workers average) and the number of days of annual paid leave taken (industry total, company scale total) in the MHLW "General Survey on Working Conditions (2012)". As a result, monthly working hours are assumed to decrease by 2.5 hours in 2020 and 6.0 hours in 2030.

Although monthly working hours by part-time workers have been tending to decrease in recent years, workers who engage in diverse employment formats (i.e. ways of working that are mid-way towards full-time employment) are assumed to increase. In the process, 25% of the difference between working hours of full-time workers and part-time workers in 2012 will be eliminated, monthly working hours of the latter increasing to 111.7 hours by 2030 (progressive labor participation case).

If the working hours of full-time workers and part-time workers obtained in the assumptions outlined above [14] are converted to a weighted average based on the part-time worker ratio (as data on working hours are obtained from the MHLW "Basic Survey on Wage

Structure" (industry total, male-female total), the part-time worker ratio in that survey is used, and is calculated to change at the same rate as the part-time worker ratio in H. above), the average monthly working hours will decrease from 157.2 hours in 2012 to 155.3 hours in 2020 and 153.4 hours in 2030 (progressive labor participation case).

Another policy target on working hours deliberated by working groups and subcommittees of the Labour Policy Council is that the ratio of employees working 60 hours or more each week should be reduced to half the 2008 figure (about 10%) by 2020. In response to this, the reduction in working hours assumed from the MIC "Labour Force Survey" is calculated on the assumption that average working hours will only decrease to reflect the 50% reduction in the ratio of employees working 60 or more hours per week. As a result, monthly working hours will decrease by 1.2 hours in 2020, and this is subtracted from the weighted averages of working hours by full-time workers and part-time workers. The decrease in intermediate years from 2012-2020 is obtained by linear interpolation, and remains fixed from 2020 onwards.

By carrying out this series of operations, ultimately, the average monthly working hours of workers as a whole are assumed to decrease from 157.2 hours in 2012 to 154.1 hours in 2020 and 152.2 hours in 2030 in the progressive labor participation case.

J. Assumptions of direct policy effects

For the progressive labor participation case in Table II-3, no parameters have been estimated as explanatory variables of the labor force participation rate function. Instead, some of the shift factors are seen as direct policy effects that increase the constant terms of said function.

One of these is the effect of improving the labor force participation rate among young people through measures for freeters and NEETs. Others are the effect of raising the continuous employment rate for

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14 Total actual working hours of full-time workers are used for the working hours of full-time workers. For part-time workers, on the other hand, working hours are calculated by multiplying the scheduled working hours of part-time workers by the number of days actually worked. It should be noted, therefore, that the working hours of part-time workers do not include unscheduled working hours.

females by developing the WLB environment, and improving the continuous employment rate for the elderly by promoting the use of part-time working systems, etc. Freeter measures are designed to convert freeters to regular employment, but they also have the effect of improving the labor force participation rate.

In addition to these, the effect of improving the employment rate by promoting employment in younger age groups through improvement of matching efficiency (direct policy effects that reduce the constant terms of the unemployment rate function) are also taken into account.

a) Freeter measures

The "Japan Revitalization Strategy" sets the target (KPI) of reducing the number of young freeters to 1.24 million by 2020.[15] According to the MIC "Labour Force Survey", the number of freeters peaked at 2.17 million in 2003, but was down to 1.80 million in 2012.

In future, the number of freeters is expected to decrease to a certain extent under the impact of population shrinkage, but is also estimated to fall further due to policy effects, as follows. Firstly, a ratio is calculated by dividing the number of freeters by gender and age group in 2012 by the population by gender and age group. Next, this ratio is multiplied by the population by gender and age group in 2020 ["Population Projections for Japan (January 2012 Medium Fertility and Mortality Projections)", "Household Projections for Japan (Whole Country Estimates, January 2013 Estimates)"]. This is taken as the number of freeters by gender and age group in 2020 if there are no policy effects. As a result, there will be 1.63 million freeters in 2020 if there are no policy effects; the difference of 0.39 million compared to the attainment target (KPI) of 1.24 million would be the number of freeters additionally reduced as a result of policy effects.

Further, the decrease in freeters by employment status, gender and age group due to policy effects is taken as the difference between the number of freeters by gender and age group in 2020 if there are no policy effects, as calculated above, and the attainment target (KPI) of 1.24 million allocated according to the component ratio of freeters by gender and age group in 2012. The decrease in freeters by employment status, gender and age group, divided by the population by gender and age group in 2012, is taken as a policy effect of improving the labor force participation rate in 2020.

However, as freeters in employment are already counted in the labor force participation rate, they are not included in the improvement of the labor force participation rate due to policy effects. The conversion of employed freeters to regular employment is seen as helping to reduce age group wage disparity. Similarly, the reduction in unemployed freeters is thought to be included in the effect of raising the labor force participation rate through the labor force participation rate function, due to the improvement in the unemployment rate (one term previously) as an explanatory variable. As such, this reduction is not included in the improvement of the labor force participation rate due to policy effects. Therefore, only the improvement of the labor force participation rate among freeters as a non-labor force element is taken as an additional policy effect.

Policy effects in the intermediate years until 2020 are estimated by linear interpolation. And from 2021 onwards, the same level of policy effects as in 2020 is envisaged, so the values for 2020 will remain constant.

b) NEETs measures

One of the policy targets deliberated by working groups and subcommittees of the Labour Policy Council is to help a total of 100,000 NEETs to take up employment or otherwise decide their career paths

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15 The definition of "freeters" is based on the MHLW "Analysis of the Labor Economy in 2003", where the term "freeter" refers to a graduate in the 15-34 age group who (1) is currently employed and whose employment format is called "part-time work" or "arbeit" (temporary work) in the place of work, or (2) is currently looking for work (completely unemployed) and wishes to work in a part-time job or "arbeit", or (3) is not currently looking for work and is neither engaged in housework nor attending school, but who wishes to find employment and would prefer to work in a part-time job or "arbeit". For females, freeters are limited to unmarried persons, in addition to conditions (1)-(3) above.

through Local Youth-support Stations in FY2011-2020. According to the MHLW Human Resources Development Bureau, meanwhile, actual figures for 2012 showed 14,713 career path deciders, of whom about 80% had found employment. In this study, it is assumed that the level of those finding employment in FY2012 can be maintained to a degree until 2020, and it is assumed that 12,000 NEETs will find employment every year.

According to the MIC "Labour Force Survey", the total number of NEETs (young people not in employment) in 2012 was 630,000.[16] This number has remained level in the 600,000 range since 2002, and no major variation is seen in the age composition of NEETs, either.

The composition of NEETs by gender and age group in 2012 is kept constant, and the number of employment finders assumed above for 2020 is divided by gender and age group. The number of employment finders by gender and age group is then divided by the 2012 population by gender and age group, and the result is taken as the policy effect of improving the labor force participation rate in 2020.

For intermediate years until 2020, as it is expected that 12,000 NEETs will find employment every year, the trend will be at the same level as the policy effects in 2020. For policy effects from 2021 onwards, similarly, it is assumed that 12,000 NEETs will find employment every year, and thus it is assumed that the policy effects in 2020 will be maintained at the same level.

c) Improving the continuous employment rate by developing the WLB environment

For females (with spouse) aged 30-34, the labor force participation rate is assumed to increase as a result of the rise in the continuous employment rate, because job leaving for reasons of childbirth and childcare will be reduced by the development of the WLB environment.

In the MIC "Employment Status Survey (2012)", childbirth and childcare account for 47.9% of all reasons for leaving jobs among females aged 30-34 (i.e. those who were previously in employment but now are not in employment).[17] The ratio of previously employed females among females aged 30-34 not in employment is 57.1%. These ratios are assumed to remain fixed in future.

Meanwhile, according to the IPSS "14th Basic Survey of Birth Trends", the ratio of continuous employment among females before and after the birth of their 1st, 2nd and 3rd child in the years 2005-2009 was, respectively, 38.0%, 72.8% and 82.9%. From this, the average ratio of continuous employment before and after childbirth, not taking account of the number of children, is calculated as 52.6%. Therefore, although an exact correspondence cannot be made owing to differences of definition and years between surveys, as well as the existence of 4th or more children, generally, when the ratio of continuous employment before and after childbirth is 52.6% (and the ratio of job leaving before and after childbirth is 47.4%), the ratio of those leaving jobs for reasons of childbirth and childcare compared to all job leavers would be 47.9% (ibid., "Employment Status Survey (2012)").

The "Japan Revitalization Strategy" sets the target (KPI) of raising the ratio of continuous employment of females before and after the birth of the 1st child to 55% by 2020, and this ratio is assumed to be maintained after 2020. if the ratio of continuous employment before and after the birth of the 2nd and 3rd child changes as a fixed rate based on actual figures in 2005-2009, an average ratio before and after childbirth among females after 2020 would be 63.0% (job leaving ratio before and after childbirth 37.0%).[18] As such, the ratio of job leaving before and after childbirth is assumed to decrease from 47.4% to

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16 Based on the Ministry of Health, Labour and Welfare, NEETs are defined as persons in the 15-34 age group in the MIC "Labour Force Survey" who are not in the labor force and are neither engaged in housework nor attending school.

17 Females previously in employment who quit their jobs in or after October 2007.

18 Here, it is assumed that the ratio of births of 1st, 2nd and 3rd children will not change in future, but in fact, the ratio of births of 1st children is predicted to rise compared to those of 2nd and 3rd children. To be more exact, therefore, the average ratio of continuous employment before and after childbirth is expected to be slightly higher than 63.0%.

37.0% in 2020, and to trend at a fixed rated from 2020 onwards.[19]

As a result, in the economic revival/ progressive labor participation scenario, this will have the effect of increasing the labor force participation rate by 2.0 percentage points in 2020 and 1.5 percentage points in 2030.[20]

d) Improving the continuous employment ratio by promoting the use of part-time working systems, among others

For males and females (with spouse) aged 65-69, the labor force participation rate is assumed to increase due to the rise in the continuous employment rate when job leaving caused by underdevelopment of systems will be eliminated by promoting the use of part-time working systems, etc. Part-time working systems are not the only means of developing employment environments for the 65-69 age group, but owing to constraints of data, this study only takes account of the increase in the labor force participation rate due to promoting the use of part-time working systems by those previously employed as regular staff or employees.

In the JILPT "Follow-up Survey on the Baby-boomer Generation's Work and Life Vision" (conducted in 2008), the ratio of respondents who replied that they would make it possible to work part-time as a necessary measure for continued employment at age 60 and over (regular employees employed by companies with a fixed retirement age of 60 at the time of the survey in 2006) was 11.0% for males and 14.1% for females. These are therefore taken as the ratios expected to leave their jobs if the use of part-time working systems or others is not promoted.[21] Meanwhile, of the total number of males and females aged 65-69 not in employment in the MIC "Employment Status Survey (2012)", the ratio of those previously employed as regular staff or employees was 21.4% for males and 4.1% for females. It is assumed that these ratios will remain fixed in future.

On the assumption that job leaving in the 65-69 age group due to underdevelopment of part-time working systems will no longer exist in 2030, the increase in the labor force participation rate in 2030 will be 0.8 percentage points for males and 0.4 percentage points for females in the economic revival / progressive labor participation scenario.

e) Promoting employment in younger age groups by improving the efficiency of matching (increase in senior high school and university graduate employment rates)

It is assumed that senior high school and university graduate employment rates will be increased by improving the efficiency of matching, and that with this, employment rates in younger age groups (ages 15-19 and 20-24) will rise. This effect will be treated as one that does not convert to the labor force participation rate, but reduces the unemployment rate among young people. In other words, rather than reducing the constant terms of the labor force participation rate function, it is seen as a direct policy effect reducing the constant terms of the unemployment rate function in the labor supply and demand adjustment block.

It is assumed that the senior high school and university graduate rates and the ratio of population subject to advancement (the ratio of junior and senior high school graduates to the general population) will remain fixed in future. That is, if the product of these

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19 The ratio of continuous employment before and after childbirth does not only concern females aged 25-29. Therefore, the reduction in the ratio of job leaving before and after childbirth is an average value including age groups other than 25-29.

20 Since the ratio of continuous employment among females before and after the birth of the 1st child is assumed to trend at a fixed rate after 2020, the upward effect on the labor force participation rate due to development of the WLB environment will not grow so greatly in 2030, when the labor force participation rate will be larger if the upward effect of WLB environment development compared to 2020 is not taken into account.

21 Calculated by dividing the number of respondents who replied that they would make it possible to work part-time as a necessary measure for continued employment at age 60 and over, by the total number of respondents citing necessary measures for continued employment at age 60 and over. Because this was a multiple response question, the total number of respondents citing necessary measures for continued employment at age 60 and over exceeds the number of actual respondents.

is made a constant, the number of future senior high school and university graduate employment rates in employment will be determined by the product of the senior high school and university graduate employment rates, the senior high school and university advancement rates, the population aged 10-14 and 15-19, and the constant.

Although the senior high school and university advancement rates are also used as explanatory variables of the labor force participation rate function, the latter is the currently active university and junior college advancement rate. As such, the future values cannot be applied as they are. Therefore, the university advancement rate (including senior high school graduates and others in past fiscal years) is assumed to be the scalar multiple (ratio of both in 2012) of the currently active university and junior college advancement rate. Figures from "Population Projections for Japan (January 2012 Medium Fertility and Mortality Projections)" are used for the population aged 10-14 and 15-19.

The employment rate of FY2011 senior high school and university graduates as of April 1st, 2012 was 20.3% and 13.6% for male and female senior high school graduates, respectively, and 62.3% and 73.4% for male and female university graduates, respectively (MEXT "School Basic Survey", preliminary figures). Meanwhile, as of April 1st, 2008, when the senior high school and university graduate employment rates were at their highest in recent years, they were 21.8% and 16.1% for male and female senior high school graduates, respectively, and 66.4% and 74.6% for male and female university graduates, respectively. Here, if policies to improve the matching efficiency of labor supply and demand were implemented, the degree of difference between the two points in time is assumed to have the potential to raise employment rates. Therefore, the improvement due to policy implementation would be 1.5 percentage points and 2.5 percentage points for males and females, respectively, in the senior high school graduate employment rate, and 4.1 percentage points and 1.2 percentage points, respectively, in the university graduate employment rate (with linear interpolation for intermediate years until 2020; from 2021 onwards, fixed at 2020 values).

As the whole increase in the number of senior high school and university graduates entering employment consists of persons in employment, the related increase in the employment rate is calculated by dividing this increase by the populations aged 15-19 and 20-24, respectively. As a result, the employment rate in ages 15-19 will be increased by 0.27 percentage points for males and 0.47 percentage points for females in 2020, and by 0.28 percentage points for males and 0.47 percentage points for females in 2030, respectively. Similarly, the employment rate in ages 20-24 will be increased by 0.41 percentage points for males and 0.11 percentage points for females in 2020 and by 0.43 percentage points for males and 0.12 percentage points for females in 2030, respectively. The operation in the Labor Supply and Demand Model is to divide the increase in the employment rate by the labor force participation rate determined endogenously for ages 15-19 and 20-24, and subtract the results from the unemployment rates for ages 15-19 and 20-24.

4. Assumptions in the Labor Supply and Demand Adjustment Block

1) Labor supply & demand ratio, active job openings-to-applicants ratio and unemployment rate

The MIC "Labour Force Survey" provides the source for the labor demand (where actual figures relate to employed persons) and labor force used to calculate the labor supply and demand ratio, and unemployment rates. The active job openings-to-applicants ratio is based on data by age group, using the full-time employment opportunity accumulation method (including part-time) in the MHLW "Employment Referrals for General Workers (Employment Security Statistics)". Relational expressions between these variables are estimated from past performance values, but in future they will all be resolved endogenously in the Labor Supply and Demand Model.

2) Rate of rise in wages

The Labor Supply and Demand Model is structured such that the rate of rise in wages adjusts supply and demand in the labor force. To ascertain the relationship between the rate of rise in wages and labor supply and demand, a rate of rise in wages function is estimated by applying the rationale of the Phillips curve. The rate

of rise in wages (industry total) is taken as the explained variable, and the active job openings-to-applicants ratio (age group total), the rate of change in the consumer price index, and terms of trade (export price index/ import price index) as explanatory variables. Data sources are contractual cash earnings (industry total, full-time workers, private businesses with 10 or more workers) in the MHLW "Basic Survey on Wage Structure" for the rate of rise in wages; the MHLW "Employment Referrals for General Workers (Employment Security Statistics)" for the active job openings-to-applicants ratio; the General Index in the MIC "Consumer Price Index" for the rate of change in the consumer price index; and the Bank of Japan "Corporate Goods Price Index" for yen-denominated export and import price indices.

The future consumer price index is shown in Table II-2. Future terms of trade are extended from the actual figure for 2012, based on the Japan Center for Economic Research "39th Medium-Term Economic Forecast". Other variables are resolved endogenously in the Labor Supply and Demand Model.

Section 4   Simulation Results

1. Labor Force

With zero growth and unchanged participation, the labor force is estimated to decrease from 65.55 million persons in 2012 to 61.90 million in 2020, and to 56.83 million in 2030 (Table II-4, II-5). Conversely, if economic and employment policies are implemented and both economic growth and participation in the labor market progress, the respective figures could be 63.31 million in 2020 and 59.54 million in 2030, in the reference/ gradual participation scenario, and 64.95 million in 2020 and 62.85 million, in 2030 in the economic revival/ participation progression scenario. In both cases, the scale of decrease is smaller than in the zero growth/ unchanged participation scenario. In the economic revival/ participation progression scenario, in particular, the female labor force is forecast to increase from 27.66 million in 2012 to 27.71 million in 2030.

2. Labor Force Participation Rate

In the zero growth/ unchanged participation

scenario, the labor force participation rate is estimated to decrease from 59.1% in 2012 to 56.5% in 2020 and 54.3% in 2030 (Table II-6). In the reference/ gradual participation scenario, it is estimated to decrease to 57.8% in 2020 and 56.9% in 2030. In the economic revival/ participation progression scenario, it would rise to 59.3% in 2020 and 60.1% in 2030, thus exceeding the 2012 level. Viewing trends in the female labor force participation rate by age, in the economic revival/ participation progression scenario, the dip in the M-shaped curve would be shallower, while the labor force participation rate is estimated to improve generally in all age groups (Figure II-7).

3. Employed Persons

In the zero growth/ unchanged participation scenario, employed persons are estimated to decrease from 62.70 million in 2012 to 59.47 million in 2020 and 54.49 million in 2030 (Table II-8). In the reference/ gradual participation scenario, they are estimated to decrease to 60.88 million in 2020 and 57.25 million in 2030. In the economic revival/ participation progression scenario, they are estimated to decrease to 62.91 million in 2020 and 61.03 million in 2030, the scale of decrease thus being smaller than in the other scenarios. In the zero growth/ unchanged participation scenario, the composition of employed persons by gender in 2030 is more or less the same as in 2012 (males 57.7%, females 42.3%), but in the economic revival/ participation progression and reference/ gradual participation scenarios, in which female M-shaped curve measures and WLB related measures are enhanced or partially implemented, the component ratio of females rises by 1.9 and 0.8 points, respectively (Table II-9). In the economic revival/ participation progression scenario, in particular, employed females are estimated to increase from 26.54 million in 2012 to 26.97 million in 2030 (Table II-8). As the composition by age in 2030, reflecting the aging of the population, the ratio of persons aged 60 and over is estimated to rise from 19.0% in 2012 to 19.8% in the zero growth/ unchanged participation scenario and 21.7% in the reference/ gradual participation and economic revival/ participation progression scenarios (Table II-9).

4. Employment Rate

In the zero growth/ unchanged participation scenario, the employment rate is estimated to decrease from 56.5% in 2012 to 54.3% in 2020 and 52.1% in 2030 (Table II-10). In the reference/ gradual participation scenario, it is estimated to decrease more gently to 55.6% in 2020 and 54.7% in 2030. In the economic revival/ participation progression scenario, conversely, it is expected to rise to 57.4% in 2020 and 58.4% in 2030.

5. Comparison with Employment Rate Targets (KPIs) in the "Japan Revitalization Strategy"

Viewing employment rates for which specific attainment targets (KPIs) have been stated in the government's growth strategy (Table II-11), in the "Japan Revitalization Strategy", an employment rate of 80% in ages 20-64, 78% in ages 20-34, 65% in ages 60-64, and 73% for females aged 25-44 are set as targets for 2020. In the economic revival/ participation progression scenario, the situation is estimated to be consistent with the employment rate targets stated in the "Japan Revitalization Strategy".

6. Number of Employees by Industry

In the economic revival/ participation progression scenario, the number of employees by industry in 2020, compared to 2012, is estimated to increase in growth sectors in the "Japan Revitalization Strategy", namely general and precision machinery (100,000 increase), electrical machinery (110,000 increase), other manufacturing (120,000 increase), information and communications (190,000 increase), and miscellaneous services (280,000 increase), as well as in miscellaneous business services (50,000 increase), and in medical, health care and welfare (1.44 million increase), where demand is expanding with population aging (Table II-12, II-13). In the economic revival/ participation progression scenario, the number of employees by industry in 2030, compared to 2012, is estimated to increase in general and precision machinery (60,000 increase), electrical machinery (10,000 increase), information and communications (330,000 increase), medical, health care and welfare (2.56 million increase),

miscellaneous business services (150,000 increase) and miscellaneous services (550,000 increase).

In medical, health care and welfare, numbers are estimated to increase in all scenarios compared to 7.06 million in 2012. Namely, in the zero growth/ unchanged participation scenario, it will rise to 8 million in 2020 (940,000 increase) and 9.08 million in 2030 (2.02 million increase); in the reference/ gradual participation scenario, to 8.34 million in 2020 (1.28 million increase) and 9.44 million in 2030 (2.38 million increase); and in the economic revival/ participation progression scenario, to 8.50 million in 2020 (1.44 million increase) and 9.62 million in 2030 (2.56 million increase). Similarly, in miscellaneous services, compared to 2012, the number is estimated to increase by 180,000 in 2020 and 190,000 in 2030 in the zero growth/ unchanged participation scenario, by 210,000 in 2020 and 260,000 in 2030 in the reference/ gradual participation scenario, and by 280,000 in 2020 and 550,000 in 2030 in the economic revival/ participation progression scenario, respectively.

In manufacturing industries as a whole, the number is estimated to fall from 10.32 million in 2012, by 810,000 to 9.51 million in 2020 and by 1.62 million to 8.70 million in 2030 in the zero growth/ unchanged participation scenario. In the reference/ gradual participation scenario, however, the number is estimated to decrease by 460,000 to 9.86 million in 2020 and 1.06 million to 9.26 million in 2030, and in the economic revival/ participation progression scenario by 160,000 to 10.48 million in 2020 and 380,000 to 9.94 million in 2030. Here, therefore, the scale of decrease is expected to be smaller. In the wholesale and retail trade, compared to 2012, the number is estimated to decrease by 1.14 million in the zero growth/ unchanged participation scenario, 1.03 million in the reference/ gradual participation scenario, and 510,000 in the economic revival/ participation progression scenario in 2020; and by 2.87 million in the zero growth/ unchanged participation scenario, 2.26 million in the reference/ gradual participation scenario, and 1.52 million in the economic revival/ participation progression scenario in 2030. Thus, the number is estimated to decrease vastly in all scenarios.

7. Labor Productivity

The annual average rate of change in labor productivity (man-hours) in 2012-2020 is estimated to be 1.3% in the zero growth/ unchanged participation scenario, 1.7% in the reference/ gradual participation scenario, and 2.3% in the economic revival/ participation progression scenario (Figure II-14). The annual average rate of change in labor productivity (man-hours) in 2020-2030 is estimated to be 0.9% in the zero growth/ unchanged participation scenario, 1.7% in the reference/ gradual participation scenario, and 2.4% in the economic revival/ participation progression scenario.

Table II-4 Outline of the Labor Force by Gender and Age Group (Unit: 10,000 Persons)

			2012	2020	Difference compared to 2012	Difference compared to zero growth scenario	2030	Difference compared to 2012	Difference compared to zero growth scenario
Scenario with zero growth and no progress in labor market participation (zero growth / unchanged labor participation scenario)	Male-female totals	Total (age 15 and over)	6555	6190	-365		5683	-872	
		Ages 15-29	1125	1024	-101		930	-195	
		Ages 30-59	4195	4042	-153		3636	-559	
		Age 60 and over	1235	1124	-111		1118	-117	
	Males	Total (age 15 and over)	3789	3564	-225		3281	-508	
		Ages 15-29	601	548	-53		496	-105	
		Ages 30-59	2430	2325	-105		2097	-333	
		Age 60 and over	757	692	-65		688	-69	
	Females	Total (age 15 and over)	2766	2626	-140		2402	-364	
		Ages 15-29	524	477	-47		434	-90	
		Ages 30-59	1766	1718	-48		1539	-227	
		Age 60 and over	476	432	-44		430	-46	
Scenario with economic growth and some progress in labor market participation (reference / gradual labor participation scenario)	Male-female totals	Total (age 15 and over)	6555	6331	-224	141	5954	-601	271
		Ages 15-29	1125	1030	-95	6	951	-174	21
		Ages 30-59	4195	4096	-99	54	3720	-475	84
		Age 60 and over	1235	1205	-30	81	1283	48	165
	Males	Total (age 15 and over)	3789	3618	-171	54	3399	-390	118
		Ages 15-29	601	545	-56	-3	503	-98	7
		Ages 30-59	2430	2329	-101	4	2102	-328	5
		Age 60 and over	757	744	-13	52	794	37	106
	Females	Total (age 15 and over)	2766	2713	-53	87	2555	-211	153
		Ages 15-29	524	486	-38	9	448	-76	14
		Ages 30-59	1766	1767	1	49	1619	-147	80
		Age 60 and over	476	461	-15	29	488	12	58
Scenario with economic growth and progress in labor market participation (economic revival / progressive labor participation scenario)	Male-female totals	Total (age 15 and over)	6555	6495	-60	305	6285	-270	602
		Ages 15-29	1125	1058	-67	34	1012	-113	82
		Ages 30-59	4195	4203	8	161	3914	-281	278
		Age 60 and over	1235	1235	0	111	1359	124	241
	Males	Total (age 15 and over)	3789	3672	-117	108	3514	-275	233
		Ages 15-29	601	559	-42	11	538	-63	42
		Ages 30-59	2430	2342	-88	17	2126	-304	29
		Age 60 and over	757	771	14	79	851	94	163
	Females	Total (age 15 and over)	2766	2823	57	197	2771	5	369
		Ages 15-29	524	499	-25	22	474	-50	40
		Ages 30-59	1766	1860	94	142	1789	23	250
		Age 60 and over	476	464	-12	32	508	32	78

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.

2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress

Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree

Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

3) As figures in the Table have been rounded up or down to the nearest notational unit, the grand totals and breakdown totals may not agree. Differences are calculated from the rounded-off figures.

Table II-5 Outline of the Labor Force by Gender and Age Group
(Component Ratio, Unit: %)

			2012			2020			2030		
			Male-female total	Males	Females	Male-female total	Males	Females	Male-female total	Males	Females
Scenario with zero growth and no progress in labor market participation (zero growth / unchanged labor participation scenario)	Male-female ratios	Total (age 15 and over)	100.0	57.8	42.2	100.0	57.6	42.4	100.0	57.7	42.3
		Ages 15-29	100.0	53.4	46.6	100.0	53.5	46.5	100.0	53.4	46.6
		Ages 30-59	100.0	57.9	42.1	100.0	57.5	42.5	100.0	57.7	42.3
		Age 60 and over	100.0	61.4	38.6	100.0	61.6	38.4	100.0	61.5	38.5
	Ages ratios	Total (age 15 and over)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Ages 15-29	17.2	15.9	18.9	16.5	15.4	18.2	16.4	15.1	18.1
		Ages 30-59	64.0	64.1	63.8	65.3	65.2	65.4	64.0	63.9	64.1
		Age 60 and over	18.8	20.0	17.2	18.2	19.4	16.4	19.7	21.0	17.9
Scenario with economic growth and some progress in labor market participation (reference / gradual labor participation scenario)	Male-female ratios	Total (age 15 and over)	100.0	57.8	42.2	100.0	57.1	42.9	100.0	57.1	42.9
		Ages 15-29	100.0	53.4	46.6	100.0	52.9	47.1	100.0	52.9	47.1
		Ages 30-59	100.0	57.9	42.1	100.0	56.9	43.1	100.0	56.5	43.5
		Age 60 and over	100.0	61.4	38.6	100.0	61.8	38.2	100.0	61.9	38.1
	Ages ratios	Total (age 15 and over)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Ages 15-29	17.2	15.9	18.9	16.3	15.1	17.9	16.0	14.8	17.5
		Ages 30-59	64.0	64.1	63.8	64.7	64.4	65.1	62.5	61.8	63.4
		Age 60 and over	18.8	20.0	17.2	19.0	20.6	17.0	21.5	23.4	19.1
Scenario with economic growth and progress in labor market participation (economic revival / progressive labor participation scenario)	Male-female ratios	Total (age 15 and over)	100.0	57.8	42.2	100.0	56.5	43.5	100.0	55.9	44.1
		Ages 15-29	100.0	53.4	46.6	100.0	52.8	47.2	100.0	53.1	46.9
		Ages 30-59	100.0	57.9	42.1	100.0	55.7	44.3	100.0	54.3	45.7
		Age 60 and over	100.0	61.4	38.6	100.0	62.4	37.6	100.0	62.6	37.4
	Ages ratios	Total (age 15 and over)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Ages 15-29	17.2	15.9	18.9	16.3	15.2	17.7	16.1	15.3	17.1
		Ages 30-59	64.0	64.1	63.8	64.7	63.8	65.9	62.3	60.5	64.5
		Age 60 and over	18.8	20.0	17.2	19.0	21.0	16.4	21.6	24.2	18.3

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.

2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress

Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree

Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

3) As figures in the Table have been rounded up or down to the nearest notational unit, the grand totals and breakdown totals may not agree.

Table II-6   Outline of the Labor Force Participation Rate by Gender and Age Group (Unit: %)

			2012	2020	Difference compared to 2012	Difference compared to zero growth scenario	2030	Difference compared to 2012	Difference compared to zero growth scenario
Scenario with zero growth and no progress in labor market participation (zero growth / unchanged labor participation scenario)	Male-female totals	Total (age 15 and over)	59.1	56.5	-2.6		54.3	-4.8	
		Ages 15-29	57.9	57.6	-0.3		58.0	0.1	
		Ages 30-59	82.9	83.7	0.8		83.7	0.8	
		Age 60 and over	30.2	25.9	-4.3		24.8	-5.4	
	Males	Total (age 15 and over)	70.8	67.6	-3.2		65.5	-5.3	
		Ages 15-29	60.5	60.1	-0.4		60.5	0.0	
		Ages 30-59	95.4	95.4	0.0		95.1	-0.3	
		Age 60 and over	41.7	36.0	-5.7		34.7	-7.0	
	Females	Total (age 15 and over)	48.2	46.2	-2.0		44.1	-4.1	
		Ages 15-29	55.2	54.9	-0.3		55.4	0.2	
		Ages 30-59	70.2	71.9	1.7		71.8	1.6	
		Age 60 and over	20.9	17.8	-3.1		17.0	-3.9	
Scenario with economic growth and some progress in labor market participation (reference / gradual labor participation scenario)	Male-female totals	Total (age 15 and over)	59.1	57.8	-1.3	1.3	56.9	-2.2	2.6
		Ages 15-29	57.9	57.9	0.0	0.3	59.3	1.4	1.3
		Ages 30-59	82.9	84.8	1.9	1.1	85.6	2.7	1.9
		Age 60 and over	30.2	27.7	-2.5	1.8	28.5	-1.7	3.7
	Males	Total (age 15 and over)	70.8	68.7	-2.1	1.1	67.9	-2.9	2.4
		Ages 15-29	60.5	59.8	-0.7	-0.3	61.4	0.9	0.9
		Ages 30-59	95.4	95.5	0.1	0.1	95.3	-0.1	0.2
		Age 60 and over	41.7	38.8	-2.9	2.8	40.0	-1.7	5.3
	Females	Total (age 15 and over)	48.2	47.7	-0.5	1.5	46.9	-1.3	2.8
		Ages 15-29	55.2	55.9	0.7	1.0	57.1	1.9	1.7
		Ages 30-59	70.2	73.9	3.7	2.0	75.6	5.4	3.8
		Age 60 and over	20.9	19.0	-1.9	1.2	19.3	-1.6	2.3
Scenario with economic growth and progress in labor market participation (economic revival / progressive labor participation scenario)	Male-female totals	Total (age 15 and over)	59.1	59.3	0.2	2.8	60.1	1.0	5.8
		Ages 15-29	57.9	59.4	1.5	1.8	63.1	5.2	5.1
		Ages 30-59	82.9	87.0	4.1	3.3	90.1	7.2	6.4
		Age 60 and over	30.2	28.4	-1.8	2.5	30.1	-0.1	5.3
	Males	Total (age 15 and over)	70.8	69.7	-1.1	2.1	70.2	-0.6	4.7
		Ages 15-29	60.5	61.3	0.8	1.2	65.6	5.1	5.1
		Ages 30-59	95.4	96.1	0.7	0.7	96.4	1.0	1.3
		Age 60 and over	41.7	40.2	-1.5	4.2	42.9	1.2	8.2
	Females	Total (age 15 and over)	48.2	49.7	1.5	3.5	50.8	2.6	6.7
		Ages 15-29	55.2	57.5	2.3	2.6	60.5	5.3	5.1
		Ages 30-59	70.2	77.8	7.6	5.9	83.5	13.3	11.7
		Age 60 and over	20.9	19.1	-1.8	1.3	20.1	-0.8	3.1

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.

2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress

Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree

Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

3) As figures in the Table have been rounded up or down to the nearest notational unit, the grand totals and breakdown totals may not agree. Differences are calculated from the rounded-off figures.

Figure II-7   Trends in the Female Labor Force Participation Rate (Unit: %)

Zero growth / unchanged labor participation

Legend: 2012, 2020, 2030

Reference / gradual labor participation

Legend: 2012, 2020, 2030

Economic revival / progressive labor participation

Legend: 2012, 2020, 2030

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.
   2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress
   Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree
   Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

Table II-8 Outline of the Number of Employees by Gender and Age Group (Unit: 10,000 Persons)

			2012	2020	Difference compared to 2012	Difference compared to zero growth scenario	2030	Difference compared to 2012	Difference compared to zero growth scenario
Scenario with zero growth and no progress in labor market participation (zero growth / unchanged labor participation scenario)	Male-female totals	Total (age 15 and over)	6270	5947	-323		5449	-821	
		Ages 15-29	1044	966	-78		876	-168	
		Ages 30-59	4034	3896	-138		3497	-537	
		Age 60 and over	1193	1086	-107		1077	-116	
	Males	Total (age 15 and over)	3616	3416	-200		3136	-480	
		Ages 15-29	554	515	-39		466	-88	
		Ages 30-59	2335	2238	-97		2013	-322	
		Age 60 and over	726	663	-63		657	-69	
	Females	Total (age 15 and over)	2654	2531	-123		2313	-341	
		Ages 15-29	490	451	-39		410	-80	
		Ages 30-59	1698	1658	-40		1483	-215	
		Age 60 and over	466	423	-43		420	-46	
Scenario with economic growth and some progress in labor market participation (reference / gradual labor participation scenario)	Male-female totals	Total (age 15 and over)	6270	6088	-182	141	5725	-545	276
		Ages 15-29	1044	972	-72	6	898	-146	22
		Ages 30-59	4034	3951	-83	55	3588	-446	91
		Age 60 and over	1193	1166	-27	80	1240	47	163
	Males	Total (age 15 and over)	3616	3470	-146	54	3259	-357	123
		Ages 15-29	554	513	-41	-2	474	-80	8
		Ages 30-59	2335	2244	-91	6	2024	-311	11
		Age 60 and over	726	714	-12	51	761	35	104
	Females	Total (age 15 and over)	2654	2618	-36	87	2466	-188	153
		Ages 15-29	490	459	-31	8	424	-66	14
		Ages 30-59	1698	1707	9	49	1564	-134	81
		Age 60 and over	466	452	-14	29	478	12	58
Scenario with economic growth and progress in labor market participation (economic revival / progressive labor participation scenario)	Male-female totals	Total (age 15 and over)	6270	6291	21	344	6103	-167	654
		Ages 15-29	1044	1005	-39	39	964	-80	88
		Ages 30-59	4034	4083	49	187	3812	-222	315
		Age 60 and over	1193	1203	10	117	1327	134	250
	Males	Total (age 15 and over)	3616	3550	-66	134	3405	-211	269
		Ages 15-29	554	530	-24	15	512	-42	46
		Ages 30-59	2335	2274	-61	36	2068	-267	55
		Age 60 and over	726	746	20	83	826	100	169
	Females	Total (age 15 and over)	2654	2741	87	210	2697	43	384
		Ages 15-29	490	474	-16	23	452	-38	42
		Ages 30-59	1698	1809	111	151	1744	46	261
		Age 60 and over	466	457	-9	34	501	35	81

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.
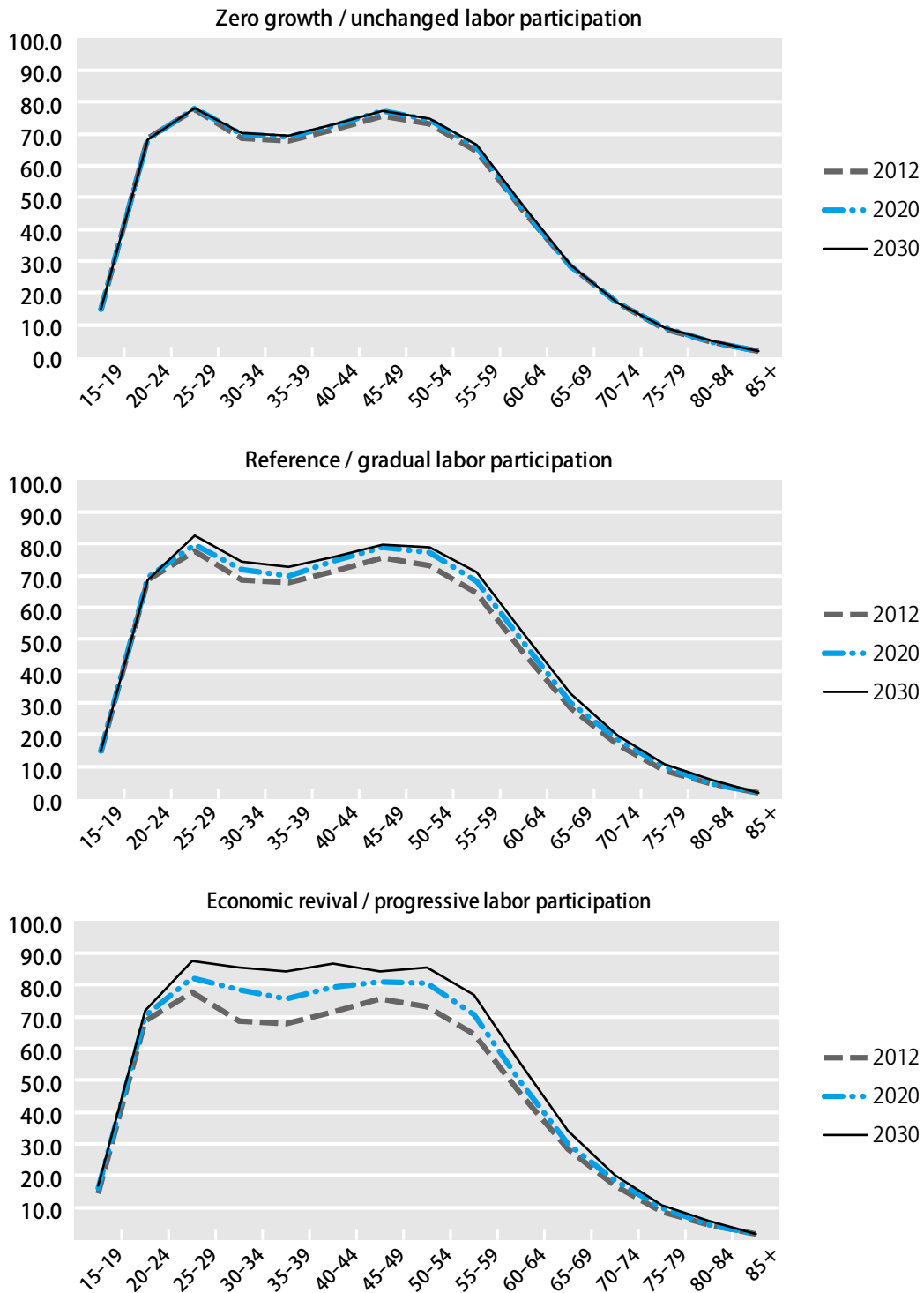
2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress

Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree

Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

3) As figures in the Table have been rounded up or down to the nearest notational unit, the grand totals and breakdown totals may not agree. Differences are calculated from the rounded-off figures.

Table II-9   Outline of the Number of Employees by Gender and Age Group
(Component Ratio, Unit: %)

			2012			2020			2030		
			Male-female total	Males	Females	Male-female total	Males	Females	Male-female total	Males	Females
Scenario with zero growth and no progress in labor market participation (zero growth / unchanged labor participation scenario)	Male-female ratios	Total (age 15 and over)	100.0	57.7	42.3	100.0	57.4	42.6	100.0	57.6	42.4
		Ages 15-29	100.0	53.1	46.9	100.0	53.3	46.7	100.0	53.2	46.8
		Ages 30-59	100.0	57.9	42.1	100.0	57.4	42.6	100.0	57.6	42.4
		Age 60 and over	100.0	60.9	39.1	100.0	61.1	38.9	100.0	61.0	39.0
	Ages ratios	Total (age 15 and over)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Ages 15-29	16.6	15.3	18.5	16.2	15.1	17.8	16.1	14.9	17.7
		Ages 30-59	64.3	64.6	64.0	65.5	65.5	65.5	64.2	64.2	64.1
		Age 60 and over	19.0	20.1	17.6	18.3	19.4	16.7	19.8	20.9	18.1
Scenario with economic growth and some progress in labor market participation (reference / gradual labor participation scenario)	Male-female ratios	Total (age 15 and over)	100.0	57.7	42.3	100.0	57.0	43.0	100.0	56.9	43.1
		Ages 15-29	100.0	53.1	46.9	100.0	52.8	47.2	100.0	52.8	47.2
		Ages 30-59	100.0	57.9	42.1	100.0	56.8	43.2	100.0	56.4	43.6
		Age 60 and over	100.0	60.9	39.1	100.0	61.3	38.7	100.0	61.4	38.6
	Ages ratios	Total (age 15 and over)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Ages 15-29	16.6	15.3	18.5	16.0	14.8	17.5	15.7	14.5	17.2
		Ages 30-59	64.3	64.6	64.0	64.9	64.7	65.2	62.7	62.1	63.4
		Age 60 and over	19.0	20.1	17.6	19.1	20.6	17.2	21.7	23.4	19.4
Scenario with economic growth and progress in labor market participation (economic revival / progressive labor participation scenario)	Male-female ratios	Total (age 15 and over)	100.0	57.7	42.3	100.0	56.4	43.6	100.0	55.8	44.2
		Ages 15-29	100.0	53.1	46.9	100.0	52.8	47.2	100.0	53.1	46.9
		Ages 30-59	100.0	57.9	42.1	100.0	55.7	44.3	100.0	54.3	45.7
		Age 60 and over	100.0	60.9	39.1	100.0	62.0	38.0	100.0	62.2	37.8
	Ages ratios	Total (age 15 and over)	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
		Ages 15-29	16.6	15.3	18.5	16.0	14.9	17.3	15.8	15.0	16.8
		Ages 30-59	64.3	64.6	64.0	64.9	64.0	66.0	62.5	60.7	64.6
		Age 60 and over	19.0	20.1	17.6	19.1	21.0	16.7	21.7	24.2	18.6

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.

2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress

Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree

Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

3) As figures in the Table have been rounded up or down to the nearest notational unit, the grand totals and breakdown totals may not agree.

Table II-10　Outline of the Employment Rate by Gender and Age Group (Unit: %)

			2012	2020	Difference compared to 2012	Difference compared to zero growth scenario	2030	Difference compared to 2012	Difference compared to zero growth scenario
Scenario with zero growth and no progress in labor market participation (zero growth / unchanged labor participation scenario)	Male-female totals	Total (age 15 and over)	56.5	54.3	-2.2		52.1	-4.4	
		Ages 15-29	53.7	54.3	0.6		54.6	0.9	
		Ages 30-59	79.7	80.7	1.0		80.4	0.7	
		Age 60 and over	29.2	25.0	-4.2		23.9	-5.3	
	Males	Total (age 15 and over)	67.5	64.8	-2.7		62.6	-4.9	
		Ages 15-29	55.7	56.5	0.8		56.8	1.1	
		Ages 30-59	91.7	91.8	0.1		91.3	-0.4	
		Age 60 and over	40.0	34.6	-5.4		33.1	-6.9	
	Females	Total (age 15 and over)	46.2	44.5	-1.7		42.4	-3.8	
		Ages 15-29	51.6	51.9	0.3		52.3	0.7	
		Ages 30-59	67.5	69.4	1.9		69.2	1.7	
		Age 60 and over	20.5	17.4	-3.1		16.6	-3.9	
Scenario with economic growth and some progress in labor market participation (reference / gradual labor participation scenario)	Male-female totals	Total (age 15 and over)	56.5	55.6	-0.9	1.3	54.7	-1.8	2.6
		Ages 15-29	53.7	54.6	0.9	0.3	56.0	2.3	1.4
		Ages 30-59	79.7	81.8	2.1	1.1	82.6	2.9	2.2
		Age 60 and over	29.2	26.8	-2.4	1.8	27.5	-1.7	3.6
	Males	Total (age 15 and over)	67.5	65.9	-1.6	1.1	65.1	-2.4	2.5
		Ages 15-29	55.7	56.3	0.6	-0.2	57.8	2.1	1.0
		Ages 30-59	91.7	92.0	0.3	0.2	91.8	0.1	0.5
		Age 60 and over	40.0	37.2	-2.8	2.6	38.4	-1.6	5.3
	Females	Total (age 15 and over)	46.2	46.0	-0.2	1.5	45.3	-0.9	2.9
		Ages 15-29	51.6	52.9	1.3	1.0	54.1	2.5	1.8
		Ages 30-59	67.5	71.4	3.9	2.0	73.0	5.5	3.8
		Age 60 and over	20.5	18.6	-1.9	1.2	18.9	-1.6	2.3
Scenario with economic growth and progress in labor market participation (economic revival / progressive labor participation scenario)	Male-female totals	Total (age 15 and over)	56.5	57.4	0.9	3.1	58.4	1.9	6.3
		Ages 15-29	53.7	56.5	2.8	2.2	60.1	6.4	5.5
		Ages 30-59	79.7	84.6	4.9	3.9	87.7	8.0	7.3
		Age 60 and over	29.2	27.7	-1.5	2.7	29.4	0.2	5.5
	Males	Total (age 15 and over)	67.5	67.4	-0.1	2.6	68.0	0.5	5.4
		Ages 15-29	55.7	58.2	2.5	1.7	62.4	6.7	5.6
		Ages 30-59	91.7	93.3	1.6	1.5	93.8	2.1	2.5
		Age 60 and over	40.0	38.9	-1.1	4.3	41.6	1.6	8.5
	Females	Total (age 15 and over)	46.2	48.2	2.0	3.7	49.5	3.3	7.1
		Ages 15-29	51.6	54.7	3.1	2.8	57.7	6.1	5.4
		Ages 30-59	67.5	75.7	8.2	6.3	81.4	13.9	12.2
		Age 60 and over	20.5	18.8	-1.7	1.4	19.9	-0.6	3.3

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.

2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress

Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree

Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

3) As figures in the Table have been rounded up or down to the nearest notational unit, the grand totals and breakdown totals may not agree. Differences are calculated from the rounded-off figures.

Table II-11   Comparison with Employment Rate Targets (KPIs) in the "Japan Revitalization Strategy" (Unit: %)

Year / Gender / Age		Actual				Target(KPI) 2020	Estimate					
							2020			2030		
		1990	2000	2010	2012	Japan Revitalization Strategy	Zero growth / unchanged participation scenario	Reference / gradual participation scenario	Economic revival / participation progression scenario	Zero growth / unchanged participation scenario	Reference / gradual participation scenario	Economic revival / participation progression scenario
Male-female total	20-34	74	73	74	74	78	75	76	78	75	77	82
	20-64	75	74	75	75	80	77	78	81	76	79	84
	60-64	53	51	57	58	65	58	63	65	58	66	70
Females	25-44	61	61	66	68	73	69	71	76	69	73	83

Notes: 1) Actual figures up to 2012 are from the Statistics Bureau, MIC "Labour Force Survey". Figures for 2020 and 2030 are estimates.

2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels

Table II-12   Outline of the Number of Employees by Industry (Unit: 10,000 Persons)

		Actual figures for 2012	2020			2030		
			Zero growth / unchanged participation scenario	Reference / gradual participation scenario	Economic revival / participation progression scenario	Zero growth / unchanged participation scenario	Reference / gradual participation scenario	Economic revival / participation progression scenario
Number of employees by industry (10,000 persons)	Agriculture, forestry and fisheries	240	215	233	248	173	201	220
	Mining and construction	506	459	464	470	409	413	416
	Manufacturing	1032	951	986	1048	870	926	994
	Food, beverages and tobacco	145	126	131	138	98	111	118
	General and precision machinery	133	128	136	143	113	129	139
	Electrical machinery	157	146	156	168	132	147	158
	Transportation equipment	115	94	97	105	93	98	103
	Other manufacturing	482	457	465	494	434	441	476
	Electricity, gas, water and heat supply	31	29	30	31	24	25	27
	Information and communications	209	219	223	228	216	223	242
	Transport	319	302	309	313	275	279	297
	Wholesale and retail trade	1093	979	990	1042	806	867	941
	Finance, insurance and real estate	248	210	212	220	175	176	205
	Eating and drinking places, accommodations	325	302	308	316	249	269	299
	Medical, health care and welfare	706	800	834	850	908	944	962
	Education, learning support	295	265	265	266	220	220	223
	Living-related and personal services	163	144	151	163	114	147	160
	Miscellaneous business services	319	314	319	324	292	309	334
	Miscellaneous services	449	467	470	477	468	475	504
	Government, compound services, industries unable to classify	335	291	293	293	248	251	279
	Industry total	6270	5947	6088	6291	5449	5725	6103
Difference compared to 2012	Agriculture, forestry and fisheries		-25	-7	8	-67	-39	-20
	Mining and construction		-47	-42	-36	-97	-93	-90
	Manufacturing		-81	-46	16	-162	-106	-38
	Food, beverages and tobacco		-19	-14	-7	-47	-34	-27
	General and precision machinery		-5	3	10	-20	-4	6
	Electrical machinery		-11	-1	11	-25	-10	1
	Transportation equipment		-21	-18	-10	-22	-17	-12
	Other manufacturing		-25	-17	12	-48	-41	-6
	Electricity, gas, water and heat supply		-2	-1	0	-7	-6	-4
	Information and communications		10	14	19	7	14	33
	Transport		-17	-10	-6	-44	-40	-22
	Wholesale and retail trade		-114	-103	-51	-287	-226	-152
	Finance, insurance and real estate		-38	-36	-28	-73	-72	-43
	Eating and drinking places, accommodations		-23	-17	-9	-76	-56	-26
	Medical, health care and welfare		94	128	144	202	238	256
	Education, learning support		-30	-30	-29	-75	-75	-72
	Living-related and personal services		-19	-12	0	-49	-16	-3
	Miscellaneous business services		-5	0	5	-27	-10	15
	Miscellaneous services		18	21	28	19	26	55
	Government, compound services, industries unable to classify		-44	-42	-42	-87	-84	-56
	Industry total		-323	-182	21	-821	-545	-167

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey" (recombined in line with industrial category notation in the Labor Supply and Demand Estimates). Figures for 2020 and 2030 are estimates.
2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress
Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree
Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels
3) "Other manufacturing" refers to forms of manufacturing other than those mentioned here. Besides other manufacturing specified in the Japan Standard Industry Classification, these also include ceramic, stone and clay products, iron and steel, metal products and other raw material industries.
4) Please note that, in the Labor Supply and Demand Estimates, dispatched workers from temporary labor agencies are classified under "Miscellaneous business services", i.e. the industry of the dispatch source, and that these dispatched workers are not included in other industries. In the "Labour Force Survey", meanwhile, dispatched workers from temporary labor agencies were classified not in the industry of the dispatch host but in that of the dispatch source until 2012. However, from 2013 they are to be classified in the industry of the dispatch host.
5) As figures in the Table have been rounded up or down to the nearest notational unit, the manufacturing and industry totals may not agree with the breakdown totals. Differences are calculated from the rounded-off figures.

Table II-13　Outline of the Number of Employees by Industry (Component Ratio, Unit: %)

		Actual figures for 2012	2020			2030		
			Zero growth / unchanged participation scenario	Reference / gradual participation scenario	Economic revival / participation progression scenario	Zero growth / unchanged participation scenario	Reference / gradual participation scenario	Economic revival / participation progression scenario
Number of employees by industry (component ratio, %)	Agriculture, forestry and fisheries	3.8	3.6	3.8	3.9	3.2	3.5	3.6
	Mining and construction	8.1	7.7	7.6	7.5	7.5	7.2	6.8
	Manufacturing	16.5	16.0	16.2	16.7	16.0	16.2	16.3
	Food, beverages and tobacco	2.3	2.1	2.2	2.2	1.8	1.9	1.9
	General and precision machinery	2.1	2.2	2.2	2.3	2.1	2.3	2.3
	Electrical machinery	2.5	2.5	2.6	2.7	2.4	2.6	2.6
	Transportation equipment	1.8	1.6	1.6	1.7	1.7	1.7	1.7
	Other manufacturing	7.7	7.7	7.6	7.9	8.0	7.7	7.8
	Electricity, gas, water and heat supply	0.5	0.5	0.5	0.5	0.4	0.4	0.4
	Information and communications	3.3	3.7	3.7	3.6	4.0	3.9	4.0
	Transport	5.1	5.1	5.1	5.0	5.1	4.9	4.9
	Wholesale and retail trade	17.4	16.5	16.3	16.6	14.8	15.1	15.4
	Finance, insurance and real estate	4.0	3.5	3.5	3.5	3.2	3.1	3.4
	Eating and drinking places, accommodations	5.2	5.1	5.1	5.0	4.6	4.7	4.9
	Medical, health care and welfare	11.3	13.5	13.7	13.5	16.7	16.5	15.8
	Education, learning support	4.7	4.4	4.3	4.2	4.0	3.8	3.7
	Living-related and personal services	2.6	2.4	2.5	2.6	2.1	2.6	2.6
	Miscellaneous business services	5.1	5.3	5.2	5.2	5.4	5.4	5.5
	Miscellaneous services	7.2	7.9	7.7	7.6	8.6	8.3	8.3
	Government, compound services, industries unable to classify	5.3	4.9	4.8	4.7	4.5	4.4	4.6
	Industry total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Difference compared to 2012	Agriculture, forestry and fisheries		-0.2	0.0	0.1	-0.6	-0.3	-0.2
	Mining and construction		-0.4	-0.5	-0.6	-0.6	-0.9	-1.3
	Manufacturing		-0.5	-0.3	0.2	-0.5	-0.3	-0.2
	Food, beverages and tobacco		-0.2	-0.1	-0.1	-0.5	-0.4	-0.4
	General and precision machinery		0.1	0.1	0.2	0.0	0.2	0.2
	Electrical machinery		0.0	0.1	0.2	-0.1	0.1	0.1
	Transportation equipment		-0.2	-0.2	-0.1	-0.1	-0.1	-0.1
	Other manufacturing		0.0	-0.1	0.2	0.3	0.0	0.1
	Electricity, gas, water and heat supply		0.0	0.0	0.0	-0.1	-0.1	-0.1
	Information and communications		0.4	0.4	0.3	0.7	0.6	0.7
	Transport		0.0	0.0	-0.1	0.0	-0.2	-0.2
	Wholesale and retail trade		-0.9	-1.1	-0.8	-2.6	-2.3	-2.0
	Finance, insurance and real estate		-0.5	-0.5	-0.5	-0.8	-0.9	-0.6
	Eating and drinking places, accommodations		-0.1	-0.1	-0.2	-0.6	-0.5	-0.3
	Medical, health care and welfare		2.2	2.4	2.2	5.4	5.2	4.5
	Education, learning support		-0.3	-0.4	-0.5	-0.7	-0.9	-1.0
	Living-related and personal services		-0.2	-0.1	0.0	-0.5	0.0	0.0
	Miscellaneous business services		0.2	0.1	0.1	0.3	0.3	0.4
	Miscellaneous services		0.7	0.5	0.4	1.4	1.1	1.1
	Government, compound services, industries unable to classify		-0.4	-0.5	-0.6	-0.8	-0.9	-0.7

Notes: 1) Actual figures for 2012 are from the Statistics Bureau, MIC "Labour Force Survey" (recombined in line with industrial category notation in the Labor Supply and Demand Estimates). Figures for 2020 and 2030 are estimates.
　　　2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress
　　　 Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree
　　　 Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels
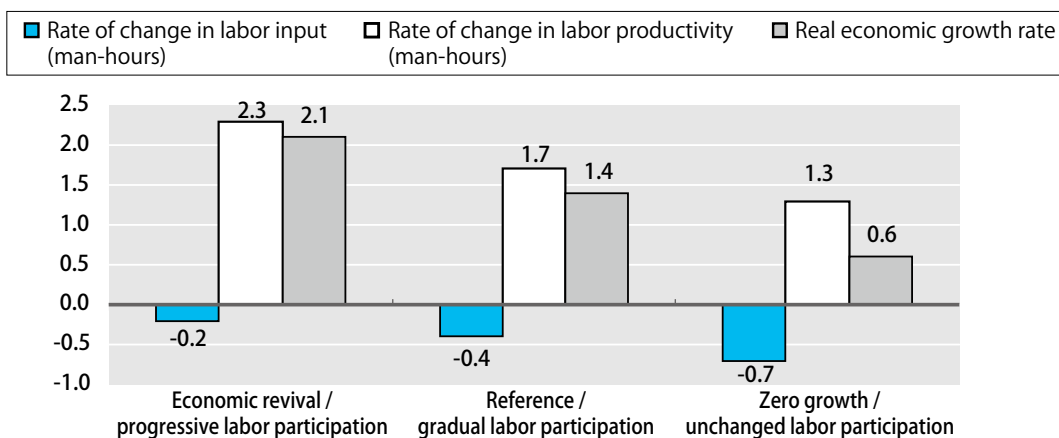　　　3) "Other manufacturing" refers to forms of manufacturing other than those mentioned here. Besides other manufacturing specified in the Japan Standard Industry Classification, these also include ceramic, stone and clay products, iron and steel, metal products and other raw material industries.
　　　4) Please note that, in the Labor Supply and Demand Estimates, dispatched workers from temporary labor agencies are classified under "Miscellaneous business services", i.e. the industry of the dispatch source, and that these dispatched workers are not included in other industries. In the "Labour Force Survey", meanwhile, dispatched workers from temporary labor agencies were classified not in the industry of the dispatch host but in that of the dispatch source until 2012. However, from 2013 they are to be classified in the industry of the dispatch host.
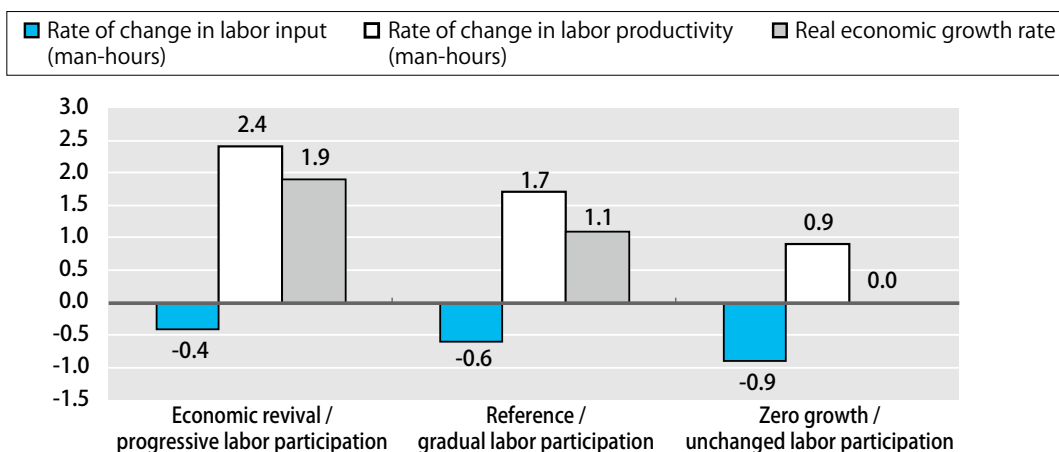　　　5) As figures in the Table have been rounded up or down to the nearest notational unit, the manufacturing and industry totals may not agree with the breakdown totals. Differences are calculated from the rounded-off figures.

Figure II-14 Trends in Labor Productivity (Man-hours, Unit: %)

2012-2020 (annual average)

- ■ Rate of change in labor input (man-hours)
- □ Rate of change in labor productivity (man-hours)
- ■ Real economic growth rate

Scenario	Rate of change in labor input (man-hours)	Rate of change in labor productivity (man-hours)	Real economic growth rate
Economic revival / progressive labor participation	-0.2	2.3	2.1
Reference / gradual labor participation	-0.4	1.7	1.4
Zero growth / unchanged labor participation	-0.7	1.3	0.6

2020-2030 (annual average)

- ■ Rate of change in labor input (man-hours)
- □ Rate of change in labor productivity (man-hours)
- ■ Real economic growth rate

Scenario	Rate of change in labor input (man-hours)	Rate of change in labor productivity (man-hours)	Real economic growth rate
Economic revival / progressive labor participation	-0.4	2.4	1.9
Reference / gradual labor participation	-0.6	1.7	1.1
Zero growth / unchanged labor participation	-0.9	0.9	0.0

(Reference) 2012-2022 (annual average)
Rate of change in labor productivity (man-hours)

"Japan Revitalization Strategy" attainment target	2 or more
Zero growth / unchanged labor participation	1.2
Reference / gradual labor participation	1.7
Economic revival / progressive labor participation	2.3

Notes: 1) The rates of change in labor input (man-hours) and labor productivity (man-hours) are estimates. For working hours, the weighted averages for full-time and part-time workers are used. The real economic growth rates in the economic revival / progressive labor participation and reference / gradual labor participation scenarios in 2012-2023 are based on the Cabinet Office "Calculations concerning Medium- to Long-term Economic and Fiscal Administration" (submitted by the Council on Economic and Fiscal Policy, January 20, 2014), while the real economic growth rate from 2024 onwards and in the zero growth / unchanged labor participation scenario are assumed in this study.
2) Economic revival / progressive labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress
   Reference / gradual labor participation: Scenario in which economic growth and labor market participation by young people, women, the elderly and others progress to a degree
   Zero growth / unchanged labor participation: Scenario assuming almost zero growth, with labor force participation rates by gender and age group trending at 2012 levels
3) The "Reference" data have been calculated by assuming the period for the rate of change in labor productivity targeted by the "Japan Revitalization Strategy" (decided by the Cabinet on June 14, 2013) as 2012-2022, since the Cabinet Office "Calculations concerning Medium- to Long-term Economic and Fiscal Administration" calculate an average real growth rate of around 2% in the economic revival case over the next 10 years (FY2013-2022).

Section 5 Conclusion

In this study, simulations have been conducted, using the Labor Supply and Demand Model, to estimate the labor force and number of employed persons by gender and age group, and employed persons by industry, by the year 2030, based on targets (KPIs) in the "Japan Revitalization Strategy".

Given the economic and employment climate in recent years, a number of issues need to be considered in addition to the estimates handled in this study. That is, how to estimate by employment format and by region, how to ascertain the structural unemployment rate by estimating a mismatch index, how to ascertain the relationship between human resource development and improving productivity, and how to incorporate these in the Labor Supply and Demand Model.

In future, as well as attempting to refine the Labor Supply and Demand Model and improve the data used in it, I would like to consider how these issues should be addressed.

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