

Japan 2.0: Toward an Optimized Society

Yoshimitsu Kobayashi

Chairman, Doyukai (Japan Association of Corporate Executives)



Japan 2.0: Toward an Optimized Society

Ceremony to Commemorate the 70th Anniversary of Doyukai's Founding

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November 21, 2016

CONTENTS

1

➔ Marking Our 70th Anniversary

➔ Why Japan 2.0?

- What is growth?
 - Integration and decentralization
 - Japan 2.0: Toward an optimized society
-

➔ Analyzing the Value of Our Nation

- Achieving economic prosperity
 - Using innovation to forge our future
 - Ensuring the sustainability of society
-

➔ Toward Optimization in 2045

➔ A New Challenge for Doyukai

Marking Our 70th Anniversary

2

1946



2016

83 far-sighted business leaders joined forces on April 30.

"The Japanese people must discard their old robes, and they must weather the current storm of economic, moral and ideological ruin and confusion to erect a completely new order ... Now is the time for all of our members to join forces, for each to encourage and prod the other, to share the best fruits of our minds, and to concentrate all our forces on the reconstruction of the Japanese economy."

(Excerpt from the Mission Statement at Founding of Doyukai)

Doyukai has played a major role in developing Japan's economy and reforming business management.

However, we once again face an era of change every bit as dramatic as the immediate postwar period.

Responsibilities of Doyukai's corporate executives as it marks its 70th anniversary

- Face head-on the reality of Japan's position in relation to the rest of the world
- Envisage our ideal society and start a dialogue with the young people who will take responsibility for Japan's future
- Based on the results of the dialogue, cooperate with them to build an ideal society

Why Japan 2.0?

3

Three Tides of Major Transformation

Globalization
Digitization
Socialization
(Diversity)

Three Changes in Relationship

Individual & group
Added value & utility
Real & virtual

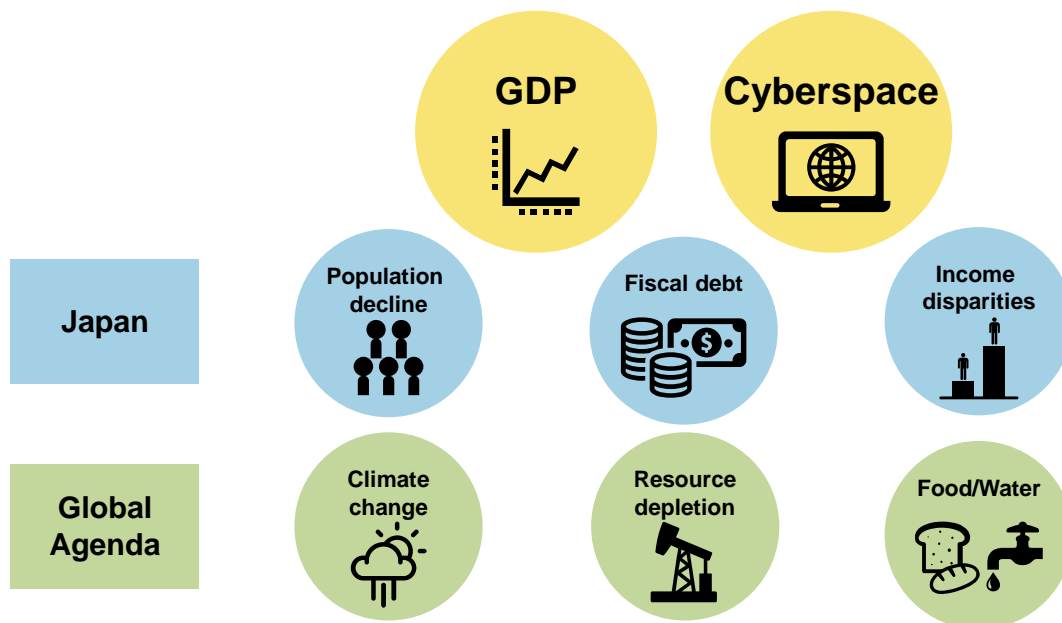
Strong sense of urgency as executives: **No future unless we break with convention**
Question from foreign intellectual: **When will Japan free itself of its postwar systems?**

Move from **playing catchup** to **being a front-runner that sets and resolves its own challenges**
Requires building new economic & social systems for Japan

Japan 2.0

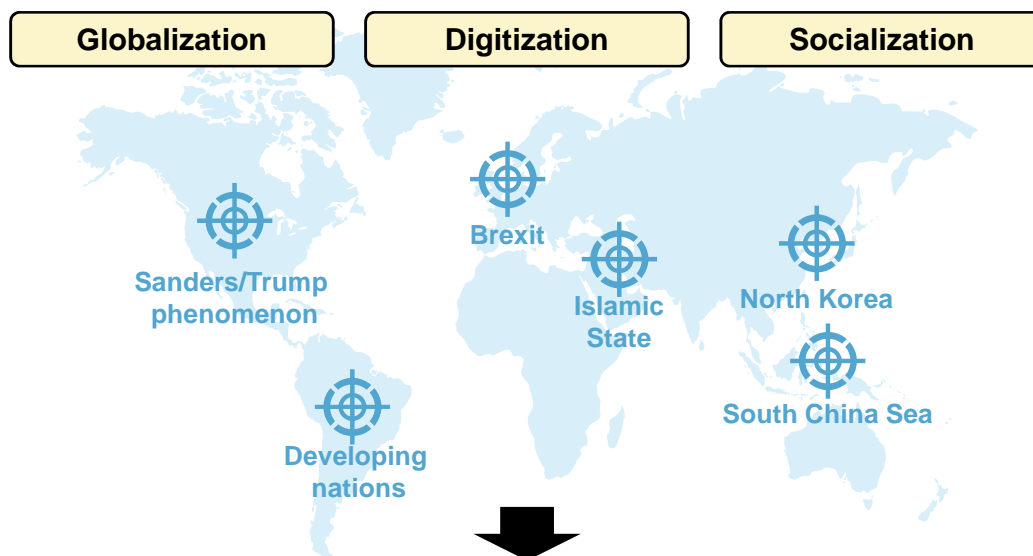
What Is Growth?

4



Integration and Decentralization — Three Tides of Integration and Accompanying Counter-Reactions

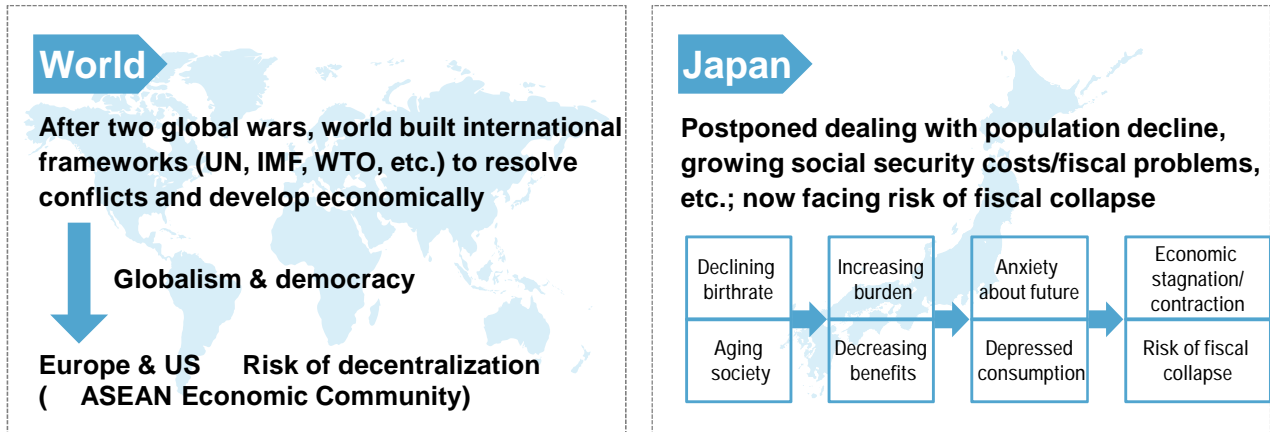
5



Moves to decentralize — Reactions against integration

Integration and Decentralization — World at Risk of Decentralization; What about Japan?

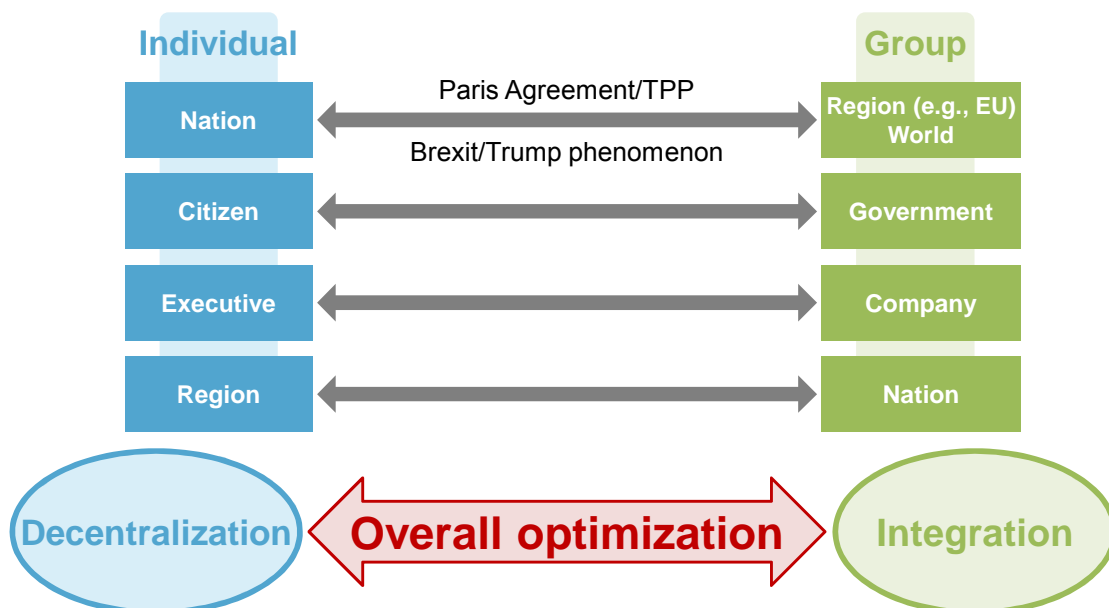
6



Shift from ideology-based conflict to process of optimization

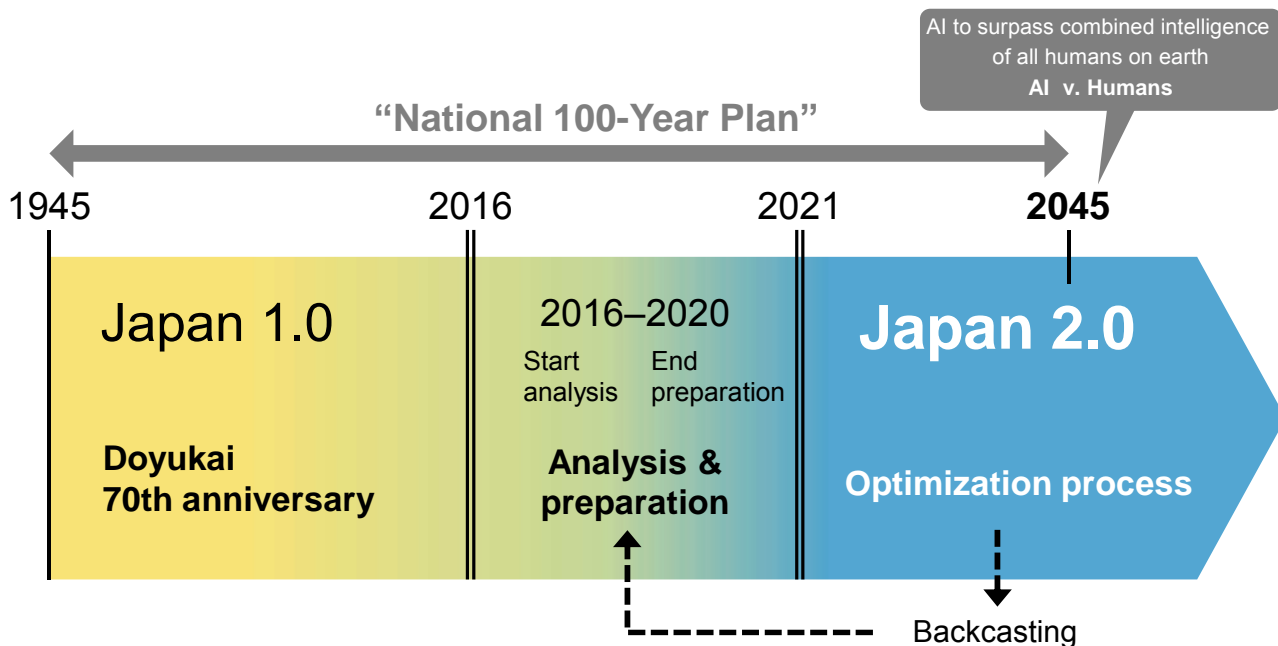
Integration and Decentralization — Optimization of Individuals & Groups

7



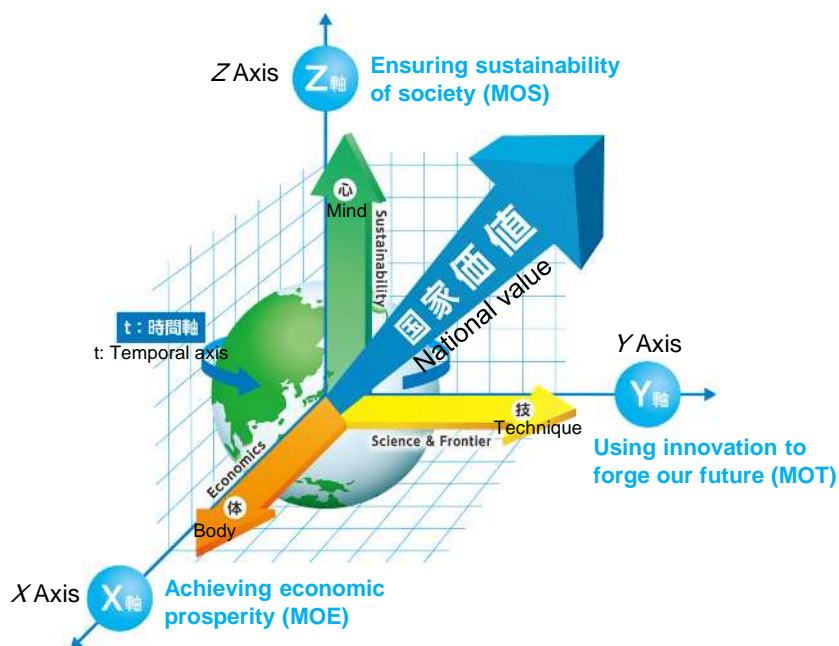
Japan 2.0: Toward an Optimized Society

8



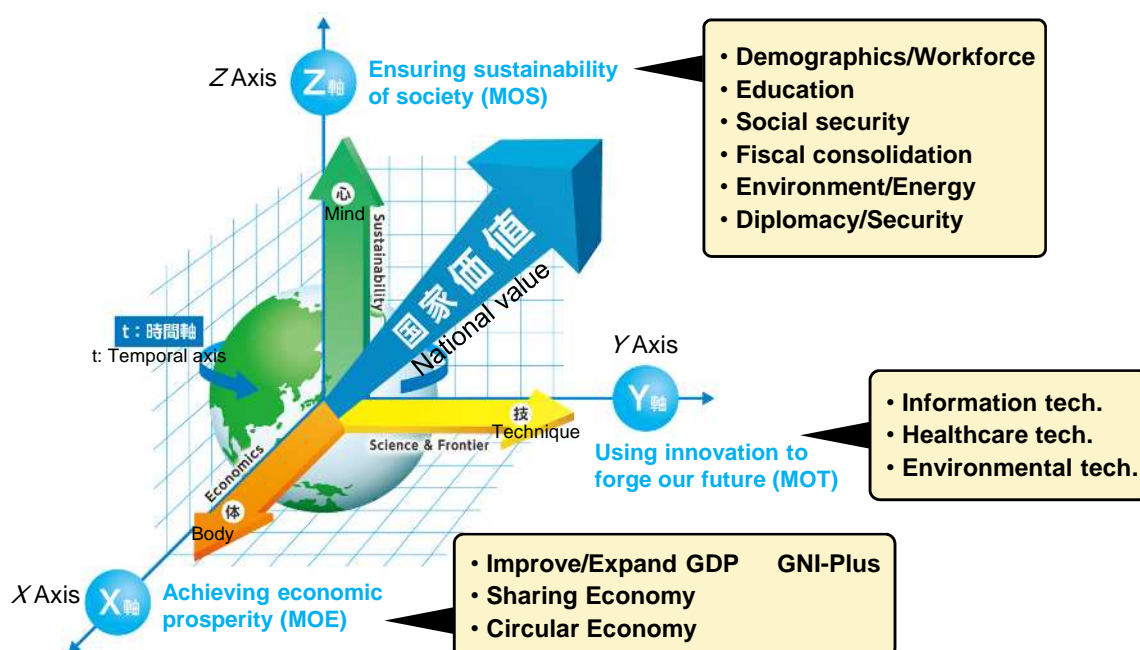
Analyzing the Value of Our Nation

9



Analyzing the Value of Our Nation

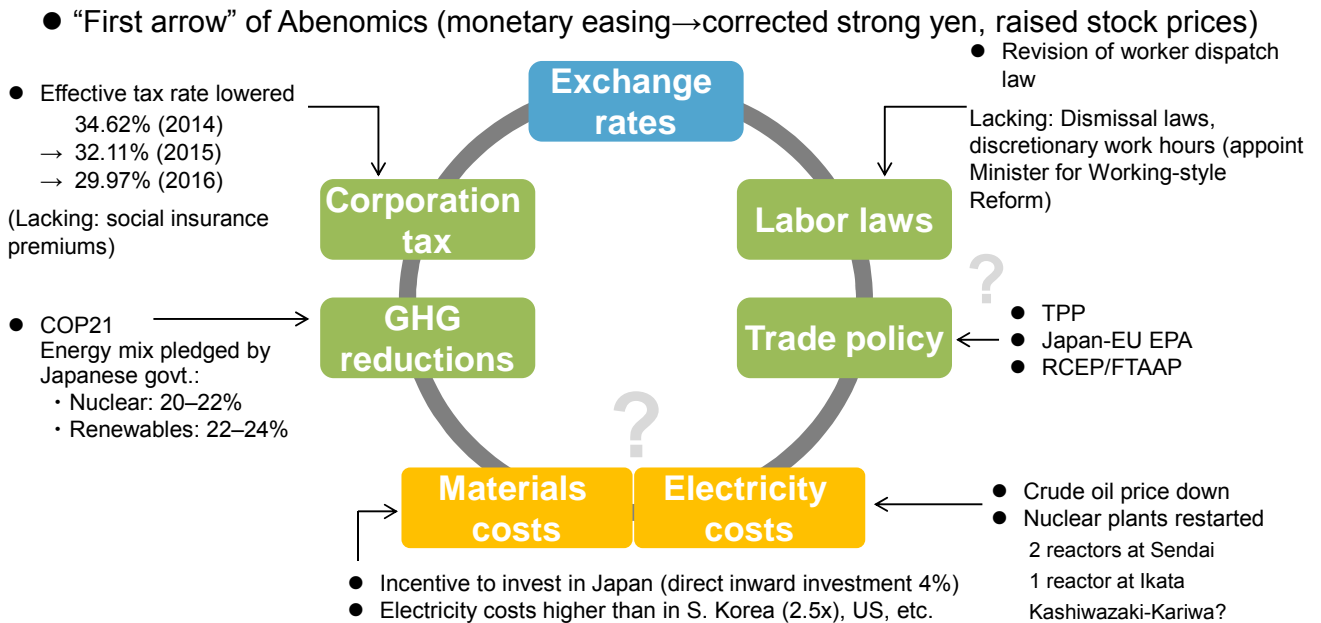
10



X Axis Achieving Economic Prosperity

Japan's Locational Competitiveness — Current Status regarding Six Major Challenges

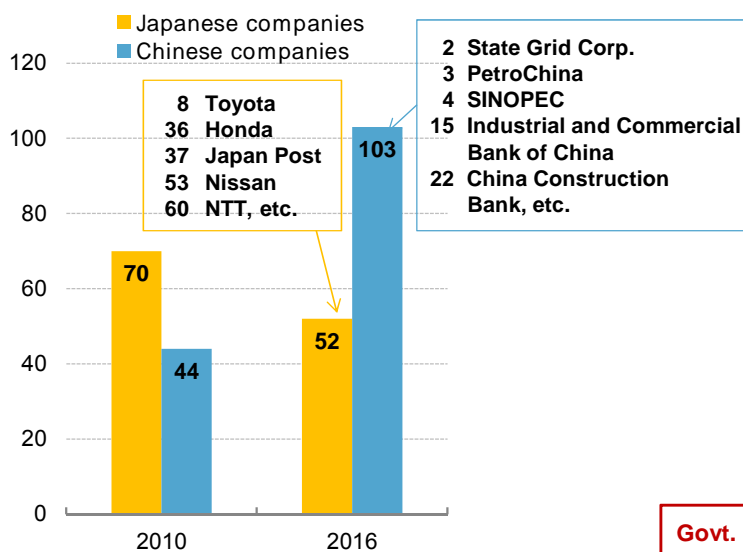
12



Japanese Corporations' International Competitiveness — Japan Declining in Relative Terms

13

No. of Fortune Global 500 Companies —
Comparison between Japan & China



Source: Fortune Global 500, 2016

World Bank Ease of Doing Business Ranking

Rank	Country/Region	Previous Year's Rank
1	New Zealand	1
2	Singapore	3
3	Denmark	2
4	Hong Kong	5
5	South Korea	4
6	Norway	8
7	UK	6
8	US	7
9	Sweden	9
10	Macedonia	16

34	Japan	32
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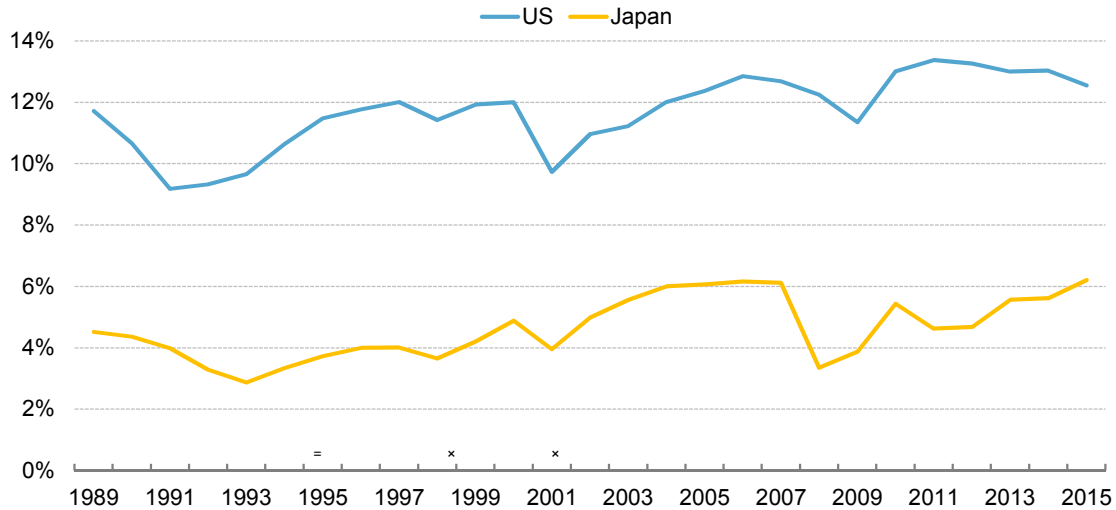
Govt. target: Among top 3 developed nations by 2020

Source: Doing Business 2017 (October 25, 2016), World Bank

Japanese Corporations' International Competitiveness — Earning Power Remains Weak

14

ROS (Return on Sales) — Comparison between Japan & US

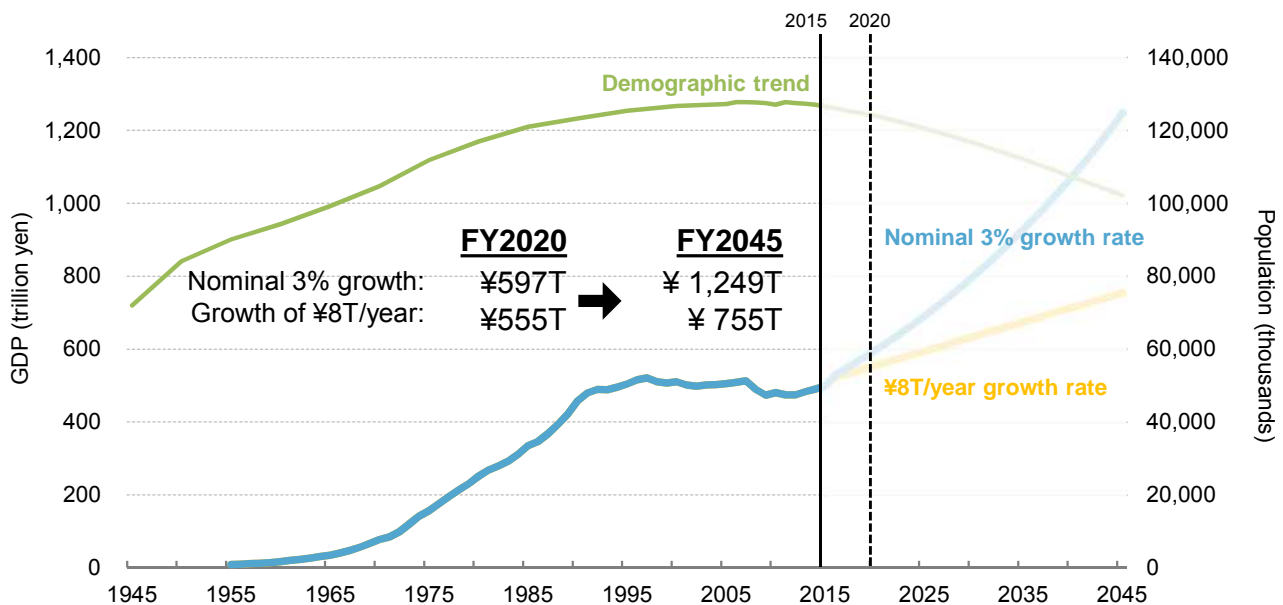


Reference:	ROE	Net income to sales	Total asset turnover	Financial Leverage
	$\frac{\text{Net income}}{\text{Equity}}$	$= \frac{\text{Net income}}{\text{Net sales}}$	$\times \frac{\text{Net sales}}{\text{Total assets}}$	$\times \frac{\text{Total assets}}{\text{Equity}}$

Source: Nomura Securities Financial Engineering & Technology Research Center
Japan: TOPIX; US: S&P500 (both excluding financial companies)

Demographic Trend and GDP

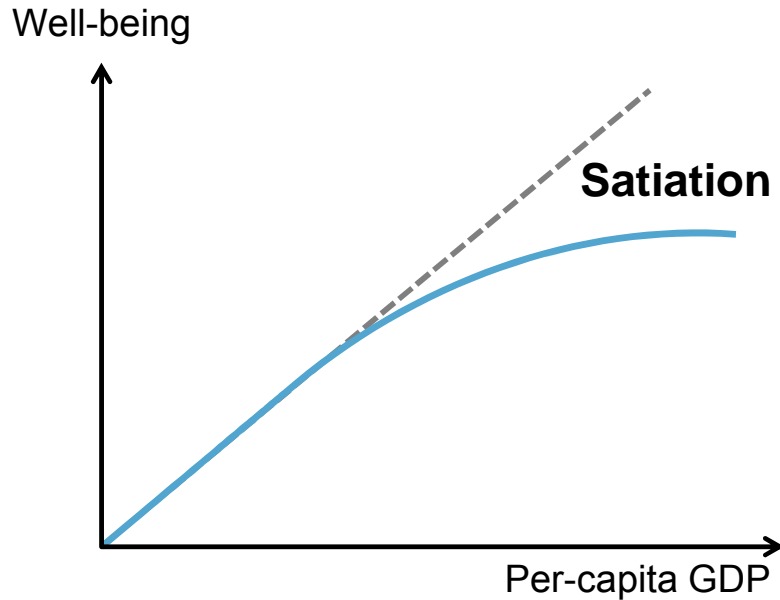
15



Note: Sources for future projections are as follows: (i) Population: median fertility and mortality estimates of the National Institute of Population and Social Security Research; (ii) GDP: estimates by Doyukai Secretariat.

GDP Growth and Satiation

16

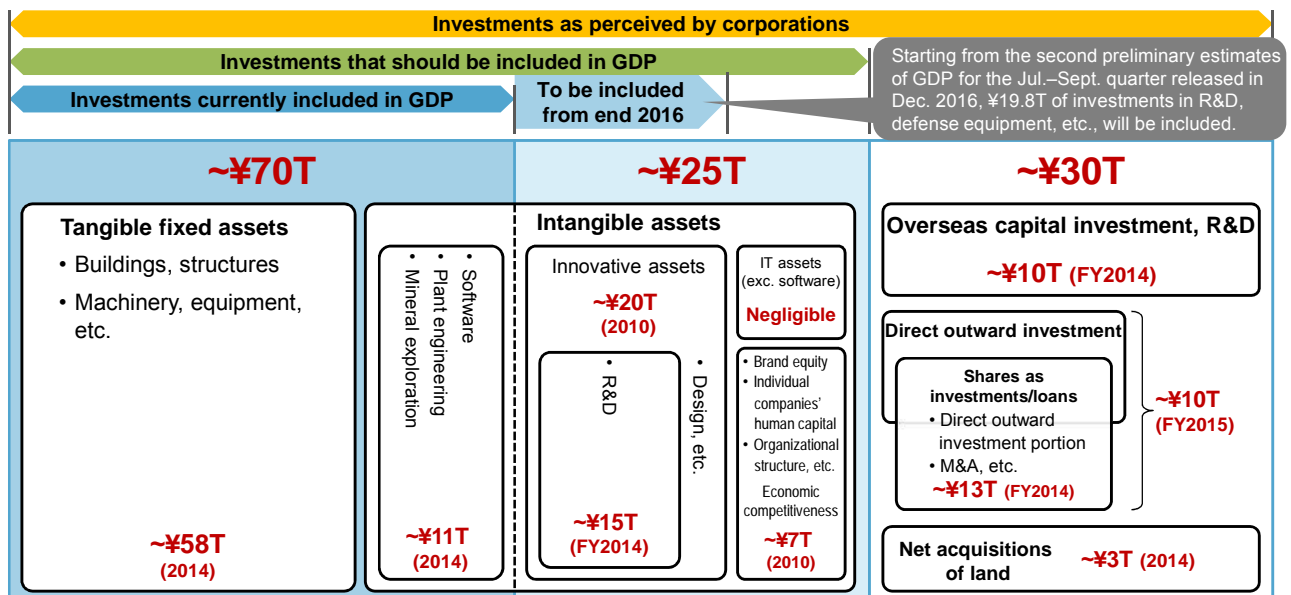


Gross Domestic Product?

Gross Debt Product?

Discrepancy between GDP Statistics and Perception

17



Notes: The most recent data available were used for each item. Figures are rounded to the nearest unit, so they may not add up to the totals.
Source: Compiled by Mizuho Research Institute (MRI) using the Research Institute of Economy, Trade and Industry's JIP (Japan Industrial Productivity) Database and other sources (permission for use obtained from MRI)

Added Value and Utility — A Multifaceted Approach to Capturing the Economic Reality

18

Doyukai's Beyond GDP Study Group: Released September 28, 2016

GNI-Plus

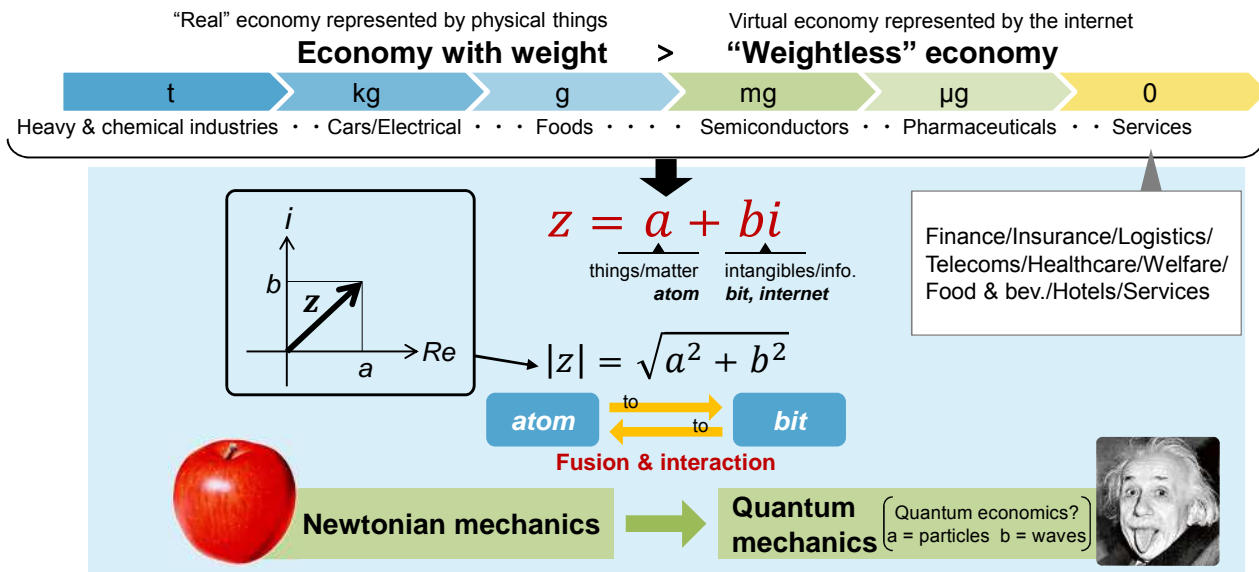
	Categories (e.g.)	Metrics (e.g.)
Economic sector		<ul style="list-style-type: none"> ● GNI & per-capita GNI ● GDP & per-capita GDP
Non-economic sector	Social sustainability	<ul style="list-style-type: none"> ● Volume of GHG emissions ● Volume of air pollutant emissions ● Volume of water pollutant emissions
	Social stability	<ul style="list-style-type: none"> ● No. of individuals/households suffering injury/damage due to natural disasters ● Crime rate (incl. terrorism) ● No. of traffic accidents/no. of casualties
	Health, hygiene & life planning	<ul style="list-style-type: none"> ● Average life span, healthy life span ● No. of doctors/nurses per 1,000 people ● Nursing home capacity filled (or ratio of people waiting) ● Total annual working hours & leisure time ● Residential living space per person
	Childcare & education	<ul style="list-style-type: none"> ● Daycare capacity filled (or ratio of children waiting) ● Ratio of workers taking childcare leave ● Hours of education (elementary, secondary, tertiary, lifelong) ● Hours of education & training per worker (within companies)

➡ ***Optimize Economic Statistics***

Y Axis Using Innovation to Forge Our Future

From Tangibles to Intangibles — The Real and the Virtual

20

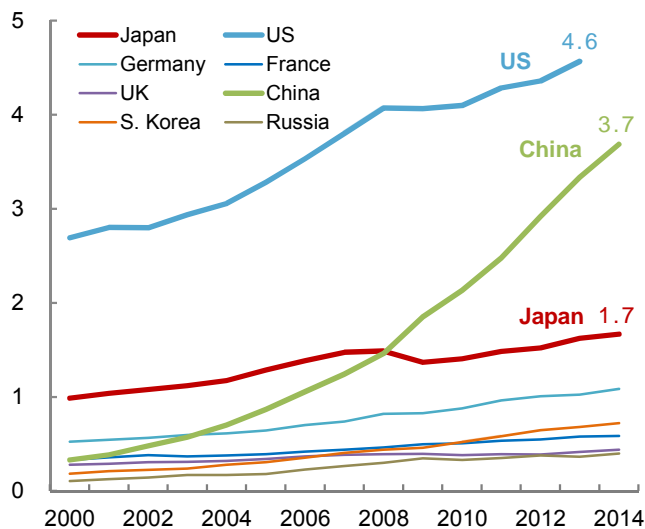


➡ **Optimize Economic Activity**

Productivity of Japan's R&D

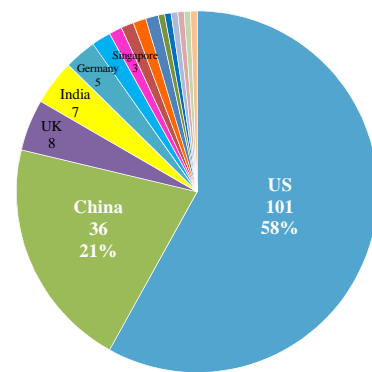
21

R&D Spending (OECD PPP/US\$100B)



Source: Main Science and Technology Indicators, OECD

No. of Unicorns by Country (World total: 174)



Japan: 0

Recently 1 or 2 Japanese companies have grown to meet unicorn criteria (unlisted, valued at US\$1B or more)

Source: Fortune magazine (as of January 19, 2016)

An Innovation Powerhouse — Japan's Path to Survival

22

**Bolster industrial competitiveness, contribute to world,
support prosperous life for citizens**

Innovation Powerhouse

Sciences

Technology

Culture

Amass world's best human resources & innovation hubs

Mother lab

World's most advanced research environment

Mother factory

Production base for world-beating products & services

Mother market

Market shaped by world's most demanding consumers

Three Advanced Technologies That Will Forge Japan's Future

23

Information technology

Targeting day-to-day well-being

Externalizing the brain

- AI/Robotics
- VR (virtual reality)
- AR (augmented reality)

Healthcare technology

Targeting health & longevity

Extending health & life span

- Molecular biology
- Regenerative medicine

Environmental technology

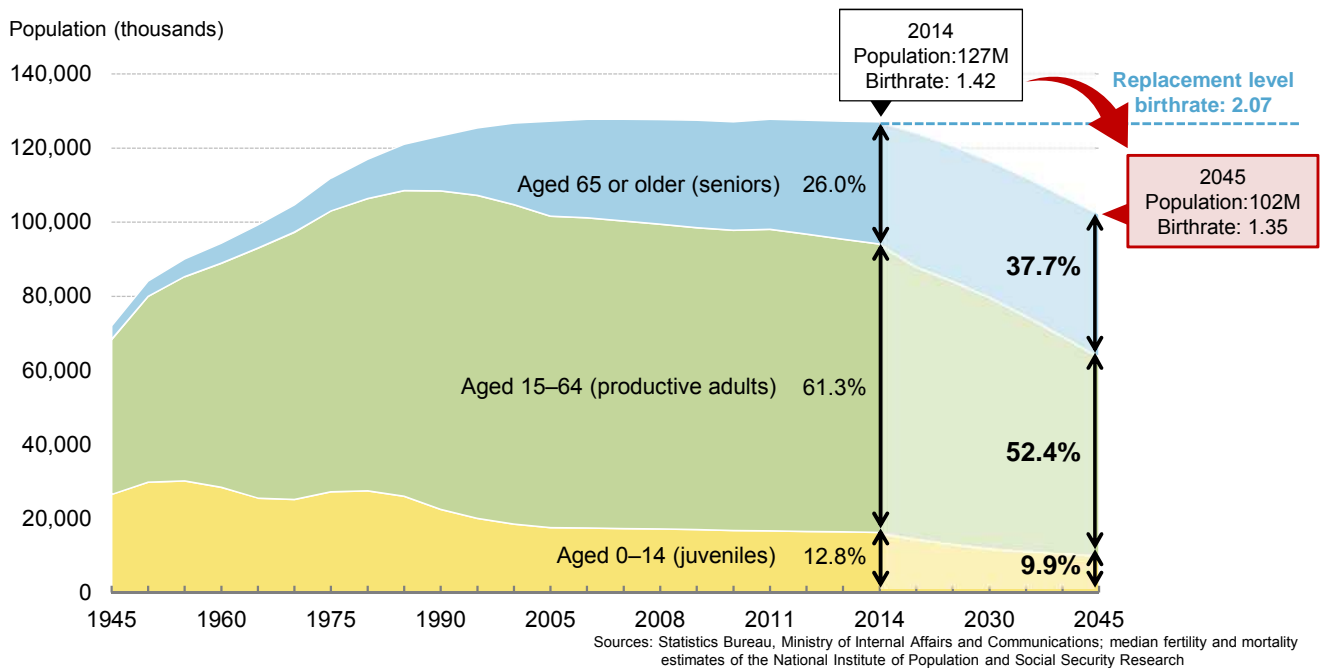
Targeting a sustainable planet

Breakthroughs in environment & resource conservation

- Artificial photosynthesis
- Renewable energy
(wind, solar, biomass)

Z Axis Ensuring the Sustainability of Society

(1) Demographics/Workforce — Productive Adults to Decrease Monotonically; Seniors to Increase Monotonically 25

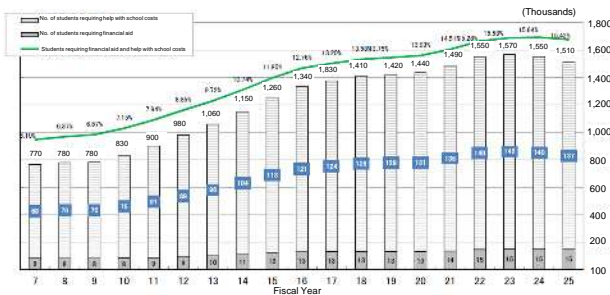


(2) Education — Response to Poverty & Income Disparities, and Globalization

26

Poverty & income disparities

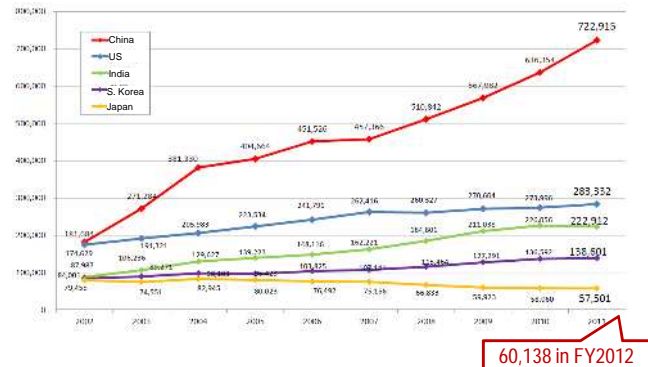
- Over 15% of elementary/junior high students require financial aid & help with school costs
 - Financial aid regulated by Public Assistance Act
 - Help with school costs associated with financial aid certified by municipal board of education under School Education Act



Sources: Heisei 25-nendo shugaku enryo jissai jokyo to chosa (FY2013 Survey on Provision of Financial Aid for School Costs, etc.), Ministry of Education, Culture, Sports, Science and Technology, and other data

Globalization

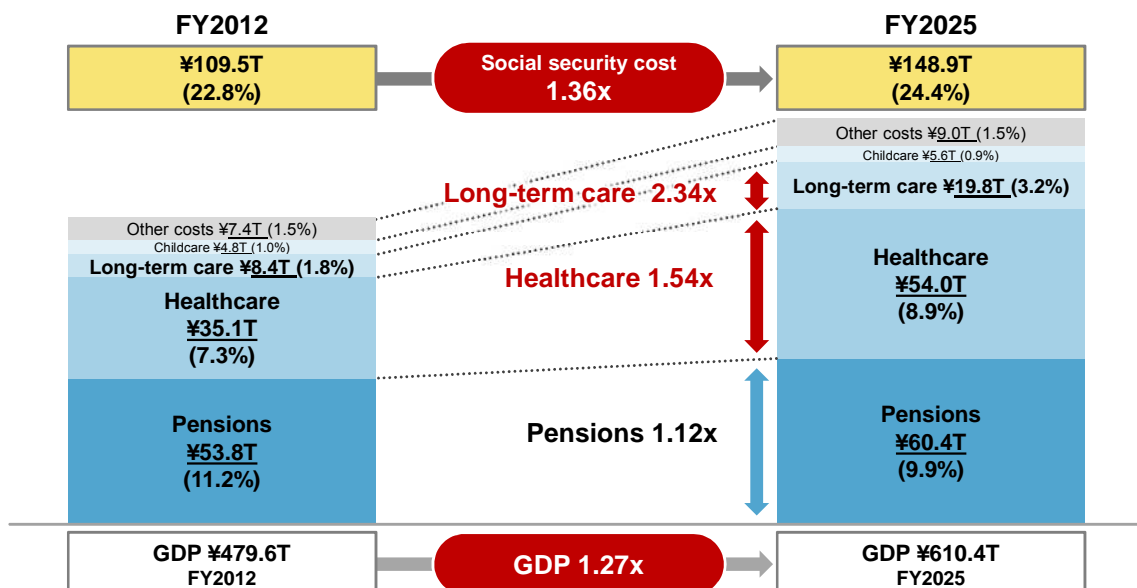
- Fewer Japanese students studying overseas
- More students from China, S. Korea, India & US studying overseas



Source: Wakamono no kaigai ryugaku wo torimaku genryo ni suite (Present Situation regarding Overseas Study by Young People), Ministry of Education, Culture, Sports, Science and Technology, April 2016

(3) Social Security — Benefits Increasing Faster than GDP Growth

27



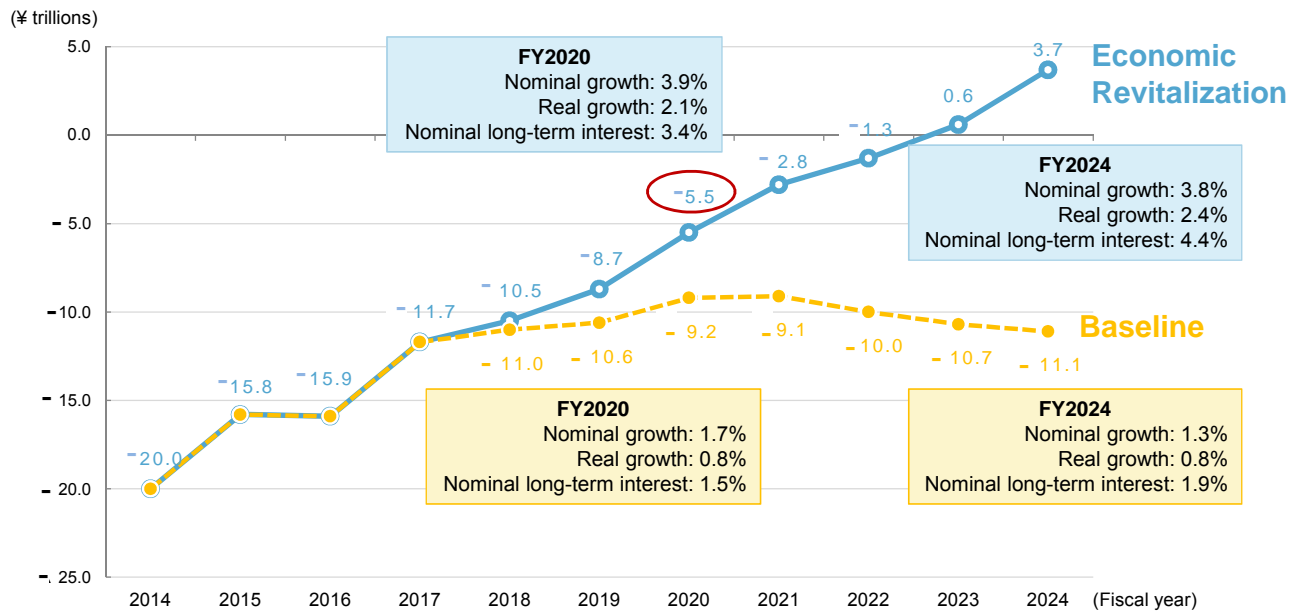
Source: Shakai hoshou ni kakawaru hiyo no shorai suikei no kaitei ni suite (Revision of Social Security Cost Projections), March 2012, Ministry of Health, Labour and Welfare
Note: Percentage figures inside parentheses indicate proportion of GDP.

Source: Nihon no zaisei kankei shiryô (Data relating to Japan's Public Finances), Ministry of Finance Japan, April 2016

(4) Fiscal Consolidation —

Primary Deficit in FY2020, Even Under Economic Revitalization Scenario

28

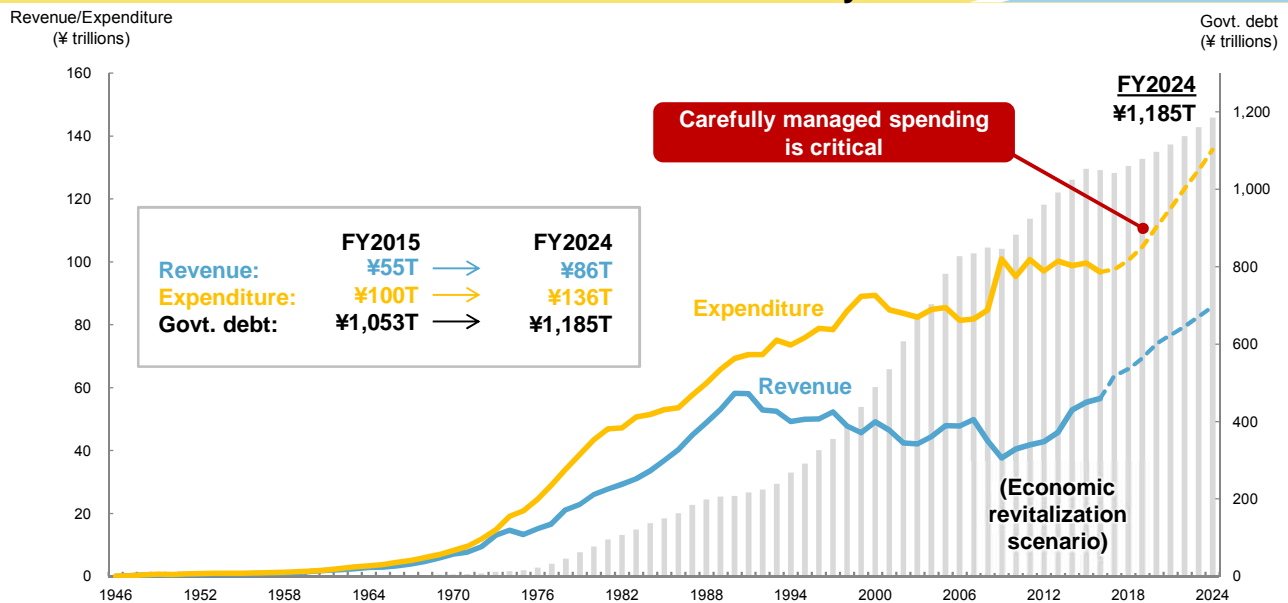


Source: *Economic and Fiscal Projections for Medium to Long Term Analysis* (submitted by the Council on Economic and Fiscal Policy on July 26, 2016), Cabinet Office, Government of Japan

(4) Fiscal Consolidation —

Government Debt Set to Increase Monotonically

29



Source: Data compiled by Doyukai based on past data of the Ministry of Finance Japan and the economic revitalization scenario in *Economic and Fiscal Projections for Medium to Long Term Analysis*

(5) The Environment & Energy — Reduce GHG Emissions to Virtually Zero

30

COP21 Paris Agreement (December 2015)

New post-2020 worldwide framework on climate change (196 countries & regions)

Japan's Response

Plan for Global Warming Countermeasures (approved by Cabinet in May 2016)

- **Medium-term target: 26% cut in emissions between 2013 and 2030**

Zero-emission power sources as % of electric power mix:

- Nuclear: 20–22%
- Renewables: 22–24%

Achieving 20–22% ratio of nuclear power generation by 2030 requires approx. 30 reactors in operation
(Assumes extended operating periods for several reactors and 80% operation rate)

- **Long-term target: 80% cut in emissions between 2016 and 2050**

(6) Diplomacy and Security — Shift in Power Balance & Increasing Uncertainty

31

Shift in Global Power Balance

- Changes in power of major industrial nations and in US foreign policy have caused power balance to shift
- Increase in threats transcending national borders and nation state boundaries (international terrorism, proliferation of WMD, risks relating to development and sustainability)

Increasing Uncertainty in Asia-Pacific Region

- China and Russia seeking to expand military influence; North Korea repeatedly provocative
- Potential for underlying conflicts/antagonisms to erupt (China-Taiwan, China-ASEAN, Korean peninsula)
- Shifts in power balance/relationships among China, US, and Japan, and effects on region

New Security Threats such as Cyber Attacks

- Threat of attacks that are cheap, spread easily, and are difficult to predict, contain, or trace
Threats that cannot be completely prevented: create systems presaged on worst-case scenarios
- Possibility of direct threat to critical infrastructure/Japan's way of life
Threat of harm to anybody, anywhere, at any time

Toward Optimization in 2045

Toward Optimization in 2045

33

(1) Demographics and the workforce

- Create an optimal environment in which people can have and raise as many children as they want to
- Clarify the prospects for stabilizing Japan's declining population
- Encourage workforce participation by women and senior citizens, as well as long-term and permanent residence among highly skilled foreign professionals

(2) Education

- Provide optimal education in cultural awareness, languages, and innovation
- Create a society in which educational opportunity is not impeded by poverty and income disparities
- Enhance grant-type scholarships and other financial aid operated by both public and private entities

(3) Social security

- Establish an optimal safety net that operates in a variety of life situations
- Make use of advanced technologies to extend the average life span and the healthy life span
- Construct a new social security system commensurate with the size of the economy
- Maintain a fair distribution of burdens and benefits between the generations, and avoid leaving financial obligations for the future

**Political, administrative, and judicial reforms, incl. reform of electoral system:
Restructure how nation is run**

Toward Optimization in 2045

34

(4) Fiscal consolidation

- Achieve an optimally balanced combination of economic growth and fiscal consolidation
- Adhere to a permanent surplus in the primary balance
- Continue reducing the balance of government debt to earn the international community's trust
- Maintain the tax and social security burdens (the rates of contribution by citizens) at levels equivalent to those of other developed nations

(5) The environment and energy

- Maintain an optimal balance between reduction of the environmental load and economic growth
- Japan to use advanced technologies to play a key role in dealing with global warming
- Make cost-competitive renewable energy a reality
- Remain among the world's most advanced nations in terms of nuclear power-related technology and human resources

(6) Diplomacy and security

- Establish a security framework founded on self-help to preserve the infrastructure supporting Japan's way of life
- Strengthen and broaden Japan's alliance with the United States as well as associated partnerships at many different levels
- Maintain the stability of Japan's economic infrastructure in terms of natural resources, energy, and food

**Political, administrative, and judicial reforms, incl. reform of electoral system:
Restructure how nation is run**

A New Challenge for Doyukai

Japan 2.0: Toward an Optimized Society — New Initiative Launched

36

Japan 2.0: Toward an Optimized Society

Doyukai 2.0 (a new founding)

Concrete Action

An action-oriented policy group spearheading reform

Doyukai is a gathering of corporate executives who are aware of their role and responsibilities and put them into practice. As executives with high aspirations, we are committed to free thinking and action unconstrained by established paradigms or points of view.

The *Forging Our Future Together* Project

Doyukai is challenging itself to go beyond the confines of its own membership and discuss, plan, and implement policy with a wide variety of stakeholders in society at large.

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— Contents —

1. Marking Our 70th Anniversary.....	1
2. Why Japan 2.0?	1
(1) What is growth?	
(2) Integration and decentralization	
(3) Japan 2.0: Toward an optimized society	
3. Analyzing the Value of Our Nation.....	4
(1) Achieving economic prosperity	
(a) Japan's locational competitiveness	
(b) Japanese corporations' international competitiveness	
(c) Demographic trend and GDP	
(d) GDP growth and satiation	
(e) Discrepancy between GDP statistics and perception	
(f) Added value and utility—A multifaceted approach to capturing the economic reality	
(2) Using innovation to forge our future	
(a) From tangibles to intangibles—the real and the virtual	
(b) Productivity of Japan's R&D	
(c) An innovation powerhouse—Japan's path to survival	
(d) Three advanced technologies that will forge Japan's future	
(3) Ensuring the sustainability of society	
(a) Demographics and the workforce	(b) Education
(c) Social security	(d) Fiscal consolidation
(e) The environment and energy	(f) Diplomacy and security
4. Toward Optimization in 2045.....	11
(a) Demographics and the workforce	(b) Education
(c) Social security	(d) Fiscal consolidation
(e) The environment and energy	(f) Diplomacy and security
5. A New Challenge for Doyukai.....	12
(1) An action-oriented policy group spearheading reform	
(2) The <i>Forging Our Future Together</i> project	

1. Marking Our 70th Anniversary

This year Keizai Doyukai (Japan Association of Corporate Executives; hereafter, Doyukai) celebrated the 70th year of its founding. It was established by 83 far-sighted business leaders on April 30, 1946, the year after World War II ended.

The association's mission statement at its founding stated that "The Japanese people must discard their old robes, and they must weather the current storm of economic, moral and ideological ruin and confusion to erect a completely new order...Now is the time for all of our members to join forces, for each to encourage and prod the other, to share the best fruits of our minds, and to concentrate all our forces on the reconstruction of the Japanese economy." The mission statement therefore clearly expressed the sense of urgency and determination the founders felt as corporate executives. These high aspirations have continued to guide Doyukai over the years as it has played a major role in developing Japan's economy and reforming business management since the end of World War II.

Now, however, given the dramatic changes in both the domestic and international environments we recognize that Japan once again faces an era of change every bit as dramatic as the immediate postwar period. As the corporate executives who comprise Doyukai, we therefore intend to use this 70th anniversary as an opportunity to reaffirm our role and responsibilities, and to put the following three goals into practice:

1. Face head-on the reality of Japan's position in relation to the rest of the world
2. Envisage our ideal society and start a dialogue with the young people who will take responsibility for Japan's future
3. Based on the results of the dialogue, cooperate with them to build an ideal society

2. Why Japan 2.0?

I believe that Japan is currently facing a period of major transformation.

In my inaugural speech of April 2015, entitled "Toward a Sustainable Society—Japan Version 2.0," I described how the world is caught in the rising tides of three major transformations: globalization, digitization, and socialization*. Since then, these tides of change have combined with increasing social diversity to further engulf us.

Moreover, in my remarks as chairman at Doyukai's annual meeting in April this year, I pointed out the changes in three relationships. These relationships are between the individual and the group, between added value and utility, and between the real and the virtual.

* In this context, the word "socialization" is used to describe a contemporary society where a broad spectrum of entities are in constant contact with each other. Today, it is easier to bypass boundaries that separate businesses from individuals and cities from outlying areas to create new communities and societies. This environment allows social entrepreneurs, nonprofit organizations, and others to contribute more effective solutions to our global problems.

My honest assessment of the current situation is that Japan has no future unless we break with convention. In fact, a foreign intellectual who works globally recently asked me, “When is Japan ever going to free itself of the economic and social systems it built after the war when it was successful?” No doubt this cold-eyed observation is representative of how the rest of the world now views Japan.

The three tides of major transformation and the three changes in relationship are progressing in parallel. They represent the inflection point of the “Japan 1.0” era that lasted for 70 years after World War II; we should take this inflection point as an opportunity to build the new “Japan 2.0” era.

As corporate executives we must maintain a strong sense of urgency and challenge ourselves to build a sustainable society. Postwar Japan’s development was focused on “catching up” and was clearly aimed at closing in on, then overtaking, Europe and the United States. But Japan is now a mature state both economically and socially, and even if we were to look to the countries of Europe and the United States for precedents to follow, they would no longer be easy to find.

That is why I want us to propel this country forward into Japan 2.0. Now more than ever Japan must itself become a front-runner that sets and resolves its own challenges to address the problems faced at home and abroad, forging a new way forward that involves contributing to the world. It is a huge task that will quite literally require rebuilding Japan’s economic and social systems.

(1) What is growth?

In order to build the new economic and social systems of Japan we need to ask ourselves the basic question of what growth actually is.

The first issue in this regard relates to the essence of economic activities predominant in mature societies. A country’s economy can be understood in terms of GDP, the sum of all added value generated by economic activity. But with the advance of digitization, economic activity has proliferated into cyberspace, and growth in zero marginal cost and free services means that economic activity is increasingly generating utility that cannot be fully grasped using GDP. Accordingly, it has become necessary to gain a multifaceted understanding of both the quantitative and qualitative aspects of the economy in order to offer people greater prosperity.

We must also take into account issues such as demographic problems, public finances, and income disparities. Populations are declining in developed nations, while in developing nations they are increasing, either steadily or explosively, so developed nations and developing nations are moving in opposite directions demographically. Depending on the circumstances in

individual countries, the severity of issues relating to public finances and income disparities varies, but these issues are inseparably linked to economic growth.

There are, moreover, problems faced by the world as a whole, such as climate change, resource depletion, and shortages of food and water. It is imperative to deal with these problems, which are directly linked to the earth's sustainability; if we cannot overcome them through innovation, major constraints will be placed on economic activity.

(2) Integration and decentralization

As I mentioned previously, the world is caught in the rising tides of three major transformations—globalization, digitization, and socialization—and these currents are oriented toward integration. At the same time, there are other currents in the world that can best be described as reactions against integration, such as Brexit (the UK's departure from the EU), the “Trump phenomenon” that arose out of the presidential election in the United States, the emergence of Islamic State, and the territorial disputes in the South China Sea.

After experiencing two global wars, the world constructed international frameworks such as the United Nations, the International Monetary Fund, and the World Trade Organization as a means of resolving conflicts and achieving economic development. However, we are now forced to acknowledge that, along with advancing globalism and democracy, has come the risk of Europe and the United States leading the world toward decentralization.

Japan, meanwhile, has postponed dealing with issues highlighted long ago, such as population decline, growing social security costs, and fiscal problems. As a result its economy has stagnated and contracted, and it now faces the risk of fiscal collapse.

In the past, ideology was the chief focus of conflict in the world, but from now on we are likely to enter an era in which each nation and the planet as a whole pursues a process of optimization in the context of a variety of constraints.

The opposing currents of integration and decentralization are also apparent within the relationships between individuals and groups at various levels. Examples of such relationships include nations and the world, citizens and government, executives and the company, and regions and the nation. Achieving overall optimization among these individuals and groups is the most important consideration when deliberating the form our ideal society should take in the face of various constraints.

(3) Japan 2.0: Toward an optimized society

Envisaging our ideal society—the Japan of the future—is something that must be approached as a national 100-year plan. Having defined the era from the end of the war in 1945 until the

present as Japan 1.0, I want us to keep in mind the year 2045, one hundred years from 1945, as we envisage our ideal.

Some say that around the year 2045 artificially created intelligence will surpass the combined intelligence of all the humans in the world. It is admittedly possible that artificial intelligence and humans could be in conflict by this time, but preventing that potential outcome is one reason why we should tackle the future with determination. Accordingly, we need to set 2045 as our target and use a backcasting approach to consider what we should do and implement the necessary action.

In specific terms, I would like us to thoroughly analyze and prepare during the four years from 2016 until 2020, when the Tokyo Olympic and Paralympic Games will be held. This will enable us to successfully launch the new Japan 2.0 era starting from 2021 and to follow the process toward an optimized society steadily thereafter.

3. Analyzing the Value of Our Nation

In order to bring about Japan 2.0 as envisaged under our national 100-year plan, we must set three clear dimensions in which to analyze and assess Japan's value and constantly strive to maximize value in these three dimensions by implementing a plan-do-check-act (PDCA) cycle.

The first dimension (the "X axis") is economics—achieving economic prosperity. The challenge is to achieve greater prosperity that includes growth in both GDP and GNI (Gross National Income). Here our MOE (Management of Economics) will be put to the test.

The next dimension (the "Y axis"), I call "science & frontier"—this means using innovation to forge our future. The challenge here is to achieve technological innovation relating to such fields as information, healthcare, and the environment. This will require MOT (Management of Technology).

The third dimension (the "Z axis") is sustainability—ensuring the sustainability of society. Challenges in this case include demographics and the workforce, education, social security, fiscal consolidation, the environment and energy, and diplomacy and security. MOS (Management of Sustainability) will be essential in this regard.

(1) X Axis: Achieving economic prosperity

(a) Japan's locational competitiveness

About four years ago, the business environment in Japan was harsh, characterized by such challenges as a strong yen, high corporation tax, stringent labor regulations, the need for significant cuts in greenhouse gas emissions, delays in economic partnership agreements, and high resource and energy costs. In November 2012, however, the House of Representatives

was dissolved and the second Abe Cabinet instated at the end of December threw itself into implementing Abenomics, resulting in considerable improvements on all these fronts.

The “first arrow” of Abenomics, monetary easing, was particularly effective, correcting the strong yen and spurring significant increases in stock prices, among other benefits. However, uncertainty arose over whether the Trans-Pacific Partnership (TPP) Agreement could be concluded quickly, while the costs of raw materials and electricity still remain relatively high compared to other developed nations. By the year 2020 the Japanese government aims to almost double foreign corporations’ direct investment in Japan to 35 trillion yen (compared to 19.2 trillion yen at the end of 2012). As of the end of 2015, inward investment by foreign corporations amounted to 24.4 trillion yen. If Japan is to make itself the easiest country in the world to do business, therefore, much remains to be done in terms of improving its locational competitiveness.

(b) Japanese corporations’ international competitiveness

The key requirement for achieving economic prosperity is to bolster the international competitiveness of Japanese corporations.

The first issue is that Japan’s corporate sales are declining in relative terms. If we compare the number of Japanese and Chinese companies listed in the Fortune Global 500, in 2010 there were 70 Japanese companies and 44 Chinese companies. By 2016, however, Japanese companies numbered 52 compared to China’s 103, marking a major reversal in just six years. Meanwhile, the Japanese government is aiming to be among the top three developed nations in the World Bank’s ease of doing business ranking by 2020. Yet in the 2017 ranking of 190 countries and regions worldwide (benchmarked to June 2016), the Asian economies of Singapore, Hong Kong, and South Korea were all in the top five, while Japan languished at number 34.

The next issue is that Japan’s earning power remains weak. If we compare return on sales (ROS) for non-financial companies listed in Japan’s TOPIX and the US S&P 500, Japan has for a long time lagged as much as 6–8% behind the United States.

Bolstering Japanese corporations’ international competitiveness is an urgent imperative if we are to maximize the value of our nation. To prevail in the global competition, therefore, we corporate executives must fulfill our role and responsibilities in that regard.

(c) Demographic trend and GDP

Japan’s population has already started declining and is expected to continue declining for the foreseeable future. On the economic front, meanwhile, nominal GDP remained more-or-less unchanged for more than two decades following the bursting of Japan’s asset bubble around

1990, but is currently demonstrating relatively strong growth, having increased by approximately 24 trillion yen in the last three years. Nonetheless, as Japan's declining birthrate and the aging of its society accelerate, it will not be easy for GDP to continue growing sustainably at a rate of 8 trillion yen annually. And it will be even less easy to meet the government's targets of sustainably achieving over 3% in nominal GDP growth and over 2% in real GDP growth, which it must be said are extremely high hurdles.

(d) GDP growth and satiation

One point to bear in mind with regard to GDP is that, even if per-capita GDP grows, people's prosperity, or sense of well-being, does not necessarily increase proportionally. In countries where the economy has grown to a certain level, individual well-being tends to approach the satiation point. And the fact that this type of long-term, fundamental change is occurring means that short-term measures to stimulate the economy are highly likely to end up causing debt to accumulate rather than spurring GDP growth. It is interesting to note that in his writings the Czech economist Tomáš Sedláček points out that GDP should actually stand for Gross *Debt* Product rather than Gross Domestic Product.

As economies continue to mature, a key task required of modern economics is to gain an accurate grasp of the economic reality.

(e) Discrepancy between GDP statistics and perception

The discrepancy between GDP statistics and the economic reality has grown to the extent that it cannot be ignored.

Most notably, corporations' perceptions of what constitutes investment cover a considerably larger scope than the investments included in GDP statistics. At the present time it is only investments in tangible fixed assets and limited intangible assets such as certain types of software that are included in GDP. A change in accounting standards does mean that from the end of this year additional categories including R&D spending will also be counted, but investments in areas such as IT assets, brand equity, and intellectual property are omitted, as are direct overseas investments and M&A.

In addition to further improving GDP statistics, moreover, another major policy issue for government is to reform economic statistics in general to better capture the reality of increasingly globalized corporate activities.

(f) Added value and utility—A multifaceted approach to capturing the economic reality

On September 28, Doyukai released a policy proposal entitled *Reform of Economic Statistics and Corporate Action Aimed at Advancing Prosperity: Recommendation of GNI-Plus as a New Set of Metrics* (compiled by the Beyond GDP Study Group).

The proposal sets out the problems associated with current economic statistics, along with potential remedial measures, recommending GNI-Plus as a set of metrics to represent the prosperity of the economy as a whole in an era in which globalization, digitization, and socialization are accelerating. The key distinguishing feature of these metrics is that they capture the economic reality in a multifaceted way, being divided between the economic sector, which can be measured in terms of monetary value, and the non-economic sector, which defies easy measurement. In specific terms, the economic sector would be represented using such metrics as GDP and GNI, as well as per-capita GDP and per-capita GNI. The non-economic sector would be divided into categories such as, for example, social sustainability; social stability; health, hygiene, and life planning; and childcare and education, enabling different types of statistics to be utilized.

Economic statistics should be reformed to enable the government, companies, and households to ascertain individuals' prosperity and take steps to increase it. Especially as the digital economy is advancing, the challenge for business management is to increase prosperity for individuals at the same time as enhancing corporate value.

(2) Y Axis: Using innovation to forge our future

(a) From tangibles to intangibles—the real and the virtual

Looking back at the Japanese economy to date, industries that create high added value have changed from the heavy and chemical industries to automobiles and electrical devices, then semiconductors, and eventually pharmaceuticals. At the same time, the units of weight used for these industries' staple products have become progressively lighter, shifting from tons to kilograms, then to grams, milligrams, and micrograms. And if we consider the service industry, which has come to account for approximately 70% of GDP and employment, the weight of its "products" is actually zero. Thus the source of economic added value is moving from the economy with weight—that is, the traditional, or "real" economy represented by physical things—to the virtual, or "weightless" economy represented by the internet.

What is important now is to combine the real and the virtual to transform corporations and industries. In the visible world that prevailed until now, the Newtonian mechanics referred to as classical mechanics played a central role, but in the invisible world that will prevail from now on, the modern physics pioneered by Einstein and Schrödinger will be more important. A key feature of quantum mechanics, for example, is light's wave-particle duality, and similarly, information could be considered to be much like a wave. Expressing particles and waves mathematically in a complex space yields the formula $z = a + bi$. If the economy with weight is represented by "a," or the "atoms" comprising physical things and matter, and the weightless economy is represented by "b" or the "bits" comprising information and other intangibles, while the complex number "i" represents the "i" of internet, I believe we can succinctly express the

relationship between the real and the virtual within the economy.

It will be essential to increase productivity in order to optimize economic activity. The innovation that will drive this should also be pursued on both fronts, the real and the virtual.

(b) Productivity of Japan's R&D

In recent years, more and more Japanese citizens have been winning Nobel Prizes in the science categories. This is extremely gratifying, but we need to bear in mind that they are earning plaudits now for research findings produced more than ten or twenty years ago.

If we compare the R&D spending of major industrial nations, Japan's spending is limited to less than half that of the United States or China and the rate of increase in spending is also far behind the rates in those two countries. Moreover, as of January 19, 2016, there were 174 so-called unicorns (unlisted companies valued at more than 1 billion US dollars) worldwide, of which the United States had 101 (58%) and China had 36 (21%), whereas Japan had zero.

It is certainly important to bolster R&D from an investment perspective, but it is also crucial to establish an innovation ecosystem that addresses output as well, for example by encouraging venture businesses.

(c) An innovation powerhouse—Japan's path to survival

As a developed nation facing new problems, Japan has no alternative but to innovate in order to overcome those problems. For Japan to bolster its industrial competitiveness, contribute to the world, and support a prosperous way of life for its citizens, it should encourage culture, as well as sciences and technology, and aim to be an innovation powerhouse. That will require it to amass the best human resources and innovation hubs in the world. Specifically, it means that Japan should (i) create the “mother lab”—the most advanced research environment in the world, (ii) become the “mother factory”—a production base for world-beating products and services, and (iii) take advantage of the “mother market”—a market shaped by the most demanding consumers in the world—to step up the pace of its own indigenous innovation.

(d) Three advanced technologies that will forge Japan's future

To succeed as an innovation powerhouse, Japan should concentrate on advanced technological fields to invest its limited reserves of people, assets, and money. It must deliberately select and focus with a future-oriented, global outlook, considering not only the fields in which it particularly excels, but also those fields in which it is the first in the world to encounter a particular problem and is leading the race to find a solution. The most promising technological fields in concrete terms are (i) information technologies targeting well-being in our day-to-day lives, (ii) healthcare technologies targeting good health and longevity, and (iii) environmental technologies targeting a sustainable planet.

(3) Z Axis: Ensuring the sustainability of society

In working toward the optimized society of 2045, Japan must consider various government policies from an ultra-long-term perspective. Here I address the six main policy areas, taking the current situation and government initiatives already under way as the basis to set out what needs to be done to ensure sustainability.

(a) Demographics and the workforce

By 2045 Japan's population is set to decline from its current level of 127 million to 102 million, almost breaching the 100 million mark. The population ratios of juveniles aged 0 to 14 and of productive adults aged 15 to 64 will both decrease monotonically, while the population ratio of seniors aged 65 or older will continue to increase monotonically. The government is implementing measures to address the declining birthrate, aiming for a target birthrate of 1.8, as well as pursuing employment and labor policies intended to increase participation in the workforce by women and senior citizens.

Population is the cornerstone of a nation's power, and as such it affects the heart of every government policy. We must therefore hope that the government deploys bold measures to turn population decrease around, with a view to eventually achieving a birthrate of 2.07, which is said to be the replacement level.

(b) Education

Various problems relating to education have been raised from a number of different standpoints, but here I address the two issues of poverty and income disparities on the one hand, and the response to globalization on the other.

With regard to the first issue—poverty and income disparities—an increasing number of elementary and junior high school students are requiring financial aid pursuant to the Public Assistance Act and associated help with school costs, having been certified as eligible by a municipal board of education under the School Education Act. At the present time the number of such students is slightly over the 1.5 million level, with 15% of students requiring financial aid and help with school costs, so in fact more than one in seven of Japan's elementary and junior high school students is receiving financial aid.

Turning to the second issue—globalization—the number of Japanese students studying overseas has decreased continuously over recent years. However, the number of students studying overseas from China, South Korea, India, and the United States has increased substantially, with China in particular seeing numbers burgeon to around four times their previous level in nine years.

When it comes to educating the young people who will be responsible for Japan's future, we should first of all seek to eliminate the disparities in educational opportunity. And, precisely because this is the global era, we need to nurture their identities and cultural awareness as Japanese citizens, supplementing that with education to cultivate their intercultural communication ability and basic skills as members of society.

(c) Social security

The sustainability of Japan's social security system is already in peril, and as the birthrate declines and society ages at an accelerating rate, the situation will deteriorate further still. During the 13 years up to fiscal 2025, Japan's GDP is projected to increase to 1.27 times its previous value, but the social security bill is expected to surpass that rate of growth, amounting to 1.36 times its previous value. The aging of society will lead to particularly dramatic growth in social security costs for healthcare and long-term care, which are set to increase to 1.54 times and 2.34 times their previous values, respectively.

The biggest problems with Japan's social security system are that the cost is rising faster than the rate of economic growth, as are the benefits being paid out. Unless these problems are resolved there can be no prospect of dispelling anxiety about the future and boosting consumption.

(d) Fiscal consolidation

The state of Japan's public finances is worse than that of any other developed nation. The government has set a target of achieving a surplus in its primary balance by fiscal 2020, and has pledged this to the international community. However, looking at the Cabinet Office's projections for fiscal 2020 under its economic revitalization scenario (which assumes a consumption tax increase to 10% in October 2019), the nominal GDP growth rate would be 3.9%, the real GDP growth rate would be 2.1%, the nominal long-term interest rate would be 3.4%, and the primary balance would remain in deficit to the tune of 5.5 trillion yen. Furthermore, the balance of government debt would continue increasing from 1,053 trillion yen and—even in a scenario assuming economic revitalization—is projected to reach 1,185 trillion yen by fiscal 2024.

In light of this situation, it is imperative to undertake decisive reforms that leave nothing sacred in ensuring carefully managed spending. To reach our fiscal consolidation target we must continue to maintain the trust of the international community and market participants, which is another reason why achieving a primary surplus in fiscal 2020 is absolutely essential. We must, moreover, legislate to impose fiscal discipline in order to show everybody inside and outside Japan how determined we are to achieve fiscal consolidation and to make steady progress in bringing it about.

(e) The environment and energy

In an effort to address the climate change problem, which affects the earth's sustainability, a new post-2020 worldwide framework was agreed under the COP21 Paris Agreement in December 2015. Japan responded with Cabinet approval of the Plan for Global Warming Countermeasures in May 2016. Specific targets detailed in the plan include a 26% cut in emissions of greenhouse gases between 2013 and 2030, as well as a long-term target of reducing emissions by 80% between 2016 and 2050.

With regard to Japan's electric power mix in particular, the plan targets a 20–22% ratio of nuclear power generation by 2030. Achieving this will require approximately 30 nuclear reactors to be operational, even assuming extended operating periods for several reactors and an 80% operation rate.

We must restart our nuclear power plants without delay once they have met the Nuclear Regulation Authority's new regulatory requirements and obtained the understanding of local communities. We also need to use innovation, deregulation, and other methods to boost the cost competitiveness of renewable energy.

(f) Diplomacy and security

Where diplomacy and security are concerned, changes in the relative power of major industrial nations and in US foreign policy have caused the power balance to shift. In addition to this, we are witnessing moves to challenge the established international order. Risks relating to international terrorism and the proliferation of weapons of mass destruction are increasing, as are threats that transcend national borders and the boundaries of nation states and are associated with more far-reaching and profound globalization and interdependency.

In the Asia-Pacific region too, uncertainties are very much on the increase due to countries such as China and Russia, which are seeking to expand their military power and their influence, and North Korea, which is developing nuclear missiles and repeatedly engaging in provocative acts.

Furthermore, we cannot help being keenly aware of newly emerging security threats such as cyber terrorism. Cyber attacks are cheap, they spread easily, and they are difficult to predict, contain, or trace. We should also be well aware that Japan's way of life is subject to major risks: anybody, anywhere, at any time could be harmed if critical infrastructure is attacked.

Constant efforts in the areas of diplomacy and security are required to respond to the changes in the world's power balance and increasing uncertainties. We should also take action to create systems presaged on worst-case scenarios and to boost resilience through collaboration transcending the barriers between organizations.

4. Toward Optimization in 2045

Here I address each of the six policy areas in turn, envisaging the ideal society that I think Japan should be aiming for as it works toward an optimized society in the form of Japan 2.0. This vision of society should be realized by focusing on the year 2045 and taking a backcasting approach, but it is not necessarily the only possible vision of society. I am, rather, expecting to exchange opinions with a wide variety of people, including those who disagree with me, to create a better society. We must, moreover, bring about reform of our electoral system, as well as other political, administrative, and judicial reforms as a means of restructuring the way our nation is run.

(a) Demographics and the workforce

- ✓ Create an optimal environment in which people can have and raise as many children as they want to
- ✓ Clarify the prospects for stabilizing Japan's declining population
- ✓ Encourage workforce participation by women and senior citizens, as well as long-term and permanent residence among highly skilled foreign professionals

(b) Education

- ✓ Provide optimal education in cultural awareness, languages, and innovation
- ✓ Create a society in which educational opportunity is not impeded by poverty and income disparities
- ✓ Enhance grant-type scholarships and other financial aid operated by both public and private entities

(c) Social security

- ✓ Establish an optimal safety net that operates in a variety of life situations
- ✓ Make use of advanced technologies to extend the average life span and the healthy life span
- ✓ Construct a new social security system commensurate with the size of the economy
- ✓ Maintain a fair distribution of burdens and benefits between the generations, and avoid leaving financial obligations for the future

(d) Fiscal consolidation

- ✓ Achieve an optimally balanced combination of economic growth and fiscal consolidation
- ✓ Adhere to a permanent surplus in the primary balance
- ✓ Continue reducing the balance of government debt to earn the international community's trust
- ✓ Maintain the tax and social security burdens (the rates of contribution by citizens) at levels equivalent to those of other developed nations

(e) The environment and energy

- ✓ Maintain an optimal balance between reduction of the environmental load and economic growth
- ✓ Japan to use advanced technologies to play a key role in dealing with global warming
- ✓ Make cost-competitive renewable energy a reality
- ✓ Remain among the world's most advanced nations in terms of nuclear power-related technology and human resources

(f) Diplomacy and security

- ✓ Establish a security framework founded on self-help to preserve the infrastructure supporting Japan's way of life
- ✓ Strengthen and broaden Japan's alliance with the United States as well as associated partnerships at many different levels
- ✓ Maintain the stability of Japan's economic infrastructure in terms of natural resources, energy, and food

5. A New Challenge for Doyukai

On the 70th anniversary of its founding, Doyukai is launching a new initiative. The association will be taking concrete action that could be described as a new founding based on the policy proposals *Japan 2.0: Toward an Optimized Society*, which we announced today, and *Doyukai 2.0: A Group of Distinctive Individuals with a Sense of Ownership and Initiative*.

(1) An action-oriented policy group spearheading reform

Doyukai is a gathering of corporate executives who are keenly aware of their role and responsibilities and put them into practice. As executives with high aspirations, we are committed to free thinking and action unconstrained by established paradigms or points of view. As a policy group that harks back to these basic principles to spearhead reform and take action, Doyukai will continue to evolve constantly.

(2) The *Forging Our Future Together* project

Doyukai is challenging itself to go beyond the confines of its own membership and discuss, plan, and implement policy with a wide variety of stakeholders in society at large. In addition to engaging in robust debate among far-sighted executives, the association is launching the *Forging Our Future Together* project aimed at providing forums for its members to move outside their own world and collaborate with a wide range of other people, particularly the younger generation. By such means as these Doyukai aims to shape public opinion and take Japan forward to a new stage of development.

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KEIZAI DOYUKAI

公益社団法人 経済同友会

