



**Discussion Summary of the G20 Symposium  
For a Better Future:  
Demographic Changes and Macroeconomic Challenges**

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**財務省** Ministry of Finance, JAPAN

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As organizers of the symposium, the Bank of Japan and the Japanese Ministry of Finance would like to express their sincere gratitude to all participants for their thought-provoking presentations and discussions. The views expressed throughout this summary are those of the participants and do not necessarily reflect those of their respective institutions. All remaining errors in this discussion summary are the organizers' responsibility.

## Executive Summary

### *Demographic Changes and their Impacts on Macro Economy*

Participants argued that population aging had wide-ranging implications for growth, both negative and positive, though demographic projections came with a high uncertainty. They considered that population aging tended to exert downward pressure on total output and returns to capital. However, they emphasized advantages of the aging society through an increase in healthier and more productive elderly labor force and technological innovation. Labor market reform and expanding educational opportunities across all generations would be key reform agendas. Participants emphasized the role of technological advances in areas such as medical technology and robotics. Participants acknowledged that population aging would have cross-country implications as different demographic profiles might generate different labor market and saving-investment trends, and hence have an impact on current account balances. Capital flows and migration might alleviate challenges posed by population aging. Going forward, participants agreed on the importance of sharing best practices across the G20 economies and tailor them to country-specific circumstances.

### *The Impacts of Demography on Fiscal Condition and Social Security System*

Many participants argued that current pay-as-you-go social security systems would need to be adjusted to maintain fiscal sustainability and social equity among generations, while noting the need to ensure adequate coverage for the elderly. Participants argued that, while there was no single solution, a realignment of contributions and benefits, retirement age and the tax system would be needed. Some noted the importance of designing a pension system that would create appropriate work incentives and a growth-friendly tax system in financing age-related outlays, including further use of broad-based consumption taxes, particularly the VAT. Some participants noted that age-related spending was politically sensitive, suggesting the introduction of automatic adjustment mechanisms as implemented in some countries.

### *Monetary Policy and Financial System during Demographic Changes*

Participants argued that population aging might put downward pressure on real interest rates, and monetary policy could face the challenge of the lower bound on nominal interest rates and lower inflation. A low level of policy rates in the long term would mean less policy space for central banks. Population aging could also impact the financial sector. First, lower real interest rates together with the declining population trend could exert downward pressure on the profitability of financial institutions. Second, some participants argued that financial institutions as well as authorities would need to adjust their business models and policies to meet the demands of senior citizens. Population aging could also have implications for global financial stability through the increasing presence of pension funds and insurance corporations.

## Introduction

“Population aging and its policy implications” was one of the key agendas for the G20 Financial Ministers and Central Bank Governors Meetings under Japan’s presidency in 2019. Against this backdrop, the Bank of Japan and the Japanese Ministry of Finance co-hosted a G20 Symposium, “For a better Future: Demographic Changes and Macroeconomic Challenges,” on January 17th, 2019 in Tokyo. The symposium, which served as one of the kickoff events of the G20 under the Japanese Presidency, was attended by about 250 participants from academia, governments, central banks, international organizations, and so on, including G20 Finance and Central Bank Deputies. The participants discussed wide-ranging issues related to the impact of demographic changes.

The symposium began with the opening remarks delivered by Masayoshi Amamiya, Deputy Governor of the Bank of Japan.<sup>1</sup> In the first session, issues related to demographic changes and their impacts on the macroeconomy were presented by four speakers: Toshitaka Sekine (Bank of Japan); Selahattin İmrohoroğlu (University of Southern California); Vitor Gaspar (International Monetary Fund); and Yasuyuki Sawada (Asian Development Bank). Takatoshi Ito (Columbia University) moderated the discussion. In the second session, five speakers presented issues related to the impact of demography on fiscal conditions and the social security system: Alan Auerbach (University of California, Berkeley); Motohiro Sato (Hitotsubashi University); Laurence Boone (Organization for Economic Co-operation and Development); Marco Buti (European Commission); and Junji Ueda (Ministry of Finance, Japan). Takeo Hoshi (Stanford University) moderated the discussion. Haruhiko Kuroda, Governor of the Bank of Japan, delivered the Keynote Speech at the luncheon session.<sup>2</sup> In the third session, four speakers presented their work on monetary policy and the financial system during demographic changes: Shigenori Shiratsuka (Bank of Japan); Gauti Eggertsson (Brown University); Hyun Song Shin (Bank for International Settlements); and Ryozo Himino (Financial Services Agency, Japan). In this session, discussion was moderated by Kazuo Ueda (Kyoritsu Women’s University). Taro Aso, Deputy Prime Minister, Minister of Finance, and Minister of State for Financial Services, Japan, closed the symposium with his closing remarks.<sup>3</sup>

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<sup>1</sup> [http://www.boj.or.jp/en/announcements/press/koen\\_2019/data/ko190117a.pdf](http://www.boj.or.jp/en/announcements/press/koen_2019/data/ko190117a.pdf)

<sup>2</sup> [http://www.boj.or.jp/en/announcements/press/koen\\_2019/data/ko190117b.pdf](http://www.boj.or.jp/en/announcements/press/koen_2019/data/ko190117b.pdf)

<sup>3</sup> [https://www.mof.go.jp/english/international\\_policy/convention/g20/20190117s.pdf](https://www.mof.go.jp/english/international_policy/convention/g20/20190117s.pdf)

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## Session I: Demographic Changes and their Impacts on Macro Economy

### *Panelists' Presentations*

**Sekine** (Bank of Japan) first showed that Japan was at the forefront of population aging in a chronological sense, and this had lowered potential growth and the natural rate of interest. He then pointed out that Japan might not be aging in a biological sense and that the difference between biological and chronological ages had widened substantially. For instance, 65 years old in 1970 in terms of the mortality rate of 2.3% was equivalent to 77 years old in 2016. Sekine argued that demography might not matter in itself, and that what really matters was institutional setups that did not accord well with demographic changes. Institutional setups for labor markets and social security systems that were tied to chronological ages would have an adverse effect on the economy, as “stickiness” in nominal wages and prices did.

**İmrohoroğlu** (University of Southern California) presented a long-term simulation of the world economy under perfect capital mobility and demographic changes using a general equilibrium model in which overlapping generations of individuals populated three regions: Japan (high aging society), a High Income region (medium aging society), and a Middle Income region (least aging society). He showed that Japan's current account would turn negative as more elderly people dissaved in the long run. Moreover, the projected unsynchronized demographic changes across regions and the differences in the social security systems and total factor productivity (TFP) growth would tend to induce capital to flow into Japan. These capital inflows would mitigate the negative impact of demographic changes through capital deepening. İmrohoroğlu also showed a number of alternative simulations showing that changes in longevity and TFP etc. would lead to different speeds of capital flows.

**Gaspar** (International Monetary Fund) overviewed the projected demographic changes across the G20 countries and their potential multi-faceted impact on economic growth, public finances, monetary policy, financial-sectors, and international capital flows. Falling shares of working-age populations would likely worsen standards of living. The public finances would come under pressure due to population aging. Monetary policy would likely face the effective lower bound more frequently due to the declining natural rate of interest. The importance of market-based finance relative to bank-based finance would likely increase due to the higher demand from pensions and insurance funds. Population aging affected the current account through its impact on saving and investment. The current account norm tended to be better in countries with the larger share of prime age workers (ages 45-64).

**Sawada** (Asian Development Bank) discussed the role of technology and regional economic integration in tackling population aging in Asia and the Pacific. He first showed that Asia was aging at an accelerating pace and some economies might be aging too quickly before getting rich. Drawing on existing empirical studies, he pointed out the possibility that population aging could induce labor-saving innovation and technology adoption. In particular, he mentioned the role of technology in health and longevity, transforming work and the workplace, and workers and supportive labor market infrastructure. Sawada also noted that regional economic integration such as immigration and foreign direct investment was important for both advanced and emerging economies in Asia to overcome the challenges of an aging population.

### *Questions and Comments*

**Ito** (Columbia University) posed three questions to the speakers: (i) whether Japan would become a net capital importer as suggested by İmrohoroğlu, or continue to be a net capital exporter as suggested by Gaspar?; (ii) would the health status of the elderly become more diversified while that of the median cohort of the elderly improved steadily?; and (iii) would it be possible for innovation to offset the downward pressure from population aging on the economy? Ito also pointed out that Japan had a net income surplus of about 2 percent of GDP and, given this fact, we needed to pay more attention to income balances as well as external assets and their returns, although trade balances had recently become more focused. **Kazuo Ueda** (Kyoritsu Women's University) pointed out that Japan's current account surplus had been more persistent than expected and one important and unexpected factor was increasing corporate saving amid the aging society. **Lipton** (International Monetary Fund) also raised doubts about the possibility that Japan would become a net capital importer assuming lower returns on capital. In relation to Ito's second question, **Wilkins** (Bank of Canada) asked about the policy implications of the expanding gap between chronological and biological ages. In a general context, **Moseley** (Global Infrastructure Hub) pointed out uncertainties over the future macroeconomic impact of demographic changes since technological progress had been accelerating recently. **Maait** (Ministry of Finance, Egypt) pointed out the importance of various factors such as pension systems and saving behaviors in considering the macroeconomic impact of population aging. **Hadiyant** (Ministry of Finance, Indonesia) stated that there was a lot that could be learned from Japan in tackling population aging.

### *Responses of Panelists*

In answer to the above questions, **İmrohoroğlu** explained that Japan would become a net capital importer partly because other countries would also experience a faster pace of population aging in the future. He added that corporate savings were not considered in his model and this would be analyzed in the future. **Gaspar** answered that his and İmrohoroğlu's scenarios on Japan's future current account did not necessarily conflict with each other. İmrohoroğlu showed longer-term scenarios over decades far into the

future while the results he presented were focused on a shorter horizon. Moreover, he also stressed the importance of accounting for social security systems when discussing the macroeconomic impact of aging populations. In reply to Ito's second and Wilkins' questions, **Sekine** agreed that the increasing diversity in health status among the elderly was a very important issue. He added that not only diversity in health status but also inequalities of income and wealth were important since they might be closely related to each other. In reply to Wilkins' question, Sekine encouraged G20 Deputies to have that discussion. In reply to Ito's third question, **Sawada** explained that population aging could have both a positive and a negative impact on productivity through various channels. While declining skills such as the cognitive ability of the elderly would have a negative impact on productivity, the introduction of new technologies such as robots to compensate for lowered skills would have a positive impact. He also emphasized that it would be important to distinguish between FDI and other capital flows when analyzing capital flows due to population aging.

## **Session II: The Impacts of Demography on Fiscal Condition and Social Security System**

### *Panelists' Presentations*

**Auerbach** (University of California, Berkley) overviewed the key factors and challenges to achieving a fiscally balanced social security system. To support social security systems while the old age dependency ratio was increasing in many countries, he mentioned several solutions such as, (i) adjusting contributions and benefits, (ii) immigration, (iii) transition to a funded system, (iv) increasing the retirement age, and (v) substituting private systems for public ones. However, all of these solutions had pitfalls and would not be sufficiently effective at addressing the basic problems. He emphasized that improving work incentives for the elderly should be considered, and that governments should not penalize the decision of elderly people to continue to work. He concluded that some rationalization of systems would be needed, combining some realignment of benefits and taxes, along with improvements in transparency.

**Sato** (Hitotsubashi University) explained the framework of the social security system in Japan. It was a de facto pay-as-you-go system, and thus susceptible to demographic changes. It could also discourage people from working, since social security contributions were a de facto tax on wages. In addition, because of the burden on employers of paying social security contributions for regular workers, employers had the incentive to substitute non-regular workers for regular workers. Sato argued that value added tax (VAT) or consumption tax would be a relatively growth-friendly solution to finance the social security system, since VAT did not distort the production activity. Moreover, since VAT was equivalent to a tax on lifetime income, it could also

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improve inter-generational equity. Finally, Sato mentioned the challenges to implementing VAT posed by digitalization and the sharing economy.

**Boone** (Organization for Economic Co-operation and Development) overviewed the costs of population aging among G20 countries, including living standards, public pensions and health expenditure, and the risk of poverty among the elderly. She then suggested that reforms to tackle barriers to the employment of older workers, such as mandatory retirement, lack of flexible work arrangements and seniority wage settings, were the key to ensuring fiscal sustainability and fostering inclusiveness in aging societies. She also suggested that promoting skills development for older workers and linking retirement age to life expectancy could improve older workers' labor participation. Finally, Boone emphasized that pension and social security reforms would need to address the double challenge of ensuring fiscal sustainability and providing adequate coverage.

**Buti** (European Commission) passed five main take-away messages. First, he argued that the fact that population aging was a global problem was not enough for a discussion in the G20. Sizeable externalities via impact on global imbalances, capital flows, and impact on growth would be a strong justification for dealing with this issue at the G20. Second, given the persistently low interest rates, Buti argued that reforms tackling problems at source rather than creating fiscal space through running down debt seemed to be preferable. Third, as an achievement of reforms, there was a sizable increase in the participation rates of older workers in Europe. The main danger at the moment was reform reversal. Fourth, pension reforms might be politically challenging. It would be better to link life expectancy and retirement age in a gradual way rather than pursuing big bang reforms. To safeguard pensions' adequacy, it would be better to index the retirement age to life expectancy rather than replacement rates. Lastly, on healthcare, the aging component might be less easy to predict as medical science advances and technology matters more. Buti concluded that there would be ample scope for sharing best practices on all these issues.

**Junji Ueda** (Ministry of Finance, Japan) explained how the Japanese pension and healthcare systems had been reformed and adjusted to demographic changes. He pointed out three lessons learned from Japan's experience for building sustainable pension and healthcare systems. First, installing flexible and automatic adjustments for benefit parameters would be important because there were always political risks and incentives to postpone renegotiation. Second, the involvement of institutions with fiscal responsibility, such as local governments, would be important for effective control of the demand and supply of health care services. Third, avoiding commitments based on optimistic assumptions and projections would be needed to cope with the uncertainties of demographic changes.

### *Questions and Comments*

**Hoshi** (Stanford University) asked Buti about possible policy coordination among countries, given the externalities in dealing with population aging. **Masai** (Bank of Japan) asked Auerbach for further explanation of how institutional frameworks could be modified to tackle rising inequality of lifetime income as well as prolonged life expectancy. **Charassangsomboon** (Ministry of Finance, Thailand) asked if raising the retirement age could cause protests from workers. **Maait** (Ministry of Finance, Egypt) pointed out that it would be important to decompose the social security costs into those arising from demographic changes and those arising from other factors. He argued that a pay-as-you-go pension system required high fiscal costs even in a less aging country.

### *Responses of Panelists*

**Buti** answered to Hoshi that international coordination for mutual learning and sharing of best practices among countries would be useful. Buti also mentioned that the externalities stemmed mainly from structural factors, especially those related to global imbalances. If a government in a country with current account surplus reformed the pension system from a pay-as-you-go to a funded system in order to secure fiscal sustainability, it could exacerbate global imbalances because the country would be further increasing its saving. In reply to Masai, **Auerbach** mentioned that some countries had already introduced policies to address widening lifetime income inequalities by adjusting the replacement rate across pensioners. He also pointed out that a defined-benefit pension system, which was more susceptible to the risks for fiscal sustainability, had an advantage in both inter- and intra-generational risk-sharing. It would be therefore important to find the appropriate mix of defined-benefit and defined-contribution pension systems. In response to Charassangsomboon, **Boone** answered that there were a number of points to consider in raising the retirement age smoothly. First, a built-in auto-adjustment mechanism for the increasing average life expectancy could avoid the need for frequent and controversial pension reforms. Second, it would be important to provide incentives for the elderly to continue working longer, and to provide opportunities for them to learn new skills. Third, setting enough transition periods would also be important for current workers to make their life plans. She also added that the problem of poverty among the elderly could become a crucial issue since there had been a noticeable increase in inequality of income and wealth among the currently younger generations that could translate into higher risk of poverty in their old age. **Junji Ueda** emphasized that it would be important to secure predictability in the adjustment of the retirement age so that young workers could prepare for the changes well in advance. He added that transparency of the pension system would also be important for people to access the necessary information. **Sato** pointed out that given the longevity of the healthy elderly, we needed to change our system to encourage the elderly to work longer, and the government should not penalize the working elderly. He argued that coordination



between pension benefits and the tax system would be important to secure incentives for older workers to work longer.

## Session III: Monetary Policy and Financial System during Demographic Changes

### *Panelists' Presentations*

**Shiratsuka** (Bank of Japan) discussed the new normal for monetary policy frameworks during demographic changes. As population aging would put persistent downward pressure on the natural rate of interest, the margin for policy rate reductions would become smaller, and forward guidance would become less effective in having future impacts of monetary easing in advance. In the event of adverse shocks, central banks would be able to employ unconventional monetary policy measures such as large-scale asset purchases, but they would need to start, most likely, from an already high level of asset holdings while avoiding the unnecessary accumulation of financial imbalances. In this context, Shiratsuka suggested the importance of long-term perspectives in assessing the sustainability of price stability, while anchoring long-run inflation expectations to the target level. In this framework, it is important to maintain a balance between two price stability concepts: “measured price stability” to focus on a specific rate of inflation measured by a specific price index at a particular point in time, and “sustainable price stability” to focus on consistency with medium- to long-term sustainable growth.

**Eggertsson** (Brown University) posed three questions related to monetary policy during demographic changes. The first question was about the impact of population aging on the interest rate. According to his quantitative evaluation using US data, population aging could account for a permanently negative real interest rate, and the nominal interest rate would hit the zero lower bound (ZLB) more frequently. The second question was about the impact of population aging on GDP per capita. He showed that lower labor force participation could lead to higher living standards through capital deepening, but this was not the case with the ZLB. The last question was about monetary and fiscal policies in the ZLB and secular stagnation. He suggested that a sufficiently higher inflation target could be effective, while fiscal expansion and a negative interest rate policy might not work. Fiscal expansion could jeopardize fiscal sustainability, while a negative interest rate policy could undermine the profitability of financial institutions.

**Shin** (Bank for International Settlements) discussed some implications of population aging for global financial stability, focusing on the currency composition of international portfolio investment. He pointed out that, while emerging markets had increasingly been able to issue local currency bonds to international investors, they

had higher duration risks in dollar terms due to the co-movement of yields and exchange rates, and therefore they were still subject to fluctuations in global risk appetite. Meanwhile, as a result of population aging, the balance sheet of pension funds and insurance corporations had expanded. They had bond-like obligations in local currency which were typically matched with local currency assets, while often holding foreign currency assets with potentially high returns. Shin suggested that population aging might deepen the investor base for local currency debt and thereby reduce currency mismatches in some cases – as highlighted in the case of Korea.

**Himino** (Financial Services Agency, Japan) argued that, while population aging might pose risks to the financial sector, the financial sector had the potential to fulfill new roles that could help seniors meet the challenges ahead – thereby turning risks into opportunities. He suggested that the financial industry in an aging society should sell solutions which would be (i) customized to address the diverse needs of seniors; (ii) cutting across sectors, combining banking, asset management, and insurance services, as well as health and elderly care; and (iii) transparent so that customers could visualize what they would mean and use them for lifelong financial planning. He also questioned the validity of an economic analysis which treated people over 65 as a single cohort, citing growing diversity within them and the greater role they would play in the economy.

### *Questions and Comments*

**Kazuo Ueda** (Kyoritsu Women's University) asked Eggertsson whether unconventional monetary policies could be effective even when the policy rate frequently and persistently hit the ZLB under secular stagnation caused by population aging. **Shin** asked Eggertsson if the relationship between population aging and per capita GDP would hold in the longer run. **Waluyo** (Bank Indonesia) asked about a possible conflict between price stability and financial stability, and the potential role of macroprudential policies when monetary policy space would be limited. In line with Himino's presentation, **Ellis** (Reserve Bank of Australia) noted that increasing healthy life expectancy and decreasing fertility rates were necessarily causes of population aging, not separate phenomena, and asked for views about their implications. **Saggar** (Reserve Bank of India) pointed out that the impact of population aging on monetary policy and inflation could be ambiguous since the population aging of society could put upward pressure on interest rates and inflation, reflecting deterioration in fiscal balances, as well as downward pressure on interest rates and inflation through lowering of the potential growth rate.

### *Responses of Panelists*

In reply to Ueda's question, **Eggertsson** answered that unconventional monetary policies, including forward guidance, might not be effective under secular stagnation,

although they were effective during the financial crisis. However, he argued that a higher inflation target could work even under secular stagnation and had been surprised that no central banks had tried to raise their inflation target. He thought the Bank of Japan's inflation target of 2 percent was not high enough, given that the natural rate of interest was below minus 2 percent. Eggertsson answered to Shin that he had not checked the historically long-term relationship between population aging and per capita GDP. In reply to Waluyo's question, **Shiratsuka** answered that price stability and financial stability might conflict with each other in the short run, but they should be consistent in the longer run. Regarding Eggertsson's argument about a higher inflation target, Shiratsuka expressed skepticism about the feasibility of raising the inflation target. Given the current situation in Japan, where it was yet to re-anchor inflation expectations to 2-percent target level, Shiratsuka argued the Bank of Japan should first establish credibility by achieving the current inflation target. In response to Ellis' question about life expectancy, **Himino** admitted that the gap between healthy life expectancy and actual life expectancy had not shrunk so far. Although the share of the gap in one's actual life expectancy had been shrinking, the number of people belonging to this gap zone was increasing. For many people, how to finance this period was a big worry and the financial sector should have an important role in alleviating the risk of the whole nation becoming risk averse. He also pointed out that, as estimated by Sekine, the rise in the effective dependency ratio, which took into account the longer working life, should be slower than the nominal dependency ratio using chronological age.