

---

AGING POPULATION AND ITS ECONOMIC IMPACT  
+ IMMIGRATION

# Aging Population and its Impacts on Fiscal Sustainability

Naoyuki Yoshino (Asian Development Bank Institute)  
Chul Ju Kim (Asian Development Bank Institute)  
Pitchaya Sirivunnabood (Asian Development Bank Institute)

March 15, 2019

## Abstract

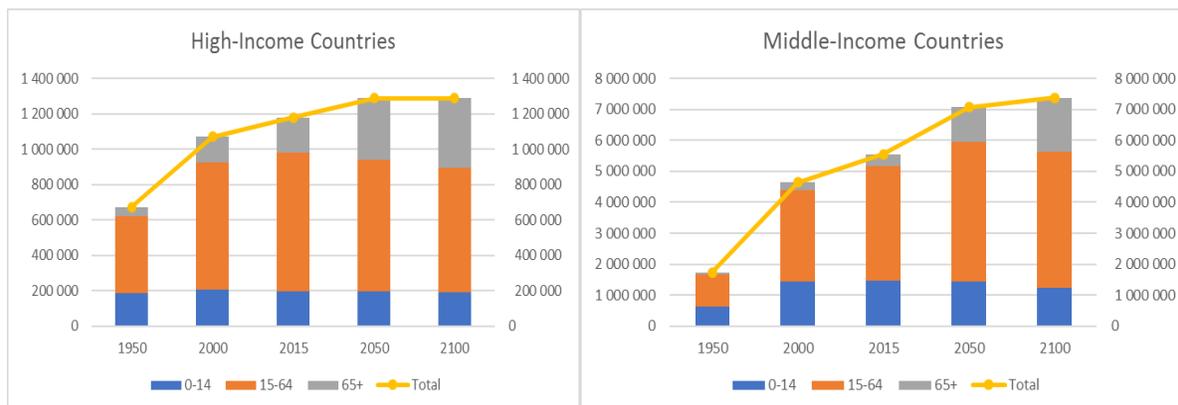
The world is in the midst of demographic change, with varying degrees, towards population aging. Though mixed trends were demonstrated in the G20 community, it is projected that most G20 economies would experience a significant degree of population aging. The impact of population aging is enormous and multifaceted i.e., deteriorating fiscal balance, changes in patterns of saving and investment, shortage in labor supply, lack of adequate welfare system, particular in developing economies, a possible decline in productivity and economic growth, and ineffectiveness of macroeconomic policy. This Policy Brief proposes policy recommendations, covering comprehensive structural reforms, public finance reforms, and reform of public and private pension schemes.

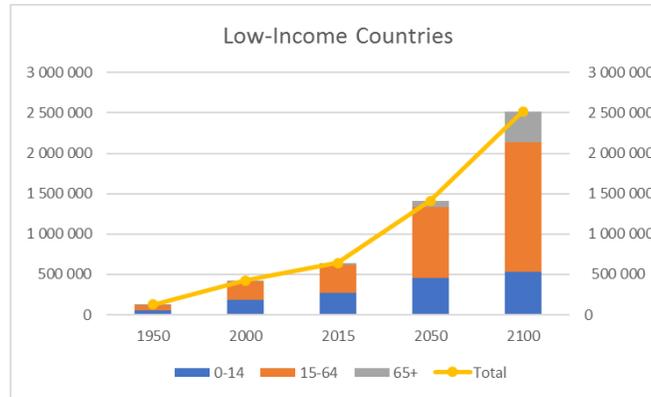


## Challenge

1. The world is in the midst of demographic change, with varying degrees, towards population aging. According to the United Nations (2017), globally, population aged 60 or above is growing faster than all younger age groups. There are estimated 962 million people aged 60 or over in the world, or accounted for 13 percent of global population. The number of older people in the world is projected to be 1.4 billion in 2030 and 2.1 billion in 2050, and could rise to 3.1 billion in 2100.
2. Figure 1 shows the projection of the world population by board age group and income group, which indicates a decreasing growth rate of population in high-income and middle-income countries. The population of aged 65 and above is forecasted to grow constantly in both economies. On the contrary, population structure of low-income countries shows an increasing growth rate with bigger working population aged between 15 – 64 years old.

Figure 1. World Population by Board Age Group and Income Group (thousands)

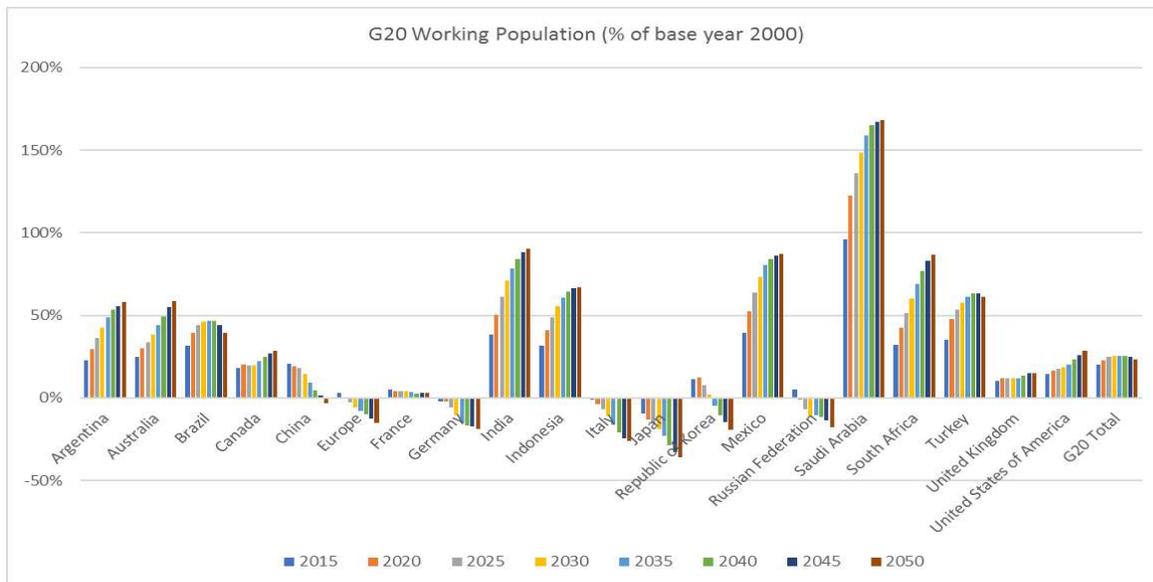




Source: Population Division, United Nations (2018)

3. For the G20 community, diversity is shown among the member countries. According to the United Nations (2018), working population is projected to rise in some members e.g., India, Indonesia, Mexico, Saudi Arabia, South Africa, and Turkey, while members like People’s Republic of China (PRC), EU, Germany, Italy, Japan, Republic of Korea (ROK), and Russia are likely to experience a declining trend of working population (Figure 2). The overall G20’s working population is forecasted to be constant.

Figure 2. G20 Working Population, aged 20-64 (percentage of base year 2000)

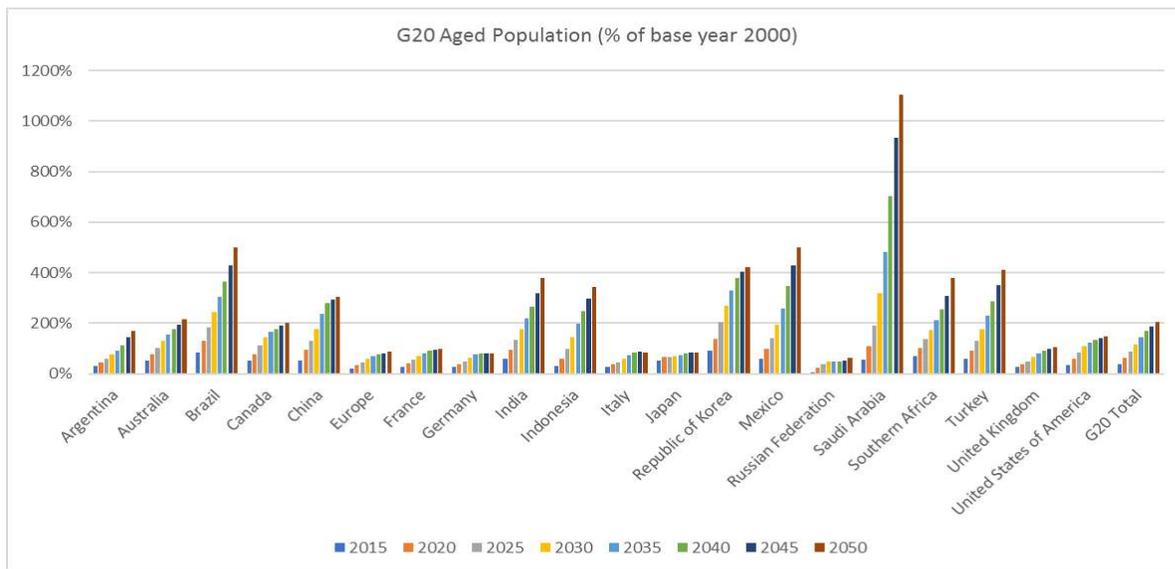


Source: Population Division, United Nations (2018)



4. On the other hand, it is projected that most G20 economies would experience a significant degree of population aging as shown in Figure 3. Different degrees of population aging are forecasted among the economies.

Figure 3. G20 Population Aged 65 and over (percentage of base year 2000)

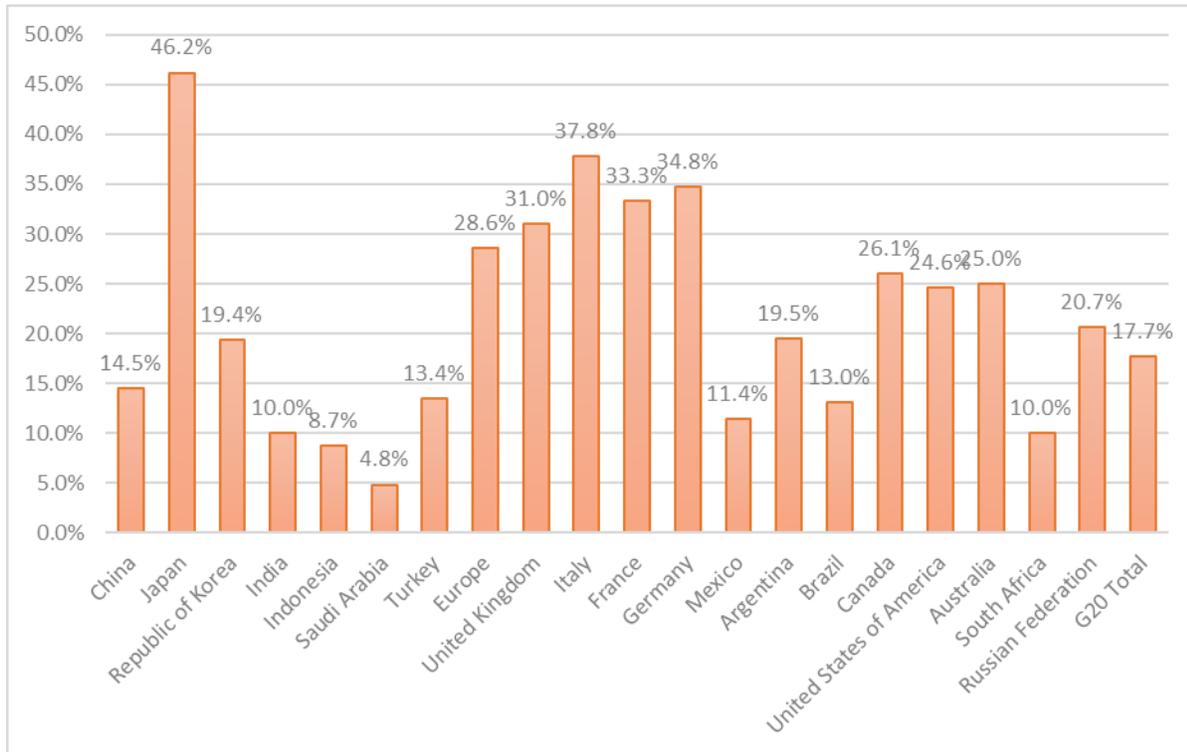


Source: Population Division, United Nations (2018)

5. Taking a closer look at the ratio of aged population to working population in 2015, Japan and Italy seem to experience most significant impact as the countries possess the highest 46.2 percent and 37.8 percent, respectively (Figure 4). However, when looking at the speed, emerging economies in G20 are aging at much faster rates. For example, the projection shows that PRC, India, Indonesia, Turkey, and Brazil will continually experience a significant increase in population aged 65 until 2050.



Figure 4. Ratio of aged population to working population 2015 (percent)



Source: Population Division, United Nations (2018)

6. The impact of population aging is enormous and multifaceted. For an economy like Japan, the advent has been long pronounced as reflected in the forms of deteriorating fiscal balance, changes in patterns of savings and investment, and a shortage in labor supply led to a decline in productivity and economic growth.
7. Moreover, for developing economies, this phenomenon of rapid population aging, before sufficient development, usually raises economic and social challenges particular in terms of sluggish economic growth and fiscal sustainability, namely a decline in tax revenues, an increase in government public expenditure, and lack of adequate welfare system. An indirect



impact also comes through productivity and economic-growth channel.

8. Taken into account the severity of its possible impacts to the economy, international communities, include the G20, have tuned in more attention on this aging phenomenon as well as started intensive discussion on policy options and responses to its impacts. In the face of aging population, it is imperative for both advanced and developing economies to identify and determine such impacts as well as to develop and designing appropriate policy responses to ease the negative impacts on the society and economy.

## Impact Analysis

### *Macroeconomic Variables*

9. As aforementioned, aging population influences a pattern of economic behavior in the society. As people get older and reach their retired age (approximately 60-65 years old), their behavior switches to spending less due to income constraint and fixed spendings only on necessary goods and services<sup>1</sup>. In parallel, shrinking working population due to population aging creates an impact through changing financial pattern of savings and investments. On one hand, a smaller base of spenders i.e., working population, with the complement of a bigger base of elderly i.e., retirees, brings about a decrease in aggregate consumption. On another hand, less aggregate income results in lower domestic savings, which limits new investment.

---

<sup>1</sup> While private consumption tend to decline with aging, combined public and private consumption rise very sharply with age in many high and middle-income countries. Total consumption with aging heavily depends, among others, on old-age support systems.



10. At an early phase of the demographic transition, an increase in a proportion of workers enhances aggregate consumption, cumulative investment, total labor input, thus output, which is called demographic dividend. As the transition progresses, a significant drop in labor supply, due to lowering fertility and mortality rates lowers aggregate output as well as domestic savings; thus, a decrease in investment. . This change in economic behavior can cause sluggish economic growth and potentially threaten national reserves as well as economic stability.
  
11. It is well documented that aging population leads to capital deepening and hence higher output per worker (Lee et al. 2014; Andrew et al. 2106). However, there have been concerns that aging population might lessen total productivity of an economy, in the context of elderly's capacity to adopt new technology and innovation. Generally, elderlies are comparatively slow learner for new technologies or approaches, which can hamper overall productivity in the face of fast-changing global economy with rapid technical progress. Without such capacity, there is a risk that productivity and economic growth will reduce.
  
12. That said, aging is not necessarily adverse to growth given a longer life may require more saving and make investment in education more attractive. In such scenario, a decline in labor force due to aging can be offset by higher productivity with increased capital, physical and human, accumulation and technological innovation. Indeed, some studies claim that there is no evidence of a negative relationship between aging and GDP per capita (e.g., Acemoglu and Restrepo 2017).



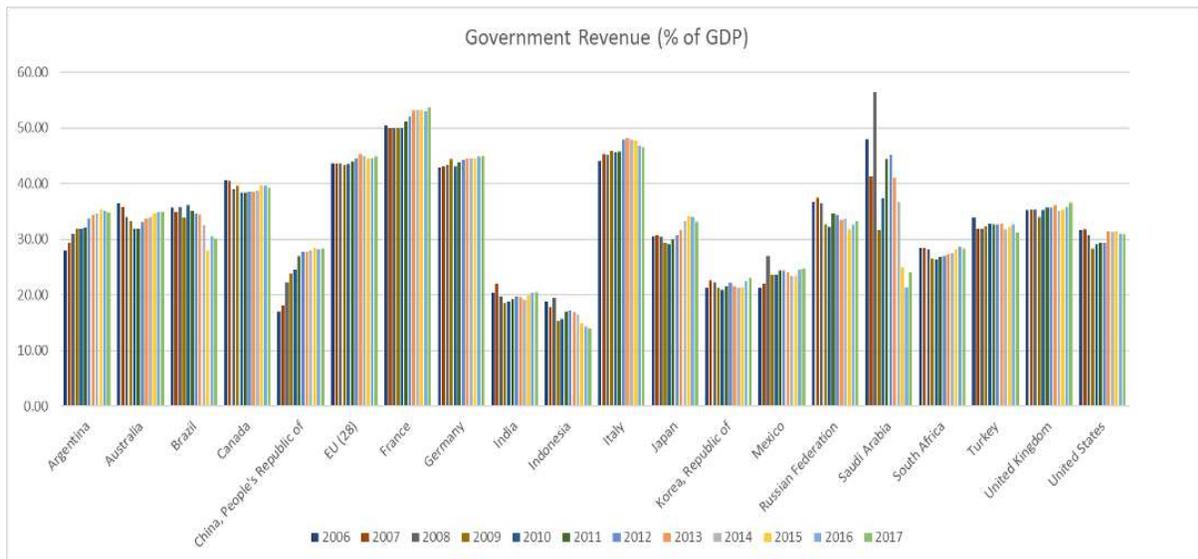
As such, there is a clear need for further works to more accurately identify economic impacts population aging could bring.

### *Fiscal Sustainability*

13. A rapid growth of aging population can pose a serious structural challenge to fiscal sustainability. Two main channels are referred to; (1) shrinking working population who are tax payers, and (2) increasing government expenditures for aged related programs, particularly healthcare expenditure. In many high-income countries, pension also plays a crucial role, as important as the healthcare spending. Complementary nature of these two factors will create serious burden on public finance. In other words, the government's ability to collect tax revenue decreases due to a smaller base of tax payers while the government expenditure, particular on healthcare spending, continuously increases.
  
14. The side effect also comes from a reduction in economic growth in corresponding to the diminishing productivity. With this circumstance, the tax collection would be jeopardized. As a foundation of economic and social development and the fundamental source of fiscal revenue, low economic growth will lead to a reduction in national revenues and savings, which in turn generates negative impacts on economic sustainability.



Figure 5. Government Revenue (% of GDP)

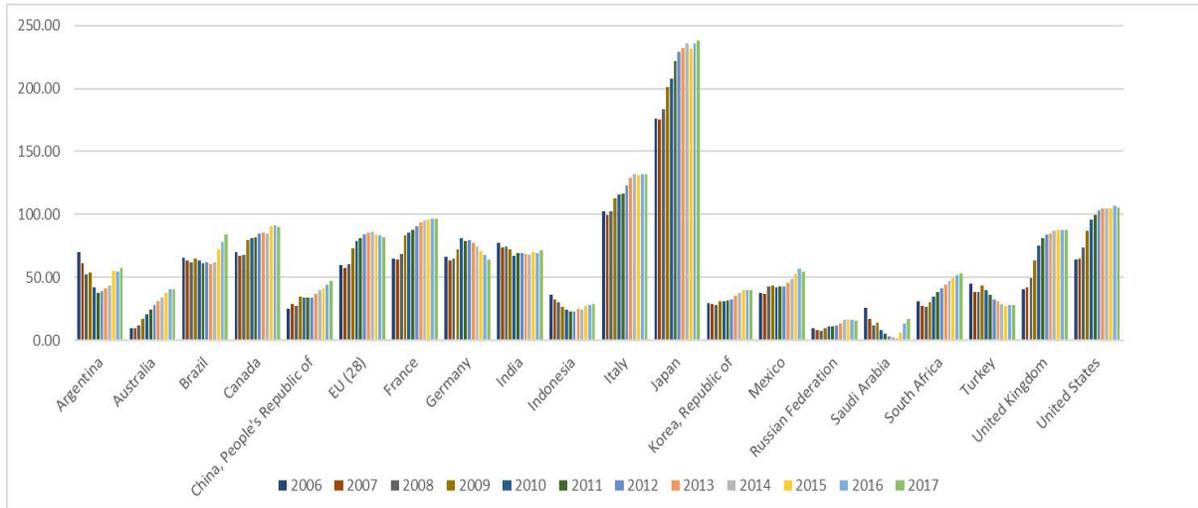


Source: IMF (2018) and EUROStat (2018)

15. For G20 community, though there are yet clear empirical figures to show a decline in government revenue due to population aging, Japan's and Italy's figures show declining trend in these past years (Figure 5). Together, many G20 countries like Japan, Italy, China, Korea, and USA have experienced an increasing rate of gross national debt as a percentage of GDP (Figure 6). In addition to the consequences from the recent financial flux and the global economic turbulence, a substantial increase in government spending can pose a further challenge to fiscal balance. If we consider the government expenditure on public health, most of these countries have increasingly spent a big proportion of health expenditure (Figure 7). As the fiscal revenues are getting smaller and the government expenditure is continuing to increase, massive burden on public finance will be further reflected.

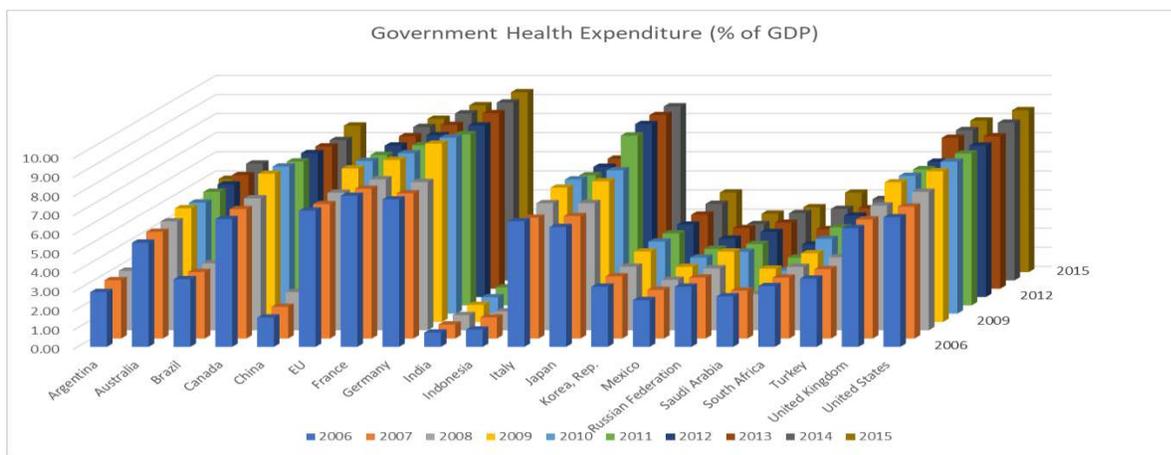


Figure 6. Gross National Debt (% of GDP)



Source: IMF (2018) and EUROStat (2018)

Figure 7. Government Health Expenditure (% of GDP)



Source: World Bank (2018)

16. Consequently, sluggish economic growth can threaten economic and financial stability. Lower economic growth implies a reduction of national revenue and savings that are a foundation of economic and social development as well as the fundamental source for government revenue. With low national income and reserves, a country can put itself at risk of insufficient social development and economic insustainability. On the other



way around, the current high level of both public and private debts in many economies would leave them poorly positioned to handle the coming effects of population aging.

### *Implication to Policy Responses*

17. Besides its impact on economic performance, population aging weakens the effectiveness of traditional macroeconomic – fiscal and monetary - policies as evidenced by Yoshino and Miyamoto (2017).
18. For the fiscal policy side, the effectiveness is lessened through lower total labor supply in the economy. The fiscal balance relies heavily on ability of the government to collect tax. Generally, income tax is the biggest proportion of total government revenue. In principle, aging population pushes down number of workers, who are tax payers, in the economy, which diminishes tax revenue collected by the government. Additionally, when it comes to a pension scheme, retirees receive pension benefits that are financed by taxes and contributions imposed on active workers and issuance of government bonds. Given a fixed amount of pension benefits per retiree, overall burden per worker is substantially raised with a decreasing working population.
19. In terms of monetary policy, the study shows that the positive impact of the expansionary policy on consumption is reduced in an aging economy. This is because a consumption decision of the aged is not affected by a change in interest or inflation rates. Unlike working



population, the consumption behavior of elderlies is inelastic to price changes due to their limited income and their fixed spending behavior. Although the central bank decides to decrease interest rate in order to boost domestic consumption, elderlies will only spend the same on their necessary and/ or routine products. As a result, a ratio of population directly affected by the monetary policy shock decreases. It also implies the declining effect of monetary policy due to diminished marginal productivity of capital faced with an aging population. Taking into account such lowering policy effectiveness, more structured responses and reforms should be in place to address challenges posed by population aging.

## Policy Proposals

20. Any successful policy responses to population aging should be geared to encourage economic growth, higher productivity, and higher income for workers. As such policy proposals to address challenges of macroeconomies and fiscal sustainability arising from population aging are presented in three areas of quantity and quality of labor supply, public finances and pension.

### *Recommendation 1: Comprehensive Structural Reforms for Improving Quantity and Quality of Labor Force*

21. To cope with the diminishing working population, more participation of senior and female workers should be encouraged in



order to maintain the size of labor force. A resultant higher proportion of working population will maintain or enhance tax-payer base as well as help reduce the amount of tax paid by worker transferred pension benefits. With these two factors combined, the results can lead to (i) an increase in government ability to collect more tax revenues, and (ii) a potential increase in productivity, which will be followed by rising consumption, savings, investment, hence, economic growth. There are several ways to facilitate longer works by the elderly including the postponement of retirement by removing mandatory retirement laws, prohibiting discrimination against the elderly, and encouraging government-job creation for the elderly. Measures for removing discriminatory practices towards women and keeping the balance between work and life are important as well to bring in female workers into labor markets. Additionally, promoting the greater role of women's productivity and use of female workers in the healthcare and long-term care systems will improve market efficiency as well as quality of labor force while dealing with aging phenomenon.

22. In particular, keeping elderly people in the labor force for longer period would be a very effective tool as a policy response to decreasing effectiveness of macro policies (Yoshino and Miyamoto, 2017). The logics is quite simple. In the long run, encouraging elderly people to continue working will bring higher output and consequently, a higher level of consumption. As elderlies carry on their employment, they do not rely heavily on social welfare, which could bring a level of tax lower. Thus, the tax burden on the younger generation will decline as



their disposable income, and their consumption, will rise. To facilitate such process would require reform measures in wage system and heavy investment in human capital.

23. The first is to redesign the wage system from the *seniority-based wage system* to performance-based one under which wages are paid at the level of marginal productivity of labor. In a country like Japan, this reform is critically important not only to encourage greater labor force participation among the elderlies, but to create more labor movement towards high-productive segments of the economy. . The second is to invest more in human capital and education. The second is to invest more in human capital and education. As living standard is determined by productivity in the long run, productivity-enhancing life-long education and/ or training programs must be offered to both working and aging populations to overcome individual's technical limitation and ensure their capability to adopt and adapt with technological advance.

### *Recommendation 2: Public Finance Reforms*

24. As population aging rapidly progresses, its fiscal consequences would be enormous. Accordingly, it is imperative for governments to take decisive actions to minimize such fiscal imbalances arising from aging. . As stated, fiscal sustainability hinges on two channels, tax revenue and fiscal spendings, each requiring robust and credible reform measures.



25. As national debt position deteriorates in accordance with population aging, government fiscal balance heavily relies on ability of the government to correct tax. The seemingly easiest way is to raise taxes – payroll, consumption and other taxes. However, a large increase in taxes inevitably leads not only to a growing burden that will result in the reduction of consumption and investment, but to the distortions to economic behaviors. Accordingly, the reform should be more on *expansion of tax base* by restructuring the tax framework to rely more on other types of tax beyond individual income, namely corporate tax, excise tax, and luxury tax. The other option is to carefully review individual income tax structure in relation to the progressive rates to increase the tax base on high income group and adjust the tax base on middle income group. Third possible approach is to reform tax reduction and incentives as well as the tax exemption. These measures would equally allow extra space for government fiscal balance.

26. As for the *reform of government spendings*, a careful review of government expenditure, especially for health care and age-related programs is required to lessen tax burden and fiscal deficit. Most important is to keep costs under control by removing unnecessary and unjustified expenditures that are not linked to improvements in health and other welfare services. The vigours reform measures in the health sector, including more use of market mechanism, demand controls, and supply-side controls, that need to be tailored to each country's



circumstances would be further warranted to stabilize spendings and thus fiscal sustainability.

***Recommendation 3: Reform of Public and Private Pension Schemes***

27. Along with the healthcare system, the public pension is a major segment where an urgent reform should be considered for fiscal sustainability. Firstly, to clearly figure out status of the pension scheme, a long-term actuarial balance management framework should be implemented fully taking into account social, economic, and demographical impacts. An appropriate pension level should be determined based on its impacts on living standard of the elderly, government fiscal and social burdens, and economic growth. The designed framework should be verified regularly on the annual basis to ensure timely responsiveness of the pension scheme to current changes and circumstances. It is also recommended to equip the framework with socioeconomic parameters to capture the effectiveness of the pension scheme.

28. Based on such regular review from the vigorous framework, it is recommended to take relevant measures to improve financial status of a pension scheme. Included are (i) raising retirement age, (ii) increasing contribution rates, (iii) compulsory government subsidy, and (iv) abolishing unjustified benefits. The other option would be to switch from a pay-as-you-go system to a fully or partially funded system. The pension fund, if well-managed, could contribute to national savings, investment and growth while reducing fiscal burdens.



29. A modification of private pension scheme is also recommended to strengthen income security for aged workers. This includes, (i) progressive expansion of employer's obligation in retirement pension program. To encourage progressive employers' contribution, tax incentive or other types of government subsidies may need to be offered. However, it is also essential to evaluate an optimal return for fiscal sustainability, (ii) improvement of asset diversification to enhance financial status, and (iii) upgrading information sharing through building pension database.
30. Consequently, a number of initiatives have been introduced and recommended to ensure the fiscal sustainability in the face of aging population. Given the serious impact of this phenomenon to the economy, the G20 community should take serious consideration to adopt appropriate measures as preparation to cope with the medium and long-term consequences. The statistics continues to show increasing trend of aging population and its negative impacts to the economy, which link to the community's wealth and economic stability.

## References

- Acemoglu, Daron and Restrepo, Pascual (2017). Secular Stagnation? The Effect of Aging on Economic Growth in the Age of Automation. *American Economic Review: Paper & Proceedings*, 107(5): 174-179.
- G20 (2015). *Silver Economy and Aging Society: an Opportunity for Growth and Job Creating within the G20*, Italian Non-Paper.



- Lee, Ronald and Mason, Andrew (2011). The Economic Consequences of Population Aging: Report on a Technical Policy Seminar. National Transfer Accounts Bulletin, East – West Center, Hawaii.
- -----, et. al. (2014). Is low fertility really a problem? Population Aging, Dependency, and Consumption. Science 346 (6206): 229-234.
- ----- (2016). Demographic Dividend. Human Capital, and Saving: Take It Now or Enjoy It Later? Journal of the Economics of Aging 7: 106 – 122.
- Presentation materials from ADBI Seminar on Aging Populations and their Impact on Fiscal Sustainability in the People Republic of China, Japan, and the Republic of Korea on 22 November 2018, ADBI, <https://www.adb.org/news/events/aging-populations-impact-fiscal-sustainability-prc-japan-korea>
- United Nations Economic and Social Commission for Asia and the Pacific (ESCAP) (2016). Population Aging and Fiscal Sustainability in East and North-East Asia, MPFD Policy Briefs, Bangkok.
- United Nations Population Division (2017). World Population Prospects: The 2017 revision. UN DESA.
- Yoshino, Naoyuki and Miyamoto, Hiroaki (2017). Declined Effectiveness of Fiscal and Monetary Policies Faced with Aging Population in Japan, Journal of Japan and the World Economy 42, Elsevier, Tokyo.