Population Aging: Need for Structural Reform of the Japanese Employment System

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Japan's economy has suffered from long-term stagnation that dates back to the bursting of its bubble three decades ago. This paper shows that population aging is one of the important causes of Japan's slowing growth and the accumulated huge government debt. We also show that monetary and fiscal policies are not effective in boosting growth in an economy with an aging population. Key to the recovery of the Japanese economy is labor market reform. Postponing the retirement age and introducing productivity-based wage rates could mitigate the decline in the labor force and improve output and broad-based consumption. In order to keep elderly workers in the workforce, various robots and technological progress suited to an aging society have to be developed. Japanese engineers are ready to cope with technological progress to help elderly workers. Innovation could be accelerated by allowing elderly workers to stay in the labor force.

Recent Slower Growth of the Japanese Economy

Japan's economy has suffered from long-term stagnation since the bursting of the bubble in the early 1990s, often called the "lost decades". To restore the Japanese economy, the government has implemented a mix of fiscal and monetary policies including a zero interest rate policy, quantitative and qualitative monetary policy, and negative interest rate policy, along with large expansionary fiscal packages. The Bank of Japan (BOJ) started its zero interest rate policy in 2012 and the quantitative easing policy was initiated by Governor Haruhiko Kuroda in 2014. As Japan still faced slow growth despite its aggressive monetary policy, in January 2017 the BOJ started its negative interest rate policy by setting the short-term interest rate in negative territory. Furthermore, the BOJ started to buy not only short-term treasury bills but also medium-term and long-term government bonds, with Japanese government bonds of up to 10-year maturity having negative interest rates. But these macroeconomic policies have not succeeded in restoring the Japanese economy.

What is the root cause of the long-term stagnation of the Japanese economy? Our answer is changes in Japan's demographic structure.

Demographic Changes in Japan

Due to steady declines in the fertility rate and rising life expectancy, Japan is undergoing a sustained process of population aging. As seen in *Chart 1*, Japan's old-age dependency ratio (the proportion of people aged 65 or older in the working-age population) has been rising for several decades and is projected to increase further. Japan is far ahead of other countries. In 2018, Japan's old-age dependency ratio was 47%, the highest in the world, and is projected to be more than 70% in 30 years' time.

These demographic changes could cause qualitative and quantitative changes in demand and supply for the whole economy. But how exactly does population aging affect the performance of an economy? Moreover, would population aging alter the effectiveness of monetary and fiscal policies?

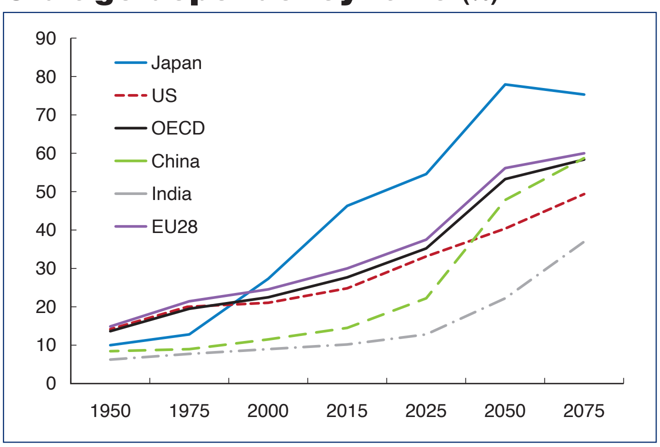
Fiscal Impact of Population Aging

In Japan, social security costs have been increasing as population aging proceeds. *Chart 2* shows that currently more than one-third of the Japanese government budget is directed to social security. On the other hand, expenditures on education and R&D are only 5.4%. In the early 1980s, the share of social welfare was only about 10% as the Japanese population was much younger in those days. Increased social security costs have contributed to the huge budget deficits of Japan and thus the debt to GDP ratio has gone up to about 240%.

Macroeconomic Effects

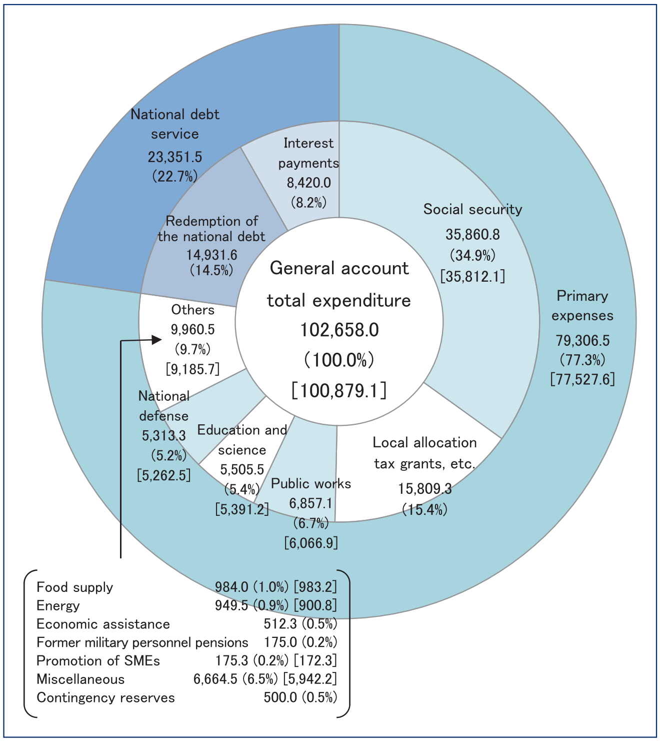
We now turn to see how population aging affects an economy,

CHART 1
Old-age dependency ratio (%)



Source: United Nations

CHART 2
General Account expenditure



Source: General Budget of Japan (MOF)

based on our study that uses a dynamic stochastic general equilibrium (DSGE) model where the retired population would gradually increase as time goes on ("Declined Effectiveness of Fiscal and Monetary Policies Faced with Aging Population in Japan", *Japan and the World Economy*, Volume 42, 2017).

Consumption by elderly people is less than that of the younger generation. This is because young people have to pay for their children and for their families much more than elderly people do. Furthermore, elderly people in Japan feel uncertain about their pensions and social welfare so that they tend to spend less than before. Pension benefits are expected to decline due to the longer life expectancy in Japan compared to previously.

Indeed, our model demonstrates that population aging, marked by a decline in the proportion of the working population, increases social security spending, which increases taxes for workers and therefore reduces aggregate output and consumption in the long run *(Chart 3)*.

Monetary Policy in an Aging Economy

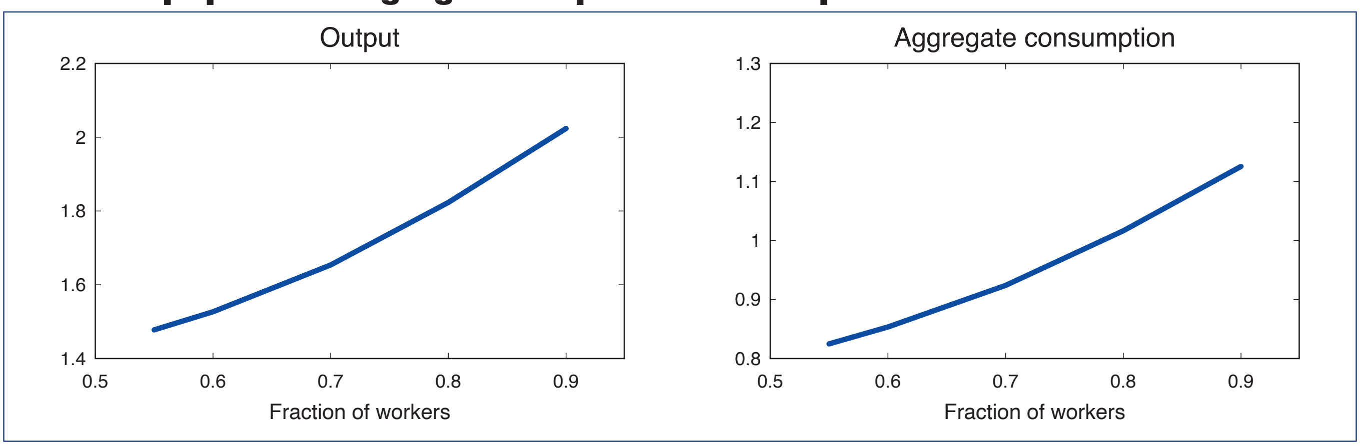
Our model also finds that the effectiveness of monetary policy declines as aging of the population progresses. This can be understood as follows. When the population is young, many people are working in society and the number of retirees is small. An expansionary monetary policy lowers interest rates, which encourages companies to invest to their businesses. Higher investment will have a multiplier effect on the economy. Those who are working in a company will receive higher income and thus increase their consumption. This will further increase GDP.

However, in an aging society, the number of those who will be affected by monetary policy diminishes. Retired people are not receiving salaries and bonuses. They rely on pensions and social security. Those who have financial assets in Japan put their money mainly in bank deposits rather than in the stock market. Lower interest rates will lower their interest income from deposits, which reduces their consumption. Monetary policy lowers the spending of retired people rather than increasing their consumption. If the retired population becomes larger and larger, the effectiveness of monetary policy diminishes. Despite the BOJ's monetary policy, the Japanese economy has not recovered for a long period of time.

Effect of Aging on Fiscal Policy

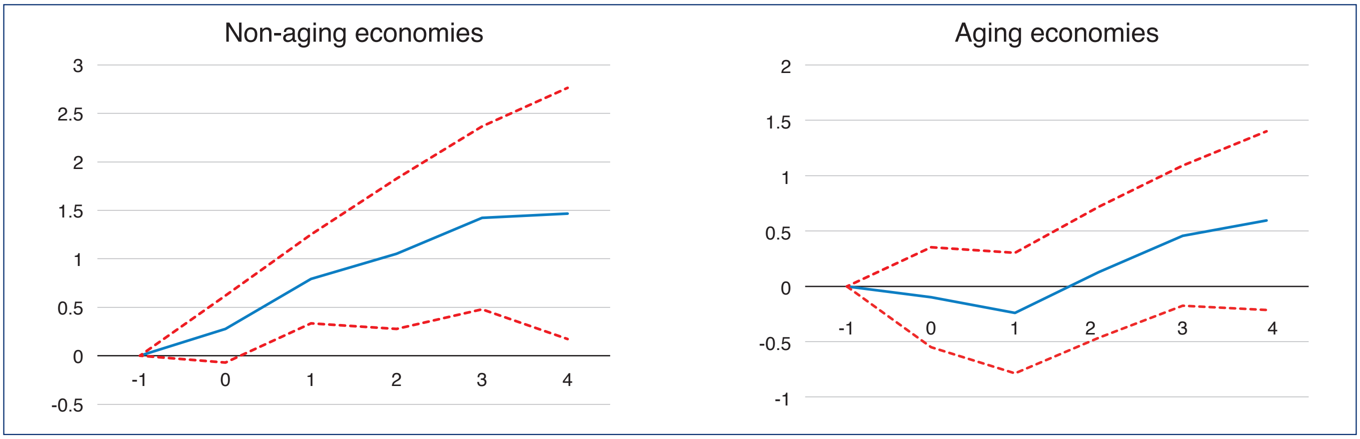
If monetary policy is less effective, fiscal policy needs to play a larger role to boost an economy. Our research ("How does population aging affect the effectiveness of monetary and fiscal policy?", *Global*

CHART 3
Effect of population aging on output & consumption



Source: "Declined Effectiveness of Fiscal and Monetary Policies Faced with Aging Population in Japan" by Naoyuki Yoshino and Hiroaki Miyamoto, Japan and the World Economy, Volume 42, 2017

CHART 4
Population aging & effects of government spending shocks



Note: t=0 is the year of the shock. Solid and dash lines denote the point estimates and 90% confidence bands, respectively.
Source: "How does population aging affect the effectiveness of monetary and fiscal policy?" by Naoyuki Yoshino and Hiroaki Miyamoto, Global Solutions Journal, Issue 5, 2020

Solutions Journal, Issue 5, 2020), however, finds that the effectiveness of fiscal policy in boosting growth would be weakened in economies with older populations. As *Chart 4* shows, fiscal stimulus in non-aging economies has a significantly positive effect on growth, but the effect is much weaker in aging economies.

The reduced effectiveness of fiscal policy can be explained as follows. Fiscal stimulus, such as public investment, increases employment opportunities and raises people's income. As a result, consumption will increase and thus total demand will increase. To meet the increased demand, companies expand their production, which further increases their income. Thus, increased government spending can boost output even more. However, this multiplier effect does not affect the retired elderly as they are not looking for jobs. Thus, the effectiveness of fiscal policy in boosting output becomes weaker in an aging economy.

True Remedies in an Aging Society

It is often believed that monetary and fiscal policy will cure a depressed economy. However, our analysis shows that neither monetary policy nor fiscal policy can boost the Japanese economy as population aging proceeds. Based on our model analysis, the solution to restoring the Japanese economy is to keep older people working and compensate them according to their productivity rather than their seniority.

The seniority-based wage system was made possible under the rapid growth period of the 1960s and 1970s. As the economy kept growing, companies needed to recruit more workers and to train them. Since the economy was growing and inflation was progressing, with training and skill upgrading, wages also increased and thus the seniority-wage system was formed. However, under this wage system, workers' wages and productivity tend to deviate toward the end of their career and thus companies are not likely to keep older workers.

As companies could recruit young people every year, company pension systems had plenty of contributors and small numbers of recipients. Longevity in Japan was not so great in those days. But the current Japanese economy faces a quite different environment. After retiring from their companies in their 60s, many people will live until their 80s. A smaller young generation has to support a growing number of retirees. The Japanese economy cannot afford to support growing numbers of elderly people with a lower number of younger people.

Japan has to increase its working population. The best policy will be to postpone the retirement age and ask people to work as long as possible. As a matter of fact, some surveys show that many elderly people want to work and contribute to society. Robot and technological progress would enable even elderly workers to contribute to a company. At the same time, the seniority wage system has to be changed by introducing a productivity-based wage rate. If elderly employees are paid by their productivity, companies would not be hesitant to keep them. Japan can reduce its social security payments by employing elderly workers. Various robots can be created in order to help elderly workers stay in the workforce. Technological progress will push up production in the Japanese economy by reducing social welfare spending and by increasing R&D expenditures. The tax burden of the younger generation will be reduced and government budget deficits will be smaller.

What will be needed in Japan is not to rely on monetary and fiscal policy, but to implement structural reforms in the labor market. Japan is aging more rapidly than other countries. Its experience could provide a good example of how to cope with an aging population to other nations. JS

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