Review of Economic Dynamics 27 (2018) 81–100

Contents lists available at ScienceDirect

Review of Economic Dynamics

www.elsevier.com/locate/red

Policy uncertainty and cost of delaying reform: The case of aging Japan

Sagiri Kitao [1]

Keio University, Faculty of Economics, 2-15-45 Mita, Minato-ku, Tokyo, Japan

ARTICLE INFO

Article history:
Received 28 October 2016
Received in revised form 3 October 2017
Available online 16 November 2017

JEL classification:
E20
H55
J11

Keywords:
Pension reform
Policy uncertainty
Aging demographics
Fiscal sustainability
Japanese economy

ABSTRACT

Reform is inevitable in an aging economy with a generous pay-as-you-go social security system. Often, however, the timing and structure of reform are unknown. We explicitly model policy uncertainty in a general equilibrium life-cycle model and let agents update expectations and react as uncertainty is resolved over time. Using the case of Japan, a country facing severe demographic and fiscal challenges, we quantify welfare tradeoff across generations by delaying reform or reducing its scope. Individuals respond to a delay by dis-saving and working less, while facing higher taxes to cover additional expenditures during the transition. Fiscal uncertainty itself has a more significant adverse effect on older individuals, who face greater income risks and a lower return on their retirement savings.

1. Introduction

Japan is aging rapidly. The ratio of the elderly to the working age population is projected to rise from a little below 0.4 in 2010 to more than 0.8 by 2050.[2] We all anticipate that the current pay-as-you-go social security system will not last long as it is. Unknown to us is when and how it will change. This paper explicitly models uncertainty associated with the timing and structure of a social security reform in an aging economy. We focus on the case of Japan, which faces the most significant and rapid transformation of a demographic structure during coming decades.

We build a life-cycle model, in which individuals anticipate a rise in government expenditures and a decline in tax revenues driven by demographic aging. They make optimal decisions taking into account the possibility that the current social security policy and tax system will change in the future. We quantify responses of individuals and the macroeconomy when uncertainty is resolved and measure the welfare costs imposed on current and future generations by reform delays and uncertainty per se.

E-mail address: sagiri.kitao@gmail.com.

[1] The author thanks the editors, three anonymous referees, Frank Caliendo, Ippei Fujiwara, Cagri Kumru, Jaelang Lee, Masayuki Morikawa, Chung Tran and participants at various seminars and conferences for helpful comments and suggestions. The author is also Faculty Fellow at the Research Institute of Economy, Trade and Industry (RIETI). The study has been conducted as part of the project "On Monetary and Fiscal Policy under Structural Changes and Societal Aging" at the RIETI. This work was also supported by JSPS Grants-in-Aid for Scientific Research (C) JP16K03705. All errors are the responsibility of the author.

[2] The old-age dependency ratio is computed as a ratio of the population at and above 65 to that of 20–64, based on estimates and projections of the National Institute of Population and Social Security Research (IPSS) in 2012.

https://doi.org/10.1016/j.red.2017.11.005
1094-2025/

In one scenario, we let replacement rates gradually decline by about one-third but individuals not know when reform will begin. When individuals learn that reform does not occur in a given year and has been delayed, they decumulate wealth and reduce labor supply. Each 10-year delay implies an approximately 2 to 3 percentage decline in capital and output, together with a rise in fiscal burden equivalent to 5 percent of total consumption at maximum. Future generations are worse off by 1.5 to 2 percent in consumption equivalent variation if they are born in an economy where reform has been delayed by 10 years.

Uncertainty itself hurts middle-aged and older individuals. Policy uncertainty implies a rise in volatility of future income at the micro level, and induces more savings by individuals. Interest rates will be lower, reducing returns on retirement savings while the elderly benefit less from higher wages. They also face the chance of a major drop in income very soon, when they are close to the retirement age, or have retired already and do not have much time to accumulate retirement wealth by working longer or saving more. Future generations would prefer a policy that starts reducing benefits and consolidating the system at the earliest timing. Results suggest that reform should have been undertaken much sooner and uncertainty should have been resolved by now, which could have improved the welfare of current and future generations.

There is a wealth of literature that analyzes fiscal policies and social security reforms using a general equilibrium life-cycle model.[3] There has been a series of recent papers focused on the Japanese economy using a similar framework.[4] These papers assume that individuals know the policy path in advance.

Caliendo et al. (2015) and Bütler (1999) are two exceptions that incorporate policy uncertainty and they are perhaps the closest in terms of focus to our paper. Caliendo et al. (2015) build a model of heterogeneous agents with uncertainty in the timing and structure of a social security reform. They find that the welfare cost of policy uncertainty is minimal for those with enough savings, but can be much larger for non-savers.[5] Bütler (1999) studies the roles of policy uncertainty in a life-cycle model calibrated to the Swiss economy. She finds that there can be a substantial increase in savings and labor supply before reform and quantifies changes in the volatility of individuals' policy functions. Gomes et al. (2012) investigate effects of policy uncertainty in terms of ages at which individuals learn that reform reducing social security benefits will take place.

In contrast to these papers, our focus is on uncertainty in social security policy and fiscal challenges associated with and driven by aging demographics. Rapid aging and a rise in the old-age dependency ratio make it increasingly costly to finance transfer expenditures under a status-quo pay-as-you-go scheme. A delay of necessary reforms intensifies the fiscal burden and exacerbates the imbalance each year. We emphasize changes in fiscal and welfare costs across generations, as well as effects of general equilibrium adjustments associated with policy uncertainty in such an economy.

This paper is organized as follows. Section 2 explains Japan's demographic situation and provides a background for the numerical exercises. Section 3 presents the model and Section 4 discusses parametrization of the model. Numerical results are presented in Section 5 and Section 6 concludes.

2. Background: aging Japan

This section provides a brief overview of the Japanese demographic situation and its fiscal challenges. While developed economies will all face a major shift in demographics and rising public expenditures during the coming decades, problems are the severest in Japan. The total fertility rate has been well below the replacement level since the mid-1970s and stands at 1.46 in 2015. The prolonged low fertility rates imply a long-lasting decline in the labor force. The working-age population of ages 20–64 stood above 75 million in 2010, but will fall to 41 million by 2060 according to official projections. At the same time, the first baby-boomer generation born after the war are now reaching retirement age, followed by another wave of retirement by the second baby-boomers in about 20 years. Japanese life-expectancy is among the highest in the world, 81 for males and 87 for females.

As a result of the low fertility rates, retirement of baby-boomers and rising longevity, the old-age dependency ratio, defined as a ratio of the population aged 65 and above to that of 20 to 64, will rise sharply and stay at an elevated level throughout the century. Fig. 1 shows the projections of the dependency ratio in Japan and several other countries. It demonstrates that the speed and magnitude of demographic aging are remarkable even compared to other countries that face similar challenges.

The ongoing shift in Japan's demographics poses a serious issue of fiscal sustainability. Expenditures for the elderly through social security and medical insurance programs will rise rapidly while tax revenues decline as the labor force and population shrink.

[3] Contributions in the literature include De Nardi et al. (1999), Conesa and Krueger (1999), Huggett and Ventura (1999), Attanasio et al. (2007), Nishiyama and Smetters (2007), İmrohoroğlu and Kitao (2012) and Kitao (2014).

[4] See, for example, Braun and Joines (2015), Kitao (2015) and İmrohoroğlu et al. (2017).

[5] One major difference from Caliendo et al. (2015) is that we build a general equilibrium model in which factor prices are determined endogenously. We identify sizeable changes in individuals' saving and labor associated with policy innovations, which induce a major shift in factor prices and affect individuals' welfare. Our model also endogenizes labor supply and the government budget, which Caliendo et al. (2015) assume as exogenous. Imposing a budget constraint is important in the context of demographic aging, which is the focus of our paper but not theirs, because budget-balancing taxes are different depending on the timing of reform and it makes a significant difference in which generation will bear the cost of a demographic transition. Bütler (1999) also assumes exogenous factor prices.