



# Intergenerational redistribution policies of the 1990s and 2000s in Japan: An analysis using generational accounting



Naomi Miyazato\*

*Nihon University College of Economics, 1-3-2 Misaki-cho, Chiyoda-ku, Tokyo 101-8360, Japan*

## ARTICLE INFO

### Article history:

Received 5 July 2012

Received in revised form 2 October 2014

Accepted 4 February 2015

Available online 11 March 2015

### JEL classification:

H20

H50

H60

J11

### Keywords:

Intergenerational redistribution policy

Generational accounting

Demographic uncertainty

## ABSTRACT

This paper uses generational accounting to analyze the intergenerational redistribution policies implemented in Japan in the 1990s and 2000s. I consider the extent of intergenerational redistribution and use time series data to examine the changes in these policies. The results show that the policies of the 1990s led to a reduction in the financial burden of the present generation, including people in their 20s, by passing this burden on to future generations. This situation lasted through the early half of the 2000s, but changed in the latter half of that decade. The decline in the lifetime net burden of the future generation between 2004 and 2007 was achieved by increasing the lifetime net burden of those in the young generation and not by reducing the remaining lifetime net benefit of the retired generation. The decline in the burden of the future generation in the latter half of 2000s was, however, not sufficient to correct the degree of generational imbalance in 1990.

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## 1. Introduction

It is well known that the Japanese birthrate is declining very rapidly and the country's population is aging very fast. In 2008, the Japanese birthrate was 1.37 children per woman, while the ratio of elderly people to the population as a whole was 22.1%.<sup>1</sup> This situation is leading to an imbalance in the financial burden of government and social programs across the generations, which many have attributed to the pay-as-you-go social security system. A useful way of quantifying this imbalance is the “generational accounting” method developed by Auerbach et al. (1991). Generational accounting is able to measure the present discounted value of the net benefit of the government for each generation. This information is very useful in quantifying intergenerational redistribution policies and assessing imbalances in the financial burdens on different generations. Previous studies have used generational accounting to estimate these imbalances in many countries. These studies generally make an estimation at one point in time, or with reference to policies in effect at a certain stage, and conduct simulation analyses to measure the extent to which intergenerational

imbalances could be reduced by policy changes. In contrast, this study uses generational accounting to assess the extent of intergenerational redistribution, not at one point only, but over time. This enables us to consider and evaluate intergenerational redistribution policies that have actually been adopted. This study analyzes the relevant policies adopted by Japan in the 1990s and 2000s and uses both old and new population projections to calculate the lifetime net burden on the future generation. This reveals the effects of the downward revision of population projections on the lifetime net burden of the future generation. My approach derives the estimation results by successively calculating the intergenerational burdens for each year in the series (from 1990 to 2007). These estimates allow me to track redistribution policy changes and see when these changes occur. When the burden on future generations becomes lighter or heavier, I am able to determine which generations or cohorts have contributed to these changes. These points have not been investigated sufficiently in previous studies, and are the major innovations of the present paper.

One study that uses a time series for generational accounting is that of Gokhale et al. (1996). Their study analyzes the relationships between lifetime net burden and saving rates for each cohort in a time series and finds correlations between the declining lifetime net burden of retired cohorts and their declining saving rates. However, they do not consider the transition of a net burden to the future generation.

\* Tel.: +81 3 3219 3466; fax: +81 3 3219 3466.

E-mail address: [miyazato.naomi@nihon-u.ac.jp](mailto:miyazato.naomi@nihon-u.ac.jp)

<sup>1</sup> National Institute of Population and Social Security Research (2010).

My estimation procedures are essentially the same as those used by Takayama et al. (1999), who use standard definitions of variables to conduct international comparisons using generational accounting. However, my study uses a broader range of time series data from the Annual Report on National Accounts, the Family Income and Expenditure Survey, the National Survey of Family Income and Expenditure, and the Population Census and Population Projections for Japan. Using these data, I construct datasets for each of the 18 years from 1990 to 2007. I then use both old and new population projections to calculate the lifetime net burden of the future generation. To my knowledge, there are no comparable datasets for Japan covering more than 10 periods and using both old and new population projections.

My estimation results can be summarized briefly as follows. During the 1990s, the lifetime net burden of the present generation, including those in their 20s, decreased every year, while the lifetime net burden of the future generation increased every year. This situation lasted through the early half of the 2000s. However, policy stances on intergenerational redistribution changed in the latter half of the 2000s. Over this period, the lifetime net burden for those in their 20s, 30s, and 40s grew heavily, while that of those aged 50 and over remained constant. Although the lifetime net burden of the future generation decreased, the decline in this burden was not sufficient to offset the generational imbalances of the 1990s. A comparison of population projections made in 1992 with those made in 2002 shows that the population aged more and the birthrate declined more than had been expected, leading to an increase in the lifetime net burden of the future generation by approximately 32%.

This paper is structured as follows. Section 2 reviews the existing literature. Section 3 describes the estimation procedures and my data. Section 4 provides my estimation results, and Section 5 concludes the paper.

## 2. Literature review

Generational accounting is an analytical method of calculating the lifetime net amount owed to the government by present and future generations, assuming that the present structure of payments and benefits does not change. According to Auerbach et al. (1991), the lifetime net burden of the future generation in the United States is 17–24% larger than that of the generation born in 1989. Their results reveal that a portion of the government services received by the present generation is supported by an increase in the financial burden on future generations. Subsequently, Auerbach et al. (1992, 1994) analyzed the intergenerational imbalance in the U.S. with updated data. In these studies, they set a precedent for using generational accounting to analyze generational imbalances in other countries.

In Japan, generational accounting has been used by the Economic Planning Agency (1995), Aso and Yoshida (1996), Hidaka et al. (1996), Miyazato (1998), and Masujima et al. (2009) to analyze intergenerational imbalances. Unlike U.S. researchers, Japanese researchers have limited access to micro-datasets, and so have had to substitute these with aggregate data to estimate the lifetime net burdens of the generations. The Economic Planning Agency (1995), Aso and Yoshida (1996), and Miyazato (1998) mainly use data from the Family Income and Expenditure Survey to estimate the lifetime net burdens of generations, which they define in units of 10 years because of data constraints.<sup>2</sup> In contrast, Hidaka et al. (1996) estimate the lifetime net burdens of generations in units of one year, in accordance with the Basic Survey on Wage Structure,

<sup>2</sup> Moreover, data constraints prevent these studies from estimating the lifetime net burden of members of the present generation who are below 20 years of age.

and find that the lifetime net burden of the future generation is 168.9% greater than that of the present generation. Aso and Yoshida (1996) estimate that the lifetime net burden of the future generation is 54.2% larger than that of the present generation, while the Economic Planning Agency (1995) and Miyazato (1998) calculate the lifetime net burden of the future generation at 51.0% and 112.3% larger than that of the present generation, respectively. Masujima et al. (2009) recently estimated the lifetime net burdens in Japan, concluding that the lifetime net burden of the future generation is 207.5% larger than that of the present generation in 2005.

Auerbach et al. (1999) employ generational accounting to analyze intergenerational redistribution in 17 countries.<sup>3</sup> Among these countries, Japan has the largest estimated intergenerational imbalance, with the burden of the future generation at 169.3% more than that of the present generation. Japan is followed by Italy (131.8%) and then Germany (92.0%). Of the countries assessed, the burden is lightest in Sweden, where the lifetime net payments of the future generation are 22.2% less than those of the present generation, while in New Zealand the future generation shoulders a burden 3.4% lighter than the present generation. In the United Kingdom, the lifetime net burden of the future generation is 28.4% greater than that of the present generation (Cardarelli et al., 2000).

In addition, recent studies that use generational accounting to analyze intergenerational redistribution have been conducted by Auerbach and Chun (2006) and Chojnicki and Docquier (2007). The former study incorporates a detailed analysis of the South Korean medical system, and the latter investigates the impact of education on the intergenerational imbalance in the United States. Chojnicki and Docquier (2007) found that, when they considered increases in the advancement rate (the ratio of students going on to higher levels of education), their results were more optimistic than when they used conventional methods to estimate the intergenerational imbalance. However, even when considering the effect of education, an imbalance in the financial burden between generations occurs, and it is necessary either to raise the tax rate by 1.2% or to reduce pension benefits by 2.7% in order to eliminate it.

The abovementioned studies mainly use generational accounting to examine the extent of intergenerational redistribution at a certain point in time and conduct simulation analyses. Here, I consider not only the extent of intergenerational redistribution in Japan, but also changes in relevant policies, as revealed through time series analysis.

## 3. Estimation procedures and data

### 3.1. Estimation procedures

Generational accounting considers payments to the government to be a burden on households, and payments received from the government to be a benefit. The present discounted value of the net burden or net benefit from the government is calculated over the lifetime of each generation. Therefore, if the behavior of households conforms to the lifecycle hypothesis,<sup>4</sup> generational accounting is a good index for assessing the effect of fiscal policy. In addition, generational accounting provides important information

<sup>3</sup> These countries are Argentina, Australia, Belgium, Brazil, Canada, Denmark, France, Germany, Italy, the Netherlands, New Zealand, Norway, Sweden, Thailand, Japan, Portugal, and the USA.

<sup>4</sup> Ihori et al. (2002) found that Japanese data do not support Barro's neutrality theorem, while Hayashi (1985) found that approximately 15% of Japanese households face liquidity constraints. Thus, it is reasonable to assume that the behavior of Japanese households conforms to the lifecycle hypothesis, lacks the altruistic bequest motive, and is unbound by liquidity constraints.

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