



# Health insurance reform and economic growth: Simulation analysis in Japan<sup>☆</sup>

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## ABSTRACT

This paper evaluates the drastic reforms of Japanese public health insurance initiated in 2006. We employ a computable general equilibrium framework to numerically examine the reforms for an aging Japan in the dynamic context of overlapping generations. Our simulation produced the following results: first, an increase in the co-payment rate, a prominent feature of the 2006 reform, would promote economic growth and welfare by encouraging private saving. Second, the ex-post moral hazard behavior following the increase in co-payment rates, however, reduces economic growth. Third, Japan's trend of increasing the future public health insurance benefits can mainly be explained by its aging population, and increasing the co-payment rate does little to reduce future payments of public health insurance benefits. Fourth, the effect on future economic burdens of reducing medical costs through efficiencies in public health insurance, emphasis on preventive medical care, or technological progress in the medical field is small. Finally, a policy of maintaining public health insurance at a fixed percentage of GDP will require reducing public health insurance benefits, perhaps up to 45% by 2050. Such a policy also reduces economic growth until approximately 2035. Our simulation indicates that the reform does not significantly reduce future public health insurance benefits, but it can enhance economic growth and welfare by encouraging private saving.

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## 1. Introduction

Japan has undergone one of the most drastic reforms of public health insurance since the present system was launched. Begun in 2006, several reforms have been implemented gradually and necessarily, because Japan's public health insurance program could be unsustainable as its population ages. Since medical expenditure by people 65 and older are more than half of Japan's total medical expenditure,<sup>1</sup> the reform particularly aims at decreasing medical expenditure by the elderly. This study investigates the effect of the 2006 reform on economic growth of Japan by simulating scenarios

involving an aging populace in a dynamic context of overlapping generations in a general equilibrium framework.

Japan's current ratio of the national medical expenditure to GDP exceeds 8% and is growing faster than the economy. Their effect on GDP is no longer negligible, and trends imply that their effect on economic growth could increase in future. Detailed numerical examination of the reform's effects on growth is warranted.

Another factor motivating reform is the prospect that future generations would pay higher premiums for public health insurance, if the current program is maintained. This study differs from previous studies in numerically exploring and evaluating intergenerational effects of reform through a multi-period overlapping-generations model developed by Auerbach and Kotlikoff (1983) within a general equilibrium framework.<sup>2</sup>

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<sup>1</sup> About 30% of the total national medical expenditure was spent by the age group of 75 and over in year 2006.

<sup>2</sup> Although many empirical studies on the Japanese health care system have been conducted, almost all use a partial equilibrium framework. Japan's health care system has not been examined within a general equilibrium framework. See Ii and Bessho (2006) for the existing empirical literature.

It has been empirically observed that changes in co-payments, a prominent feature of the 2006 reform, have little effect,<sup>3</sup> and empirical studies using micro-data have found little evidence of ex-post moral hazard in individual behavior. However, the literature has evaluated the behavioral consequences of changing co-payment rates within a partial equilibrium framework and left unexplored the effects on the macro-economy and on the welfare of disparate generations. This study numerically examines, within a general equilibrium framework, the effect of changing the co-payment rate over time on the macro-economy and intergenerational welfare.

The reform seeks to reduce national medical expenditure by improving efficiency in providing medical services and by urging practitioners to augment preventive care. As Hiroi (1994) pointed out, however, technological advances might induce increases in national medical expenditure. Thus, this study simulates the effects of increases and decreases in national medical expenditure via reform. Some advocate limiting the growth rate of Japan's national medical expenditure to the rate of economic growth. This argument is also evaluated numerically.

Our simulation results indicate that the reform is not particularly effective in reducing future national medical expenditure. On the other hand, an increase in the co-payment rate would promote economic growth and welfare by encouraging private saving. However, the magnitude of the effect on economic growth is not large. The effect on future economic burdens of reducing medical costs through efficiencies in public health insurance, emphasis on preventive medical care, or technological progress in the medical field is also small. These results suggest that Japan's trend of increasing the future public health insurance benefits can mainly be explained by its aging population.

This paper is organized as follows: the next section introduces the Japanese health care system. Section 3 explains reforms initiated in 2006. Section 4 simulates the effect on economic growth and burdens of changes in key instruments by incorporating population aging. Section 5 concludes.

## 2. The Japanese health care system

The demand side of Japan's health care system is characterized by guaranteed free access to services at any medical institution and compulsory coverage of all age and income groups.<sup>4</sup>

Free access implies that people can receive consultations, treatments, and procedures at any medical institution without referrals, and patients can decide where and when they seek medical services.

Universal and compulsory coverage means everyone must contribute to an insurer consisting of the public health insurance,<sup>5</sup> based on their employment.<sup>6</sup> It consists of several insurers,<sup>7</sup> as shown in Fig. 1. Japanese public health insurance can be categorized according to type of employment, employment-based health insurance, and other types of insurance. Persons not insured under an employment-based policy are insured by the Local

<sup>3</sup> See Li and Bessho (2006), which mainly surveyed the empirical literature where the micro data were used.

<sup>4</sup> There is a separate public health insurance for long-term care (*Kaigo Hoken*). Since persons of age 40 and over also must contribute to long-term care insurance, Japanese public health insurance can be interpreted as being compulsory and universal. Persons 65 and older are category 1 insured and are entitled to long-term care through public long-term care insurance. Persons of age 40–64 occupy category 2. They usually are ineligible to receive public long-term care, but they must contribute to the system.

<sup>5</sup> All dependents and retired persons are also insured.

<sup>6</sup> The number of insured persons who have not paid the compulsory premium has been increasing. However, this study does not discuss that issue.

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Governments' National Health Insurance (*Shichoson Kokuho*). Some self-employed persons have individual public health insurance through networks serving persons in similar professions such as medical doctors and barbers; such insurance is integrated into the Unions of National Health Insurance (*Kokumin Kenko Hoken Kumiai*). Self-employed persons not insured by a provider affiliated with Unions of National Health Insurance are insured by Local Governments' National Health Insurance. Together, Local Governments' National Health Insurance and the Unions of National Health Insurance are called National Health Insurance (*Kokuho*). Employees' health insurance is of four types: Seamen's Insurance, Mutual Aid Associations, insurance by National Federations of Health Insurance Societies, and insurance by Japan Health Insurance Association. Table 1 shows several insurers comprising the public health insurance system.

Almost all medical services are covered by public health insurance,<sup>8</sup> and the costs of medical services, including drugs prescribed at medical institutions, is financed by premiums paid for public health insurance, public funds (taxes), and co-payments. The co-payment rate depends on age and not on the differences among insurers.<sup>9</sup> All insured persons can obtain almost all medical services by paying a co-payment at any medical institution when they receive treatment.

In terms of public health insurance for the elderly, the government introduced a system in 2008 to address the unequal distribution of financial burdens among different bodies consisting of the public health insurance. Fig. 2 shows the new public health insurance for the elderly. In general, employees purchase their own insurance through premiums paid during their working lives.<sup>10</sup> After retirement, they fall under National Health Insurance. People usually require more medical services as they age, implying that National Health Insurance acquires more "costly" persons who did not contribute to it during their careers. Hence the government has divided persons 65 and older into two groups shown in Fig. 2. The first includes persons aged 65–74. Persons in this group retain their previous insurance after retirement, but the biased distribution of financial burden is adjusted among different insurers according to the ratio of the number of the elderly to the total number of persons each insurer insures. Every person 75 and older moves to a new public health insurance called *Choju Iryo Seido*, as discussed in Section 3.

The supply side of Japanese health care can be described as fee-for-service.<sup>11</sup> Japan's medical fee system (*Shinryo-hoshu Seido*) is based on government-allotted points specified for all treatments, procedures, and drugs covered by public health insurance. Payment for covered services is made to medical institutions based on these points. Points include income of physicians generated by the provision of medical services.<sup>12</sup> Since almost all medical services are covered by public health insurance, government essentially determines prices for medical services,

<sup>8</sup> For instance, normal births and cosmetic surgeries are not covered by public health insurance. Many expensive medical services also are excluded from coverage.

<sup>9</sup> Current co-payments range from 20 to 30%. The rate depends on different insurers, although the range is regulated by law.

<sup>10</sup> As explained in Section 4.2.3, public health insurance premiums are usually paid on a monthly basis, as a short-term contribution to the social insurance program, together with a contribution to the public pension. The contribution to the public pension is called a long-term contribution in the program. Social insurance consists of several provisions; public health insurance and the public pension are Japan's primary social insurance schemes.

<sup>11</sup> Several hospitals have moved to the prospective reimbursement scheme with Diagnosis Procedure Combinations (DPC), Japan's version of diagnosis-related grouping (DRG). However, many medical services are still based on the fee-for-service scheme.

<sup>12</sup> One point is equivalent to 10 Japanese yen. For example, a physician who provides treatment assessed at 1000 points can claim 10,000 Japanese yen minus the patient's co-payment to the insurer.

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