Chapter 1

Simulation Analysis of Japanese Future Fiscal Conditions under the Integrated Reforms of Expenditure and Revenue 2006

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1. Introduction

The fiscal condition of the Japanese government, both central and local, is serious. The amount of government debt has reached 773 trillion yen—the sum of the central and local government debt—and its ratio to GDP is approximately 150%. This is the worst level among developed countries.

In addition, a decline and aging of the population has been progressing rapidly in Japan. This means increased public expenditure, especially for social security benefits are required by elderly, and a decline of younger people who bear the burden of most taxes and social security contributions.

Considering this situation, the Japanese government decided to implement fundamental fiscal reforms, not only to reduce expenditure but also to increase revenue. In Japan, it is called the “Integrated Fiscal Reform of Expenditures and Revenues.” The targets and roadmap have been presented in “Basic Policies for Economic and Fiscal Management and Structural Reform 2006” (so-called “Basic Policies 2006”), which the cabinet announced in July 2006. “Basic Policies 2006” stated that the government would achieve a combined surplus of the primary balance of central and local governments by 2011 by reducing expenditures and increasing revenues.

This paper analyzes whether the “Integrated Fiscal Reform of Expenditures and Revenues” can really achieve its goals by simulating the future fiscal balance of central and local governments. The future depends
on the future economic situation. So, this paper focuses on assumptions for the future economic situation and presents a sensitivity analysis.

The paper comprises the following. The next section summarizes "Integrated Fiscal Reform of Expenditures and Revenues," and Section 3 explains the simulation methodology and data employed in the analysis. Section 4 represents simulation results, and the final section offers conclusions.

2. Outline of "Integrated Fiscal Reform of Expenditures and Revenues"

To promote fiscal consolidation, the Japanese government has set several goals. The first goal is to achieve a combined surplus in the primary balance of central and local governments by FY 2011. The government has decided to attain the first goal by both reducing expenditures and increasing revenues, and has made a plan for the reforms. The details of the plan are presented in "Basic Policies for Economic and Fiscal Management and Structural Reform 2006 (Basic Policies 2006)."

"Basic Policies 2006" states that the required expenditure reduction and revenue increase come to approximately 16.5 trillion yen. The government has made two reform plans; one plan reduces expenditures by 14.3 trillion yen and increase revenues by 2.2 trillion yen; and, the other plan reduces expenditures by 11.4 trillion yen and increase revenues by 5.1 trillion yen from 2007 to 2011. In this paper, we call the first plan Reform A and the second plan Reform B.

The main items of expenditure reductions are personnel expenses, public investment, and social security. The total required personnel expenses reduction during the next five years is 2.6 trillion yen under both Reform A and Reform B. Public investment cuts amount to 5.6 trillion yen under Reform A and 3.9 trillion yen under Reform B. The required social security cut is 1.6 trillion yen in both Reform A and Reform B. Expenditure other than personnel expenses, public investment, and social security will
be reduced by 4.5 trillion yen under Reform A and 3.3 trillion yen under Reform B.

On the other hand, the “Basic Policies 2006” has not made clear the details of revenue increases. In particular, the government has not decided clearly which taxes it will increase. In this paper, we assume that revenue reform will be implemented by increasing consumption tax.

3. Methodology

This section explains the methodology and the data employed in the estimation. Firstly, the assumptions for the future economic situation are explained, and then the methodology for estimating future expenditure, revenue, fiscal deficits, and fiscal debt is presented.

(Assumptions for future economic situation)

The estimation of the future fiscal situation depends on economic circumstances: economic growth rate, price index, interest rate, population, etc. Table 1 presents assumptions for the future economic situation used in the analysis. These assumptions are the same as those in “Basic Policies 2006.”

Table 1: Assumptions for future economic circumstances in Japan

<table>
<thead>
<tr>
<th></th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Growth Rate (nominal)</td>
<td>1.6</td>
<td>2.0</td>
<td>2.3</td>
<td>2.5</td>
<td>2.7</td>
<td>2.9</td>
<td>3.1</td>
</tr>
<tr>
<td>Interest Rate (nominal)</td>
<td>1.4</td>
<td>1.7</td>
<td>2.5</td>
<td>2.9</td>
<td>3.3</td>
<td>3.7</td>
<td>4.1</td>
</tr>
<tr>
<td>Growth Rate (Real)</td>
<td>2.7</td>
<td>1.9</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
<td>1.6</td>
</tr>
<tr>
<td>GDP Deflator</td>
<td>-1.1</td>
<td>0.1</td>
<td>0.7</td>
<td>0.9</td>
<td>1.1</td>
<td>1.3</td>
<td>1.5</td>
</tr>
<tr>
<td>CPI Growth Rate</td>
<td>0.1</td>
<td>0.5</td>
<td>1.1</td>
<td>1.4</td>
<td>1.6</td>
<td>1.9</td>
<td>2.1</td>
</tr>
<tr>
<td>Interest Rate (Real)</td>
<td>1.3</td>
<td>1.2</td>
<td>1.4</td>
<td>1.5</td>
<td>1.7</td>
<td>1.8</td>
<td>2.0</td>
</tr>
</tbody>
</table>

1 For details of simulation method and data used in the estimation refer to Maekawa (2007).
SNA data are used for the estimation. The future amounts of expenditures and revenues, except for pensions, medical care, and nursing care, are estimated fundamentally by extending SNA data for 2004 by the annual growth rate in Table 1.

(Expenditures)

Five categories of expenditures of central and local governments are considered in the estimation: final consumption, gross fixed capital formation, transfers to other government sections, payment related to debt, and other expenditures.

Final consumption, gross fixed capital formation, and other expenditures are estimated by multiplying SNA data for 2004 by nominal growth rate. Transfers to other government sections are estimated by considering a certain ratio of expenditures of the government section that receives those transfers. The ratio is calculated by dividing the amount of transfers in 2004 by the expenditures of the receiving section in 2004.

There are two kinds of payment related to debt: interest payment and repayment. The interest payment is calculated by multiplying the amount of debt in the previous year by the interest rate, and repayment is calculated by multiplying the amount of debt in the previous year by the repayment rate\(^2\).

(Social Security)

Future social security benefits such as pension, medical care, and nursing care are estimated from reports of Ministry of Health, Labor, and Welfare in Japan. The reports are “The 1999 Actuarial Valuation of the Employees’ Pension Insurance and the National Pension,” and “Review of the Future Social Security Benefits and Burdens –Revised May 2006-,” which are the reports on which the Japanese government bases the budget.

\(^2\) The repayment rate of the central government is assumed to be 1.6%. That of local governments is assumed to be 7.2%.
for social security and reforms of the social security systems.

Other social security services are estimated by multiplying the amount of social security expenditures, excluding pensions, medical care, and nursing care, in 2004 by the CPI growth rate.

(Revenues)

Four categories are considered in the estimation: tax revenues, social securities premium revenues, bond issues, and other revenues. Tax revenues are estimated by multiplying the tax revenues of central and local government in 2004 by nominal GDP growth rate and elasticity ratio 1.1. Moreover, the additional increase of tax revenues caused by economic recovery and the changes of tax revenues caused by tax reforms are considered in the estimation. The additional increases of tax revenues in 2005 are considered to be 2 trillion yen (central) and 1 trillion yen (local). The changes to tax revenues caused by tax reform in 2006 are considered to be a reduction of 1.1 trillion yen (central) and an increase of 3 trillion yen (local) in the estimation.

Social security premium revenue consists of pension premium, medical premium, and nursing care premium. Revenues of pension premium are calculated by multiplying the per-capita burden by the number of people who are insured. Revenues from medical and nursing care premium are calculated by multiplying the amount of medical and nursing care expenditures by a certain ratio. The ratio is estimated by dividing the total amount of premium revenues by the total amount of expenditures for medical and nursing care.

The fiscal deficits of central and local government are considered to be the amount of bond issues.

(Integrated Fiscal Reform of Expenditures and Revenues)

This paper assumes that expenditure reform will reduce the amount of
expenditures by a certain ratio every year. The annual ratios of expenditure reduction in each category are presented in Table 2.

Table 2 Annual Rates of Expenditure Reduction (FY 2007-FY2011)

<table>
<thead>
<tr>
<th></th>
<th>Reform A</th>
<th>Reform B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Expenditure Reform: 14.3 trillion yen</td>
<td>Expenditure Reform: 11.4 trillion yen</td>
</tr>
<tr>
<td></td>
<td>Revenue Reform: 2.2 trillion yen</td>
<td>Revenue Reform: 5.1 trillion yen</td>
</tr>
<tr>
<td>Pension</td>
<td>2004 reform</td>
<td></td>
</tr>
<tr>
<td>Medical Care</td>
<td>Per-capita growth rate of general medical care : -1%</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Per-capita growth rate of Old medical care : -1.7%</td>
<td></td>
</tr>
<tr>
<td>Nursing Care</td>
<td>Per-capita growth rate of benefits : -2.8%</td>
<td></td>
</tr>
<tr>
<td>Personnel Expenses</td>
<td>Central : -1.6%, Local : -2.3%</td>
<td></td>
</tr>
<tr>
<td>Gross Fixed Capital Formation</td>
<td>-6%</td>
<td>-4%</td>
</tr>
<tr>
<td>Other expenditures</td>
<td>-3.2%</td>
<td>-2.3%</td>
</tr>
</tbody>
</table>

Revenue reform is assumed to be achieved by increasing consumption tax. In the estimation, revenue generated by a 1% increase in the consumption tax rate would be 2.5 trillion yen. The consumption tax rate under each reform is presented at Table 3.
Table 3 Consumption Rate Under the Fiscal Reform
(Increasing in FY 2009)

<table>
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<tr>
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<tr>
<td>Revenue Reform</td>
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<td>5.1 trillion yen</td>
</tr>
<tr>
<td>6% (increasing by 1%)</td>
<td>7% (increasing by 2%)</td>
<td></td>
</tr>
</tbody>
</table>

4. Simulation Results

This section shows how the fiscal situation would change when the “Integrated Fiscal Reform of Expenditures and Revenues” is implemented. As already mentioned, the estimation of the future situation depends on economic assumptions. Therefore, this paper also reveals how the results would be affected by changing the assumptions.

4.1 Base Case (nominal GDP growth rate: 3%, nominal interest rate: 4%)

Figure 1 shows the primary balance of central and local governments combined with GDP. It indicates that integrated reform could achieve its target: a surplus of the primary balance by FY2011. Figure 1 also tells us that the differences between Reforms A and B would hardly affect the future fiscal situation. This is because although Reforms A and B are different in terms of the combination of expenditure and revenue reforms, the net effect of the reforms is the same.
On the other hand, the ratio of government debt to GDP would not be changed. Figure 2 shows that the ratio would continue to be 140% even in the case of the reforms.
Moreover, it should be noted that the situations of central and local governments are quite different. Figure 3 makes it clear that the primary balance of the central government would continue to be in a deficit while that of local government would have an increasing surplus. The same is shown in the results for government debt. Figure 4 shows that the ratio of central government debt to GDP will increase in the future, while the ratio of local government debt to GDP would decline continuously.
Figure 3 Ratio of Primary Balance to GDP
(for each of central and local) in the case of Reform A

Figure 4 Ratio of Government Debt to GDP
(for each of central and local) in the case of Reform A
4.2 Sensitivity Analysis

This section presents how the simulation results would be changed with different economic assumptions. We pick up four results of the sensitivity analysis: increase of real interest rate, inflation rate, real growth rate, and additional increase of tax revenues. Those results are shown in Figures 5 and 6.

Figure 5 Sensitivity Analysis of Ratio of Primary Balance to GDP (central and local combined) in the Case of Reform A
Figure 6 Sensitivity Analysis of Ratio of Government Debt to GDP (central and local combined) in the Case of Reform A

(1% increase of real interest rate)

In this case, only nominal interest rate would be higher, while nominal growth rate would be the same. Therefore, expenditures and revenues based on economic growth would not be changed, but payments related to debt would be increased. That would greatly increase the amount of debt as Figure 6 shows.

(1% increase of inflation rate)

In this case, both nominal interest rate and nominal growth rate would increase. As a result, not only would administrative expenditures and social security benefits increase, but also tax revenues. In particular, the growth of tax revenues is assumed to be much larger than that of economic growth. This is because the elasticity ratio is assumed to be 1.1. Therefore, the primary balance would improve, and the rate of increase of government debt
would be slower as shown in Figure 6.

(1% increase of real growth rate)

In this case, economic growth would increase tax revenues, while social security benefits, which depend on the inflation rate, would be unchanged. So, the primary balance would be better. Moreover, as the nominal interest rate would be the same, the ratio of government debt to GDP would be smaller.

(Additional increase of tax revenue)

The Japanese government has announced that the tax revenue of central government in 2006 is expected to increase by 2.6 trillion yen. The government also announced that such an increase of revenue would reduce the target of integrated reform. Based on the government estimation, the target of the reform would be changed from 16.5 trillion yen to 13 trillion yen.

This paper also considers this change to the estimation. Figure 5 shows that a surplus of the primary balance would be achieved in 2010, which is a year earlier than the year announced in “Basic Policies 2006.” The ratio of government debt to GDP would also begin to be decline in the latter half of 2010s. That is quite different from the result without such an increase of revenue. This result indicates that if tax revenue increases more than expected, fiscal conditions could improve by doing only the reforms announced in “Basic Policies 2006.”

5 Concluding Remarks

This paper estimates the future Japanese fiscal situation if the “Integrated Fiscal Reform of Expenditures and Revenues 2006” announced in “Basic Policies 2006” is implemented, and it tries to reveal how the reforms could contribute to promoting fiscal consolidation.
The estimation results indicate that the primary balance of central and local governments combined would be better, and its surplus would be achieved by FY 2011. But, the situation of government debt would hardly be improved. In particular, it should be noted that the fiscal situation of the central government would deteriorate rather than improve.

The main results of the sensitivity analysis show, however, that if the real growth rate is increased by, for example, developing technologies and knowledge, the fiscal situation under the reforms would be better than expected. Based on the results, we can say that it is important to promote technical research and development, as well as to implement fiscal reforms to achieve both healthy fiscal conditions and economic growth in the future.
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