

Projections for outstanding government debt in Japan

(2010, March)

Fiscal sustainability in Japan is in a dangerous zone. The outstanding stock of government debt as a proportion of GDP amounts to 1.8 as of 2009. Despite this fiscal difficulty, the Democratic Party government decided a new spending plan for the 2010 fiscal year that is projected to widen the budget deficit further. In 2010 the annual expenditure rises to 92 trillion yen, despite the expectation that tax revenue declines to 37 trillion yen. To cope with this huge fiscal deficit, the government has promised the release of the medium-term fiscal policy framework until June.

We simulate the future debt-to-GDP ratio for possible several fiscal policies. We report three scenarios, and Plan-2009 as a reference.

Case 1: Raise the consumption tax rate 1 percent every year for 2011-2015 until the tax rate is raised up to 10%.

Case 2: Raise the consumption tax rate 1 percent every year for 2014-2018 until the tax rate is raised up to 10%.

Case 3: Raise the consumption tax rate 1 percent every year for 2014-2023 until the tax rate is raised up to 15%.

Plan-2009: It was decided by the Council on Economic and Fiscal Policy on June 9, 2009. (<http://www.cao.go.jp/en/importantcouncil.html>)

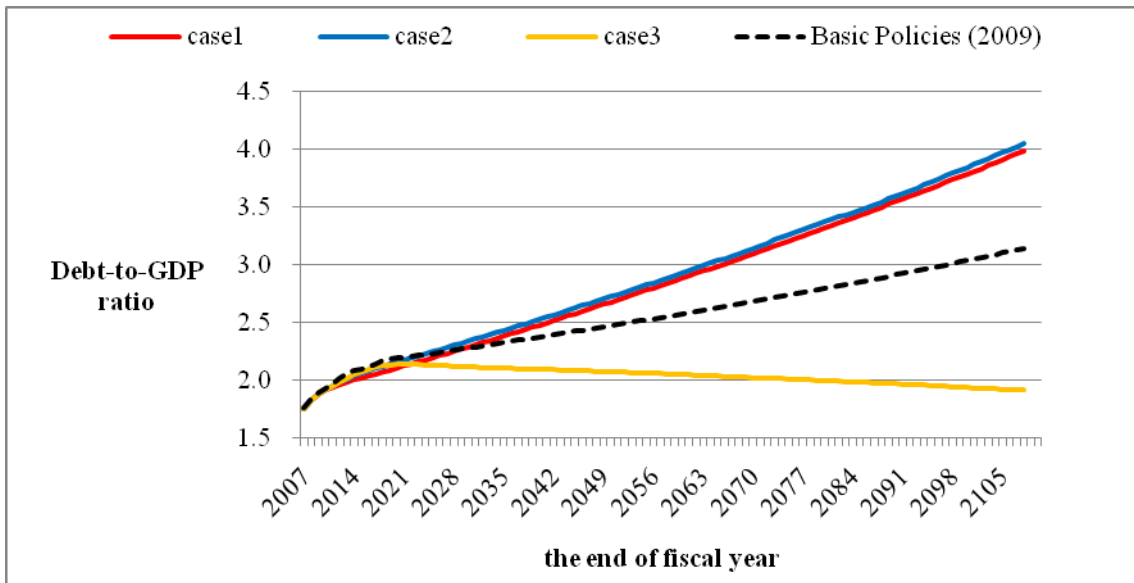
We make four reservations in conduction simulations.

1. The simulated model is a stochastic one. (See “Fiscal sustainability of Japan; A Dynamic Stochastic General Equilibrium Approach“)
2. Assume that real GDP grows at rate 1.5 percent on average.
3. The ratio of the expenditure to GDP is constant over time. This assumption implicitly implies that the expenditure for social security grows at the same rate as the economy.
4. The real interest rate remains low and stable (1.8 percent on average, see Table 2).

Main Findings for the projected debt-GDP ratio (see Figure 1)

1. Cases 1 and 2 report that the average debt-GDP ratio explodes unboundedly when the government raises the consumption tax rate up to 10 percent. The impact of the difference of timing of taxation is almost irrelevant to the long-run consequence.
2. The comparison between Plan 2009 and Case 1(or Case 2) suggests that the fiscal position has been gotten worse due to the fiscal expansion at the 2010 fiscal budget.
3. Case 3 reports that the debt-GDP ratio first increases but finally declines less than 2 when the government raises the consumption tax rate up to 15 percent.

Figure 1! Projected Debt-to-GDP ratio



The simulated model is stochastic and we calculate the probability under which the debt-GDP ratio exceeds some critical value. We depict details below.

Table 1.1! Probability under which the debt-to-GDP ratio exceeds 2

Year	2034	2059	2084	2109
	After 25 years	After 50 years	After 75 years	After 100 year
Case 1	80.3%	89.5%	94.1%	96.7%
Case 2	85.7%	91.9%	95.1%	97.5%
Case 3	63.9%	52.0%	46.7%	42.9%
Plan2009	85.7%	82.1%	83.8%	85.9%

Table 1.2! Probability under which the debt-to-GDP ratio exceeds 2.5

Year	2034	2059	2084	2109
	After 25 years	After 50 years	After 75 years	After 100 year
Case 1	34.0%	68.4%	82.4%	90.4%
Case 2	38.1%	70.6%	84.5%	91.3%
Case 3	9.2%	20.8%	24.4%	25.9%
Plan2009	23.0%	51.3%	62.5%	69.8%

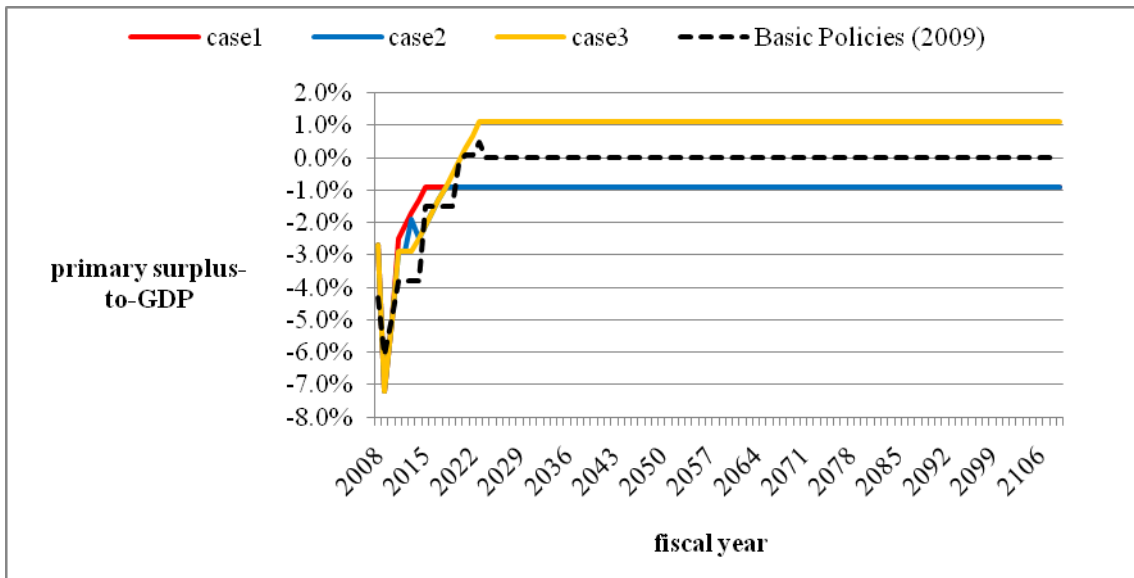
Table 1.3! Probability under which the debt-to-GDP ratio exceeds 3

Year	2034	2059	2084	2109
	After 25 years	After 50 years	After 75 years	After 100 year
Case 1	6.0%	38.4%	63.8%	78.3%
Case 2	6.0%	41.0%	66.0%	80.4%
Case 3	0.2%	5.5%	10.6%	13.9%
Plan2009	0.9%	21.1%	38.9%	51.5%

Main findings for the ratio of the primary surplus to GDP (see Figure 2)

1. When the government raises the consumption tax rate up to 10 percent, the primary surplus-GDP ratio finally becomes -1.0 percent and does not arrives at any positive value.
2. When the government raises the consumption tax rate up to 15 percent, the primary surplus-GDP ratio finally becomes 1.0 percent.
3. Plan-2009 was constructed to realize the zero primary surplus.

Figure 2! Primary surplus-to-GDP



Data

1. GDP growth rate

We calculate the real GDP growth rate for 2008-2010 from “Fiscal 2010 Economic Outlook and Basic Stance for Economic and Fiscal Management”.¹ According to this prospect, GDP growth rates are negative until 2010. But the Japanese economy is expected to recover gradually after 2011. As a result, we set the average projected GDP growth rate to be 1.5 percent.²

2. The ratio of the primary surplus to GDP

We calculate the primary surplus-to-GDP ratio for 2008-2010 from “FINANCIAL STATISTICS OF JAPAN”.³ According to that data, the primary deficit as a proportion of GDP ratio was expected to widen from 2.7% in 2008 to 7.2% in 2009. After 2011, it depends on several scenarios.

3. The initial value of the ratio of government debt to GDP

We calculate the initial value of the government debt-to-GDP ratio from “Outstanding Government Bonds and Borrowings” released by the Ministry of Finance.⁴ After 2008, the debt-to-GDP ratio depends on several scenarios.

4. Data of Plan-2009

Plan-2009 was decided by the Council on Economic and Fiscal Policy on June 9, 2009. For the period 2008-2024, we use that data to set the GDP growth rate and the primary-surplus-to-GDP ratio. After 2025, we set the average projected GDP growth rate to be 1.5 percent and the average primary surplus to be zero.

¹ This value comes from the Cabinet on January 22, 2010.
(<http://www5.cao.go.jp/keizai1/2010/0122mitoshi-e.pdf>)

² Awe set the GDP growth rate to be around 1.5 percent 2006 to 2009.

³ Source: Ministry of Finance (<http://www.mof.go.jp/english/fsj.htm>).

⁴ Source: Ministry of Finance (<http://www.mof.go.jp/english/bonds/e1c020.htm>)

Table 2! Projected data (percent)

Fiscal year Items		2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
		Case 1	primary surplus -to-GDP	- 2.7	- 7.2	- 5.0	- 2.5	- 2.1	- 1.7	- 1.3	
Real GDP growth rate	- 3.70		- 2.60	1.40							
Average real interest rate	- 1.60		- 0.87	1.80							
Case 2	Primary surplus -to-GDP	- 2.7	- 7.2	- 5.0	- 2.9	- 2.9	- 2.9	- 2.5	- 2.1	- 1.7	- 1.3
	Real GDP growth rate	- 3.70	- 2.60	1.40							
	Average real interest rates	- 1.60	- 0.87	1.80							
Case 3	Primary surplus -to-GDP	- 2.7	- 7.2	- 5.0	- 2.9	- 2.9	- 2.9	- 2.5	- 2.1	- 1.7	- 1.3
	Real GDP growth rate	- 3.70	- 2.60	1.40							
	Average real interest rates	- 1.60	- 0.87	1.80							
Plan 2009	Primary surplus -to-GDP	- 4.3	- 6.1	- 4.9		- 3.8					- 1.5
	Real GDP growth rate	- 3.50	- 3.30	0.40		2.20					1.70
	Average real interest rates	- 1.47	- 1.34	1.14		2.34					2.00