Japan 2005-2100: Projections of Government Expenses as a Percent of GDP by Population Group under Different Scenarios

Figure 2.6
Case 1 (Assymetric: γ = g; μ = g - π(young))
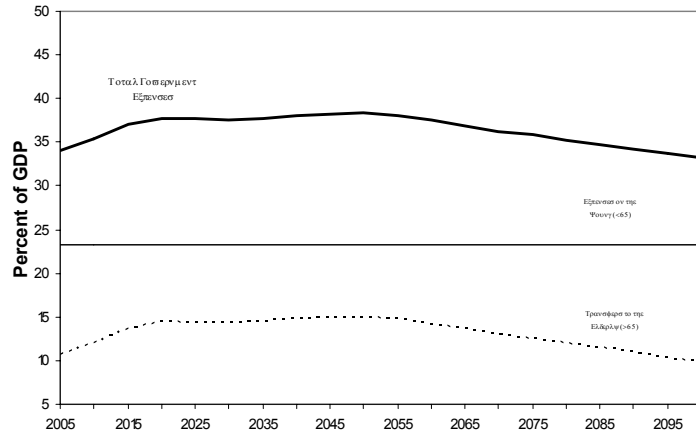
Figure 2.7
Case 2 Symmetric (γ = μ =g)
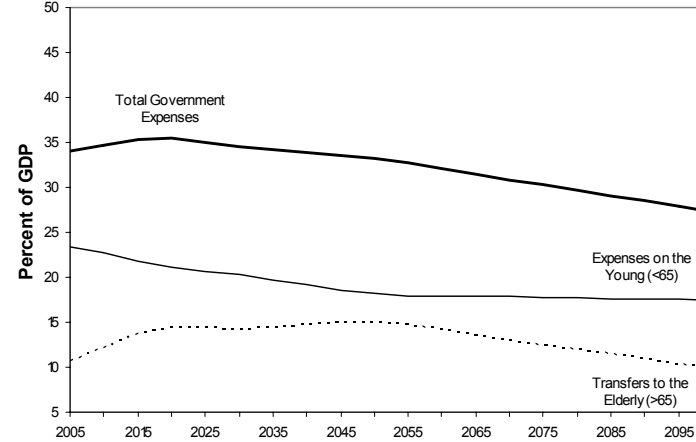
Figure 2.8
Case 3 (Symmetric γ = μ = g - π(working pop))
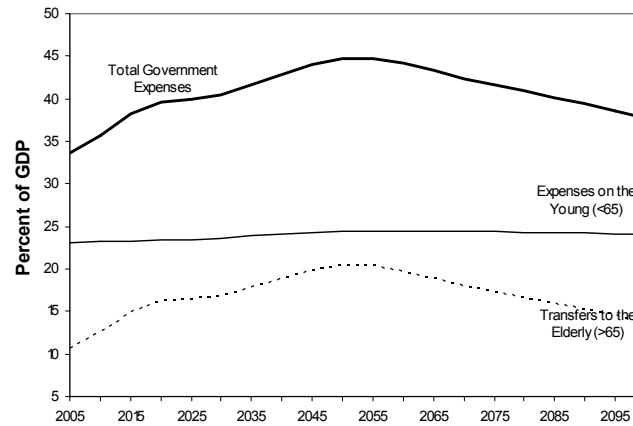
Figure 2.9: Japan's Net Debt/GDP Dynamics, 2005-2100

Sustainable Tax Rate = 34.5

Sustainable Tax Rate
with 120% Cap = 35.0
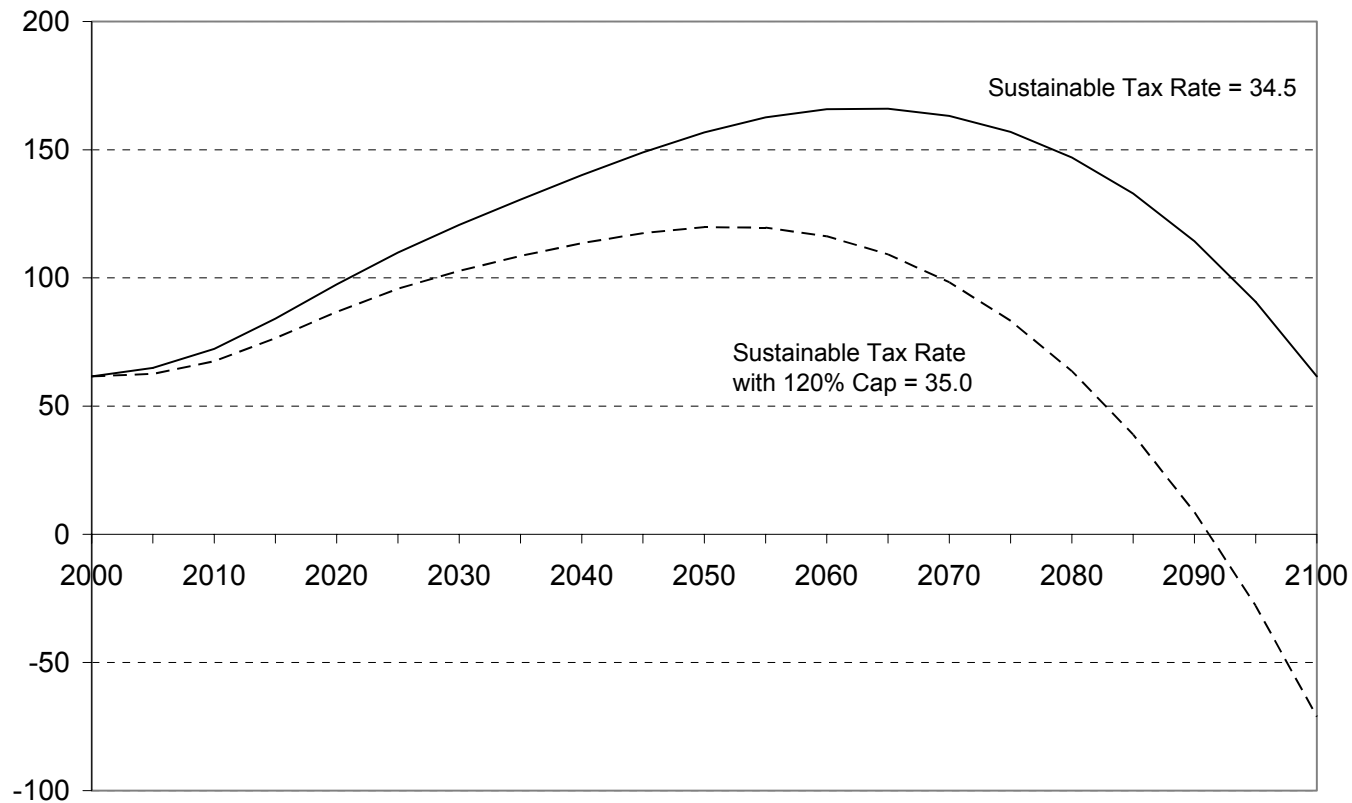
The solid line represents the path of the debt-to-GDP ratio for Table 2.2 column 3 with an interest rate gap of 2, so the sustainable tax rate is 34.6%. The dotted line is a tax rate of 35%, and it stays below a 120% net debt-to-GDP level. Because tax rates are assumed to be constant over the entire horizon, a higher tax rate than the sustainable tax rate implies that debt to GDP ratios are smaller at the end of the sustainability period than at the beginning. In the case depicted in Figure 2.9, the Japanese government moves from a net debtor position to a net creditor position around 2090.

Table 2.1

Sustainable Tax Rates with Elderly Benefits Growing Proportional to GDP per Worker, Cases 1 and 3

Sustainable Tax Rates, Cases 1 and 3

	Case 3				Case 1
Population Forecast	NIPSSR		IMF		IMF
Sustainability Horizon	2100	2040	2100	2040	2100
Rate Gap[1]					
0	44.9	40.2	40.7	39.0	39.7
1	44.4	40.4	41.0	39.3	40.1
2	43.9	40.6	41.1	39.6	40.4
3	43.3	40.8	41.1	39.8	40.5
4	42.9	41.0	41.2	40.1	40.6
Monetary Policy[2]	43.2	39.6	40.5	38.5	39.7

Entries are percentages of GDP. As explained in the text, Case 3 is growth in per capita expenditures equal to per worker GDP growth, with no monetary-policy effects. Case 1 is growth in per capita elderly expenditures equal to that of per worker GDP and the share of other government expenditures to GDP remaining constant. NIPSSR means that organization's population forecasts are used; IMF means the Faruqee and Muhleisen (2001) forecasts are used.

[1]The rate gap is the interest rate minus the nominal GDP growth rate.

[2]This row shows the results of monetizing 50% of government debt. Specifically, monetary policy is used to increase M/GDP by 30% during the first 5 years. The interest rate minus the growth rate is 2.

Table 2.2

Sustainable Tax Rates with Elderly Benefits Growing Proportional to GDP, Cases 1 and 2

	Sustainable Tax Rates, Cases 1 and 2				
		Case 2			Case 1
Population Forecast		NIPSSR		IMF	IMF
Sustainability Horizon	2100	2040	2100	2040	2100
Rate Gap[1]					
0	32.3	35.3	32.2	34.6	36.4
1	33.7	35.9	33.4	35.2	37.1
2	34.9	36.5	34.6	35.8	37.8
3	36.0	37.0	35.6	36.4	38.3
4	36.9	37.6	36.4	37.0	38.8
Monetary Policy[2]	34.3	35.4	33.9	34.8	37.1

Entries are percentages of GDP. As explained in the text, case 2 is growth in per capita expenditures proportional to GDP, with no monetary-policy effects. Case 1 is growth in per capita elderly expenditures equal to that of GDP and the share of other government expenditures to GDP remaining constant. NIPSSR means that organization's population forecasts are used; IMF means the Faruqee and Muhleisen (2001) forecasts are used.

[1]The rate gap is the interest rate minus the nominal GDP growth rate.

[2]This row shows the results of monetizing 50% of government debt. Specifically, monetary policy is used to increase M/GDP by 30% during the first 5 years. The interest rate minus the growth rate is 2.