Debt and Taxes in Japan

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Basic Issue

- In a 1789 letter Benjamin Franklin wrote that Our new Constitution is now established, and has an appearance that promises permanency; **but in this world nothing can be said to be certain, except death and taxes.**
- In Japan, with the highest and still rising life expectancy among advanced economies, taxes seem more certain than death.
- How high can government debt go?
- How high will taxes have to go?
- What will be economic consequences?

Basic Issue

- Two significant challenges faced by Japan
  - High debt to output ratio (about 150%).
  - Projected increase in government expenditures due to aging population.
    - Spending to output projected to rise by 7% due to increases in pension and health expenditures.
- We explore size and consequences of fiscal responses to this problem.

Aging Population

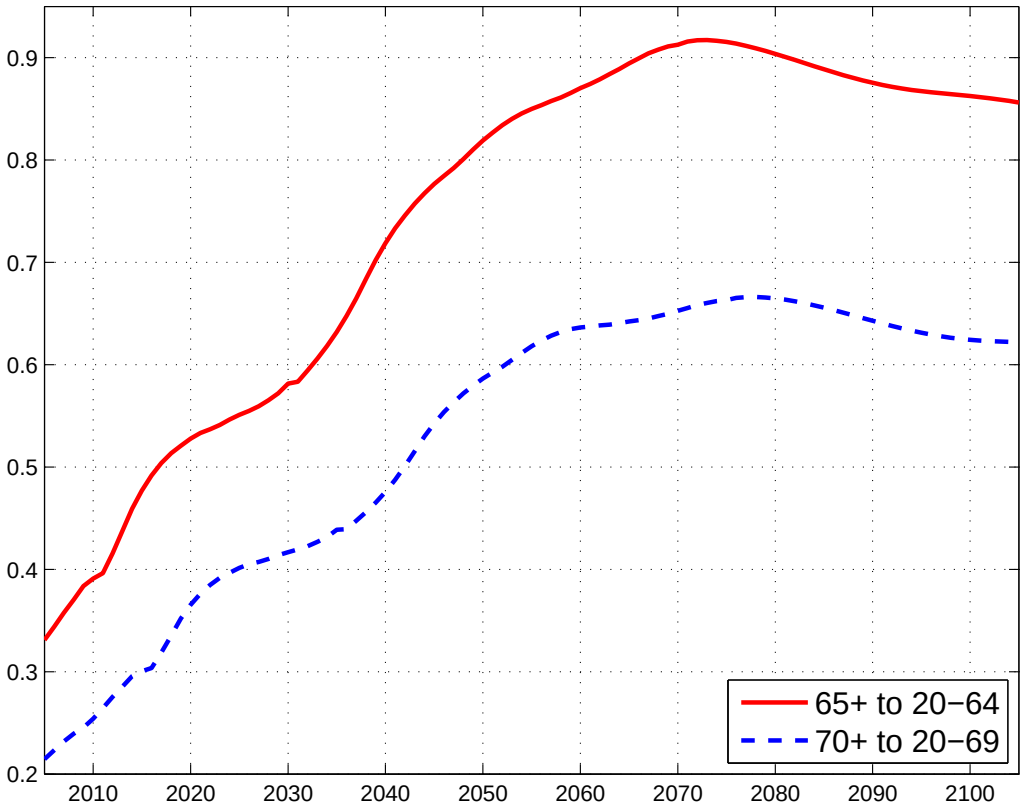


Figure : Dependency Ratios

An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

- Individuals live from 1 to 111 years old
- Individuals differ in terms age, gender, job type, number of children they have, earnings, pensions
- Jobs: Regular, contingent, self-employed
- Individuals' earnings (for both male and females and for each job type) are estimated from Japanese data
- Follow Japanese pension rules and tax policy closely
- Assume that markets are complete

An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

- Consumptions are then given by Permanent Income Hypothesis: at each age, consumption is a fraction of present value of discounted disposable income
- Asset holdings are computed as a residual from the individual's flow budget constraint
- Aggregation done using the number of individuals in category
- Government budget and debt implications are calculated from 2010 to 2100

An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

Table : Tax Revenue Implications

Year	Scenario 1	Scenario 2
2010	0.0006	0.0015
2011	0.0006	0.0016
2012	0.0006	0.0017
2013	0.0007	0.0018
2014	0.0006	0.0135
2015	0.0084	0.0213
2016	0.0084	0.0213
2060	0.0081	0.0207

An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

Table : Primary Deficit to GDP Ratio

	Benchmark	Scenario 1	Scenario 2
2010	0.0732	0.0737	0.0746
2011	0.0745	0.0751	0.0761
2012	0.0739	0.0745	0.0756
2013	0.0704	0.0711	0.0721
2014	0.0585	0.0591	0.0720
2015	0.0493	0.0577	0.0706
2040	0.0603	0.0683	0.0808
2060	0.0754	0.0835	0.0961

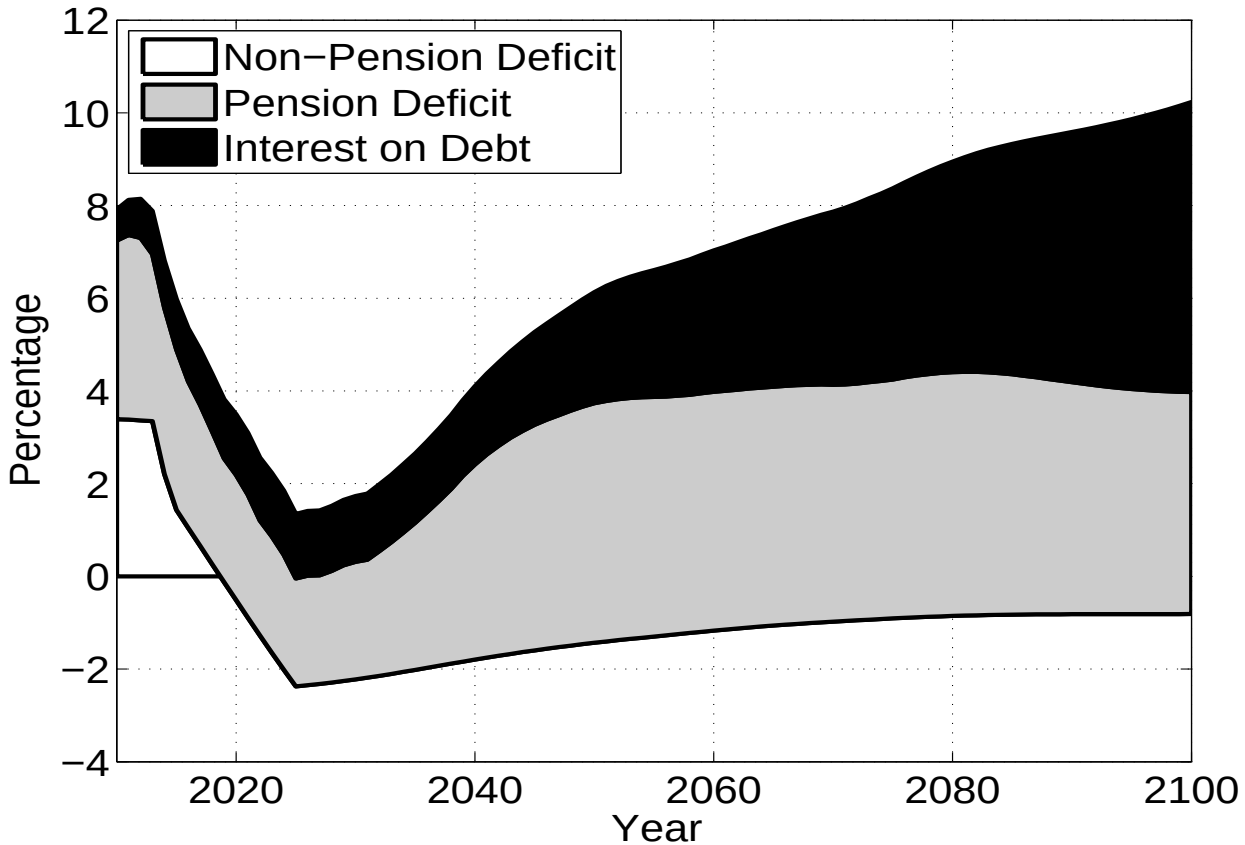
An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

Table : Net Debt to GDP Ratio

	Benchmark	Scenario 1	Scenario 2
2010	1.0423	1.0423	1.0423
2011	1.1144	1.1149	1.1158
2012	1.1886	1.1897	1.1916
2013	1.2626	1.2644	1.2672
2014	1.3333	1.3357	1.3397
2015	1.3924	1.3954	1.4122
2016	1.4428	1.4543	1.4838
2040	2.7016	2.9265	3.2855
2060	4.7719	5.2196	5.9270

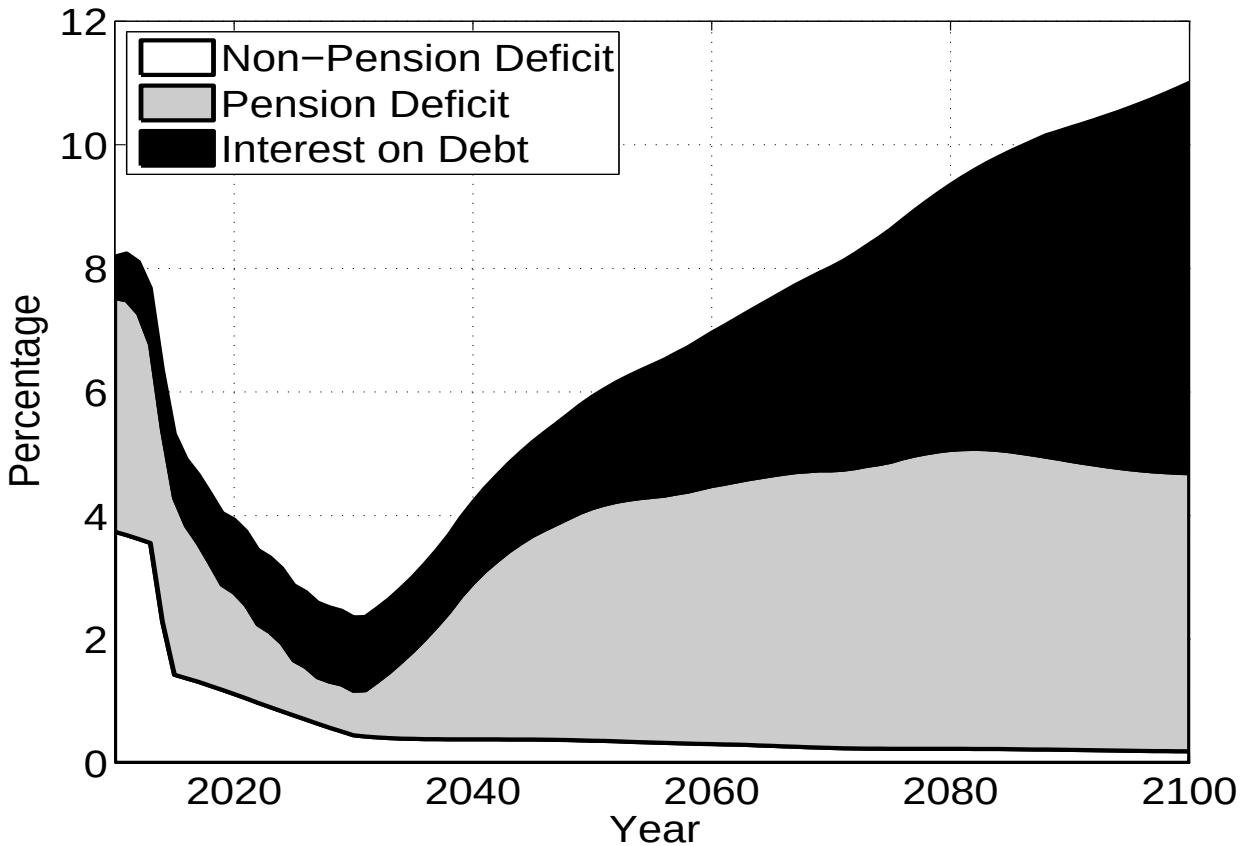
An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

- Sources of New Borrowing with a 20% Consumption Tax



An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

- Sources of New Borrowing with Higher FLFP



An Accounting Model: İmrohoroğlu, Kitao, and Yamada (2013)

- No single policy or economic outcome can restore fiscal balance in Japan.
- Among the alternative scenarios employed:
  - Pension reform (retirement age to 70 and benefits cut by 10% reduces the pension deficit significantly
  - An increase in the consumption tax from the scheduled 10% to 20% turns the non-pension deficit into a surplus immediately and for several decades
  - An increase in the female labor force participation (both the participation rates and employment types of females similar to those of males) has a large impact
  - Only a combination of these and other outcomes may accomplish the task of achieving fiscal balance in Japan

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

- İmrohoroğlu and Hansen (2013) develop a general equilibrium model with the following features:
  - Infinitely lived representative household makes consumption, labor supply and bond holding decisions
  - Cobb-Douglas production function
  - Government taxes income from labor, capital, bond holdings, and consumption, to finance expenditures on government purchases, transfer payments (including pensions) and interest payments on outstanding debt.
  - Markets are complete
  - Compute equilibrium transition paths under alternative fiscal policies

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

- Economic distortions
  - Consumption tax reduces current consumption (lower aggregate demand)
  - Consumption tax reduces incentive to work; more work needed to buy same consumption, and leisure is now cheaper
  - Labor income tax reduces incentive to work
  - In a complete markets setup, the labor income tax is more distorting than the consumption tax for a give amount of revenue

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

- Nature of the experiment
  - When JGB/GNP goes above a threshold (250%), then a fiscal rule raises a tax rate (consumption or labor income or both) or implements an expanding the tax base (reduction in exemptions and deductions) for as long as necessary until a steady state is reached in the far distant future in which there is fiscal balance

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

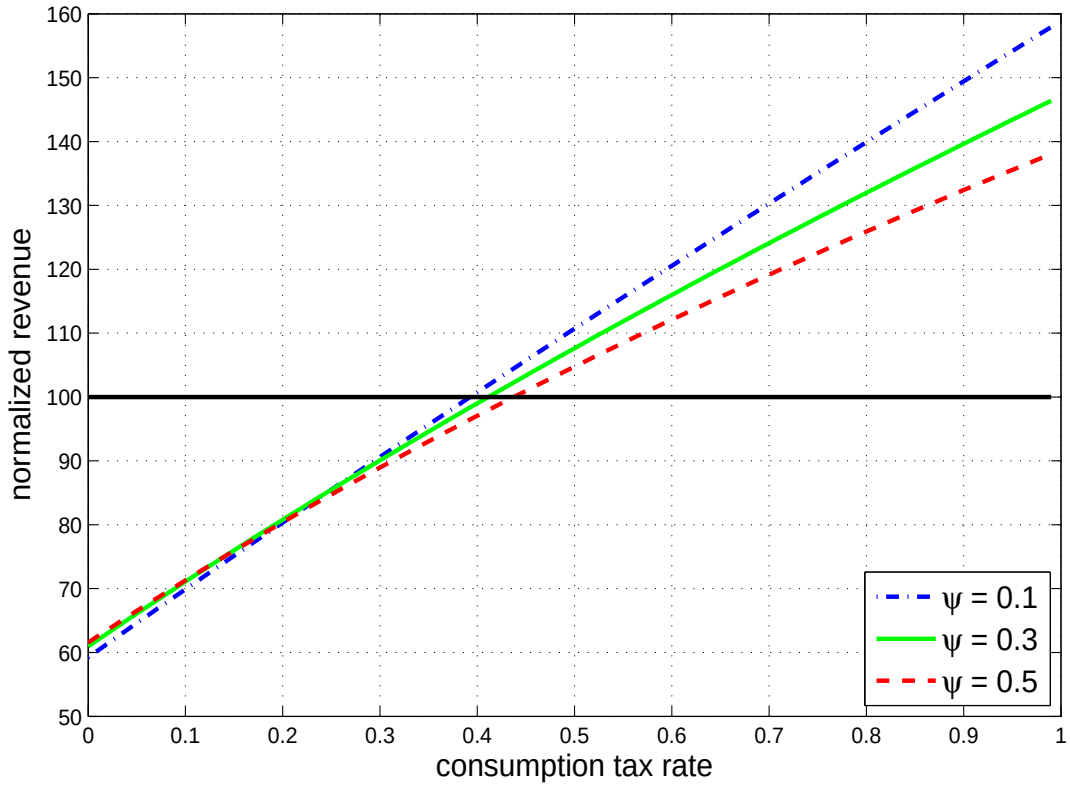


Figure : Consumption Tax Rate and Steady State Tax Revenue

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

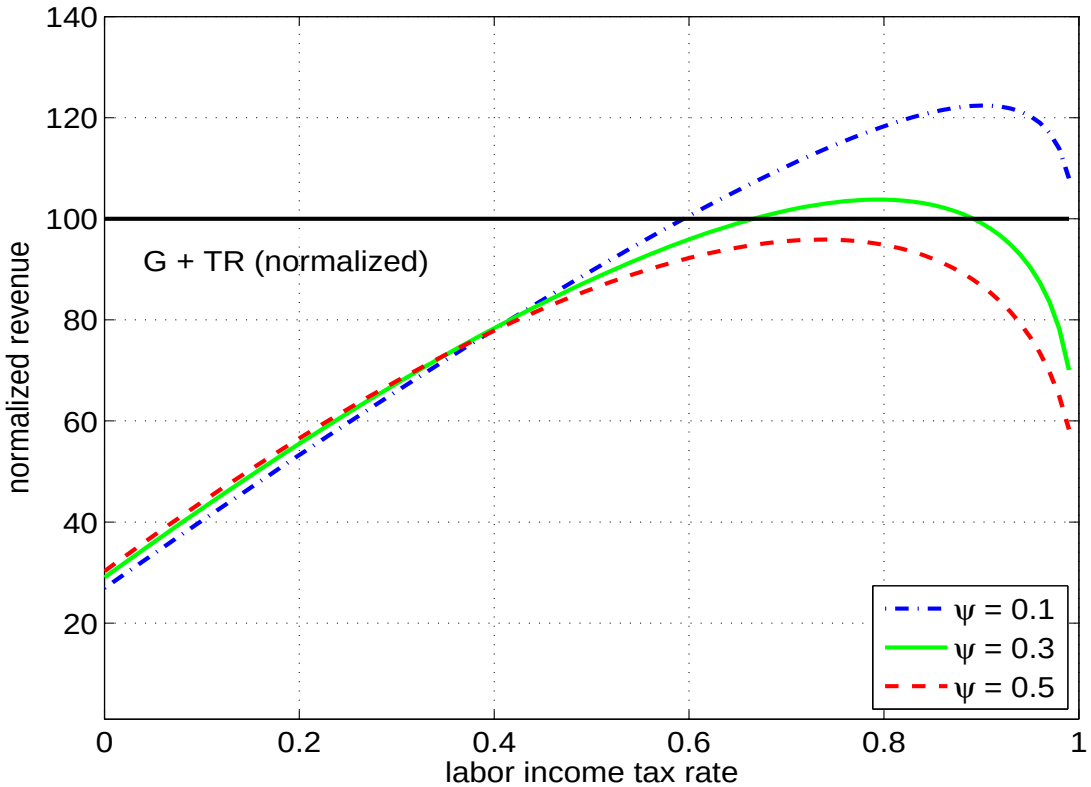


Figure : Labor Income Tax Rate and Steady State Tax Revenue

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

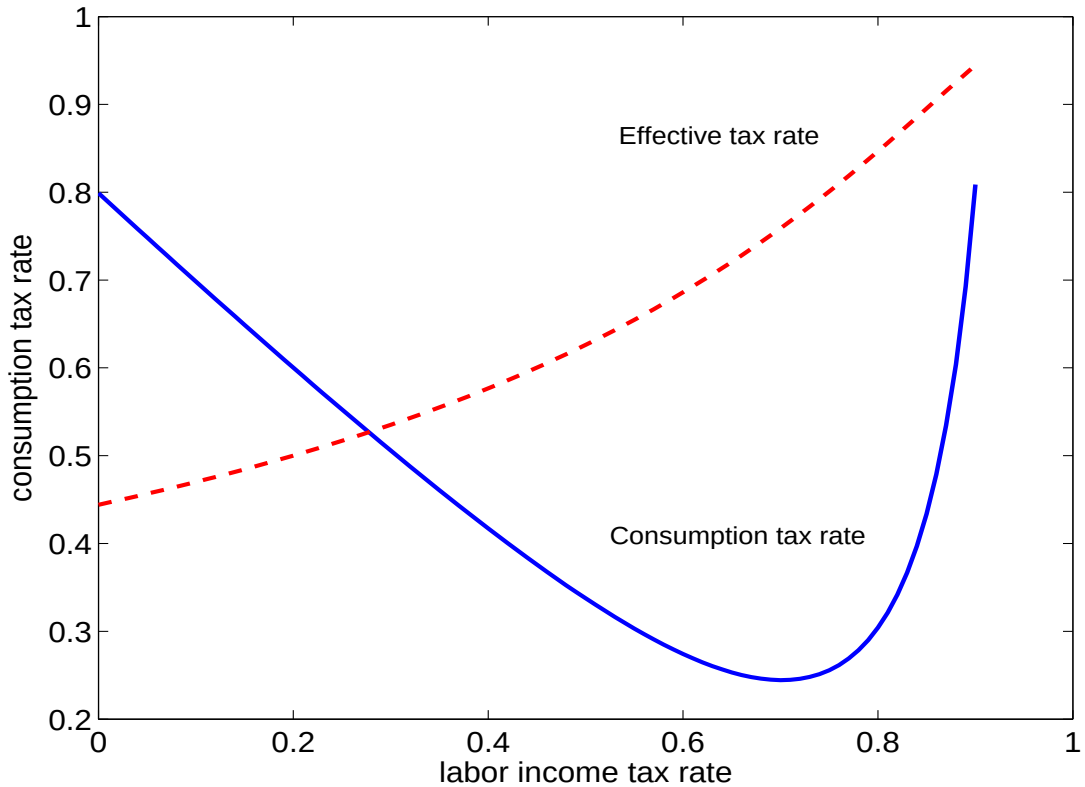


Figure : Steady State Iso-Revenue Curve

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

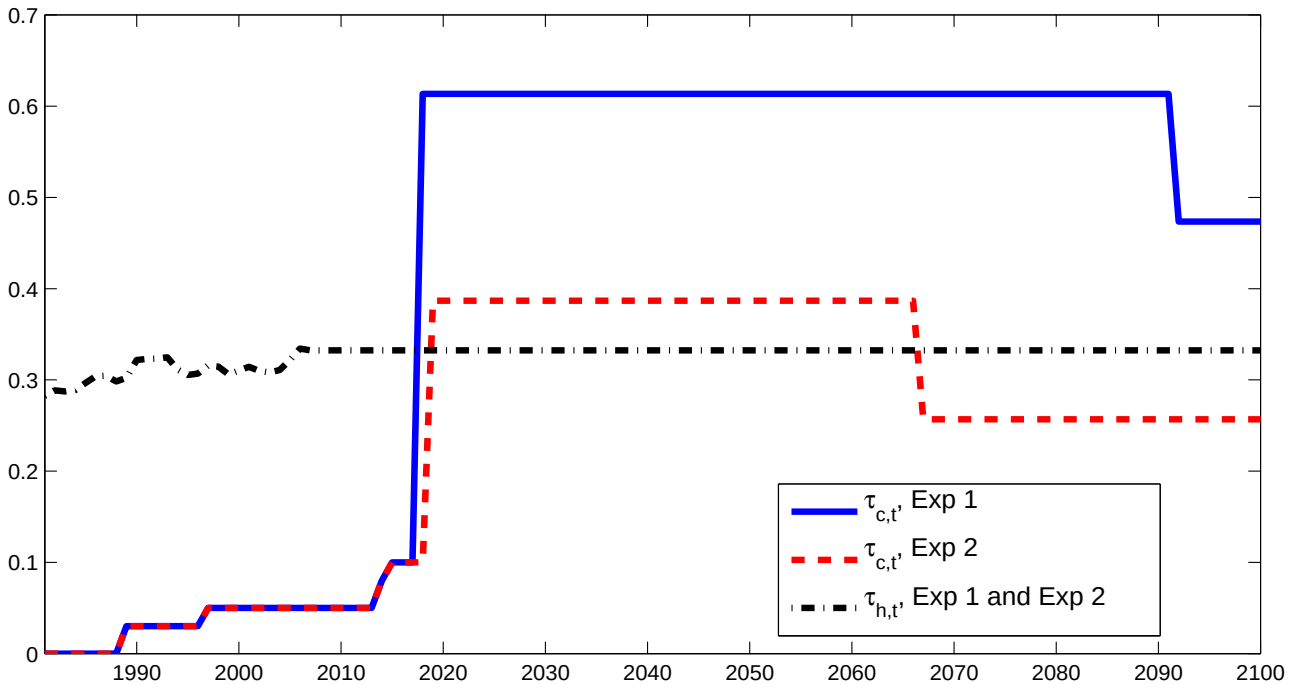


Figure : Consumption Tax Experiments

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

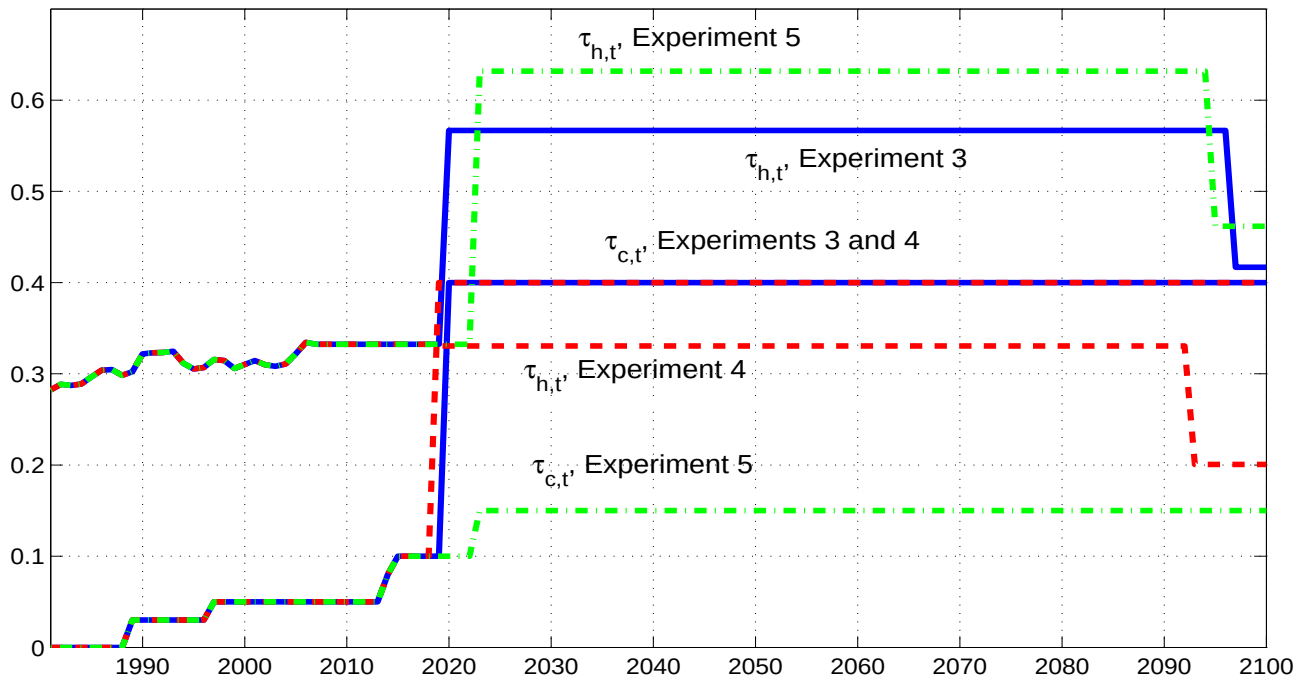


Figure : Labor Income Tax Experiments

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

- Our main result is that fiscal sustainability requires a large adjustment in tax revenues, in the range of 30-40% of aggregate consumption if we abstract from distortions.
- Adjusting the consumption or labor income tax rate to achieve this, however, requires that taxes be set to unprecedentedly high levels–tax rates of 40-60%.
- The lower end of this range is made possible if revenue equal to 8% of output can be raised through broadening the tax base.

A One-Sector Growth Model: Hansen and İmrohoroğlu (2013)

- The dismal nature of these findings is motivation for research that explores policy measures that will allow some of the fiscal adjustment to come from sources other than higher taxes.
- These may include
  - reducing expenditures via reforms of public pensions and health expenditures
  - a new approach to immigration
  - family policies to increase fertility and especially female labor force participation
  - microeconomic reforms to incentivize higher rates of innovation and growth

Immigration

- An accounting model that measures the tax revenue implications of guest workers
- Use (scarce) data on immigrants in Japan
- Assume an age and ability distribution of guest workers
- Assume that there is annual inflow of X number of guest workers of a given age and ability distribution who work for Y number of years
- Calculate the fiscal impact, with varying values of X and Z

Female Labor Force Participation

- Develop a general equilibrium model with age, gender, job type as key state variables including time use in market activities and home production by males and females
- Use micro data in Japan to calibrate the model to produce observed FLFP and other macro indicators
- Conduct experiments on the extent and size of government subsidies that reduce the cost of FLFP in many dimensions (child care, schooling, social norms, etc)
- Calculate the effects of the increased FLFP on macro indicators and on fiscal issues