

Homework 7- Fiscal Policy

1. With the idea of preparing you for a fruitful classroom discussion of social security, I ask you to read the (EROP) Economic Report of the President (2004, CH 6). I will also ask you to look at the 2008 Trustee's Report for the Social Security System. Both are available online. Simply Google the title. Based on this reading, answer the following questions:

- According to the EROP what are the main problems which “justify” a government role in old-age programs?
- What does OASIDI mean? What is the OASIDI tax rate? Note to answer these questions and the remaining questions below it is helpful to read the Trustee's Report for the Social Security System.
You can Google this or go to <http://www.ssa.gov/OACT/TR/> and then look for the 2008 report.
- What is the fundamental reason that social security (not medicare) is projected to run out of money under current law? When is the OASI trust fund projected to be exhausted under the intermediate cost projections?
- What is the present value of the unfunded obligation for OASI over the next 75 years? What is the answer over “an infinite horizon”? What approximately are these answers as a ratio to current GDP?

2. Consider the model developed in the textbook to analyze fiscal policy questions. Suppose an economy is in steady state with a pay as you go social security system that each period taxes each young agent s and pays each old agent s . Now, suppose that the government abolishes the social security system but still pays off the current old. More precisely, the new government policy is described by the following three points.

- (1) In the present and all future periods the government no longer collects social security taxes nor pays social security benefits, except to the current old.
- (2) The government pays off the current old the promised social security benefit by borrowing an amount equal to s per young agent.
- (3) The government continues to borrow s per young agent in all periods beyond the current period and finances this by taxing next period and beyond each old agent an amount equal to the net interest rate on the debt times the debt per young agent (i.e. the tax equals sr).

What are the effects of this policy over time on the output-labor and the capital-labor ratios? Explain in detail your reasoning. Make an effort to explain your reasoning in an intuitive manner.

3. BONUS PROBLEM: Can the U.S. roll over its debt forever?

The problem asks you to look at U.S. data. The data series are on GDP (Y_t), Debt (B_t) and Interest Payments (IP_t) for the U.S. economy. The data themselves do not answer the question posed above. Nevertheless, the data are certainly relevant for addressing the empirical issue as to how, in an accounting sense, movements in the debt-GDP ratio are related to (i) primary deficits, (ii) nominal interest rates and (iii) the nominal growth rate of GDP.

(a) Calculate the Debt-GDP ratio for every year in the data. Graph this series.

(b) Calculate (1) $\frac{PrimaryDeficit_t}{Y_{t+1}}$, (2) $\frac{InterestPayment_t}{Y_{t+1}}$ and (3) $-\frac{B_t}{Y_{t+1}}(\frac{Y_{t+1}-Y_t}{Y_t})$. Plot (1)-(3) on the same graph. Calculate the primary deficit from the accounting identity: $PrimaryDeficit_t = B_{t+1} - B_t - InterestPayment_t$.

(c) Summarize the main patterns in the data in parts a-b. What does the accounting exercise tell you about how the U.S. reduced its debt-DGP ratio after World War II?

NOTE: The algebra below shows that there is an accounting relationship between the change in the Debt-GDP ratio and the three quantities mentioned in question 3b. The first equation is the government budget constraint. The second follows from the first equation after division by GDP. The third equation rearranges the second equation. It says that the change in the debt-GDP ratio over time equals (1) the primary deficit term plus (2) the interest term plus (3) the nominal growth rate of GDP term.

$$B_{t+1} = B_t + PrimaryDeficit_t + InterestPayment_t$$

$$B_{t+1}/Y_{t+1} = B_t/Y_{t+1} + PrimaryDeficit_t/Y_{t+1} + InterestPayment_t/Y_{t+1}$$

$$\frac{B_{t+1}}{Y_{t+1}} - \frac{B_t}{Y_t} = \frac{PrimaryDeficit_t}{Y_{t+1}} + \frac{InterestPayment_t}{Y_{t+1}} - \frac{B_t}{Y_{t+1}} \frac{Y_{t+1} - Y_t}{Y_t}$$