Homework #4: Intertemporal Economics and Credit Market Imperfections

Econ 352: Macroeconomics

1 Williamson Ch 9. problem 1: (4 pts)

A consumer's income in the current period is $y = 100$, and income in the future period is $y' = 120$. He or she pays lump-sum taxes $t = 20$ in the current period and $t' = 10$ in the future period. The real interest rate is 0.1, or 10% per period.

1.1 Williamson Ch 9. problem 1, sub-problem a:

Determine the consumer's lifetime wealth

1.2 Williamson Ch 9. problem 1, sub-problem b:

Suppose current and future consumptions are perfect complements for the consumer and that he or she always wants to have equal consumption in the current and future periods. Draw the consumer's indifference curves.

1.3 Williamson Ch 9. problem 1, sub-problem c:

Determine what the consumer's optimal current-period and future-period consumptions are, and what optimal savings is, and show this in a diagram with the consumer's budget constraint and indifference curves. Is the consumer a lender or a borrower?

1.4 Williamson Ch 9. problem 1, sub-problem d:

Now suppose that instead of $y = 100$, the consumer has $y = 140$. Again, determine optimal consumption in the current and future periods and optimal saving, and show this in a diagram. Is the consumer a lender or a borrower?

1.5 Williamson Ch 9. problem 1, sub-problem e:

Now suppose that instead of $y = 100$, the consumer has $y = 140$. Explain the differences in your results between parts (c) and (d).

2 Williamson Ch 9. problem 12: (4 pts)

Suppose in our two-period model of the economy that the government, instead of borrowing in the current period, runs a government loan program. That is, loans are made to consumers at the market real interest rate r, with the aggregate quantity of loans made in the current period denoted by L. Government loans are financed by lump-sum taxes on consumers in the current period, and we assume that government spending is zero in the current and future periods. In the future period, when the government loans are repaid by consumers, the government rebates this amount as lump-sum transfers (negative taxes) to consumers.

2.1 Williamson Ch 9. problem 12, sub-problem a:

Write down the government's current-period budget constraint and its future-period budget constraint.

2.2 Williamson Ch 9. problem 12, sub-problem b:

Determine the present-value budget constraint of the government.

2.3 Williamson Ch 9. problem 12, sub-problem c:

Write down the lifetime budget constraint of a consumer.

2.4 Williamson Ch 9. problem 12, sub-problem d:

Show that the size of the government loan program (i.e. the quantity L) has now effect on current consumption or future consumption for each individual consumer and that there is no effect on the equilibrium real interest rate. Explain this result.

3 Williamson Ch 10. problem 2: (4 pts)

Suppose there is a credit market imperfection due to limited commitment. As in the setup with collateralizable wealth we examined in this chapter, each consumer has a component of wealth that has value pH in the future period, cannot be sold in the current period, and can be pledged as collateral against loans. Suppose also that the government requires each consumer to pay a lump-sum tax t in the current period, and a tax t' in the future period. Also suppose that there is limited commitment with respect to taxation as well. That is, if a consumer refuses to pay his or her taxes, the government can seize the consumer's collateralizable wealth, but cannot confiscate income (the consumer's endowment). Assume that if a consumer fails to pay off his or her debts to private lenders, and also fails to pay his or her taxes, the government has to be paid first from the consumer's collateralizable wealth.

3.1 Williamson Ch 10. problem 2, sub-problem a:

Show how the limite commitment problem puts a limit on how much the government can spend in the future and current periods.

3.2 Williamson Ch 10. problem 2, sub-problem b:

Write down the consumer's collateral constraint, taking into account the limited commitment problem with respect to taxes.

3.3 Williamson Ch 10. problem 2, sub-problem c:

Suppose that the government reduces t and increases t' so that the government budget constraint continues to hold. What will be the effects on an individual consumer's consumption in the present and the future? Does Ricardian Equivalence hold in this economy? Explain why or why not.