سوالات از کتاب Kurlat است.

6.1 Two-Period Problem with Taxes and Initial Wealth

Suppose a household solves the following two-period consumption-savings problem with taxes:

$$\max_{c_1, a, c_2} u(c_1) + \beta u(c_2)$$

$$s.t.$$

$$a = a_0 + y_1 - \tau_1 - c_1$$

$$c_2 = y_2 - \tau_2 + (1+r) a$$

with $u(c) = \frac{c^{1-\sigma}}{1-\sigma}$, where: c_1 is consumption at time 1, c_2 is consumption at time 2, y_1 is household income at time 1, y_2 is household income at time 2, τ_1 are taxes at time 1, τ_2 are taxes at time 2, and a_0 is initial wealth.

(a) Solve for the household's choice of c_1, c_2 and a in closed form.[13]

(b) How does $\frac{c_1}{y_1}$ depend on y_2? What would happen if households suddenly became optimistic about the future?

(c) How does $\frac{c_1}{y_1}$ depend on a_0? Interpret.

(d) How does $\frac{c_1}{y_1}$ depend on β? Interpret.

(e) Suppose $y_2 = \tau_1 = \tau_2 = 0$ and compute $\frac{\partial c_1}{\partial r}$. How does the answer depend on σ? Interpret the answer. [Hint: this is a hard question, not the maths but the interpretation. Think about what σ means for the relative importance of income and substitution effects]

6.5 Credit Constraints and Ricardian Equivalence

Suppose a household solves the following variant of the problem in Exercise 6.1:

$$\max_{c_1, a, c_2} u(c_1) + \beta u(c_2)$$

$$s.t.$$

$$a = y_1 - \tau_1 - c_1$$

$$c_2 = y_2 - \tau_2 + (1+r) a$$

$$a \geq -b \tag{6.4.1}$$

(a) What does equation (6.4.1) mean? What does b represent?

(b) Plot the household's budget constraint. In the same graph, plot constraint (6.4.1).

(c) Solve for c_1, c_2 and a.

[Hint: notice that the constraint (6.4.1) is a weak inequality, not an equality, so it may or may not be binding. If it is not binding, then you can use the answer from Exercise 6.1. Then think about what happens if it is indeed binding. Then figure out whether or not it will be binding]

(d) Show that, other things being equal, constraint (6.4.1) is more likely to be binding if

   i. $y_2 - \tau_2$ is high,

   ii. $y_1 - \tau_1$ is low,

   iii. b is low.

Interpret each of these conditions.

(e) Suppose that the government announces a "stimulus package" of size Δ. This involves lowering τ_1 by Δ and increasing τ_2 by $\Delta(1+r)$ so that the present value of taxes is unchanged. How does c_1 respond to the stimulus package if we start from a situation where constraint (6.4.1) is NOT binding? How does c_1 respond to the stimulus package if we start from a situation where constraint (6.4.1) is binding? Explain.

(f) Suppose that instead of announcing a stimulus package, the government announces that it will allow households to borrow Δ from the government and repay it back (with interest) at $t = 2$. How do the effects of this policy compare with the effects of the stimulus package? Explain.