

Problem Set 2

1. Consider the following consumer's problem:

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

subject to

$$c_1 + s_1 = y_1$$

$$c_2 = y_2 + (1 + r)s_1$$

$$u(c) = \frac{1}{1 - 1/\sigma} c^{1-1/\sigma}$$

Where the consumer is a price taker.

- a) Derive the intertemporal budget constraint for this consumer.
- b) Write the Lagrangean for this problem.
- c) Find the first order necessary conditions for a maximum.
- d) Does the saving schedule slope up? That is, what is the effect of an increase in the interest rate r on savings?

2. Consider an environment with two consumers. The first consumer receives a perishable endowment of gizmo y_1 in period 1 and y_2 in period 2. She solves the following problems:

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

subject to her intertemporal budget constraint, where $u(c) = \ln(c)$. The second consumer receives a perishable endowment of gizmo x_1 in period 1 and x_2 in period 2. He solves the following problems:

$$\max_{d_1, d_2} v(d_1) + \beta v(d_2).$$

subject to her intertemporal budget constraint, where $v(d) = \ln(d)$. Denote the aggregate supply of gizmo by W_1 and W_2 .

- a) Write the intertemporal budget constraint for each consumer.
- b) Derive individual demand functions for each consumer.
- c) Find aggregate demand functions, and show that they are of the same form as those of a representative consumer.
- d) Suppose that the second consumer has no access to credit market. Show that aggregate demand does not correspond to that of a representative consumer.