

Exam #2 - Fall 2006

Read each question carefully. All answers must be clearly justified. Calculations must be detailed. Unjustified answers are worth zero points.

With a fair understanding of the material seen in class, it is possible to answer each question independently of the others, using the information provided in the preceding questions.

You have 90 minutes to answer as many questions as possible. All questions carry equal weight: Do not waste all your time on answering one question.

Consider an economy in which there are two consumers with preferences over c_0 and c_1 described by the utility function $U(c_0, c_1) = \ln(c_0) + 0.8 \ln(c_1)$. Both consumers earn 12.5 each in period 0 and 16 each in period 1. There is also a government whose objective is to spend 5 in period 0 and 12 in period 1. This government issues 1 bond in period 0. This bond pays interest rate r . Consumers can also issue bonds at the same interest rate.

- 1) Define the competitive equilibrium of this economy. Give the corresponding equilibrium conditions.
- 2) **Explain**, in your own words, why the marginal rate of substitution between c_0 and c_1 cannot be below $1 + r$ in equilibrium.
- 3) Suppose that consumers share the total tax burden (i.e. T_0 and T_1) equally. Find the level of individual taxes t_0 and t_1 that each consumer pays, in equilibrium, given r .
- 4) **Explain** why it is possible to find the competitive equilibrium of this economy by assuming that $B_0 = 0$, that $t_0 = 2.5$, and that $t_1 = 6$ rather than using the values of t_0 and t_1 found in question 3).
- 5) Show that the equilibrium interest rate is 25% (i.e. $r = 0.25$).
- 6) **Explain** why consumers only lend to the government and not to each other in equilibrium.
- 7) Illustrate the competitive equilibrium of this economy with a graph.
- 8) The aggregate demand for goods in period 0 as a function of aggregate income Y_0 and the interest rate r is given by $\frac{5}{9}Y_0 + \frac{100}{9(1+r)} + \frac{4}{9}G_0$ in this economy. Explain, using a graph, why the goods market cannot be in equilibrium if $r = 0.2$.
- 9) Question 8) suggests that the correlation between aggregate consumption and the interest rate is negative. Does this mean that a reduction in r causes an increase in consumption? **Explain** why or why not.
- 10) Suppose that in period 0, one of the consumer learns that he is very sick. As a result, there is a high chance that he may not be alive in period 1. **Explain** why the equilibrium interest rate must increase in period 0 as a result of this news.