Economics 304 Fall 2014

Mid-Term Makeup Problems Due: Friday, October 31

Instructions

For those who wish to improve on their midterm grades, completing the following problems will enable you (with an excellent answer) to capture up to half of the missed points on any question. In other words, if you got 4/10 on the question, you missed six points, and an outstanding answer would add half of that (3) to your score, bringing you up to 7. A lesser-quality answer would raise your score by 1 or 2 points. In each case, you must do *all parts* of the problem below to receive any additional points for the question. Your responses are due in class on Halloween.

Because it is exam-related, this assignment is to be done individually without collaboration from your classmates. You may ask the instructor for guidance.

1.

a. What determines the steady-state growth rate of real GDP in an economy in the Solow growth model? How, if at all, is the steady-state growth rate affected by each of the following: the saving rate, the rate of productivity growth, the population growth rate, and the depreciation rate?
b. What determines the steady-state inflation rate inflation rate if the quantity theory holds and the propensity to hold money (or, equivalently, velocity) is not changing over time?
c. What is the real exchange rate? What would the numerical value of the real exchange rate be if absolute purchasing-power parity held, and why? Why do we call a situation in which the real exchange rate does not change over time "relative purchasing-power parity"? In such a situation, what two variables determine the rate of nominal appreciation of each currency relative to the other, and by what formula?
d. How, if at all, is the *level* (not the growth rate) of the steady-state growth path of per-capita GDP affected by each of the following: the saving rate, the rate of productivity growth, and the population growth rate?
e. Based on your answers above, what are the correct answers to the four parts of question 1 on the exam?

2.

a. What is the equation for the two-period budget constraint for a consumer with no initial wealth and who leaves no bequest, for given levels of income in the two periods and a given level of the real interest rate?
b. Solve this budget-constraint equation for C_2 in terms of C_1, writing it in the form $C_2 = a + bC_1$. What are the values of the constants a and b in terms of Y_1, Y_2, and r?
c. Show that the point where $C_1 = Y_1$ and $C_2 = Y_2$ satisfies this equation.
d. What is the slope of the budget constraint, $\Delta C_2/\Delta C_1$, and how does it relate to a and/or b from part b?

e. What is the vertical intercept and how does it relate to a and/or b from part b?
f. Apply your analysis to determine the correct answers to the numerical problem in question 2 on the exam.

3.

a. What is the formula for the money-supply multiplier M/B in terms of the currency/deposit ratio (C/D) and the reserve/deposit ratio (R/D)?
b. Who decides on the currency/deposit ratio and what factors enter into that decision?
c. Who decides on the reserve/deposit ratio and what factors enter into that decision?
d. What effect does an increase in the currency/deposit ratio have on the money-supply multiplier? What is the intuition of this effect?
e. What effect does an increase in the reserve/deposit ratio have on the money-supply multiplier? What is the intuition of this effect?
f. If the money-supply multiplier goes up and the Fed keeps the monetary base the same, what happens to the money supply? What is the mechanism by which this happens?
g. Apply this analysis to question 3 on the exam.

4.

a. For given values of n, a, and δ, show in a diagram the effects of changes in the saving rate on steady-state consumption per effective labor unit. In your diagram, show that the effect can be either positive or negative.
b. What slopes are equal at the level of k^* when steady-state consumption per effective labor unit is maximized?
c. Translate that condition of equality of slopes into a relationship between the real interest rate and the growth rate of the economy.
d. How does the effect of an increase in the saving rate on steady-state consumption per effective labor unit depend on the relative magnitude of the interest rate and the growth rate?
e. Use your analysis to answer question 4 on the exam.

5.

a. If the nominal interest rate is 4%, how much do you receive back one year from now from a $100 loan today?
b. Assume that one good costs $1 today. If the inflation rate over the next year is 1%, how much does one good cost one year from now?
c. With the 4% nominal interest rate and the 1% inflation rate, how many goods can you buy next year if you forgo 100 goods today by making a $100 loan?
d. Is the real interest rate exactly or approximately 3%? Explain.
e. Should consumption/saving behavior depend on the real interest rate or the nominal interest rate? Explain.
f. Should business capital investment decisions depend on the real interest rate or the nominal interest rate? Explain.

g. Should the choice of holding wealth as money or bonds depend on the real interest rate or the nominal interest rate? Explain.
h. Use your analysis to answer question 5 on the exam.