Econ 100B MT1 questions
Spring 2019

Question 1 (13 points; 9 minutes total) Consider this activity

The government constructs a bridge over a previously impassable river.

A. (8 points) In the growth model, would this activity be recorded as K? L? E? Y? (One or more answers are "yes.") Defend your "yes" answer(s).

B. (5 points) Where would this activity be recorded in GDP expenditure accounting: C, I, G, GX, IM, or not recorded? Defend your answer.

Question 2 (10 points; 7 minutes)

Starting from the definition of balanced growth equilibrium (BGE) and assuming our usual Cobb-Douglas production function, $\frac{Y}{L} = \left(\frac{K}{L}\right)^{\alpha} E^{1-\alpha}$, derive the BGE expression for $\frac{Y}{K}$.

Show all your steps.

Question 3 (22 points total; 15 minutes total)

Suppose the economy can be defined by the following (three versions):

s = 20 %	s = 24 %	s = 25 %
n = 2 %	n = 2 %	n = 1 %
g = 1 %	g = 2 %	g = 2 %
δ = 2 %	δ = 4 %	δ = 2 %
α = 1/3	α = 1/3	α = 1/3

A. (12 points) In BGE, what are the values or expressions for the values of K/Y, Y/L, and K/L? You must write down the formulas you are using, then plug in the values, then simplify – or no credit. If you cannot complete the math without a calculator, go as far as you can to receive the most partial credit. Please put a box around each answer.

B. (4 points) If K/L = $100,000 and Y/L = $50,000, is this economy in BGE? How do you know?

C. (6 points) Draw a graph that depicts BGE. Show the approximate location of the point described in b.

Question 4 (18 points total; 13 minutes total)
Assume the economy is initially in balanced growth equilibrium. Assume the usual Cobb-Douglas production function. Assume our usual measure of the standard of living. Now suppose the government cuts taxes and thereby permanently increases the budget deficit by $150 billion annually. (That is, each year tax collections are $150 billion less than they would have been without the tax cut. There is no annual acceleration in the tax cut.) The tax cut has no effect on productivity.

A. (6 points) When the government increases the budget deficit, what is the effect on the saving rate? Defend your answer. Your defense should include the relevant equations.

B. (12 points) What is the long-run effect of the $150 billion annual tax cut on the standard of living? What is the effect over the next few decades on the growth rate of the standard of living? What is the long-run permanent effect on the growth rate of the standard of living? Defend your answers.

Question 5 (17 points total; 12 minutes total)
Consider again the scenario in question 4. Now suppose that the permanent increase in the budget deficit is due instead to an annual $150 billion increase in government spending for improved infrastructure: better and more efficient transportation and communication networks, for instance. (That is, each year infrastructure spending is $150 billion more than it would have been without the infrastructure project. There is no annual acceleration in the spending.)

A. (5 points) Would you characterize the effect of increased spending on infrastructure as a change in efficiency (E) or a change in the growth rate of efficiency (g)? Defend your answer.

B. (12 points) What is the long-run effect of the $150 billion annual infrastructure spending on the standard of living? What is the effect over the next few decades on the growth rate of the standard of living? What is the long-run permanent effect on the growth rate of the standard of living? Defend your answers.

Question 6 (10 points total; 7 minutes total) Consider this argument

If the government permanently increases the budget deficit,
then the standard of living will be lower.

Following the Olney 5-step method for critiquing an argument, and based on all the work you've done on the rest of this midterm, critique the argument.

Question 7 (10 points total; 7 minutes total)

Suppose there are 2 groups of households

Group 1 are laborers

- receive all income from labor
- are low-income households
- have low household saving rate

Group 2 own the capital

- receive all income from capital
- are high-income households
- have high household saving rate

Suppose that income is distributed unevenly: when income rises, most of the gain in income goes to the high-income households who own the capital and very little goes to the low-income households who are the workers. Suppose g=0; that is, there is no **ongoing** growth in efficiency (E) over time.

Suppose there is a **one time** increase in E. Over time, what will happen to the overall saving rate? To the average standard of living in this economy? To the level of inequality in this economy?