Midterm 2
Spring 2017
Econ 100B

Based on the standard equations we used in class, in equilibrium,

$$Y = \frac{C_0 - C_y T_0 + I_0 + G_0 + GX_0 + X_f Y^f + X_s \varepsilon_0 + X_s \varepsilon_r r^f - IM_0}{1 - C_y(1-t) + IM_y} - \frac{I_r + X_s \varepsilon_r}{1 - C_y(1-t) + IM_y} r$$

and

$$r = \frac{C_0 - C_y T_0 + I_0 + G_0 + GX_0 + X_f Y^f + X_s \varepsilon_0 + X_s \varepsilon_r r^f - IM_0 + (C_y(1-t) - IM_y - 1)Y^*}{I_r + X_s \varepsilon_r}$$

Question 1 (16 points total; 11 minutes total)
We have considered two models in recent weeks: the long-run flexible price model, and the short-run sticky price model.

a)   (4 points) Of these two models, which is the appropriate model to use to answer this question: "When the central bank changes interest rates, how does this affect unemployment?" Why?
b)   (4 points) Of these two models, which is the appropriate model to use to answer this question: "When the federal government increases its spending, what is the effect on interest rates?" Why?
c)   (4 points) The equilibrium equations for Y and r are on page 1. Describe the steps you would follow to derive the short-run equilibrium. There is no need to actually complete the derivation; just tell us what steps you would take to do so.
d)   (4 points) The equilibrium equations for Y and r are on page 1. Describe the steps you would follow to derive the long-run equilibrium. There is no need to actually complete the derivation; just tell us what steps you would take to do so.

Question 2 (12 points total; 8 minutes total)
a)   (4 points) What is the difference between "long term" and "long run"?

b)   (8 points) When surprising events happen and suddenly the federal government's budget deficit is expected to rise over the next many years, long-term interest rates change. Explain why.

Question 3 (12 points total; 8 minutes total)
a)   (8 points) The behavioral equation describing the real exchange rate is $\varepsilon = \varepsilon_o - \varepsilon_r(r - r^f)$. Explain why an increase in interest rates in other countries, all else constant, leads to an increase in the real exchange rate.

b)   (4 points) Explain why an increase in the real exchange rate leads to an increase in US gross exports.

Question 4 (14 points; 10 minutes)
Suppose that the central bank follows this rule when setting the risk-free short-term interest rate, r:
•   [A] When aggregate demand is increased and there is a large output gap, do not change interest rates
•   [B] When aggregate demand is increased and the economy is near Y*, increase interest rates

When is the short run effect of an increase in government spending (G_o) on equilibrium income (Y) larger: [A] when there is initially a large output gap or [B] when the economy is initially near potential output. Explain fully.

Supplement your answer with a graph showing the IS curve(s). In labels, use subscript "1" for before G increases and subscript "2" for after G increases. Use superscript "A" for case [A] and superscript "B" for case [B].

Question 5 (8 points; 6 minutes)
Okun's law relates the unemployment rate to the output gap. Let "OLC" stand for the Okun's Law Coefficient, set equal to 0.4 in the textbook. Y* stands for potential output. u* stands for the natural rate of unemployment (the unemployment rate when the economy is at full employment).

$$u = u^* + OLC \cdot \left(\frac{Y^* - Y}{Y^*} \right)$$

Consider two economies in the short run.

- In Economy A, when output falls, very few workers are laid off (fired) and instead shareholder profits decline. When output rises, very few workers are hired and instead shareholder profits rise.
- In Economy B, when output falls, workers are laid off (fired) and shareholder profits remain the same or rise slightly. When output rises, workers are hired and shareholder profits rise.

In which economy – A or B – will the Okun's Law coefficient (OLC) be larger? Defend your answer.

Question 6 (38 points total; 27 minutes total)
Suppose that the government sector always has a balanced budget. In that case
$$G = T = T_o + tY$$
There can be no autonomous or exogenous change in G in this economy <u>unless</u> there is also a change in net taxes, T.

a)   (2 points) If there is a decrease in autonomous taxes, *in this economy* what is the effect on government spending?

b)   (12 points) Is the spending multiplier in this economy larger, smaller, or the same size as the spending multiplier in an economy in which there is no connection between G and T? Explain. As part of your explanation, be sure to describe the multiplier process itself.

c)   (12 points) In a short-run sticky price economy, *in this economy in which G = T = T_o + tY* what is the effect of a decrease in autonomous taxes on equilibrium GDP? Would the effect on equilibrium GDP be the same if we had the usual equations in which there is no connection between G and T? Explain.

d)   (12 points) In a long run flexible price economy, *in this economy in which G = T = T_o + tY* what is the effect of a decrease in autonomous taxes on the equilibrium real interest rate? Would the effect on the equilibrium interest rate be the same if we had the usual equations in which there is no connection between G and T? Explain.