Economics 2 Professor Christina Romer
Spring 2018 Professor David Romer

PROBLEM SET 5

DUE AT THE *BEGINNING* OF LECTURE ON THURSDAY, APRIL 12TH

You may work together on the problems, but your answers must be ***in your own words*** and ***handwritten***. You also must ***list the other students with whom you worked***.

For all questions be sure to explain your answers and to use graphs whenever appropriate.

1. Consider the long-run labor market for all American workers. For simplicity, assume that the normal real wage adjusts to equilibrate the supply and demand for labor.

- **a.** Suppose that the government raises the marginal tax rate that households have to pay on their income. How would this show up in the diagram? What would be the effect on the normal real wage and employment of American workers?
- **b.** Now consider the effect of an increase in the tax rate firms have to pay on payrolls. (In this context, you should think of a payroll tax as a percentage tax on wages physically collected from employers.) What will such a rise in the payroll tax rate have on the normal real wage and employment?
- **c.** If, in fact, there is some force, such as efficiency wages, that prevents the prevailing real wage from falling to its equilibrium level, will an increase in the marginal income tax rate or the payroll tax rate be more likely to increase normal unemployment?

2. Describe how each of the following developments will affect the economy's normal real interest rate and normal investment.

- **a.** The government institutes a permanent investment tax credit (ITC). (You can think of an ITC as a program that reduces the effective purchase price of new capital for firms.)
- **b.** Increasing risk aversion causes American consumers as a group to permanently consume less at every level of the real interest rate.

3. Suppose that the components of planned aggregate expenditure (PAE) take the following specification:

$$C = 1000 + 0.5Y$$
$$I^p = 2000$$
$$G = 1000$$
$$NX = 500$$

- **a.** Graph the expenditure line corresponding to this specification, the 45-degree line, and the equilibrium level of total output in the short run.
- **b.** Now solve the example algebraically to determine the equilibrium level of total output in the short run. (Think of the two equations represented in your diagram above: Y = PAE and PAE = f(Y). Substitute the second into the first and then solve for Y. If you need more help, see pp. 606–607 of the textbook.)

c. Suppose that government purchases (G) increase to 1500. Show what will happen to total output in the short run both graphically and algebraically.

4. Suppose that the marginal propensity to consume is lower in Japan than in the United States. In which country would the multiplier for government purchases (that is, the amount that Y changes in response to a given change in G) be larger? Be sure to explain your answer both graphically and in terms of the underlying economics.

5. Consider the long-run labor market for married female workers. In the 1950s, many employers had a policy of not hiring married women (and of even firing female employees when they married). How would the end of such policies affect the normal real wage and employment of married women working outside the home?

6. The rate of growth of potential output per person appears to have slowed down noticeably (from roughly 2% per year in the 1990s and early 2000s to less than 1% per year in recent years). Use the aggregate production function to discuss the role that changes in the normal employment-to-population ratio could have played in this slowdown. What are other possible sources of this change?