Masters Macroeconomics Fall 2015
Homework Assignment Due: 7 October

(Questions are taken from Mankiw's Chapter 3.)

1. Use the neoclassical theory of distribution to predict the impact on the real wage and the real rental price of capital of each of the following events:

a. A wave of immigration increases the labor force.

b. An earthquake destroys some of the capital stock.

c. A technological advance improves the production function.

2. According to the neoclassical theory of distribution, the real wage earned by any worker equals that worker's marginal productivity. Let's use this insight to examine the incomes of two groups of workers: farmers and barbers.

a. Over the past century, the productivity of farmers has risen substantially because of technological progress. According to the neoclassical theory, what should have happened to their real wage?

b. In what units is the farmers' real wage discussed in part (a) measured? (Be careful here, there are two goods in the model, food and haircuts. Which price should be involved in the calculation?)

c. Over the same period, the productivity of barbers has (we assume) remained constant. What should have happened to their real wage?

d. In what units is the barbers' real wage in part (c) measured? (Again, you should specify which P is used here.)

e. Suppose workers can move freely between being farmers and being barbers. What does this mobility imply for the nominal wages of farmers and barbers?

f. What do your previous answers imply must have happened to the price of haircuts relative to the price of food?

g. Use the results above to discuss who benefits from technological progress in farming, farmers or barbers.

3. Consider an economy described by the following set of equations:

$$Y = C + I + G$$
$$Y = \bar{Y} = 5000$$
$$G = \bar{G} = 1000$$
$$T = \bar{T} = 1000$$
$$C = 250 + 0.75(Y - T)$$
$$I = 1000 - 50r.$$

a. What is the marginal propensity to consume?

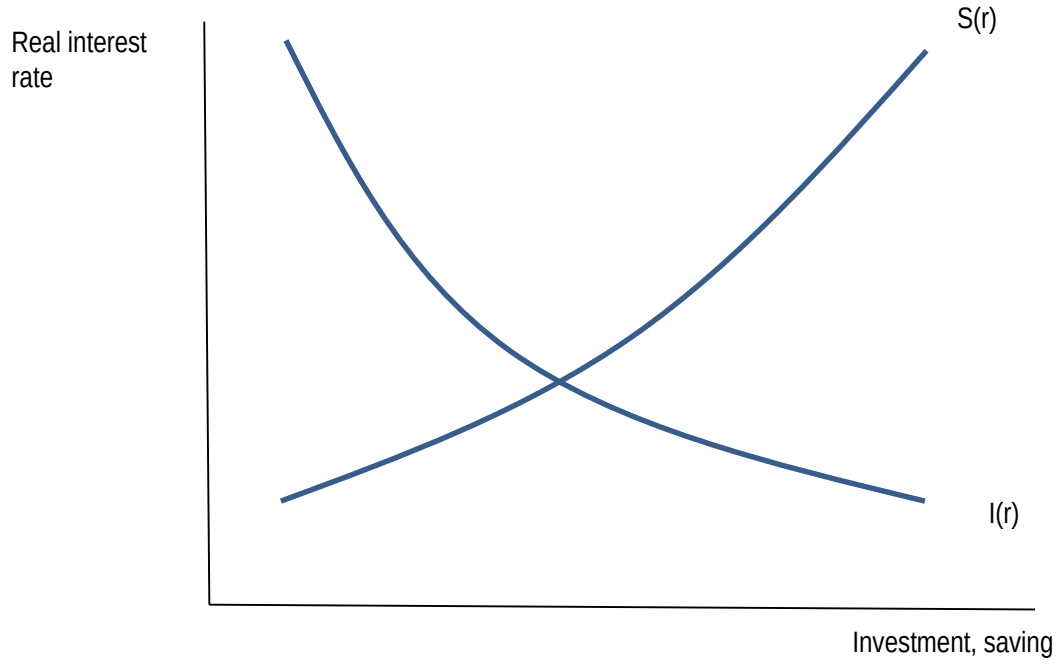
b. Compute private saving, public saving, and national saving. Do these depend on the interest rate in this model? Is this realistic or just a simplification? Explain.

c. What is the equilibrium real interest rate in this economy?

d. Suppose that G rises to 1250 (holding T constant). Compute the new values of private saving, public saving, and national saving.

e. Find the new equilibrium real interest rate and explain in words why it has changed.

4. One source of frustration to empirical macroeconomists in the last half of the 20th century was the absence of a strong negative correlation between real interest rates and investment spending, which seems to follow naturally from the assumption that the demand curve for investment slopes downward. We can use the neoclassical model to explore why this might occur. We shall use the variant in which private saving is positively related to the real interest rate (as in the figure below, which is similar to Figure 3-12 in the text).



a. Suppose that the demand curve for loanable funds is stable, but that the supply curve fluctuates from year to year. What might cause such fluctuations in supply? In this case, what correlation would you observe between the equilibrium quantity of investment and the equilibrium real interest rate?

b. Now suppose that the supply of loanable funds is stable, but that the demand curve fluctuates from year to year. What might cause these fluctuations in demand? In this case, what correlation would you observe between the equilibrium quantity of investment and the equilibrium real interest rate?

c. Finally, suppose that both the supply and demand curves fluctuate from year to year. If you were to construct a scatter plot of the points of equilibrium investment and real interest rate, what would you expect to find? Is there a consistent correlation between them? Why or why not?

d. Which of the above three cases seems most realistic to you and why? Might this explain the frustrating absence of a strong negative correlation between real interest rates and investment spending?