Economics 101b; Fall 2000; Final Exam

Definitions--one sentence on each (1/6 of exam)

1. What kinds of changes in economic policy affect the economy most rapidly?

2. What is wrong with GDP as an index of economic well-being?

3. What is the single most important leading indicator of economic activity?

4. What are adaptive expectations of inflation?

5. Suppose that the *multiplier* is 3, and that a 1% reduction in the real interest rate increases investment spending by $90 billion and exports by $30 billion. By how much—and in what direction—will a 1% increase in the real interest rate change real GDP?

6. Why is that component of investment that simply replaces worn-out or obsolete capital included in GDP?

Short answers--one (short) paragraph on each (1/6 of exam):

1. What difference does it make if managers, workers, and investors in an economy have *rational expectations of inflation*?

2. Why does a high level of the stock market indicate that investment is going to be high?

3. What are recessions?

Income and Expenditure (1/6 of exam):

Suppose that we have the following income-expenditure model of the economy:

Y = C+I+G+NX (national income identity)
C = C_0 + 0.75(Y - T) (consumption function)
T = .333 x Y (taxes)
NX = GX - IM (net exports)
IM = .1 x Y (imports)

And suppose that I, G, and GX are determined outside this model's system.

(1) Solve, algebraically, for Y as a function of the outside variables I, G, GX, and the parameter C_0.

(2) What is the value of the multiplier in this model?

(3) Suppose that the sum C_0 + I + G + NX increases by $100 billion. By how much does equilibrium real GDP Y change?

Economic Growth (1/6 of exam):

Consider an economy in which the (real) savings rate is about 16 percent of output, the average rate of increase in the efficiency of labor E is 1 percent per year, the average rate of growth of the labor force L is about 3 percent per year, and the depreciation rate is about 4 percent per year.

(1) Suppose that the economy maintains these investment, population growth, depreciation, and labor efficiency growth rates far into the future. What is the steady-state capital-output ratio Y/K?

(2) Suppose that the parameter α in the production function $Y/L = (K/L)^{\alpha} \times E^{1-\alpha}$ is 1/3. (Remember that steady-state output per worker equals:

$$\frac{Y}{L} = (\kappa^*)^{\frac{\alpha}{1-\alpha}} \times E$$

where κ^* is the steady-state capital-output ratio.) What is steady-state output per worker as a function of the efficiency of labor E and of the parameters of the model)?

(3) What will the long-run rate of growth of GDP per worker be in steady state?

(4) Suppose that population and labor force growth drop to zero and the savings rate rises to 20 percent of output. What happens to the steady-state value of output per worker?

Macroeconomic Shocks (1/6 of exam):

A. In a full-employment economy, what do you think would be the *qualitative* effects—on the equilibrium distribution of GDP between consumption, investment, government purchases, and net exports, and on the real exchange rate and the real interest rate, of each of the following shifts in the economic environment?

- An increase in interest rates overseas (holding all other aspects of the economic environment constant).
- Greater optimism on the part of domestic investors (holding all other aspects of the economic environment constant).
- An increase in the tax rate (holding all other aspects of the economic environment constant).
- An increase in government purchases (holding all other aspects of the economic environment constant).

B. How would your answers differ if the economy was a sticky-price, unemployment economy (in which the Federal Reserve was fixing the real interest rate) instead?

Inflation and Unemployment (1/6 of exam):

Suppose that the economy can be modeled by:

$$\pi_t = \pi_{t-1} + \alpha \times y_{t-1} + \eta_t \text{ (Phillips curve in "output" form)}$$

$$y_t = y^* - \gamma \times r_t \text{ (IS curve)}$$

Where subscripts denote years, and where π is the inflation rate, y is the difference between real GDP and potential output, r is the real interest rate chosen by the Federal Reserve, η is a supply shock, and y*, α and γ are parameters.

(i) Suppose that the initial values at time t of y and π are zero, and suppose that the central bank sets r at a constant rate equal to y^*/γ always. Solve—as functions of the parameters of the model and the values of the shock η at times t+1, t+2, t+3, t+4, t+5—for what the values of y and π will be at t+5.

(ii) Does your answer to (i) make you think that setting r equal to y_0/γ is an effective stabilization policy? Explain why or why not.

(iii) Suppose that at time t y equals 0 but π equals π^*, and suppose that there are no shocks to the economy—that η is always equal to zero. To what values does the Federal Reserve need to set r_t in order to make π_{t+1} equal to zero? What happens to output if the Federal Reserve sets r to that value?

(iv) Discuss whether the rule

$$r_t = \frac{y^*}{\gamma} + \left(\frac{1}{\alpha\gamma} \right) \times \pi_t$$

would be an effective stabilization policy or not. Can you think of a better factor than $(1/\alpha\gamma)$ for the amount by which to raise interest rates in response to a one percentage point increase in inflation?