

Economics 101b; Fall 2005; Midterm 1

1. (25 points/12 minutes) What does Robert Heilbroner see as the lasting, permanent impact on economics of Karl Marx and John Maynard Keynes?

2. (25 points/12 minutes) Consider the Solow growth model, in which output per worker along the steady-state growth path is given by:

$$\frac{Y_t}{L_t} = \left(\left(\frac{K}{Y} \right)^* \right)^{\frac{\alpha}{1-\alpha}} \times E_t$$

where the steady-state capital-output ratio $(K/Y)^*$ is given by:

$$\left(\frac{K}{Y} \right)^* = \frac{s}{n + g + \delta}$$

where the diminishing-returns-to-scale parameter in the production function is α , and where s is the economy's savings-investment rate, n is the labor force growth rate, δ is the depreciation rate, and g is the proportional rate of growth of the efficiency of labor E_t .

- a. Suppose that we have two economies A and B, identical save that in economy A the efficiency of labor is twice that of economy B. What is the ratio of their steady-state output per worker levels?
 - b. Suppose that we have two economies A and B, identical save that in economy A the capital-output ratio is twice that of economy B. Write an equation for how the ratio of their steady-state output per worker levels varies depends on the value of the production function parameter α .
 - c. Suppose that we have a labor force growth rate of 2% per year, a depreciation rate of 4% per year, a rate of growth of the efficiency of labor of 2% per year, and a savings rate of 20% of GDP. What is the steady-state capital-output ratio? Suppose that the efficiency of labor is currently \$20,000 per year and the economy is on its steady-state growth path. What is the economy's level of output per worker if the diminishing-returns-to-capital parameter α is 1/2?
 - d. With the same parameter values as (c), what is the proportional reduction in the steady-state level of output per worker that would be generated by a reduction in the savings rate from 20% to 16%?
3. (25 points/12 minutes) Write how you would explain to somebody who hasn't taken any economics courses:
- a. How it could possibly be that human population increased from roughly 170 million in year 1 to 400 million in year 1500 without there being any noticeable improvement in median standards of living or life expectancy.

- b. How it could be that labor productivity levels and living standards in the world economy's industrial core have risen more than eight-fold in the past two centuries.
- c. How much we should worry that continued population growth will lead over the next century to an overcrowded world with insufficient natural resources.

4. (25 points/12 minutes) Suppose that in the flexible-price full-employment business-cycle model the relevant parameters of the economy are:

$t = 0.33$ Tax rate of one-third.

$I_r = 75$ A 1-percentage-point fall in the interest rate raises investment spending by \$75 billion a year.

$C_y = 0.75$ A marginal propensity to consume of three-quarters.

$\varepsilon_r = 10$ With an initial value for the real exchange rate e set at the traditional indexed value of 100, a 1-percentage-point change in the interest rate difference vis-à-vis abroad generates a 10 percent shift in the exchange rate.

$X_\varepsilon = 7.5$ A 10 percent change in the exchange rate leads to a \$75 billion-a-year change in exports.

And recall the key equations of this model for consumption C , investment I , government purchases G , exports X , imports IM , and real output Y (in "changes" form):

$$\Delta C = \Delta C_0 + C_y(1 - t)\Delta Y$$

$$\Delta I = \Delta I_0 - I_r \Delta r$$

$$\Delta X = X_f \Delta Y^f + X_\varepsilon \Delta \varepsilon$$

$$\Delta IM = IM_y \Delta Y$$

$$\Delta Y = \Delta Y^*$$

$$\Delta \varepsilon = \Delta \varepsilon_0 + \varepsilon_r (r^f - r)$$

$$\Delta C + \Delta I + \Delta G + \Delta X - \Delta IM = \Delta Y$$

Suppose that irrational exuberance causes a real estate boom that leads to increase of \$200 billion in C_0 , with no other changes in economic policy or the economic environment. Calculate the changes to investment, exports, the interest rate r , and the exchange rate ε in the new equilibrium.