

14.02 Problem Set 7

Due May 7, 1999

Please write your name and section on the completed assignment

1. Growth and Technology. (Chapter 24)

Show the all answers to the questions graphically.

a. Using the Solow Growth model, show the effect of a change in the savings rate on output per effective worker, capital per effective worker, and the growth rate of the economy.

b. Assume that the production function in the economy is $Y=A K^{0.5}$. Now assume that technology, A , is a function of the amount of capital in the economy, $A = K^a$. Assume depreciation rate of d and a saving rate of s .

Solve for the steady state level of output and capital when $a < 0.5$. (Express as a function of s , d , and a .)

If $a > 0.5$ what happens to output over time? (Show graphically)

c. Define and explain the idea of **convergence** of per capital output across countries. If the economies of the world look like part b above with $a > 0.5$, what implication would this have for the convergence of economies' output over time?

d. Name one example of a technology that might depend very heavily on the level of capital ($a \gg 0$) and one example where A does *not* depend on the level of capital ($a=0$).

2. PIH, Social Security.

It is now the year 2001, and H. Ross Perot has just been sworn into office as the first president of the U.S. of the new Millennium. The top items on his agenda are 1. keep the budget balanced, 2. Help out senior citizens, and 2. do nothing else to the spending side of the budget.

a. Assume that in 2001 Bill Clinton has already fixed social security. First, explain why Social Security needed to be "fixed".

b. Perot announces that he will raise benefits by 50% to all retirees. Describe the effect that this will have on the economy both today and in the future assuming that taxes remain unchanged. Trace out the effects on output, inflation, and the budget deficit. Using the Permanent Income Hypothesis, how will this effect the savings rate for young people in the economy?

c. Since President Perot is also committed to balancing the budget, he must raise taxes to cover the additional spending on Social Security recipients. If taxes are raised at the same time as benefits, describe the impact on the economy. What will happen to the savings rate of young people in this case (Compare with b)? Who benefits (or loses) from this policy?