

## Midterm Exam—Practice Problems

**Exam: October 23<sup>rd</sup>, 2008 in-class**

**Material Covered: Chapter 2, 3, 6, 7, 8, 9, 10**

**Make sure you understand the homework problems and examples done in class in addition to the problems given below.**

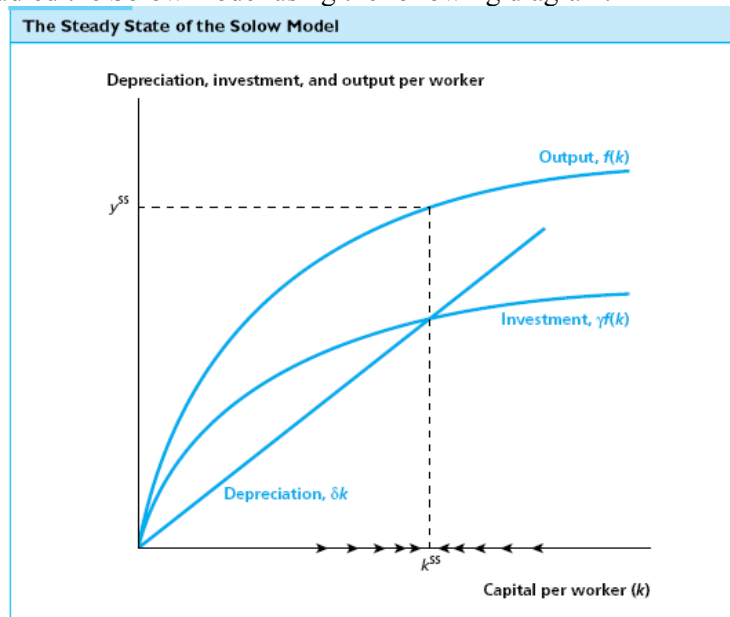
### Growth

1. Chapter 2 #2
2. In 2005 GDP per capita in the United States was \$36,806 while GDP per capita in Sri Lanka was \$4,650. Suppose that income per capita in the United States has been growing at a constant rate of 1.9% per year. Calculate the year in which income per capita in the United States was equal to year 2005 income per capita in Sri Lanka.
3. Suppose that there are only two goods produced in the world: computers, which are traded internationally, and ice cream, which is not. The following table shows information on the production and prices of computers and ice cream in two countries:
  - a. Calculate the level of GDP per capita in each country, measured in its own currency.

Country	Computers Produced per Capita	Ice Cream Produced per Capita	Price of Computers in Local Currency	Price of Ice Cream in Local Currency
Richland	12	4	2	4
Poorland	3	1	1	1

- b. Calculate the market exchange rate between the currencies of the two countries.
    - c. What is the ratio of GDP per capita in Richland to GDP per capita in Poorland, using the market exchange rate?
    - d. Calculate the purchasing power parity (PPP) exchange rate between the two currencies.
    - e. What is the ratio of GDP per capita in Richland to GDP per capita in Poorland, using the PPP exchange rate?

4. In class, we studied the Solow model using the following diagram:



Say an economy saves a fraction of its output. Saving is determined as follows: There is a subsistence level of consumption per worker,  $c^*$ . If income per worker is equal to  $c^*$ , people will consume all of their income. All income per worker in excess of  $c^*$  will be split between consumption and investment, with a fraction  $g$  going to investment and the rest going to consumption. Use a diagram like above to analyze the steady states of this economy.

### Inequality

5. Chapter 7 #5 a, b, c

### Poverty

6. Chapter 8 #3 a, c, d

### Population

7. Chapter 9 #1
8. Chapter 9 #5 a
9. Consider the Solow model with population growth, as presented in class. Assume that population can grow at two different rates  $n_1$  and  $n_2$ , where  $n_1 > n_2$ . The population growth rate depends on the level of output per capita (and therefore the level of capital per capita), that is it is endogenous. Specifically, population grows at rate  $n_1$  when  $k < k^*$  and slows down to rate  $n_2$  when  $k > k^*$ . Draw a diagram for this model. Assume that  $(n_1 + \delta)k^* > \gamma f(k^*)$  and  $(n_2 + \delta)k^* < \gamma f(k^*)$ . Explain what the diagram says about the steady state of the model.

### Rural & Urban

10. Chapter 10 #4
11. Chapter 10 #6

12. Chapter 10 #8

**Correlation vs. Causation**

13. For each of the following scenarios, discuss what statistical problem might make the inference incorrect:

- a. People who vote for right-wing political parties tend to live longer than those who vote for left-wing parties. Therefore, being a political conservative is good for you.
- b. People in hospitals are generally less healthy than those outside of hospitals. Therefore, it is best to avoid hospitals.