

# **Economics 3334: Intermediate Economics**

## **Problem Set #1**

*Hard Copy must be turned in at McElhinney Room 115 by 10:00am on Thursday September 17<sup>th</sup>, 2009. All answers must be written in ink or typed. You must show your work for calculations in order to receive credit.*

### **Chapter 1 Questions**

#### **1) Macroeconomics and Models**

- a) What is the definition of Macroeconomics?
  
  
  
  
  
  
  
  
  
  
- b) Why do economists use economic models?
  
  
  
  
  
  
  
  
  
  
- c) What is a parameter?
  
  
  
  
  
  
  
  
  
  
- d) What is the definition of an exogenous variable?
  
  
  
  
  
  
  
  
  
  
- e) What is the definition of an endogenous variable?

#### **2) Economic Analysis**

- a) What is the definition of long-run economic analysis?
  
  
  
  
  
  
  
  
  
  
- b) What is the definition of short-run analysis?
  
  
  
  
  
  
  
  
  
  
- c) What is the definition of Potential Output (GDP)?
  
  
  
  
  
  
  
  
  
  
- d) What are economic fluctuations?
  
  
  
  
  
  
  
  
  
  
- e) What is the definition of inflation?

## Chapter 2 Questions

### 3) Gross Domestic Product

Table 2.1: U.S. 2006 Gross Domestic Product (\$billions)

|                                   |      |
|-----------------------------------|------|
| Personal consumption expenditures | 9269 |
| Goods                             | 3785 |
| Services                          | 5484 |
| Gross private domestic investment | 2213 |
| Fixed investment                  | 2163 |
| Change in private inventories     | 50   |
| Net exports of goods and services | -763 |
| Exports                           | 1466 |
| Imports                           | 2229 |
| Government expenditures           | 2528 |
| Federal                           | 927  |
| State and local                   | 1601 |

- What is the definition of Gross Domestic Product (GDP)?
- What is the equation for the expenditure approach to national income accounting?
- Consider Table 2.1, the National Income Accounts for 2006 total GDP is:
- Using Table 2.1 in 2006, household consumption expenditures accounted for about \_\_\_\_ of total GDP.
- In Table 2.1, the nominal GDP is in billions of 2006 dollars. How are Nominal GDP (NGDP), the Price Level(P) and Real GDP (RGDP) related in an equation?

### 4) Defining Macroeconomic Rates

- What is the definition of Nominal GDP?
- What is the basic formula for Nominal GDP?
- What is the definition of the GDP deflator?
- What is the equation for the percentage change in nominal GDP?
- What is the definition of the inflation rate?

## Chapter 3 Questions

### 5) Economic Growth

- a) What is the definition of economic growth?
- b) What is the definition of a growth rate?
- c) What is the definition of the constant growth rule?
- d) What is the equation of the constant growth rule?
- e) What is the Rule of 70?

### 6) Calculating Growth Rates

- a) What is the rule for computing growth rates?
- b) What is the rule for computing growth rates of ratios?
- c) What is the rule for computing growth rates of products?
- d) What is the rule for computing growth rates of powers?
- e) What is the definition of the growth rate of total GDP?

### 7) Growth Rate of Income Per Capita

- a) What does “ $t$ ” represent in the rule for computing growth rates?
- b) What does “ $y_0$ ” represent in the rule for computing growth rates?
- c) If income per capita was \$2525 in 1870 and \$46859 in 2008, then calculate the growth rate of income per capita from 1870 to 2008.
- d) If income per capita was \$7100 in 1929 and \$46859 in 2008, then calculate the growth rate of income per capita from 1929 to 2008.
- e) If income per capita was \$11720 in 1950 and \$46859 in 2008, then calculate the growth rate of income per capita from 1950 to 2008.

## Chapter 4 Questions

### 8) A Model of Production

- a) What is the definition of the production function?
  
- b) What is the Cobb-Douglas Production Function?
  
- c) What is the definition of constant returns to scale?
  
- d) What is the definition of increasing returns to scale?
  
- e) What is the definition of decreasing returns to scale?

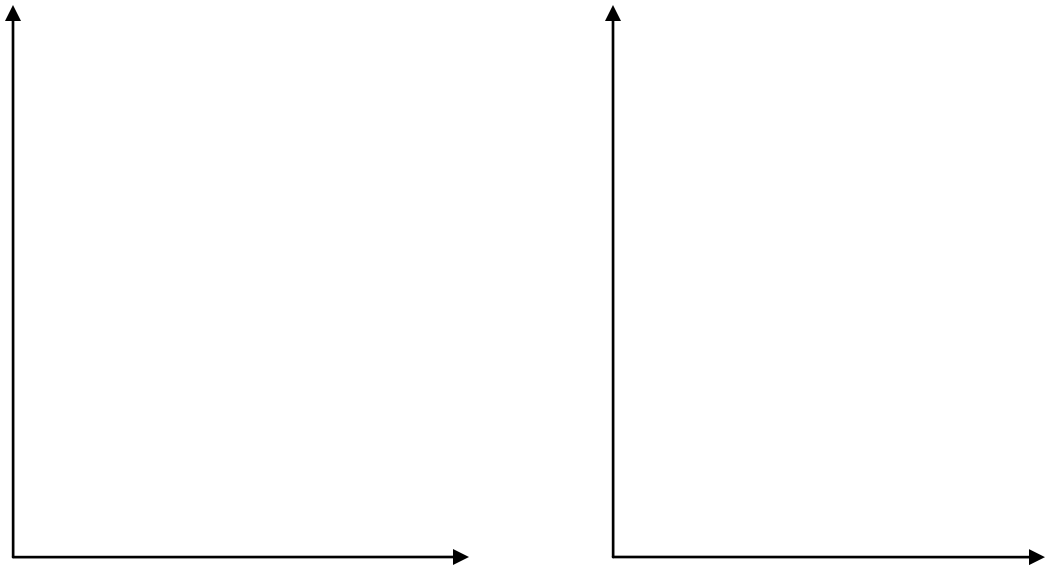
### 9) Cobb-Douglas: For the Cobb-Douglas Function: $Y = \bar{A}K^{1/3}L^{2/3}$ use the following values of labor and capital to answer the questions. Assume the Total Factor Productivity parameter is (TFP= $\bar{A}=1$ ).

- a) If the values of capital and labor are ( $\bar{K} = 8$ ) and ( $\bar{L} = 27$ ) respectively, then calculate the output and label it as  $Y_1$ .
  
- b) If we increase the capital to ( $\bar{K} = 16$ ) and labor input is the same ( $\bar{L} = 27$ ), then calculate the output and label it as  $Y_2$ .
  
- c) If the value of capital is ( $\bar{K} = 8$ ) and we double the labor input ( $\bar{L} = 54$ ), then calculate the output and label it as  $Y_3$ .
  
- d) If we double both of the inputs with ( $\bar{K} = 16$ ) and ( $\bar{L} = 54$ ), then calculate the output and label it as  $Y_4$ .
  
- e) How do we know the production function exhibits constant returns to scale? Show inference from the calculated values.

**10) The Gift of Dying.** Alwyn Young, an economist at the London School of Economics, has a recent paper in which he studies the macroeconomic consequences of the horrible tragedy of AIDS in sub-Saharan Africa. Answer the following questions motivated by his research. (There is no need to read the article in order to complete this exercise. This is similar to problem 3 in chapter 4 of your book)

a) In the production function approach we studied in class, we noted that the wage rate is equal to the marginal product of labor. Write the mathematical expression of this statement. That is, write the wage ( $w^*$ ) as a function of capital ( $\bar{K}$ ), labor ( $\bar{L}$ ) and the Total Factor Productivity parameter (TFP= $\bar{A}$ ).

b) Graphically represent the change in the labor supply before and after the AIDS epidemic.



c) Young estimates that AIDS may eventually kill 25% (or  $\frac{1}{4}$ ) of the population in some of the poorest countries in the world. (So, three-fourths of the population remains because  $\bar{L}$  fell to  $\frac{3}{4}\bar{L}$ .) Assuming TFP and the amount of capital are unchanged by the epidemic, by how much would the wage rate change as a consequence of AIDS.

d) Discuss your result. Why does the wage rate change? Why is the effect larger of smaller in magnitude than 25% percent?

e) In what sense is there a “gift of the dying,” to use Young’s evocative title?