Chapter 3 Review

Readings: Mankiw: Chapter 3 all

Outline

I. Notes on Functions
   A. Functional form
   B. Endogenous and Exogenous Variables

II. The Production Function
   A. General functional form
   B. Criteria for a specific functional form?
   C. Marginal Product of Labor and Kapital
      1. definition
      2. diminishing marginal product
      3. Demand for a resource = MP
   D. Euler’s theorem & the production function
   E. Our favorite specific production function: Cobb-Douglas

III. Adding G & I to the Circular Flow (Ignore the ROW)

IV. Supply-Side for Our First Formal Model

IV. Demand Side Relationships
   C
   I
   G
   T

V. The Demand Side: Accounting Identities
   A. Goods and Services Mkt Equilibrium
      What keeps this market in equilibrium?
   B. Financial Market Equilibrium
      What keeps this market in equilibrium?

VI. Putting it all together: an example

VII. Applications

Problems to Study (not graded)

1. p 70: Questions For Review # 1.
2. p 70: Questions For Review # 2.
3. p 70: Questions For Review # 3.

5. p 70: Questions For Review # 5.


10. p 71: Problems and Applications # 5.


14. • What is the Cobb-Douglas production function? i.e. Give me its functional form.
   • Can Cobb-Douglas production run on inputs such as capital and labor, or is it just limited to corn cobbs?
   • Explain what is meant by constant returns to scale (in particular a production function having constant returns to scale).
   • Demonstrate that the Cobb-Douglas production function exhibits constant returns to scale. Do this by either of two methods: 1) use numerical examples, or 2) use calculus. In either case, include a good written explanation of what you are doing and how it demonstrates constant returns to scale.
   • What is Euler’s theorem (as it applies to production functions)? does the Cobb-Douglas meet the criteria for Euler’s theorem to hold? Explain why or why not.

15. Congratulations! Upon graduating from TCU, you receive a lucrative government job as an economic forecaster for the nation of Cobbistan. You are highly certain the Cobbistani economy exhibits constant returns to scale. Cobbistan also has some unusual characteristics in that it only has three types of resources: 1) capital, 2) skilled labor, and 3) unskilled labor. All capital in Cobbistan is alike. All skilled labor is alike. Finally, all unskilled labor is alike. Oh yeah. All resources in Cobbistan are fully employed.¹
   • Given the following information, calculate the total production in Cobbistan.
     rental price of capital = $4,000/year per machine

¹ Hint: In class and the text we talked about production functions with only 2 inputs. Certain conditions resulted if the production function meet some basic criteria. These conditions also apply to 3 input production functions as long as they meet the same basic criteria.
skilled wage = $6,000/year per worker
unskilled wage = $3,000/year per worker

# of machines = 20,000
# of skilled worker = 10,000
# of unskilled worker = 30,000

Explain how you got your answer. Did you have to assume anything else (ex. regarding the Cobbistani production function) to get your answer.

• Holy bad habits Batman! New designer drugs become popular among the skilled workers of Cobbistan. This does not directly affect their productivity i.e. If nothing else were to change, everyone’s productivity would be the same. However, some else does change. In particular large numbers of skilled workers overdose and die from these drugs. The economy loses 25% of its skilled workers. What will happen to each of the following because of this? Explain your reasoning behind each of your answers.

a. Total production in Cobbistan?

b. Wages of the surviving skilled workers in Cobbistan?

c. Wages of the unskilled workers in Cobbistan?

d. The rental price of capital in Cobbistan?

17. • Draw a graph indicating equilibrium in financial markets according to what was learned in this chapter. More particularly, assume the following:

1) \( C = C \ (Y - T) \)  
2) \( 0 < MPC < 1 \)  
3) \( I = I(r) \)  
4) \( G = \bar{G} \)  
5) \( T = \bar{T} \)  
6) there is no foreign sector  
4) \( Y = \bar{Y} \)

Label your curves and outcomes with the subscript 0 (ex. \( S_0, \) and \( I_0, r_0, \) etc.).

• Explain how your savings function is derived from the above information. Further, tell me what savings is a function of.

• Now assume that government spending (\( G \)) decreases. Shift the necessary curves and indicate the new outcomes. Label your curves and outcomes with the subscript 1 (ex. \( S_1, \) and \( I_1, r_1, \) etc.).

• Assume that government spending returns to its original level and the economy returns to \( E_0, \) the initial equilibrium. Next assume that Taxes (\( T \)) increase. Shift the necessary curves and indicate the new outcomes. Label your curves and outcomes with the subscript 2 (ex. \( S_2, \) and \( I_2, r_2, \) etc.).

• Assume that taxes return to its original level and the economy returns to \( E_0, \) the initial equilibrium. Next assume that Income (\( Y \)) increases. Shift the necessary curves and indicate the new outcomes. Label your curves and outcomes with the subscript 3 (ex. \( S_3, \) and \( I_3, r_3, \) etc.).