Microeconomics, Module 6: Production and Costs

Microeconomics module 6: Required reading from ninth edition: Landsburg Chapter 6

(The attached PDF file has better formatting.)

Module 6 covers two factors that affect costs: the available technology and input prices.

Focus on the *concepts*; the final exam does *not* test the details of this chapter.

Section 6.1: The quantity of fixed inputs cannot be changed during the time period; the quantity of variable inputs can be changed. In the short run, some inputs are fixed and some are variable.

- Total, average, and marginal product curves describe the relation between the amount of a variable input and the level of output, assuming other inputs are fixed.
- Total, average, average variable, and marginal cost curves describe the relation between output and cost in the short run and can be derived from the product curves.
- The U-shape of short run average, average variable, and marginal cost curves reflects the diminishing marginal returns to variable inputs.

Section 6.2: In the long run, all inputs are variable.

- An isoquant shows the combinations of labor and capital needed to produce a given level of output.
- The slope of an isoquant is the marginal rate of technical substitution of labor for capital, or the amount of capital that can replace a unit of labor while holding output level.

- An isocost shows the combinations of labor and capital that can be used at a given cost.
- The slope of an isocost is the relative price of labor in terms of capital.

- The expansion path is the set of tangencies between isoquants and isocosts.
- This path is the cost-efficient combinations of labor and capital in the long run.
- On the expansion path, the marginal rate of technical substitution of labor for capital is the relative price of labor in terms of capital.

- Long-run total, average, and marginal cost curves describe the relation between output and cost in the long-run and can be derived from the expansion path.
- If factor prices are fixed, the long-run average cost curve is
  - downward sloping when there are increasing returns to scale;
  - horizontal when there are constant returns to scale;
  - upward sloping when there are decreasing returns to scale.

Section 6.3: Short run total cost is always at least as great as long-run total cost, and every short run total cost curve is tangent to the long-run total cost curve.

The final exam does *not* test numerical problems from this Module. Understand the *concepts* of isoquant and isocost curves. We use the total, average, and marginal cost curves to *derive equilibrium prices and quantities* in competitive and noncompetitive industries (Modules 7, 8, 11, and 12). For those topics, the final exam has numerical problems, based on the practice problems and homework assignments for those modules.

Review exercise N1 on page 163. Barro's macroeconomic textbook uses the more general production function $L^\alpha K^{(1-\alpha)}$. For this exercise, $\alpha = \frac{1}{2}$. Review exercise N2. The final exam may use a value for α between 0 and 1.

Review question 4 on page 167. The final exam problems for this course use continuous production schedules, but the concepts are the same.