LECTURE 7
FIRMS AND PROFIT MAXIMIZATION
FEBRUARY 9, 2016

I. FIRMS AND THE DECISIONS THEY MAKE
   A. What is a firm?
   B. Three decisions a firm has to make
   C. Profit maximization as a key goal
   D. Economic profits vs. accounting profits
      1. The definition of economic profits
      2. Implicit costs

II. PERFECT COMPETITION
    A. The definition of perfect completion
    B. How relevant is perfect competition?
    C. The demand curve facing a competitive firm

III. SHORT-RUN PROFIT MAXIMIZATION
     A. The constraints that firms face
     B. Marginal revenue
     C. Marginal cost
     D. Optimization
     E. The irrelevance of fixed costs

IV. WHY SUPPLY CURVES SLOPE UP
    A. How a firm responds to an increase in the market price
    B. Individual and market supply curves

V. WHY SUPPLY CURVES SHIFT
   A. A change in technology
   B. A change in the cost of an input
   C. Entry or exit
   D. Other influences
Lecture 7

Firms and Profit Maximization

February 9, 2016
Announcements

• Problem Set 2 is being handed out.
  • It is due at the beginning of lecture next Tuesday (Feb. 16).
  • The ground rules are the same as on Problem Set 1.
  • Optional problem set work session: Friday, 4:00–6:00, in 639 Evans and 648 Evans.
• Problem Set 1 is being returned in section this week.
• Reminder: We have a no electronics policy.
I. FIRMS AND THE DECISIONS THEY MAKE
Three Decisions a Firm Has to Make

• **Short-run choice of output:** How much to produce today with the existing set-up?

• **Long-run choice of output:** Expand or contract? Exit the industry? Enter the industry?

• **Both short-run and long-run – the choice of input mix:** What combination of inputs (labor, capital, raw materials, and so on) to use to produce the output?
Profit Maximization

• We assume that firms’ objective is to maximize their economic profits.

• The definition of economic profits:

  \[ \text{Profits} = \text{Total Revenue} - \text{Total Costs}, \]

  where:

• Total Revenue = \text{Price} \times \text{Quantity}

• Total Cost = \text{Opportunity Cost of All Inputs}
II. PERFECT COMPETITION
Perfect Competition

• Each firm can sell as much or as little as it wants at the prevailing market price.

• Three reasons for starting our study of firm behavior with the case of perfect competition:
  • It’s a reasonable description of important parts of the economy.
  • It’s relatively simple.
  • It’s an important reference point.
Individual-Household and Market Demand Curves

**Individual Household**

\[ P \text{ vs. } q \]

\[ d \]

**Market**

\[ P \text{ vs. } Q \]

\[ D \]
The demand curve facing a perfectly competitive firm is perfectly elastic at the prevailing market price.
III. SHORT-RUN PROFIT MAXIMIZATION
Marginal Revenue: The Additional Revenue Associated with Producing One More Unit

Marginal revenue for a perfectly competitive firm is constant and equal to the prevailing market price.
Different Types of Costs

- **Fixed costs**: Costs that do not depend on how much is produced.
- **Variable costs**: Costs that do vary with how much is produced.
- **Total costs**: The sum of fixed and variable costs.
- **Marginal cost**: The change in total costs from producing one more unit.
  - **Note**: Since fixed costs do not change when one more unit is produced, marginal cost is also equal to the change in variable costs from producing one more unit.
Marginal Cost: The Additional Cost Associated with Producing One More Unit
The Profit-Maximizing Level of Output for a Perfectly Competitive Firm
Condition for Profit-Maximization

- Marginal Revenue = Marginal Cost \((MR = MC)\)
- For a perfectly competitive firm, this is the same as:
  
  \[
  \text{Price} = \text{Marginal Cost} \quad (P = MC).
  \]
IV. **Why Supply Curves Slope Up**
The firm’s supply curve is its marginal cost curve.
Market and Individual-Firm Supply Curves

Market

\[ S \text{ (also } \Sigma S_i, \Sigma MC_i, MC) \]

Individual Firm

\[ S_i \text{ (also } MC_i) \]
V. Why Supply Curves Shift
An Improved Production Technology

Market

\[ P \quad S_1 \quad S_2 \quad Q \]

Individual Firm

\[ P \quad MC_{i1} \quad MC_{i2} \quad q \]
An Increase in the Price of an Input

**Market**

- $S_1$
- $S_2$

**Individual Firm**

- $MC_{i1}$
- $MC_{i2}$
Entry of New Firms

Market

Individual Firm

$P$ vs $Q$

$P$ vs $q$

$S_1$, $S_2$, $MC_{i1}$