Lecture 16 – The Firm’s Supply Curve

I. Overview

In the previous lecture, we were able to explain how much output a firm would want to produce if we know the price of output.

A. The firm calculates the marginal cost of each unit of output

B. The firm calculates the marginal revenue of selling each unit of output. For the competitive firm this is the price of output.

C. The firm finds the point at which marginal revenue equals marginal cost. This is the point at which the firm gains the most profits. Producing less than this point may have positive profits, but additional profits can be gained by increasing output to the optimal point. Producing more than the optimal level of output may also yield positive profits, but each unit produced past the optimal point costs more than the firm gains in revenue.

D. The firm checks to make sure that the maximum profits are positive. If not, the firm shuts down (does not pay the fixed costs of production) and produces zero units of output.

The relationship between all of the possible prices of output and the amount that the firm would supply to the market is the supply curve of the firm.

II. Relationship Between Marginal Cost and the Competitive Firm’s Supply Curve

In the example from the last lecture, we saw that when the price of output is $10, the firm maximizes profit by producing and selling 6 units:
If the price of output had been $12/unit, the firm would want to produce 8 units:
We can plot these two points:

If we do this for all of the prices above 10, we would trace out the marginal cost curve of the firm:
The firm will decide to shut down when the price is less than average cost. This occurs at the lowest point of the average cost curve. In this case, the lowest point on the average cost curve is at a quantity of 5, at which marginal cost equals average cost equals 9 (actually average cost is $8.80).
Below a price of 9, the firm would lose money. For example, with a price of $6/unit:
At all prices below 9, the firm would decide not to produce (Quantity equal zero) and the supply curve of the firm would look like:

![Supply Curve of Competitive Firm](image)

III. Market Supply in the Short-run and the Long-run

A. Short-run

In the short-run, there are a fixed number of firms that have made the decision to pay the fixed costs. In the long-run, other firms can enter the market or firms in the market can choose to leave.

With a fixed number of firms, the market supply curve is the horizontal sum of all the individual firm supply curves. For example, if we had 100 firms in the market and each firm had the same marginal cost (supply) curve, then we would have something like:
B. Firm Entry and Exit

Key Idea 1 -- If the equilibrium between demand and supply results in a price at which the firm have positive profits, firms will enter the market. If the equilibrium between demand and supply results in a price at which firms have negative profits, firms will leave the market.

When firms enter, the market supply curve shifts out. Firms will enter the market until the profits are driven down to zero.

When firms leave the market, the market supply curve shifts in. Firms will leave the market until the profits are zero.

Key Idea 2 -- In the long run, profits in a competitive market are zero. The price at which profits are zero is the lowest point on the long-run average total cost curve. This is the price in the market when firms can enter and exit the market. Any quantity can be supplied at that price by adjusting the number of firms in the market.
C. Market Supply in a competitive market in the long run when all firms are the same

In the long-run, each firm produces at the point at which its average total cost is lowest. In this case, each firm produces 30 units of output. The market supply curve is perfectly elastic at this price.

IV. Equilibrium in the Market in the Short-run and the Long-run

A. Initial Equilibrium (quantity demand equal long-run quantity supplied and short-run quantity supplied)
B. Short-run Response to a Shift out of Demand Curve (Number of Firms Fixed)

C. Long-run after Demand Shift (More Firms enter)