

FOUNDATION COURSE IN MANAGERIAL ECONOMICS

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Lecture 19: Market Structures

Market Structures

- Profit = $TR - TC$
- Costs behave in similar ways for all producers and the cost curves also look similar
- $TR = P \times Q$ would depend on what price the firm charges and what level of output it decides to produce
- So, how does a firm decide what price to charge and what level of output to produce?

Depends on the market structure in which the firm operates

Market structure

- Demand, Prices and quantity produced will vary according to the structure of the market a firm is operating in.
- Variations in market structure basically arises due to certain characteristics of the product that the firm is selling.
- Broadly, market structures differ from each other on the basis of the following:
 - Number of sellers
 - Substitutability of the product
 - Ease of entry and exit from the market
 - Market power of individual seller

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Lecture 20: Perfect Competition

We try to understand the following

- What is a perfectly competitive market?
- How does a firm in a competitive market determine how much output to produce?
- What price does it charge?
- How much does it produce in the short run and in the long run?
- When might a firm shut down?
- When might a firm decide to exit the market?
- What does market supply look like in the short run and in the long run?
- Is the market equilibrium efficient?

Perfect Competition

- There are many buyers and sellers in the market
- The products are homogeneous and there is perfect information
- Firms can easily enter or exit the market
- Buyers and sellers are all “price takers”, i.e. they take the market price as given and no individual buyer or seller has any influence on the market price.

We shall study all four market structures with the assumption that the objective of any firm is to maximize profit

- Profit = $P \times Q$ – Total Cost
- For a perfectly competitive firm, P is given
- So, where does P come from?
- What happens if firm decides to charge a different price?
- How does the firm decide how much Q to produce?

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Lecture 21: Perfect Competition and Profit maximization

How does a firm decide the level of output Q?

- Profit maximization:

- Maximize: $\pi = TR - TC$

- Determining the level of Q that will maximize π

$$\rightarrow \frac{\Delta \pi}{\Delta Q} = 0$$

- or, $\frac{\Delta TR}{\Delta Q} - \frac{\Delta TC}{\Delta Q} = 0$

- or $MR - MC = 0$

- Firm chooses the level of output Q^* that fulfills the condition of
 $MR=MC$

Understanding Revenue for a competitive firm

- Total revenue = $TR = P \times Q$
- Average revenue = $AR = \frac{TR}{Q} = P$
- Marginal revenue = $MR = \frac{\Delta TR}{\Delta Q}$
- $MR = P$ is true for only competitive firms

Profit maximizing condition

- $MR=MC$
- Or, for a perfectly competitive firm, profit is maximized at that level of output where, marginal cost equals marginal revenue which is equal to price
- If $MC < P$, the producer can make profit by raising output
- If $MC > P$, he needs to reduce output to raise profit

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Lecture 22: Perfect Competition and Supply Decision

Supply curve of a Competitive firm

- Profit maximizing quantity for a competitive firm is the level where its $MC = P$
- Thus, as P rises, profit maximizing output also rises along the marginal cost curve
- As P falls, profit maximizing output also falls along the marginal cost curve
- MC curve determines the firm's Q at any price, or,
- MC curve is the supply curve of the competitive firm

Shutdown and Exit

- Shutdown is decision of the firm not to produce anything. It is a short run decision, when the firm is stuck with fixed inputs
- Exit is decision of the firm to leave the market. This is a long run decision when the firm can dissolve all fixed inputs and quit the market
- Hence, in shutdown, the firm still bears the fixed costs
- In case of exit, all costs are zero

How does a firm decide?

- Shutting down implies $Q=0$, hence, on the one hand revenue=0 and on the other, variable cost=0
- So, firm will shut down if $TR < VC$, i.e. if the firm is at least able to cover its variable cost from producing output, it will continue to produce
- $TR < VC \rightarrow TR/Q < VC/Q \rightarrow P < AVC$
- So, firm shuts down if its average variable cost is more than price

A competitive firm's short run supply curve is the portion of the MC curve above the AVC curve

Sunk Cost

- Costs that have already been incurred and cannot be recovered are called sunk costs
- Since there is not much way to recover these costs, they are known as sunk costs
- Sunk costs should not matter in any decision whether to continue production or not
- Many firms do not distinguish between sunk costs and fixed costs and treat the sunk costs as fixed costs
- So, fixed costs also do not matter in the short run decision to shut down

Decision to exit the market

- To exit the market is a long run decision when fixed costs can be brought down to zero
- If a firm exits the market, revenue = zero and all costs reduce to 0
- Hence firm will exit if $TR < TC$
- $TR < TC \rightarrow TR/Q < TC/Q \rightarrow P < ATC$
- So, a competitive firm will leave the market in the long run if price is unable to cover its average total cost
- If price is more than the average total cost for a firm, the firm will enter the market

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Lecture 23: Perfect Competition and Market Supply Curve

Market Supply

- Assumptions:
 - All existing firms and potential entrants have identical costs
 - Each firm's costs do not change as new firms enter or exit the market
 - The number of firms in the market is fixed in the short run (due to fixed costs) and variable in the long run (due to free entry and free exit)

SR Market Supply curve

- As long as $P \geq AVC$, each firm will produce its profit maximizing quantity at $MC=MR=P$
- Market supply is the aggregate of all quantities supplied by all firms at the market price.

Entry and Exit in the Long Run

- In the LR, firms enter and exit the market
- If existing firms earn positive economic profit, new firms enter the market.
- As number of firms in the market goes up, supply curve shifts to the right and hence price falls in the market, slowing entry
- The process continues till all existing firms earn **zero economic profit** in the long run
- The firms which incur losses will exit the market in the long run thus shifting the supply curve to the left and raising prices, thus reducing losses of the remaining firms.

Zero economic profit in the LR

- In the long run entry and exit is complete and all firms earn zero economic profit
- So, for every firm, in the LR, $P = ATC$
- Also, since profit maximization condition for every firm is $MC=MR=P$, the zero profit condition implies that $MC=P=ATC$
- Since, MC intersects ATC at its minimum, hence in the long run, $P = \text{Minimum ATC}$
- *Note: Economic profit includes implicit costs, hence zero economic profit means positive accounting profit, i.e. the firm earns enough revenue to cover its opportunity costs, hence it stays in business*

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Lecture 24: Perfect Competition and Market Supply Curve
(Contd.)

The LR Market Supply Curve

As we have assumed that all firms are identical and as all firms produce at $P = \text{Minimum ATC}$, the long run market supply curve is horizontal at $P = \text{Minimum ATC}$

Impact of an increase in demand in the market

- Increase in demand in the market would lead to P going up
- In the short run, existing firms would earn positive economic profit
- New firms would enter the market shifting supply curve to the right and bringing down P back to the level of minimum ATC, restoring long run equilibrium

LR market supply curve may slope upward: Relaxing the assumptions

- LR supply curve is horizontal with the assumptions that
 - All firms have identical costs, and
 - Costs do not change with change in number of firms in the market
- What happens if we relax the assumptions?

Firms have Different Costs

- As P rises and there are positive profits to be made, first the low cost firms will enter the market.
- As P increases further, higher cost firms also enter the market and increase supply in the market
- Hence LR supply curve would be positively sloping
- For the marginal firms, or the firms who are last to enter the market, economic profit = 0,
- But for lower cost firms, economic profit > 0

Costs rise as firms enter the market

- As new firms enter the market, the demand for inputs could go up, raising their prices
- Costs would go up for all firms
- To supply higher quantities thus, prices would have to go up, so that the LR market supply curve would be positively sloping

Efficiency in a Perfectly Competitive Market Equilibrium

- Productive efficiency, i.e. production at minimum cost is achieved in the competitive market as the most efficient firms enter the market first and firms operate at their minimum average cost.
- Allocative efficiency is achieved in a competitive equilibrium because it ensures that the willingness to pay i.e. P , by the buyers, for the last unit produced, is equal to the marginal cost of producing it.
- This happens because, in perfectly competitive market, $P=MR$ and hence the profit maximizing condition of the firm implies that at equilibrium, $MC=MR=P$