3.3 Lecture 7: Competition I

3.3.1 Perfect competition

- Firms in the market are price takers, on both the output and input sides. Conditions for perfect competition are:
  - Firms sell identical products
  - Consumers know prices charged by all firms in market
  - There are very low transaction costs in searching across possible purchase opportunities

3.3.2 Short run profit maximization

In the short run, we assume no firm entry or exit.

- Firms choose output q to maximize $\pi(q) = R(q) - C(q)$, where $R(q)$ is the total revenues the firm receives from selling output q, and $C(q)$ is the total cost

$$\max \pi(q) = R(q) - C(q)$$
$$\frac{\partial \pi(q)}{\partial q} = \frac{\partial R(q)}{\partial q} - \frac{\partial C(q)}{\partial q} = 0$$
$$\frac{\partial R(q)}{\partial q} = \frac{\partial C(q)}{\partial q}$$
$$MR = MC$$

- In perfect competition, marginal revenue MR equals the market price p. Therefore, firms produce until $MR = MC = p$.
- In the short run, competitive firm faces a perfectly elastic demand curve $MR = p$. Hence, for a perfectly competitive firm, $P = MC$.
- Shutdown decisions: firms continue producing in the short run as long as it covers its variable costs. Firms shut down only if $P < \min AVC$.

3.3.3 Short run and long run supply

- A firm's short-run supply is its MC curve above the minimum AVC
- A firm's long-run supply is its MC curve above ATC
- Market supply is the horizontal sum of individual firms' supply curves
- Short run equilibrium happens at the intersection of market demand with market supply determines the equilibrium price; each firm then produces where $MC = p$.

3.3.4 TO KNOW – Conceptual Understanding

- Explain/know the condition when a firm will shut down (1) in the short run and (2) in the long run
- Explain when firms will enter/exit in the long run
- Know why $MR = MC = p$ in the short run for a firm in a perfectly competitive market

3.3.5 TO KNOW – Graphical and Math Understanding

- Calculate MR and MC given production function and cost function
- In a perfectly competitive market, given a short run cost curve, find the short run supply curve for a firm
- In a perfectly competitive market, show graphically how aggregate market supply changes as there are more firms
- In a perfectly competitive market in the short-run, given cost curves for firms, demand, and the number of firms, find the equilibrium price, what each firm produces, and the total quantity