Profit Maximization and Output Choise

A profit-maximizing firm:

- Chooses both its inputs and its outputs so as to maximize profits.
- Seeks to maximize the difference between total revenue and total costs.

Revenues:

- Total revenue for a firm is given by $R(q) = p(q) \cdot q$

Total Revenue: $TR(Q) = p(q) \cdot q$

Average Revenue: $AR(Q) = TR(Q)/Q$

Marginal Revenue: $MR(Q) = dTR(Q)/dQ$

Profit Maximization and Output Choise

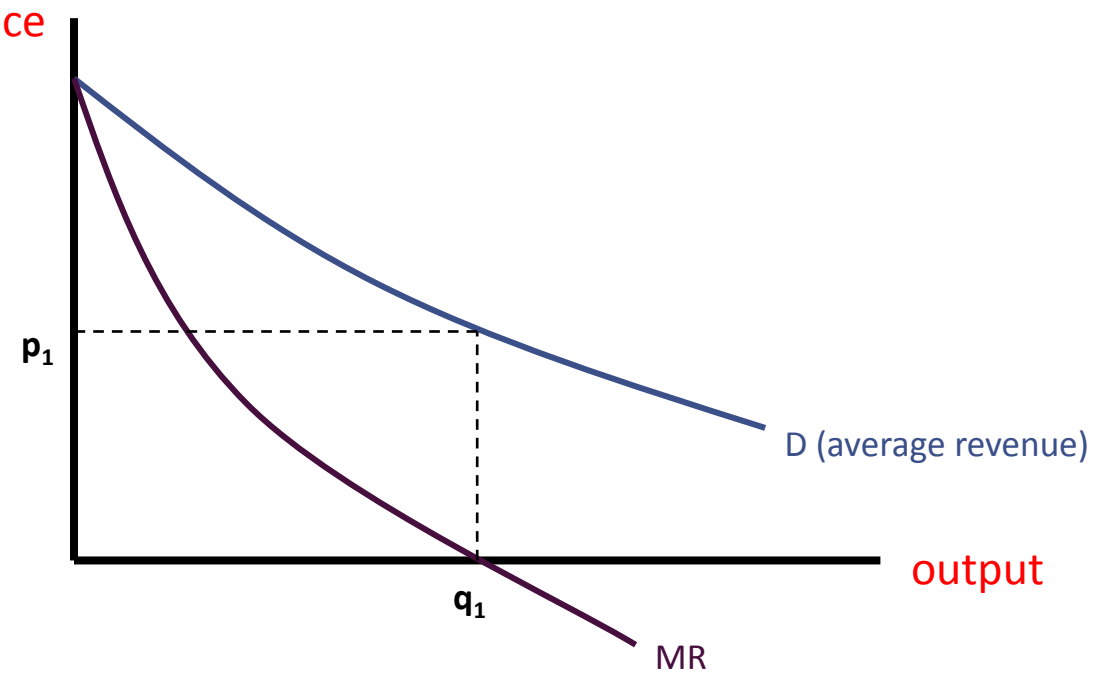
If a firm is strictly profit maximizer:

- It make decisions in a "marginal" way.
- It examines the marginal profit obtainable from producing one more unit of hiring one additional employee.
- Total revenue for a firm is given by $R(q) = p(q) \cdot q$
- In the production of q, certain economic costs are incurred $[C(q)]$
- Economic profits (π) are the difference between total revenue and total costs $\pi(q) = R(q) - C(q) = p(q) \cdot q - C(q)$
- To maximize economic profits, the firm should choose the output for which marginal revenue is equal to marginal cost:

$$MR = \frac{dR}{dq} = \frac{dC}{dq} = MC$$

Marginal Revenue

- If a firm faces a downward-sloping demand curve, more output can only be sold if the firm reduces the good's price.
- The marginal revenue curve shows the extra revenue provided by the last unit sold.
- When the demand curve shifts, its associated marginal revenue curve shifts as well.



Short-Run Supply by a Price-Taking Firm

Short Run Inputs: Fixed + Variable

Short Run Cost (STC) = Fixed cost (F) + Variable (VC)

Production stop: Q=O [VC=O and TR=O]

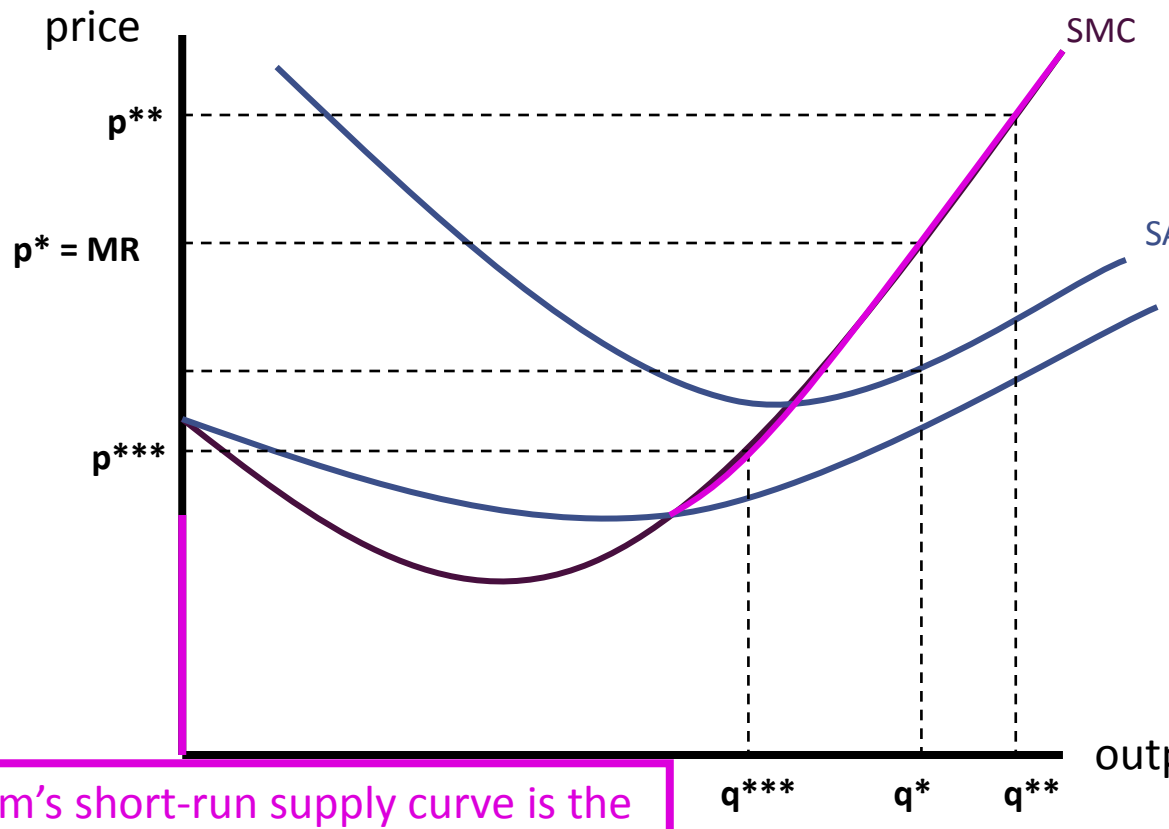
TR=P*Q and AVC=VC/Q

➔ TC= F The firm pays its fixed cost (F)

Production stop if:

TR<VC➔(PQ)/Q<VC/Q ➔P<AVC

Short-Run Supply by a Price-Taking Firm



Since p > SAC, profit > 0

•If the price rises to p**, the firm will produce q** and $\pi > 0$

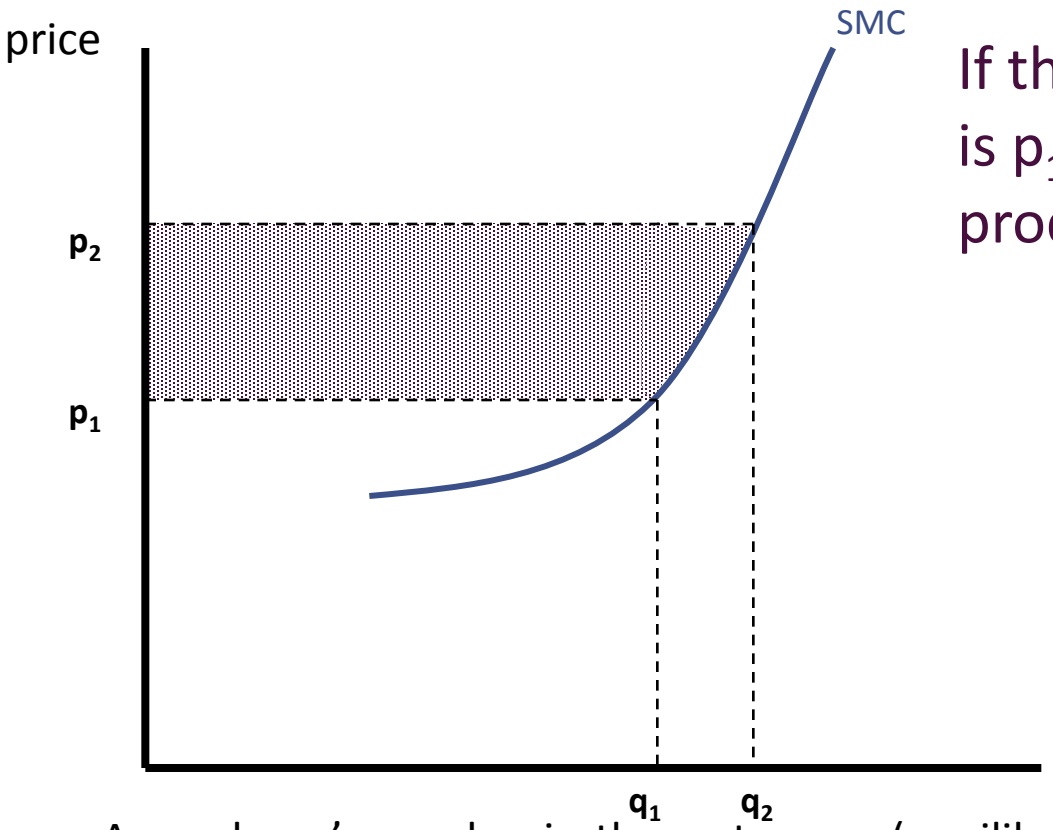
•If the price falls to p***, the firm will produce q***

The firm's short-run supply curve is the SMC curve that is above SAVC

Profit maximization requires that p=SMC and that SMC is upward-sloping

Thus, the price-taking firm's short-run supply curve is the positively-sloped portion of the firm's short-run marginal cost curve above the point of minimum average variable cost.
For prices below this level, the firm's profit-maximizing decision is to shut down and produce no output

Producer Surplus in the Short Run



If the market price is $p_1(p_2)$, the firm produces $q_1(q_2)$

- A producer's surplus is the outcome: (equilibrium price of a good - price the producer is willing to receive) X equilibrium quantity of a good.
- This outcome depicts the benefit the producer receives for selling the good in the market.
- A producer surplus is generated by market prices in excess of the lowest price producers would otherwise be willing to accept for their goods.

Long-Run Supply by a Price-Taking Firm

All firms are in profit-maximizing equilibrium (*P = LMC*)

- When π > 0, firms enter the industry supply increases and the price falls until zero profits are made.
- When π < 0, firms leave the industry.
- When π = 0, there is no exit or entry of firms - Market adjusts so *P = LMC = LAC*