UNIT II

Objectives of Firm and Price Determination

Profit Maximization vs Sales Maximization

- Sales maximization and profit maximization are distinct business objectives.

- Sales maximization is an approach to business where the company's primary objective is to generate as much revenue as possible.

- Profit maximization is an objective where the company intends to generate the highest net income over time.

- Managerial models of the firm

- Profit Maximization not the only goal of a firm.

- According to William Baumol–Firm's objective is "Sales Maximization" not "Profit Max."

- Why do firms prefer Sales Maximization?
  - Ownership and Management are separate.
  - Managers and Owners have different goals.

Why Sales Maximization?

- Salaries and perks to managers depend on sales, not profits.

- Banks give loans to firms with more sales,

- Better payment to staff, when sales increases, but falls when sales decrease

- Sales increases prestige of managers, but large profits go to shareholders/ owners.

- Managers prefer steady level of profits, not maximum profits which are difficult to maintain.

- Increasing sales increases firm's market power,

- Managers wish to avoid risky ventures that may temporarily increase profits.

Types of Market Structure

- Perfect Competition

- Monopoly

- Monopolistic Competition

- Oligopoly

- - classification based on the degree of competition

Determinants of market structure

- Freedom of entry and exit
- Nature of the product – homogenous (identical), differentiated?
- Control over supply/output
- Control over price
- Barriers to entry

Introduction: A Scenario

- Three years after graduating, you run your own business.

- You must decide how much to produce, what price to charge, how many workers to hire, *etc*.

- What factors should affect these decisions?
  - Your costs (studied in preceding chapter)
  - How much competition you face

- We begin by studying the behavior of firms in perfectly competitive markets.

Characteristics of Perfect Competition

1. Many buyers and many sellers.

2. The goods offered for sale are largely the same- Homogenous products

3. Firms can freely enter or exit the market.

4. Sellers are price takers – have to accept the market price.

5. Perfect information available to buyers and sellers

Examples

- In the real world, it is hard to find examples of industries which fit all the criteria of 'perfect knowledge' and 'perfect information'. However, some industries are close.

- **Foreign exchange markets**. Here currency is all homogeneous. Also, traders will have access to many different buyers and sellers. There will be good information about relative prices. When buying currency it is easy to compare prices

- **Agricultural markets**. In some cases, there are several farmers selling identical products to the market, and many buyers. At the market, it is easy to compare prices. Therefore, agricultural markets often get close to perfect competition.

- **Stock Markets :**Several firms selling shares

The Revenue of a Competitive Firm

- Total revenue (*TR*)

$$TR = \boldsymbol{P} \times \boldsymbol{Q}$$

- **Average revenue (*AR*)**

$$AR = \frac{TR}{\boldsymbol{Q}} = \boldsymbol{P}$$

- **Marginal revenue (*MR*)**: The change in *TR* from selling one more unit.

$$MR = \frac{\Delta TR}{\Delta \boldsymbol{Q}}$$

$MR = P$ for a Competitive Firm

- A competitive firm can keep increasing its output without affecting the market price.

- So, each one-unit increase in **Q** causes revenue to rise by **P**, *i.e.,* $MR =$ **P**.

$MR =$ **P** is only true for firms in competitive markets.

Profit Maximization

- What **Q** maximizes the firm's profit?

- To find the answer, "***think at the margin***."

  If increase **Q** by one unit,
  revenue rises by *MR*,
  cost rises by *MC*.

- If *MR* > *MC*, then increase **Q** to raise profit.

- If *MR* < *MC*, then reduce **Q** to raise profit.

Profit Maximization

At any **Q** with
MR > MC,
increasing **Q**
raises profit.

At any **Q** with
MR < MC,
reducing **Q**
raises profit.

Q	*TR*	*TC*	Profit	*MR*	*MC*	ΔProfit = *MR − MC*
0	$0	$5	−$5			
				$10	$4	$6
1	10	9	1			
				10	6	4
2	20	15	5			
				10	8	2
3	30	23	7			
				10	10	0
4	40	33	7			
				10	12	−2
5	50	45	5			

MC and the Firm's Supply Decision

Rule: $MR = MC$ at the profit-maximizing Q.

At Q_a, $MC < MR$.
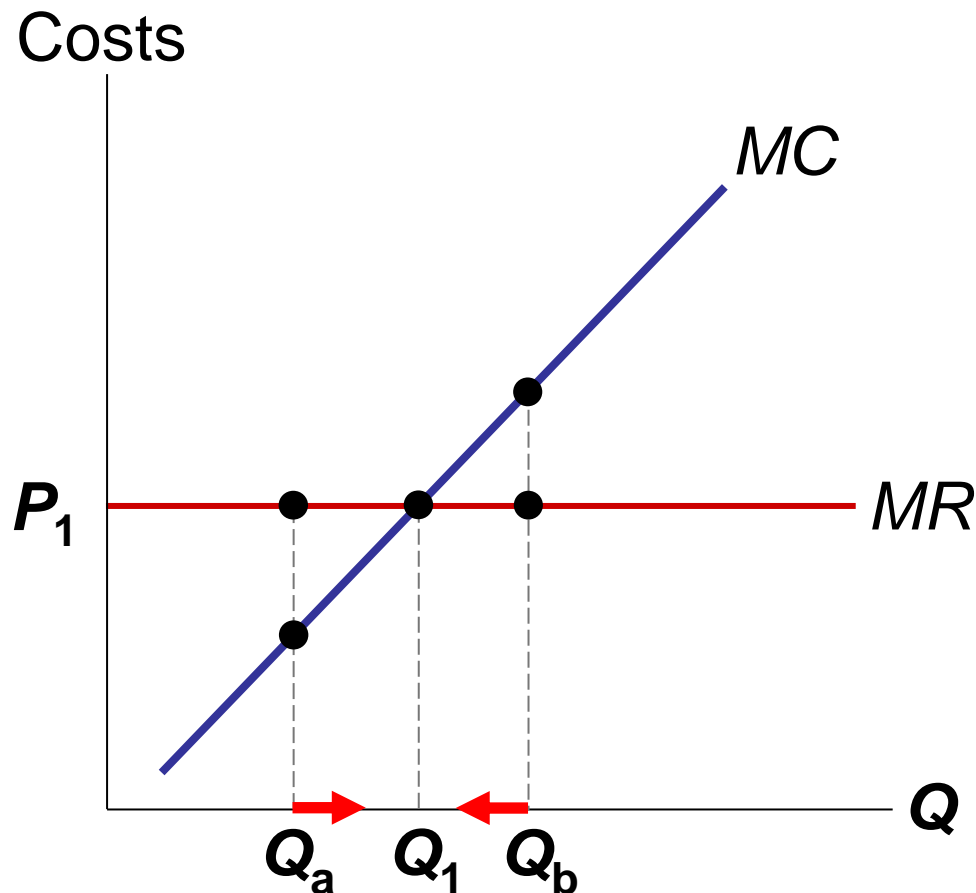So, increase Q to raise profit.

At Q_b, $MC > MR$.
So, reduce Q to raise profit.

At Q_1, $MC = MR$.
Changing Q would lower profit.

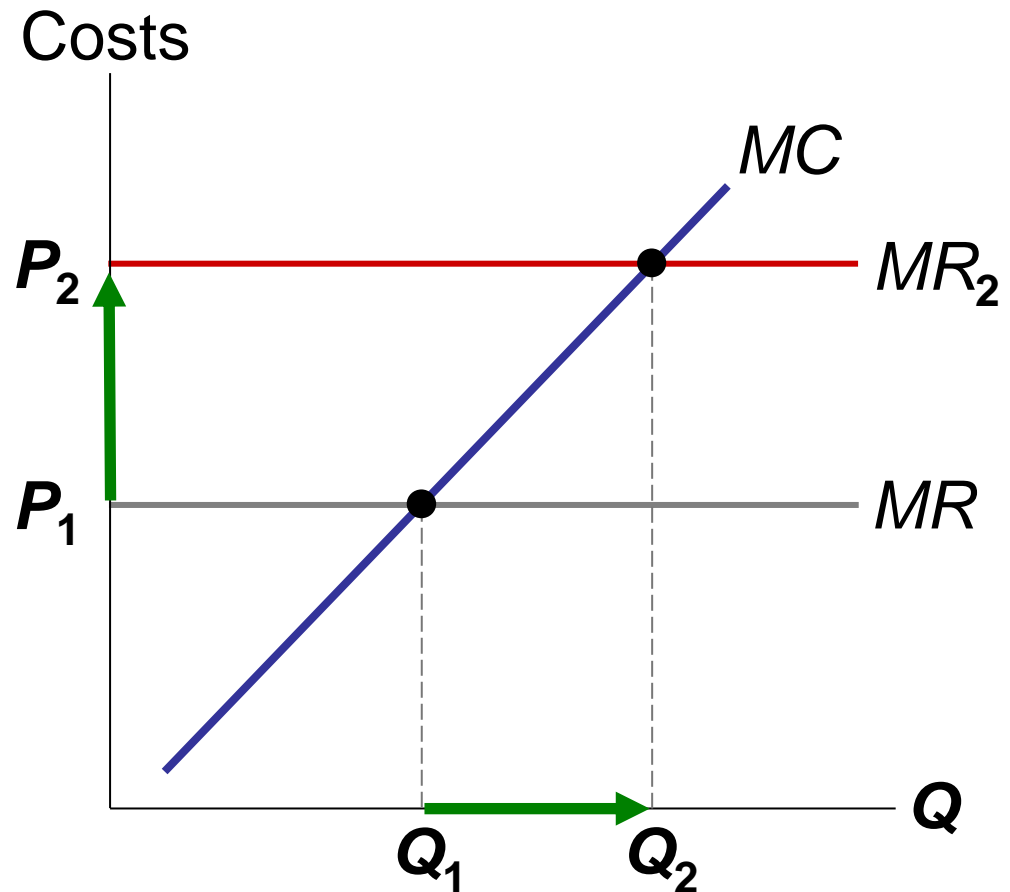Costs

MC

P_1

MR

Q

Q_a Q_1 Q_b

MC and the Firm's Supply Decision

If price rises to P_2,
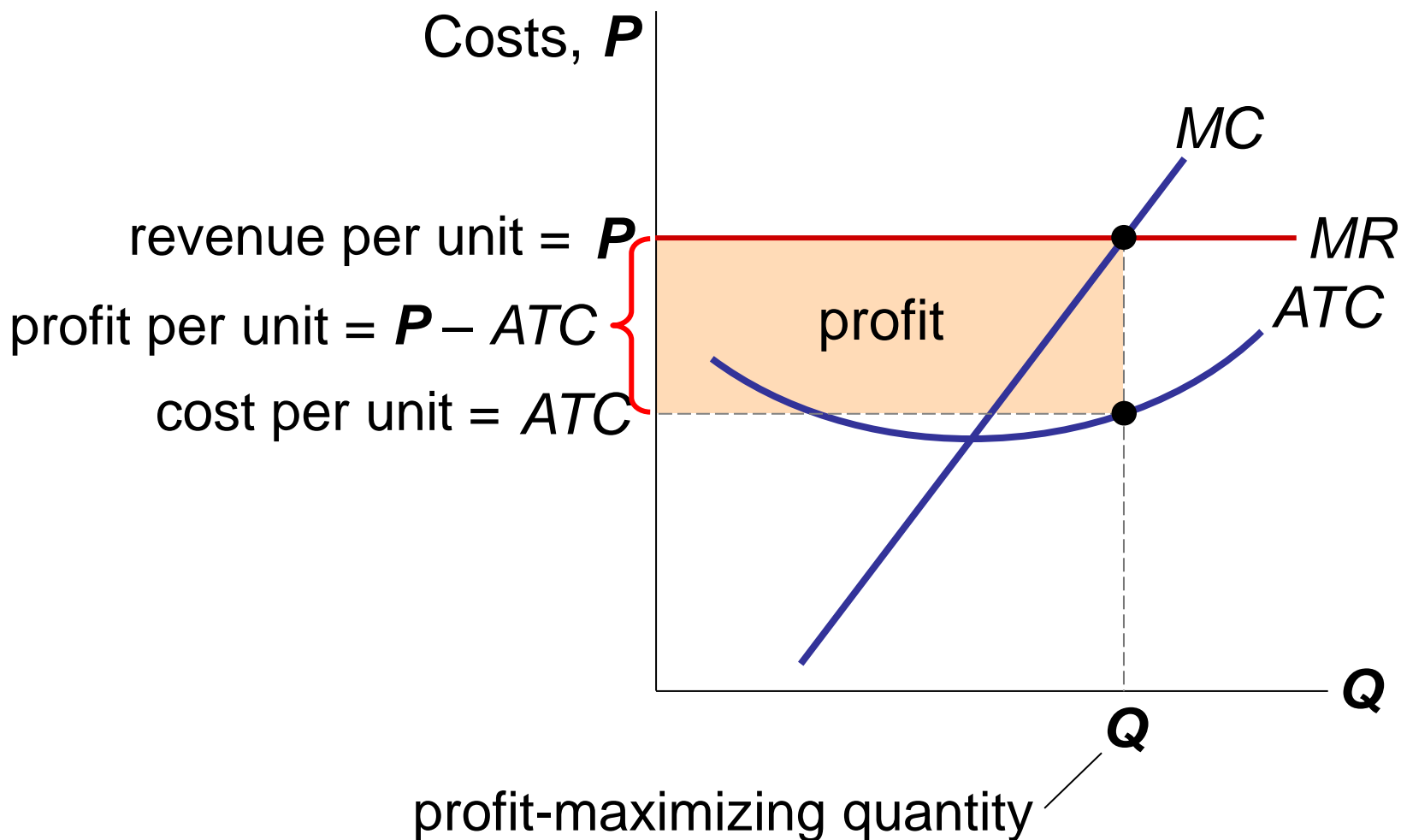
then the profit-maximizing quantity rises to Q_2.

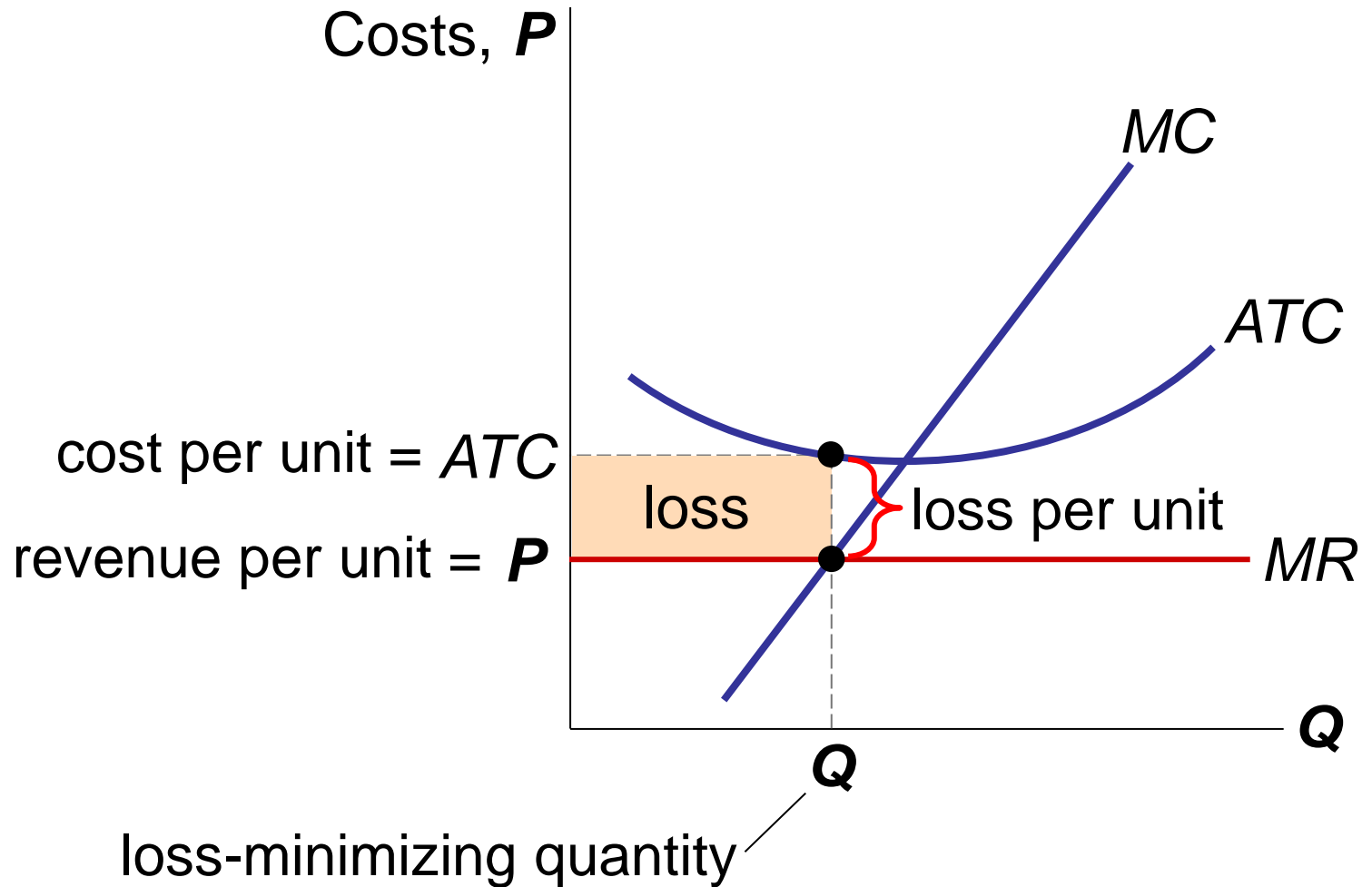The *MC* curve determines the firm's *Q* at any price.

Hence,

the *MC* curve <u>is</u> the firm's supply curve.

A Firm With Profits

Costs, P

MC

revenue per unit = P — MR

profit per unit = P – ATC

profit

ATC

cost per unit = ATC

Q

Q

profit-maximizing quantity

A Firm With Losses

Costs, P

MC

ATC

cost per unit = ATC

loss

loss per unit

revenue per unit = P

MR

Q

Q

loss-minimizing quantity

Shutdown vs. Exit

- **Shutdown**:
A short-run decision not to produce anything because of market conditions.

- **Exit**:
A long-run decision to leave the market.

- A key difference:
  - If shut down in SR, must still pay *FC*.
  - If exit in LR, zero costs.

A Firm's Short-run Decision to Shut Down

- Cost of shutting down: revenue loss $= TR$

- Benefit of shutting down: cost savings $= VC$
  (firm must still pay FC)

- So, shut down if $\boxed{TR \ < \ VC}$

- Divide both sides by Q: $TR/Q \ < \ VC/Q$
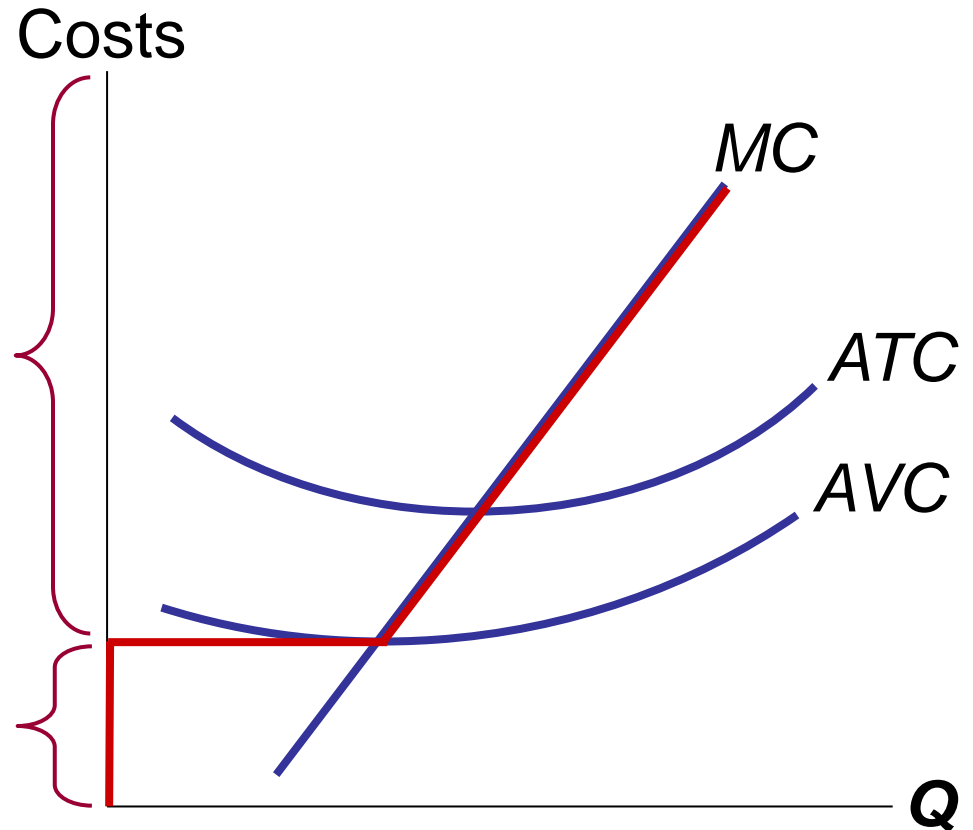
- So, firm's decision rule is:

  Shut down if $P < AVC$

A Competitive Firm's SR Supply Curve

The firm's SR supply curve is the portion of its *MC* curve above *A...*

If **P** > *AVC*, then firm produces **Q** where **P** = *MC*.

If **P** < *AVC*, then firm shuts down (produces **Q** = 0).

Costs

MC

ATC

AVC

Q

The Irrelevance of Sunk Costs

- **Sunk cost**: a cost that has already been committed and cannot be recovered

- Sunk costs should be irrelevant to decisions; you must pay them regardless of your choice.

- *FC* is a sunk cost: The firm must pay its fixed costs whether it produces or shuts down.

- So, *FC* should not matter in the decision to shut down.

A Firm's Long-Run Decision to Exit

- Cost of exiting the market: revenue loss = *TR*

- Benefit of exiting the market: cost savings = *TC*
  (zero *FC* in the long run)

- So, firm exits if $\boxed{TR < TC}$

- Divide both sides by **Q** to write the firm's decision rule as:

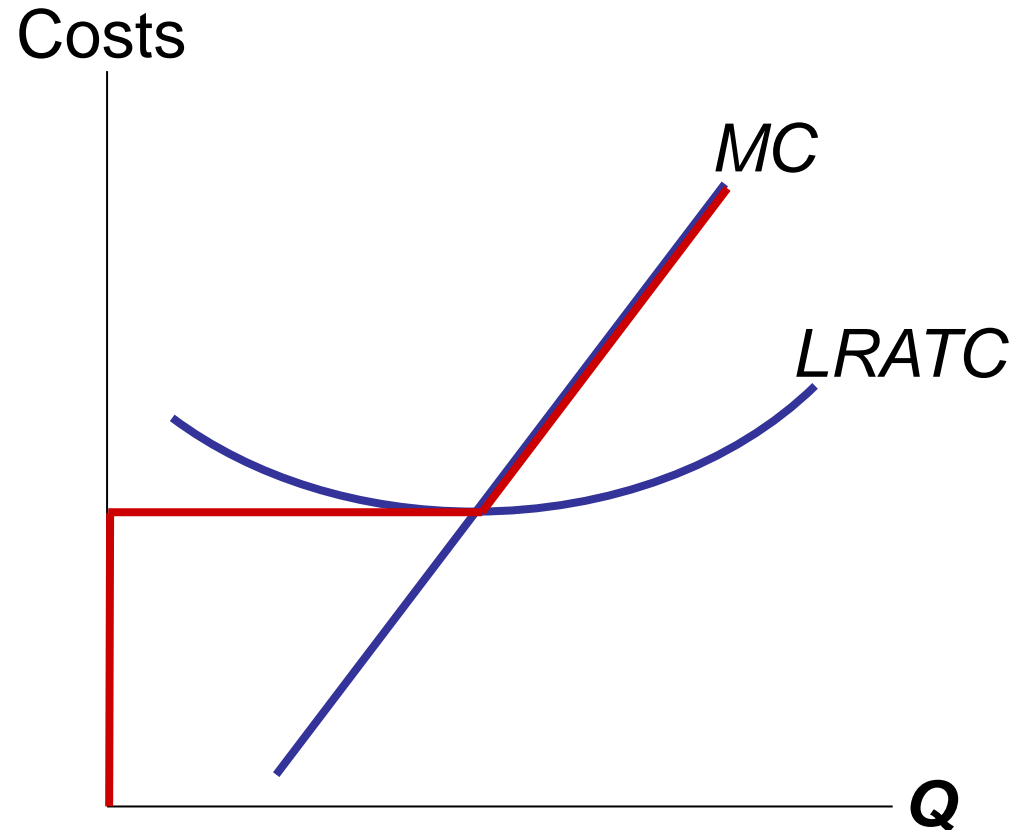$$\text{Exit if } \boldsymbol{P} < ATC$$

A New Firm's Decision to Enter Market

- In the long run, a new firm will enter the market if it is profitable to do so: if *TR* > *TC*.

- Divide both sides by **Q** to express the firm's entry decision as:

Enter if **P** > *ATC*

The Competitive Firm's Supply Curve

The firm's LR supply curve is the portion of its *MC* curve above *LRATC*.

Entry & Exit in the Long Run

- In the LR, the number of firms can change due to entry & exit.

- If existing firms earn positive economic profit,
  - new firms enter, SR market supply shifts right.
  - P falls, reducing profits and slowing entry.

- If existing firms incur losses,
  - some firms exit, SR market supply shifts left.
  - P rises, reducing remaining firms' losses.

The Zero-Profit Condition

- **Long-run equilibrium**:
  The process of entry or exit is complete – remaining firms earn zero economic profit.

- Zero economic profit occurs when $P = ATC$.

- Since firms produce where $P = MR = MC$, the zero-profit condition is $P = MC = ATC$.

- Recall that MC intersects ATC at minimum ATC.

- Hence, in the long run, $P = \text{minimum } ATC$.

Why Do Firms Stay in Business if Profit = 0?

- Recall, economic profit is revenue minus <u>all</u> costs – including implicit costs, like the opportunity cost of the owner's time and money.

- In the zero-profit equilibrium,
  - firms earn enough revenue to cover these costs
  - accounting profit is positive

The LR Market Supply Curve

In the long run, the typical firm earns zero profit.

The LR market supply curve is horizontal at P = minimum ATC.

One firm

P

MC

$LRATC$

P = min. ATC

Q (firm)

Market

P

long-run supply
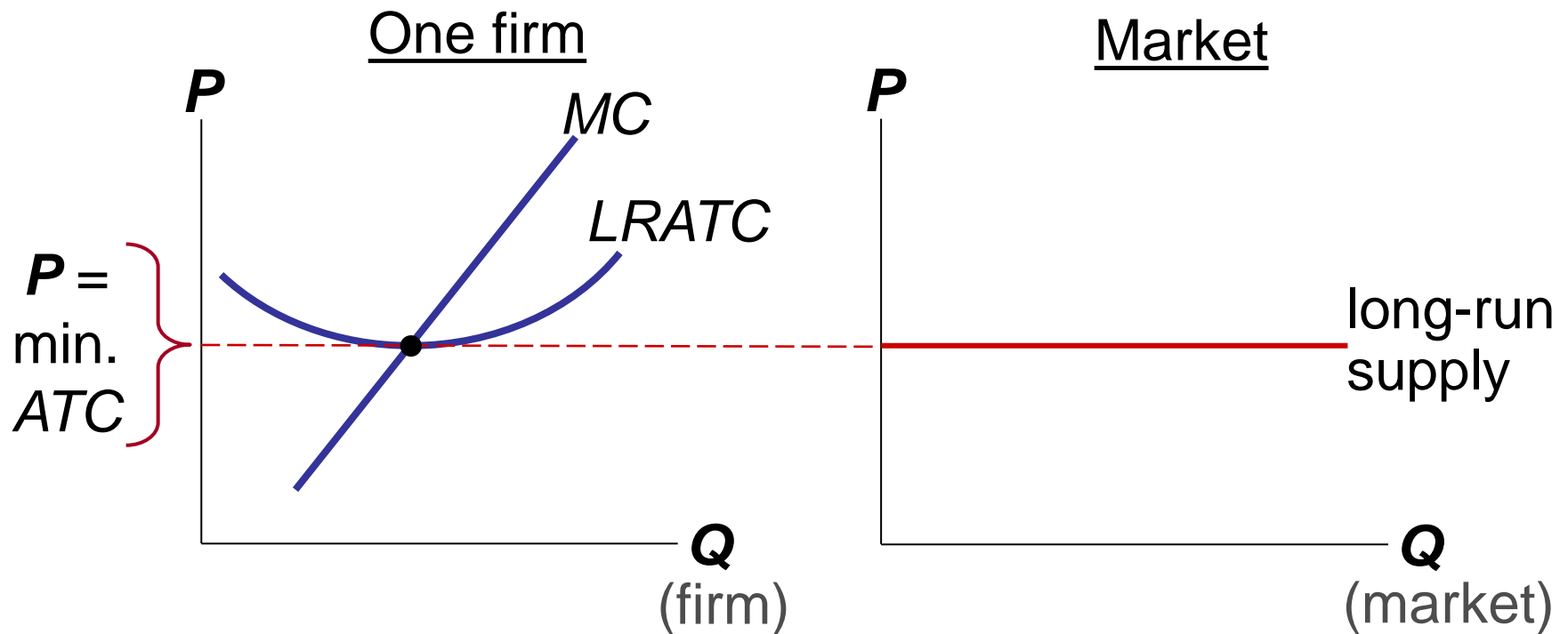
Q (market)

Why the LR Supply Curve Might Slope Upward

- The LR market supply curve is horizontal if

  1) all firms have identical costs, and

  2) costs do not change as other firms enter or exit the market.

- If either of these assumptions is not true, then LR supply curve slopes upward.

CONCLUSION: The Efficiency of a Competitive Market

- Profit-maximization: $MC = MR$

- Perfect competition: $P = MR$

- So, in the competitive eq'm: $P = MC$

- Recall, MC is cost of producing the marginal unit. P is value to buyers of the marginal unit.

- So, the competitive eq'm is efficient, maximizes total surplus.

Summary

- For a firm in a perfectly competitive market, price = marginal revenue = average revenue.

- If $P > AVC$, a firm maximizes profit by producing the quantity where $MR = MC$. If $P < AVC$, a firm will shut down in the short run.

- If $P < ATC$, a firm will exit in the long run.

- In the short run, entry is not possible, and an increase in demand increases firms' profits.

- With free entry and exit, profits = 0 in the long run, and $P =$ minimum ATC.