Long-Run Equilibrium

AP Microeconomics | Unit 3 | perfect competition: entry, exit, zero profit, efficiency

1. Perfect competition and the price taker

Perfect competition: many small firms and many buyers; identical products; no barriers to entry or exit.

Price taker

Each firm is too small to affect the market price, so it takes the price as given. Its demand curve is a horizontal line at the market price, and

$$P = MR = \text{the firm's demand curve.}$$

2. Profit attracts entry

Draw two graphs side by side: the **market** (supply and demand set the price) and **one firm** (MC and ATC; the price is a horizontal line carried across from the market).

Market price \$100, above the firm's ATC	firms earn an economic profit
Profit attracts new firms	market supply shifts *right*
The market price falls	the firm's price line drops; its profit shrinks
Entry stops when $P =$ minimum ATC (\$70)	economic profit is zero

Entry shifts the *market* supply curve. The firm's cost curves do not move; only its price line does.

3. Long-run equilibrium

If the price is *below* minimum ATC, the reverse happens: losses ⇒ some firms exit ⇒ market supply shifts left ⇒ the price rises back to minimum ATC.

Long-run equilibrium in perfect competition

$$P = MR = MC = \text{minimum } ATC$$

Economic profit is **zero** (a normal profit). No firm wants to enter and no firm wants to leave.

4. Why it is efficient

Allocative efficiency	$P = MC$	the right amount is produced
Productive efficiency	$P =$ minimum ATC	produced at the lowest cost per unit

Perfect competition achieves both in the long run. Every other market structure is measured against these two conditions.

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5. How many firms, and long-run shifts

Number of firms. In the long run each firm produces at its minimum ATC and $P = \min ATC$. With minimum ATC \$30 at 40 units and market demand $Q_d = 9{,}000 - 100P$: $Q_d = 6{,}000$ at \$30, so there are $6{,}000/40 = 150$ firms. Each earns revenue $\$30 \times 40 = \$1{,}200$, equal to its total cost: zero economic profit, and the market clears.

Demand rises (constant-cost industry). Entry does not change firms' costs. Short run: the price jumps (\$70 to \$85 in the video) and firms earn a profit. Long run: entry shifts supply right until the price is back at the minimum ATC (\$70), with more firms and more output (90 to 120). Long-run supply is horizontal at the minimum ATC, and the short-run price and profit exceed their long-run levels.

Costs change. A \$5 per-unit tax raises the minimum ATC by \$5, so the long-run price rises by the full \$5: buyers pay the whole tax. A new fixed cost raises ATC but not MC: losses, exit, and a higher price at the new minimum ATC. In the new long run $P = MC = \min ATC$ again: zero profit, still allocatively and productively efficient.

Where students lose points

1. Shifting the firm's curves when firms enter: the market supply shifts.
2. Price lines that do not match across the two graphs.
3. Saying zero economic profit means firms leave.
4. A long-run price that is not at the minimum of ATC.
5. Mixing up the two efficiencies: $P = MC$ is allocative, $P =$ minimum ATC is productive.

Now practise it

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