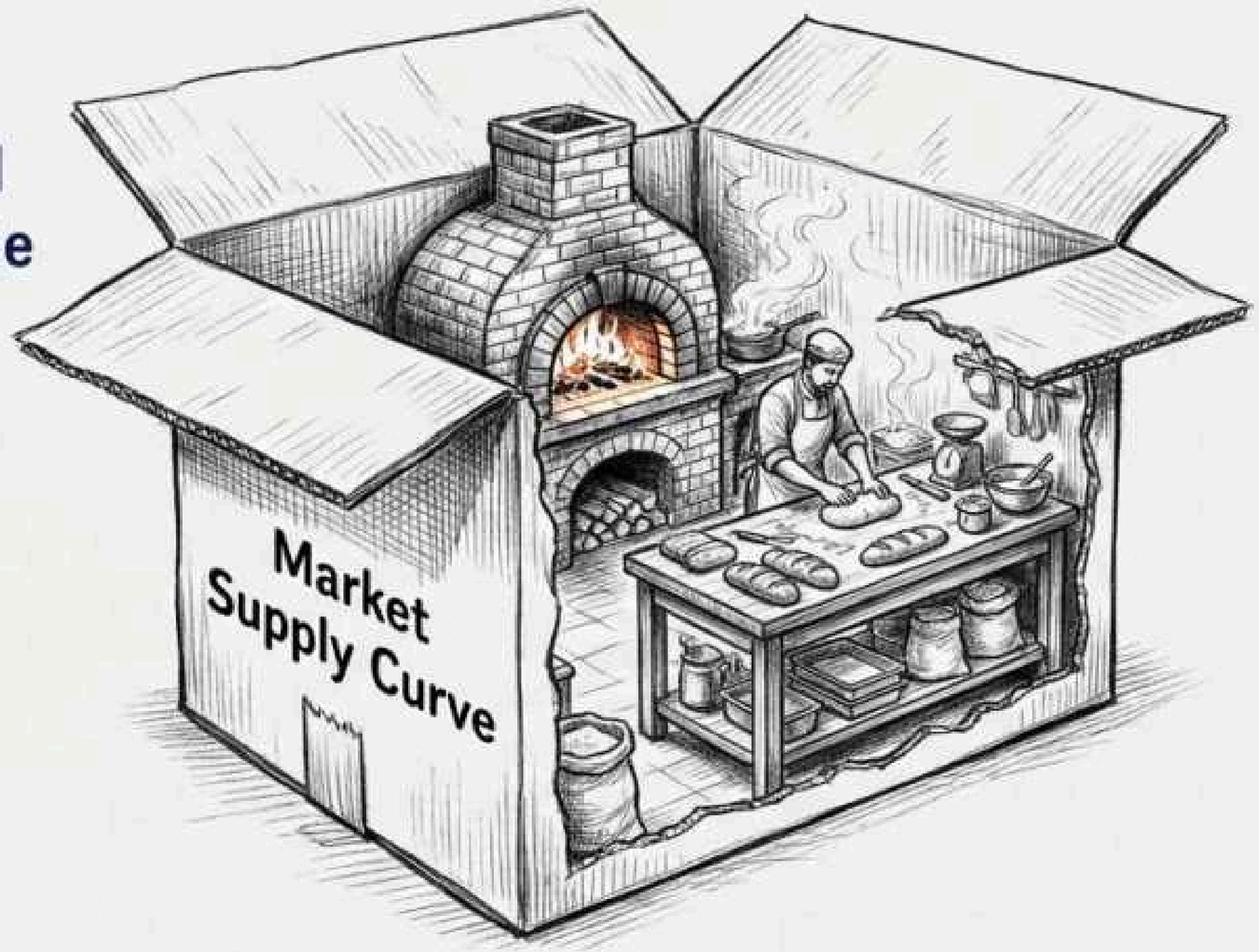
¶ 5.1 & 5.2

Costs, Profit, and Competition (ECON 120 B — Lecture 5)

Core Concept: We have treated sellers as a single supply curve.

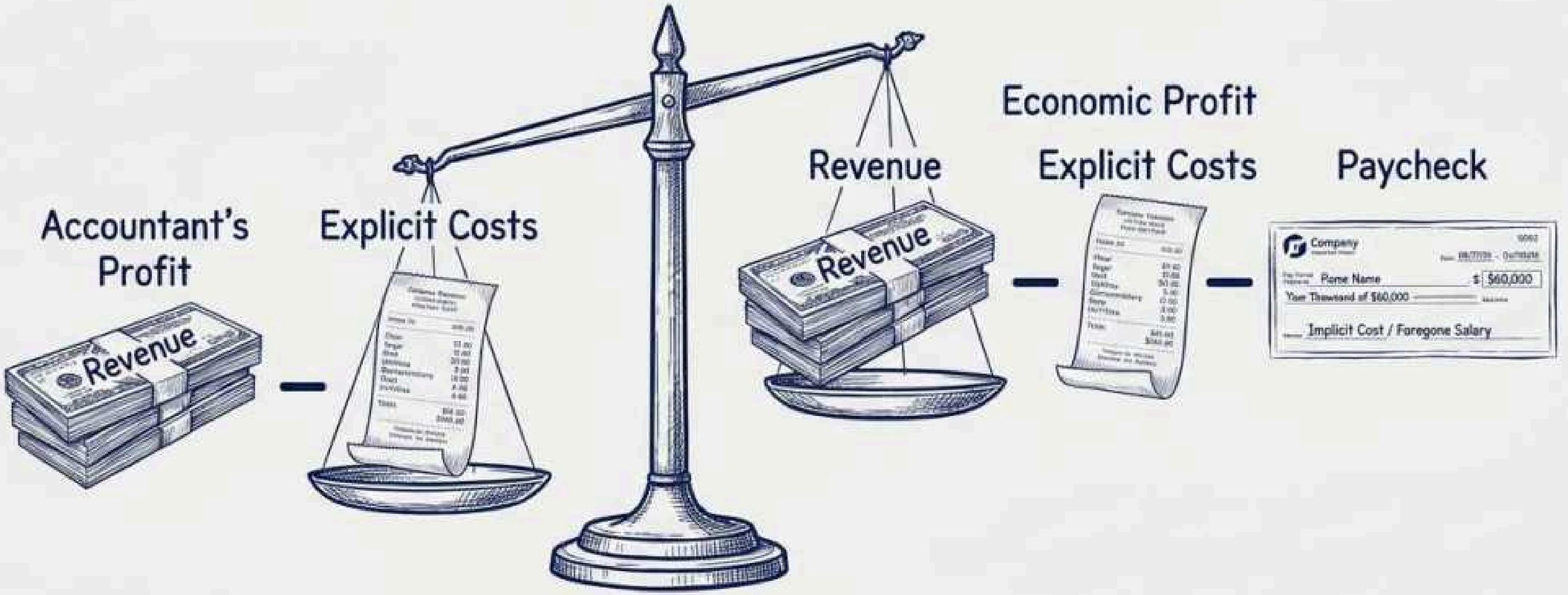
Now, we open the box.



Callout: How does one small bakery decide exactly how much to produce?

By tracing the simple numbers of this bakery, we will discover where the market supply curve actually comes from.

Economists measure profit by counting all opportunity costs.



$$\pi_{econ} = TR - (TC_{explicit} + TC_{implicit})$$

Takeaway: If the baker could earn $60,000 working elsewhere, that lost wage is a very real opportunity cost of running the bakery. Economic profit is always smaller than the profit an accountant reports.

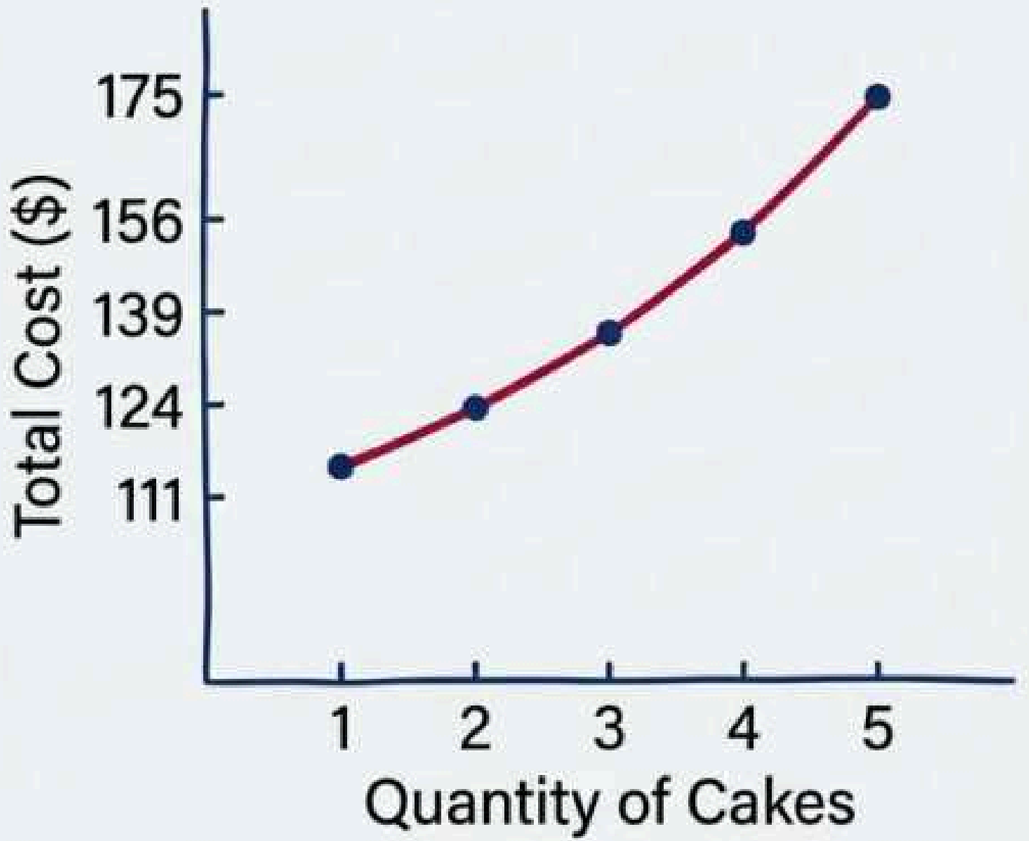
The two components of a firm's total cost.

Fixed Costs (FC)	Variable Costs (VC)
 $100/day	  $10/cake + Q^2
Unchanging regardless of output. The bakery pays $100 for the oven whether it bakes 1 cake or 10.	Rise directly with output (flour, wages).

$$TC = 100 + 10Q + Q^2$$

Total costs rise faster and faster as output grows.

Q (Cakes)	TC (Total Cost)
Q=1	$111
Q=2	$124
Q=3	$139
Q=4	$156
Q=5	$175



Observation: Producing 5 cakes costs $175 in total. Notice the shape of the curve: as output increases, the financial penalty for producing the next unit accelerates.

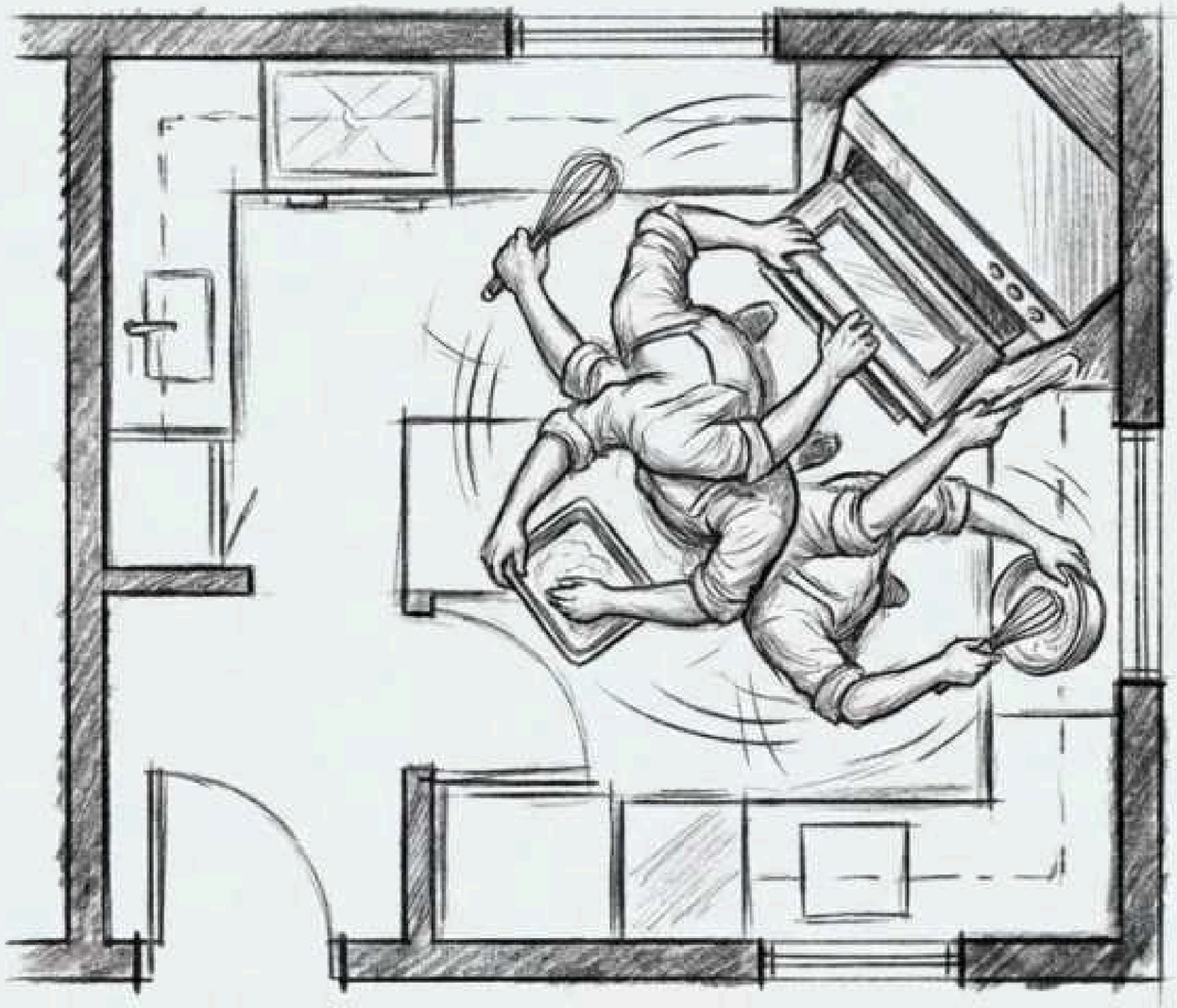
Marginal Cost: The extra cost of producing one more unit.



$$MC = \frac{\Delta TC}{\Delta Q}$$

Insight: The first cake adds $11 to the total cost. The second adds $13. The fifth adds $19. Marginal cost rises relentlessly with output.

The physical reality of diminishing marginal product.



- The Short-Run Law: In the short run, some inputs (like the single oven) are permanently fixed.
- The Result: The first baker has the whole kitchen. As a third and fourth baker are added, they end up waiting for the oven. Each extra worker less output than the one before, meaning each extra cake costs more to produce.

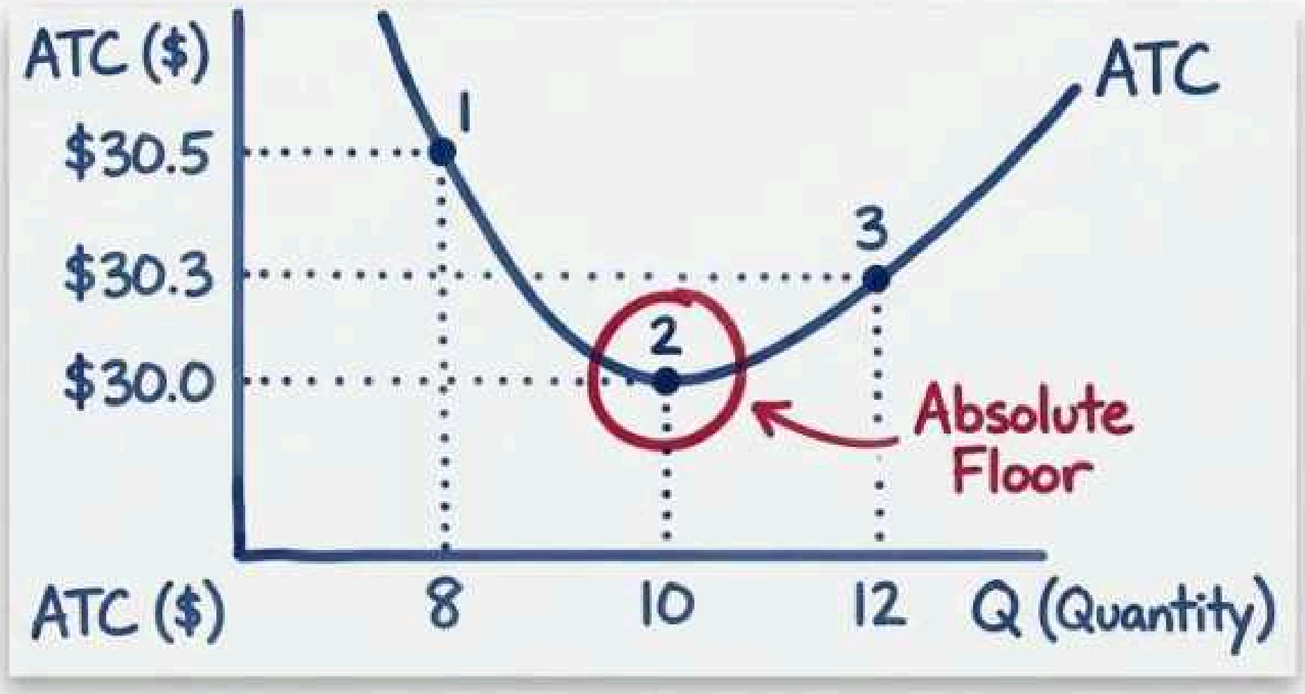
Average Total Cost forms a U-shaped curve.

$$ATC = \frac{TC}{Q}$$



Data Check: At 5 cakes, average cost is $35/cake. At 10 cakes, the average drops to $30/cake.

Finding the absolute minimum average cost.

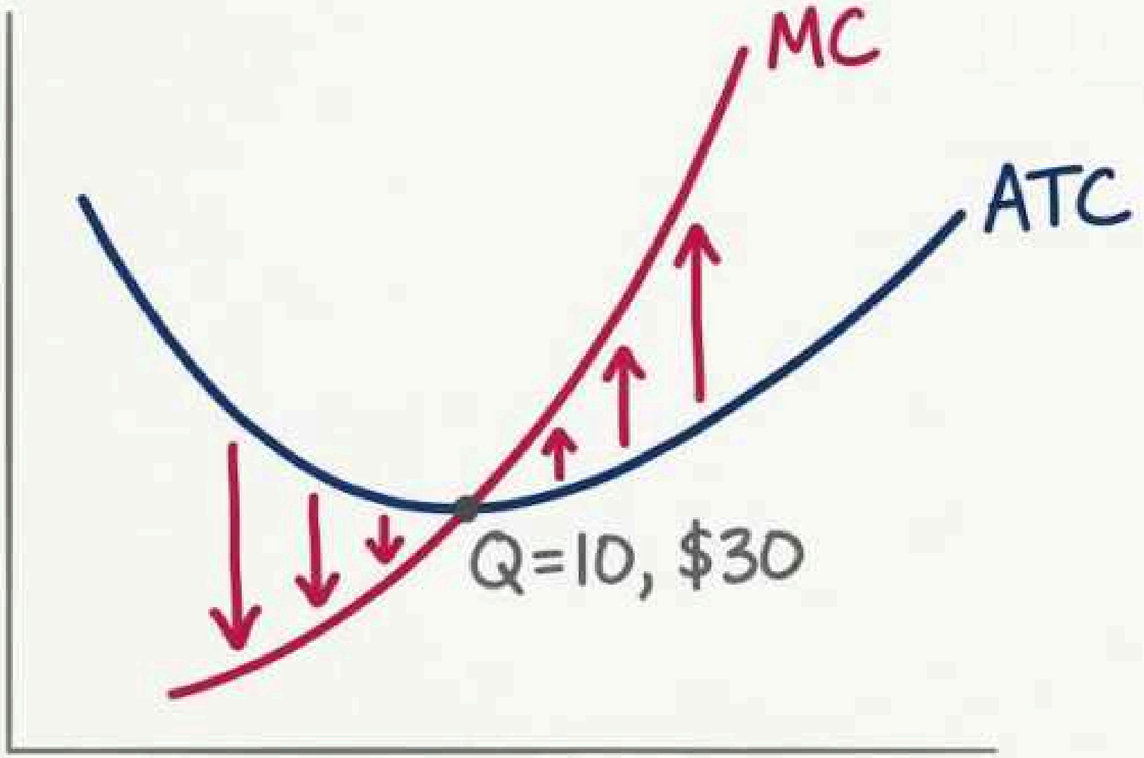


Analysis: The average cost dips to its absolute floor of $30 precisely at 10 cakes, and then immediately begins to rise again.

Marginal Context: At this dip, the marginal cost of the 10th cake is $29, and the 11th is $31.

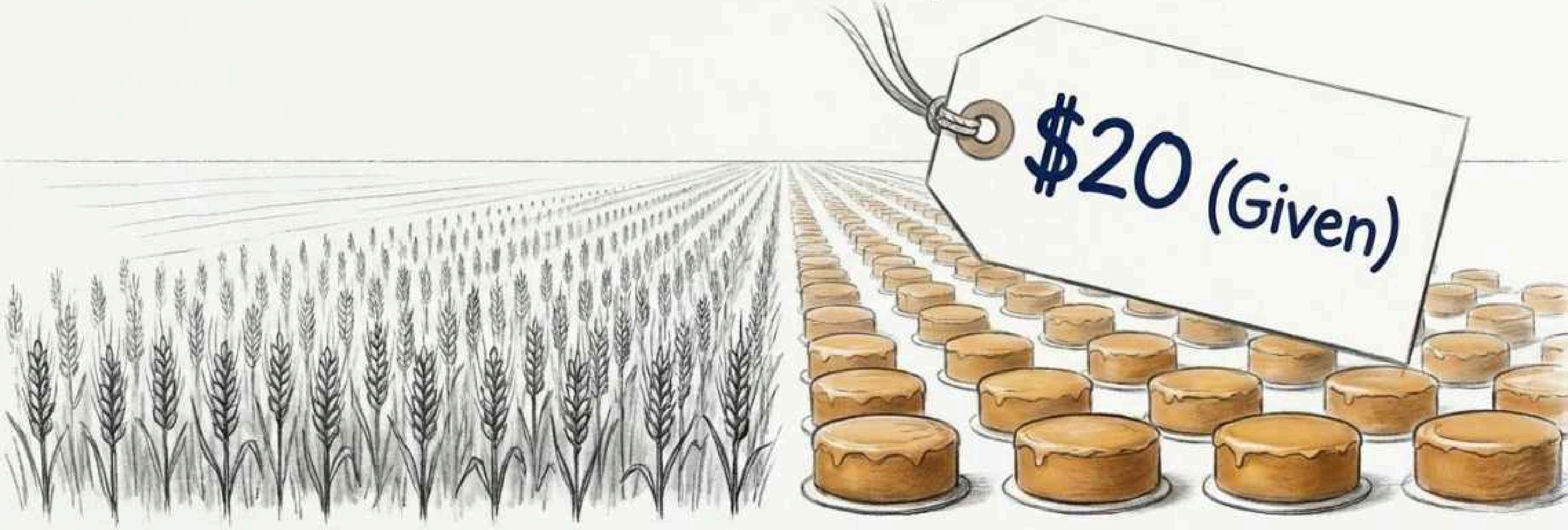
Marginal cost always cuts through average cost at its lowest point.

¶ 5.10



The Link: When marginal cost is below average cost, it pulls the average down. When it rises above, it pulls the average up. The intersection strictly dictates the firm's most efficient scale (10 cakes).

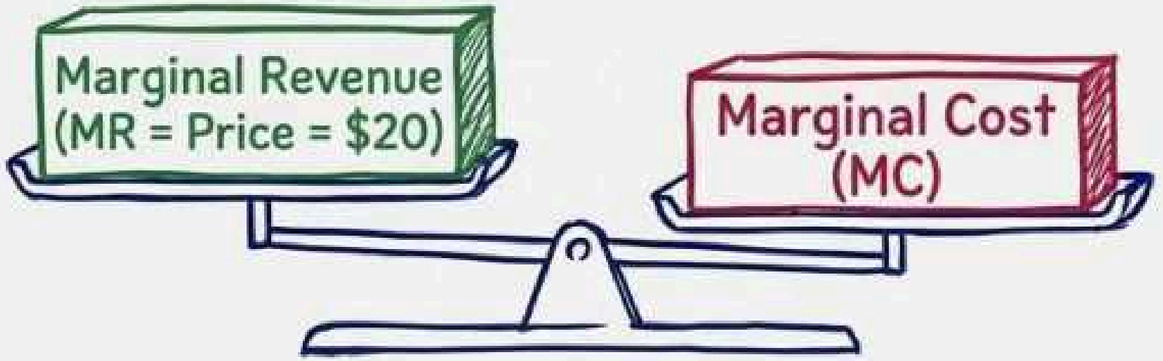
The Price Taker's environment: Perfect Competition.



Market Traits: Many small sellers, completely identical products (like wheat farming), and free entry or exit.	The Constraint: The firm cannot affect the market price. It must take the $20 going price for a cake as an absolute given.

Marginal thinking dictates the optimal output.

The Golden Rule: Produce one more unit only if its Marginal Revenue is at least its Marginal Cost.



5th Cake:
MC $19 vs MR $20

Bake it.

6th Cake:
MC $21 vs MR $20

Stop.

Stop

Conclusion: The bakery's best output is exactly 5 cakes.

The profit calculation presents a painful dilemma.

1. Revenue: 5 cakes × $20 = $100
2. Total Cost: = $175

---

3. Bottom Line: -$75 Loss

Close down? Oven rent is $100 regardless.

- The Problem: At optimal output, the bakery loses $75 a day. Should it close immediately?
- The Reality: Closing does not erase the fixed oven rent. Closing means a $100 loss, which is worse than a $75 loss.

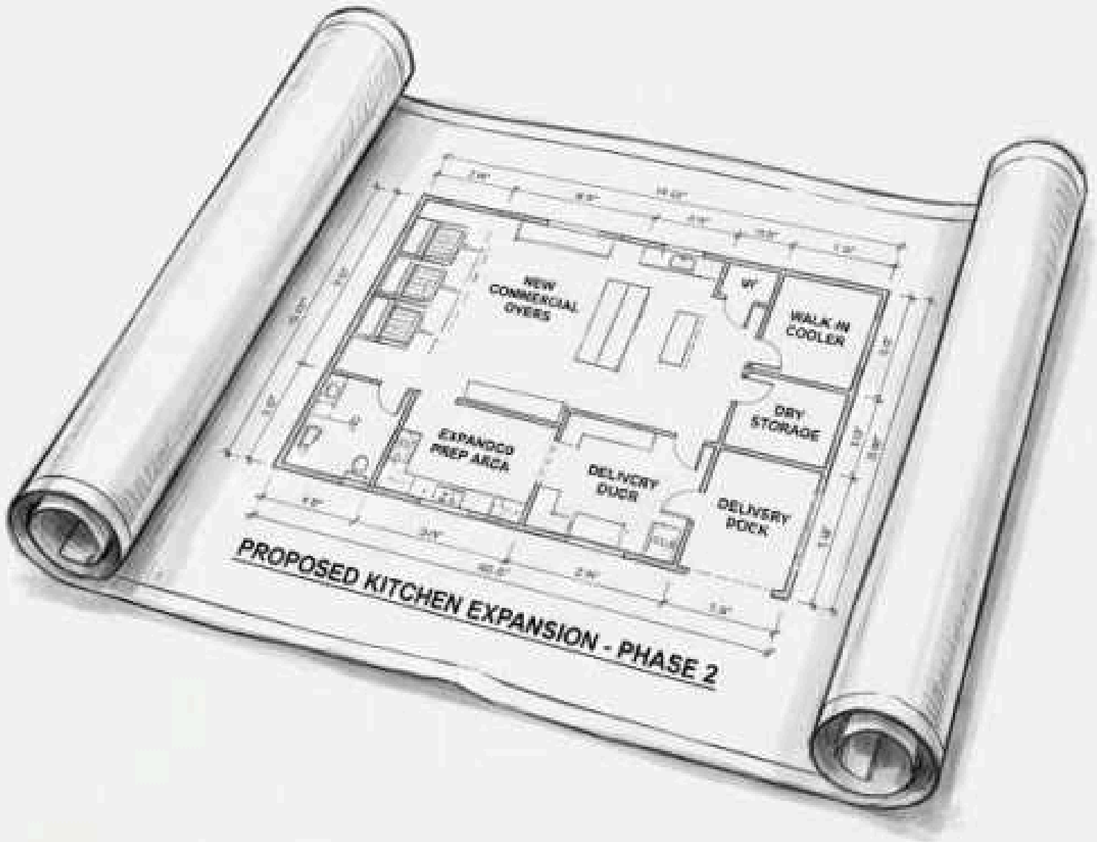
The Short-Run Shutdown Rule: Ignore sunk costs.



- Principle: Fixed costs already paid are sunk. A firm should stay open as long as revenue covers its variable costs.
- Trigger: Only shut down if the price falls completely below the lowest Average Variable Cost.

In the long run, all costs are variable.

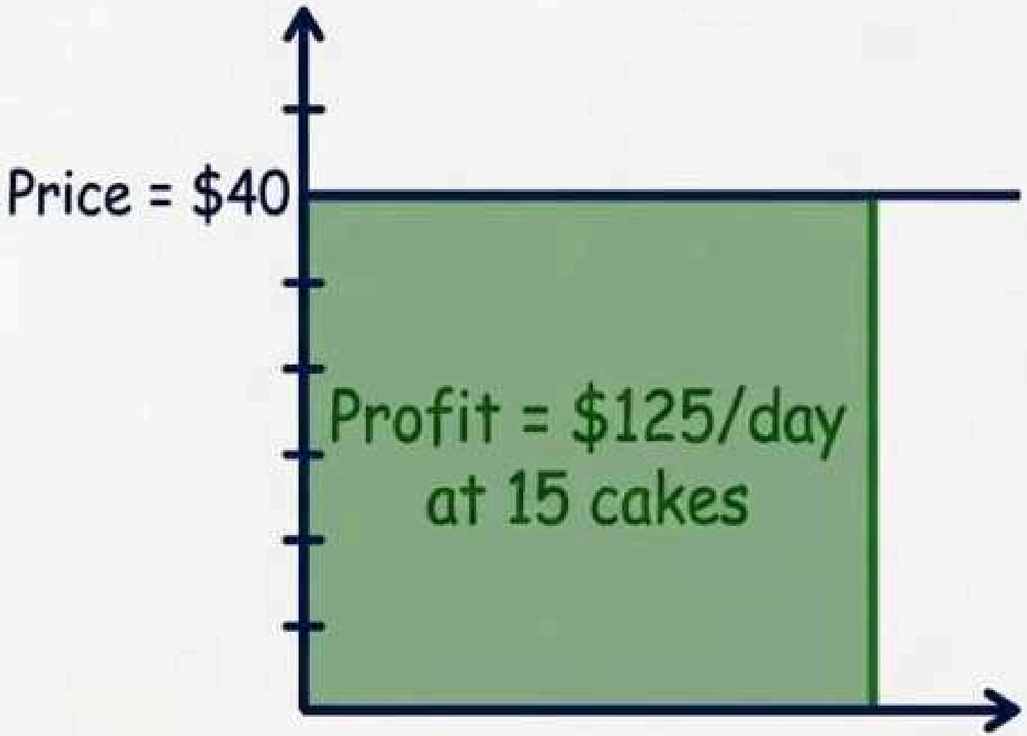




The Shift: The lease on the oven eventually ends. The firm can build a bigger kitchen or leave the business entirely. There are no fixed costs.

The Long-Run Rule: The firm stays in business only if the market price covers the Average Total Cost ($P \geq ATC$). This explains why firms operate at a loss for a while, but eventually close.

The magnet of profit triggers market entry.

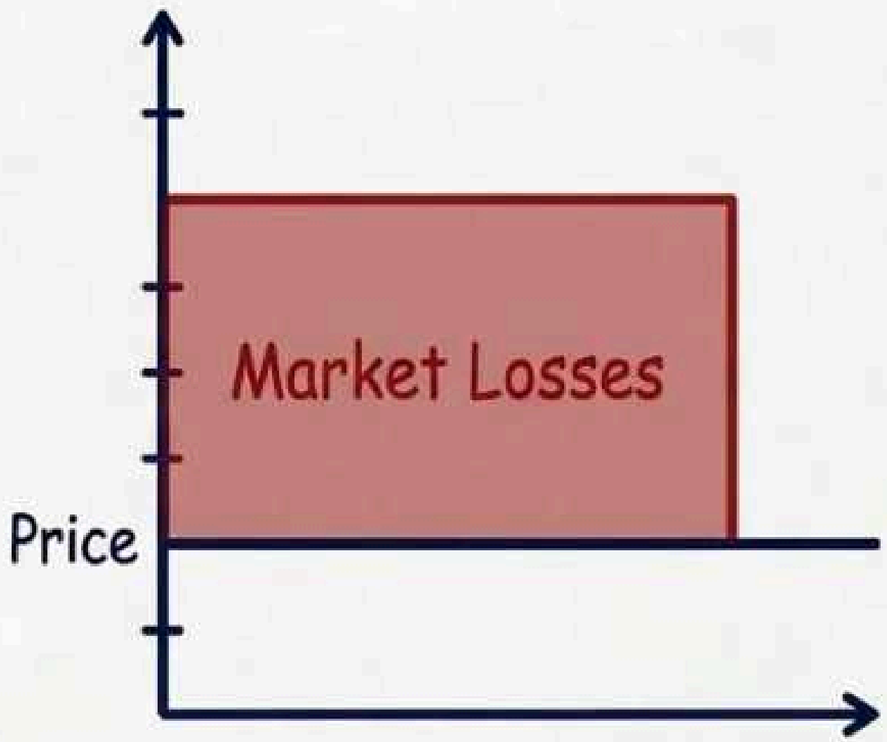




- Dynamics: If the price spikes to $40, the firm produces 15 cakes, making $125 in profit.
- The Correction: These rich profits inevitably attract new bakeries. As they enter, market supply rises, driving the price back down.

The exit of losses drives the market to zero profit.

¶ 5.17





Market Supply ↓

Price ↑

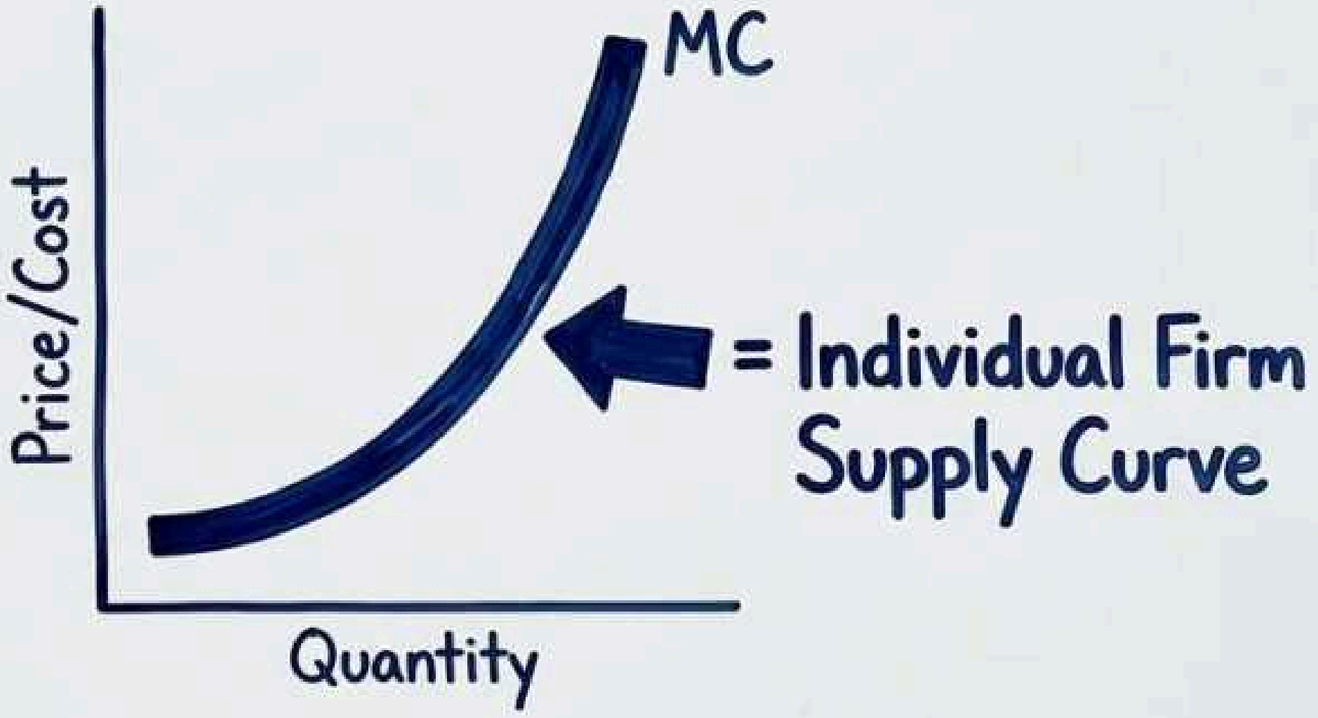
- Dynamics: When bakeries lose money, firms leave, supply falls, and the price recovers.
- Equilibrium: Entry and exit only stop when economic profit is exactly zero. This occurs precisely when Price equals the lowest Average Total Cost ($30 at 10 cakes).

Zero economic profit means owners earn their exact opportunity cost.

¶ 5.18

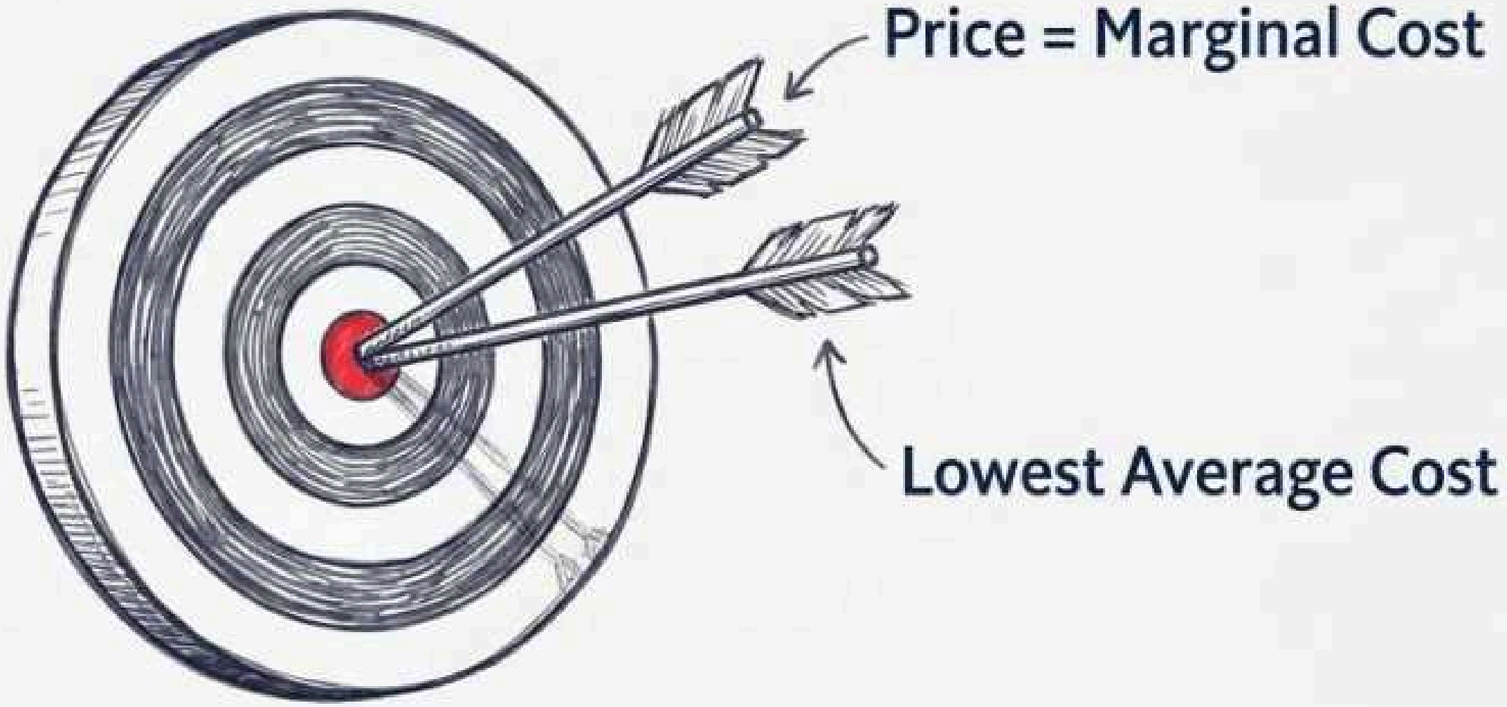


Zero Economic Profit



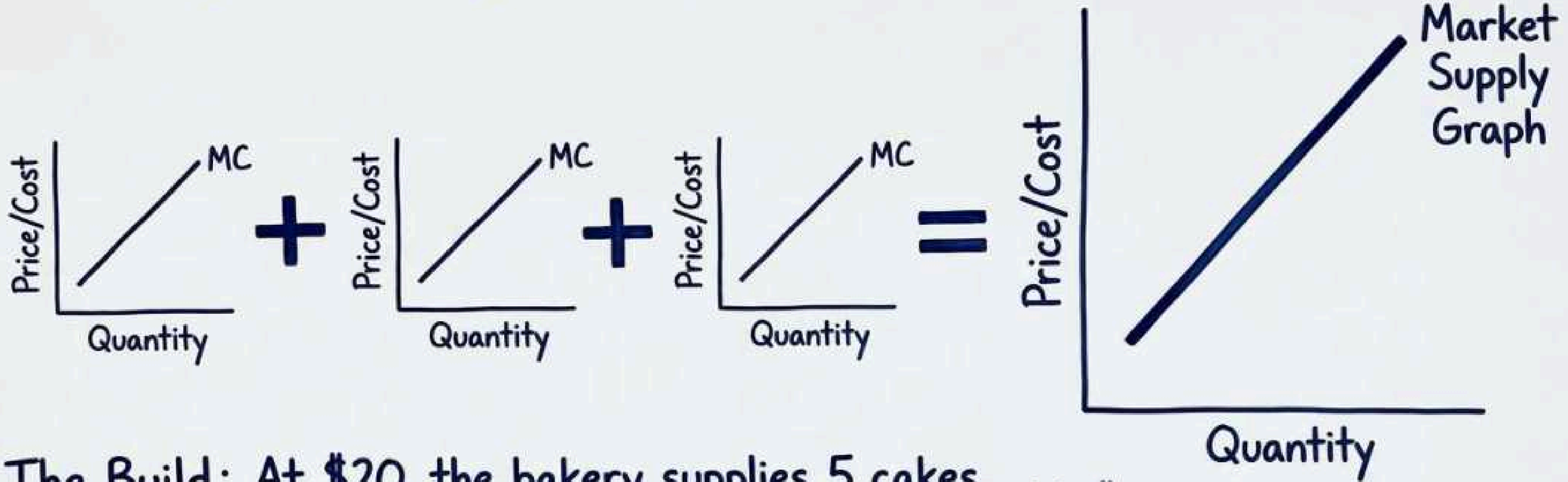
- Reality Check: Zero economic profit does not mean the bakers starve; it means they earn exactly what they could elsewhere ($60k).
- The Revelation: Above the lowest average variable cost, the firm's Marginal Cost curve dictates exactly how much it will supply at any given price. The MC curve IS the supply curve.

Why economists admire perfect competition



Maximum Efficiency: The market hits two targets simultaneously. Buyers pay exactly what the last unit costs to make (P=MC), and in the long run, all goods are produced at the absolute lowest average cost possible. The market serves buyers at the lowest sustainable price.

From single firm to global market supply.



The Build: At $20, the bakery supplies 5 cakes. At $40, it supplies 15. At $30, it supplies 10.

Conclusion: Adding up the individual marginal cost curves of a thousand small bakeries gives us the exact market supply curve we use in macroeconomic models.

Apply the model to your local economy.



- Think: Pick a small local business you interact with frequently.
- Identify: Which of their costs are fixed, and which are variable?
- Decide: If their prices suddenly fell, at what specific point would you advise them to shut down versus operating at a loss?

What happens when the model breaks?

¶ 5.22

Perfect Competition



Looking Ahead: Perfect competition is an ideal baseline. In our final lecture, we will explore the reality of what happens when competition fails through market power and market failure.