PRINCIPLES OF MICROECONOMICS

The Competitive Firm

How a Price-Taker Decides

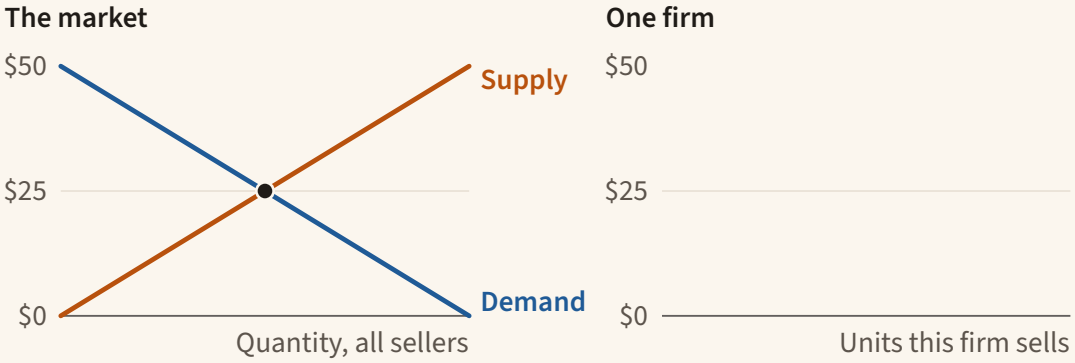
Prof. Bryan Cutsinger
Florida Atlantic University

HOW TO READ THE CHARTS

- **Price**: what the market pays per unit
- **Marginal cost**: the cost of one more unit
- **Gain**: what a choice adds over its cost
- **Hatched**: money lost

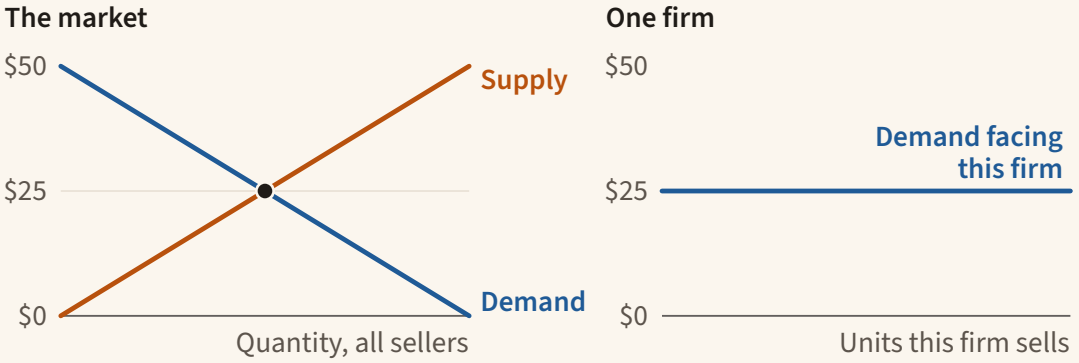
A Small Seller Takes the Market Price

Suppose this firm is one of hundreds selling an identical product, and the market price is $25 a unit. Its output is tiny next to the market's.



Its Demand Curve Is a Flat Line at $25

Suppose it asks $25.01. Buyers walk to a rival selling the same product at $25. It sells all it wants at $25, so it has no reason to charge less. A **price-taker** accepts the going price and chooses only a quantity.



One More Unit Adds Exactly $25

MARGINAL REVENUE

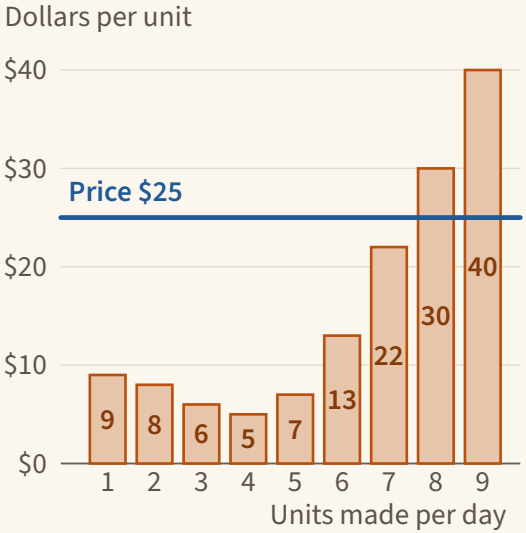
The extra revenue from one more unit. The price does not move when the firm sells one more, so revenue rises by exactly the price.

$175
revenue from 7 units

$200
revenue from 8 units

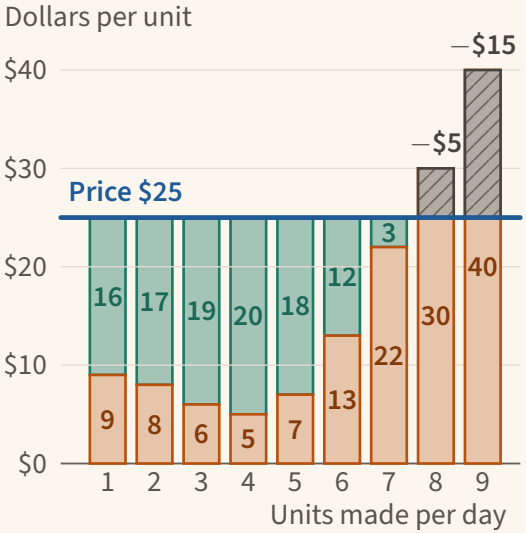
+$25
marginal revenue = the price

How Many Units Should the Firm Make at $25?



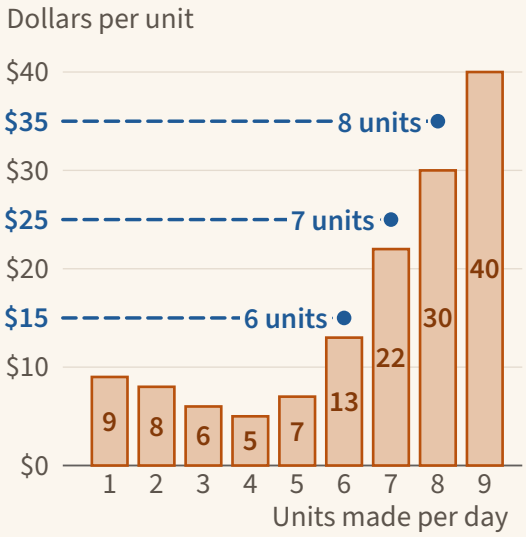
This firm sells its product at $25 a unit, whatever it makes. The bars show what each extra unit costs to make. Make a unit if it adds more to revenue than to cost. How many units should it make?

Unit 7 Pays Its Way; Unit 8 Does Not



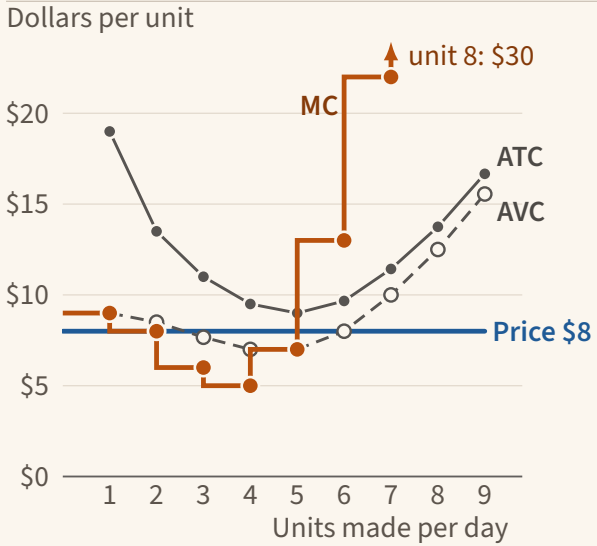
The seventh unit costs $22, below $25, and adds $3. The eighth costs $30, above $25, and would lose $5. Stop at seven. The seven **gains** add to $105 over running cost.

The Firm's Supply Curve Is Its Marginal Cost



Give the firm a price and it makes units until rising marginal cost passes the price. Units 1 to 4 cost $9 or less, below all three prices, so they come along. At $15 it makes 6 units, at $25 it makes 7, at $35 it makes 8: its rising **marginal cost is its supply curve**.

The Price Falls to $8: Make Anything at All?

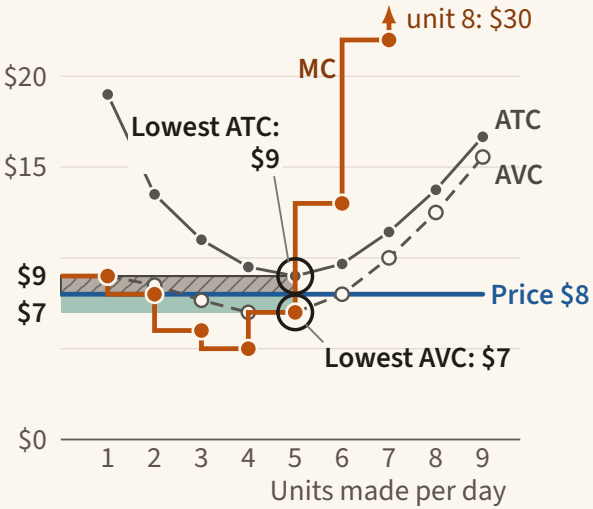


SAME COSTS: ONE STEP PER UNIT

The price is expected to stay at $8. The equipment costs $10 a day and cannot be resold, so that money is spent whether the firm runs or not (a sunk cost). **AVC** (average variable cost): running cost per unit. **ATC** (average total cost): running cost plus the equipment, per unit.

Units	MC	AVC	ATC
4	$5	$7.00	$9.50
5	$7	$7.00	$9.00
6	$13	$8.00	$9.67

At $8, Running Loses $5 and Shutting Loses $10



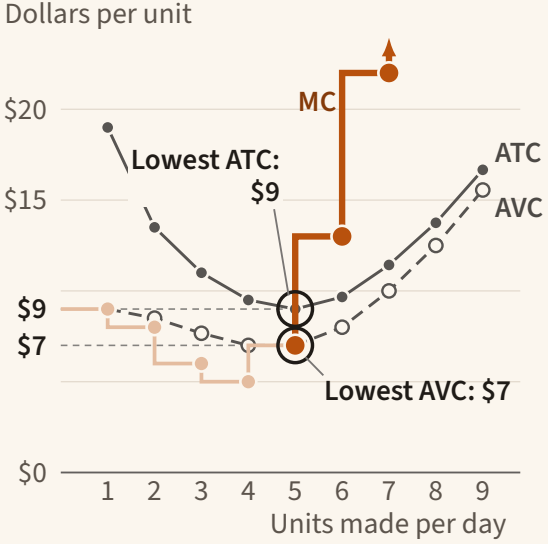
At $8 the firm makes 5 units: read it where MC rises through the price. Units 1 and 2 cost $9 and $8, but they lead to the cheaper units: $40 revenue against $35 running cost.

($8 price − $7 AVC) × 5 = **$5** goes toward the equipment.

($9 ATC − $8 price) × 5 = **$5** is not recovered.

Shutting down saves the $35 running cost, but the $10 is already spent: it loses $10.

Shut Down Below $7; Break Even at $9



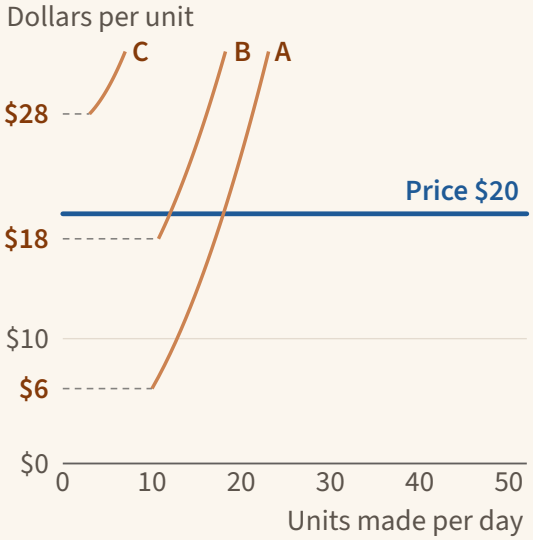
Below $7: shut down. $7 is the shutdown price; below it, price does not cover running cost.

Between $7 and $9: run what you have. When it wears out, the $10 a day is a choice again, and the price does not cover it: do not replace it; exit.

$9 or more: the $9 break-even price covers all cost, the $10 included. Replace and stay.

Rising marginal cost, from the $7 dot up, is the firm's supply.

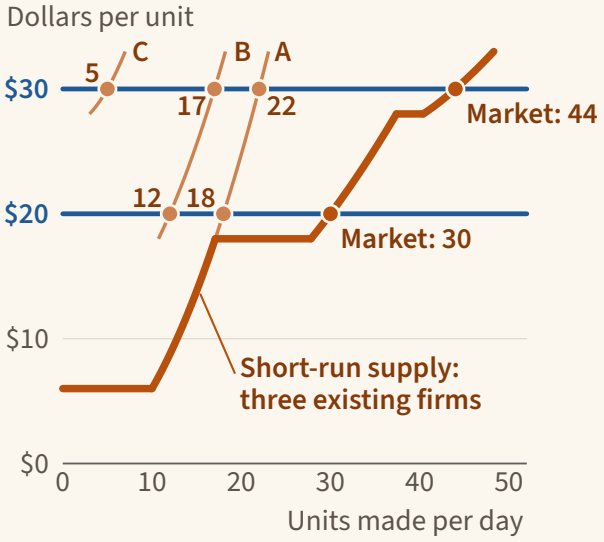
Three Firms Face a Price of $20



THE MARKET: THREE FIRMS

Firms A, B, and C stand in for the many firms that sell the same product. Each curve is one firm's marginal cost above its shutdown price (its lowest AVC): $6 for A, $18 for B, $28 for C. The market price is $20.

Add the Firms' Quantities to Get Market Supply

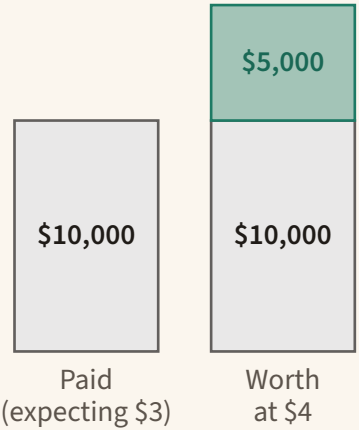


At $20, A makes 18 units and B makes 12; C sits idle: 30 in all. At $30, A makes 22, B 17, and C 5: 44. Short-run **market supply** adds the existing firms' quantities at each price.

Rivals Bid Profit Into the Machine's Price

Suppose firm A's costs leave it a profit at $30. Where does it go? Follow one machine.

1. An investor pays $10,000 for a machine that makes 5,000 units. Other inputs cost $1 a unit. At a price of $3 each unit nets $2, so the machine just earns back its cost.
2. The price turns out to be $4. Each unit nets $3, so the machine earns $15,000, a profit of $5,000.
3. Rivals expect that to last. No more machines like it can be had for $10,000, so they bid its price up to $15,000. A later buyer earns only what any similar investment earns.



Simplified: no discounting and no risk. Capitalization: collapsing a stream of future earnings into one price today.

What Does It Cost to Use the Machine?

The machine cost $10,000 and makes 5,000 units; other inputs cost $1 a unit.

Price	Net per unit	Machine's value	Cost of using it	Value vs. $10,000 paid	Keep running?
$4.00	$3.00	$15,000	$15,000 ÷ 5,000 = $3.00	+$5,000	Yes
$2.00	?	?	?	?	?

The Cost of Using It Is What It Is Worth Now

The machine cost $10,000 and makes 5,000 units; other inputs cost $1 a unit.

Price	Net per unit	Machine's value	Cost of using it	Value vs. $10,000 paid	Keep running?
$4.00	$3.00	$15,000	$15,000 ÷ 5,000 = $3.00	+$5,000	Yes
$2.00	$1.00	$5,000	$5,000 ÷ 5,000 = $1.00	−$5,000	Yes
$3.50	$2.50	$12,500	$12,500 ÷ 5,000 = $2.50	+$2,500	Yes
Below $1	below $0	about $0	—	about −$10,000	No

Not the $2.00 you get from $10,000 ÷ 5,000: that $10,000 is history. The $8 firm's equipment cannot be sold, so using it costs nothing today; this machine can be, so using it costs what it would fetch. Old equipment is no burden: it is revalued until it competes on equal footing with new.

BEFORE YOU GO

Tell me what worked and what didn’t.

One minute, anonymous.

