

ECON 101: Principles of Economics I

Lecture Note 13

University of Michigan at Ann Arbor

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Lecture 13: Perfect Competition and the Supply Curve

Wednesday, November 9, 2022 12:27 PM

Characteristics of Perfect Competition

A perfectly competitive market/industry is a market/industry in which there are

- Many buyers and sellers
 - None have a large **market share** $\frac{q}{Q}$, where $Q = \sum_1^N q_i$, Q means market quantity, q means firm quantity
 - All individuals are **price-takers**
 - Standardized good or service
 - **Free entry and exit** (no additional cost or constraints beyond the normal "startup costs")
- * Exiting happens in the long run

Production and Profit (market price is \$18)

Quantity (q)	Total Revenue (TR)	Total Cost (TC)	Profit (π)
0	0	14	-14
1	18	30	-12
2	36	36	0
3	54	44	10
4	72	56	16
5	90	72	18
6	108	92	16
7	126	116	10
8	144	144	0
9	162	176	-14
10	180	212	-32

The firm's desire is to **maximize Profit**, which is $\pi = \text{Total Revenue} - \text{Total Cost}$.

$\text{Total Revenue} = \text{price} \times \text{quantity}$

Marginal Revenue = Price

In perfect competition, we take price as given and thus, Marginal Revenue is the price.

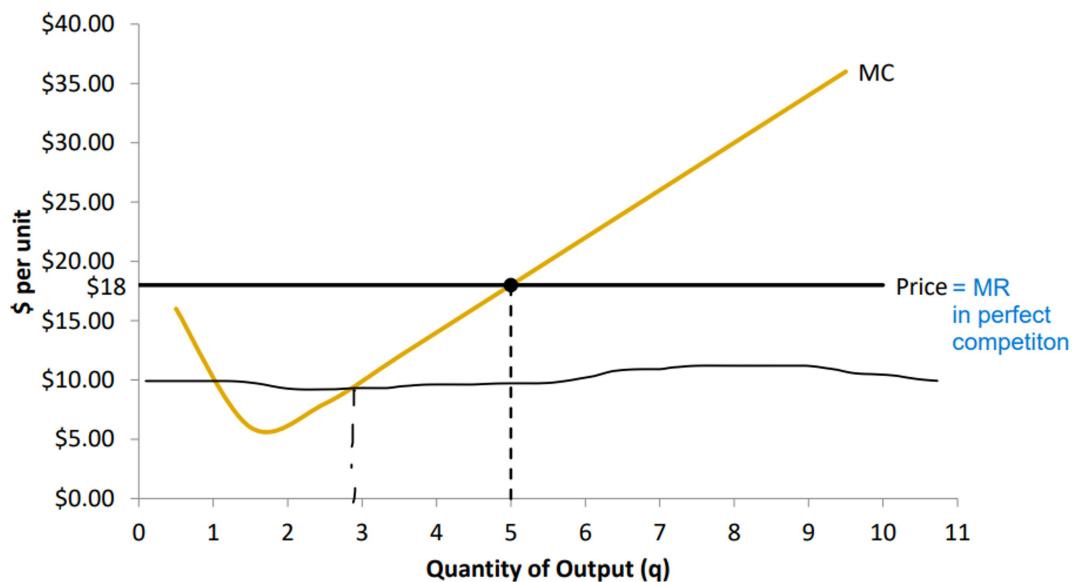
q	FC	VC	TC	AFC	AVC	ATC	MC	
0	\$14	\$0	\$14				\$16	For a perfectly competitive firm the minimum AVC is the shutdown price.
1	\$14	\$16	\$30	\$14.00	\$16.00	\$30.00	\$6	
2	\$14	\$22	\$36	\$7.00	\$11.00	\$18.00	\$8	For a perfectly competitive firm the minimum ATC is the first Break even price.
3	\$14	\$30	\$44	\$4.67	\$10.00	\$14.67	\$12	
4	\$14	\$42	\$56	\$3.50	\$10.50	\$14.00	\$16	
5	\$14	\$58	\$72	\$2.80	\$11.60	\$14.40	\$20	
6	\$14	\$78	\$92	\$2.33	\$13.00	\$15.33	\$24	
7	\$14	\$102	\$116	\$2.00	\$14.57	\$16.57	\$28	
8	\$14	\$130	\$144	\$1.75	\$16.25	\$18.00	\$32	
9	\$14	\$162	\$176	\$1.56	\$18.00	\$19.56	\$36	
10	\$14	\$198	\$212	\$1.40	\$19.80	\$21.20		

Recall that in perfect competition marginal revenue is Price

Quantity (q)	Marginal Revenue	Marginal Cost	Marginal Net Gain
0			
1	\$18	\$16	\$2
2	\$18	\$6	\$12
3	\$18	\$8	\$10
4	\$18	\$12	\$6
5	\$18	\$16	\$2
6	\$18	\$20	-\$2
7	\$18	\$24	-\$6
8	\$18	\$28	-\$10
9	\$18	\$32	-\$14
10	\$18	\$36	-\$18

π (profit) is maximized when MR intersects with MC

We always want a greater quantity



When is Production Profitable?

- $TR > TC \Rightarrow$ profitable
- $TR = TC \Rightarrow$ breaks even
- $TR < TC \Rightarrow$ incurs a loss

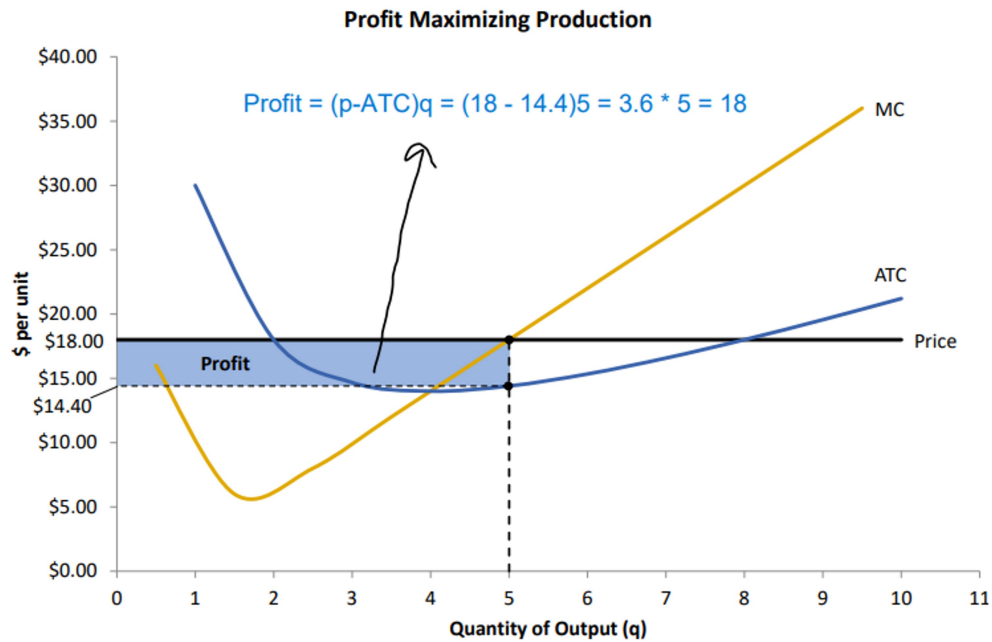
$$\pi = TR - TC$$

$$\pi = (p \times q) - \left(\frac{TC}{q} \times q \right) = q \left(p - \frac{TC}{q} \right) = q(p - ATC)$$

* Recall that $ATC = \frac{TC}{q}$, and ATC must be evaluated at the relevant q .

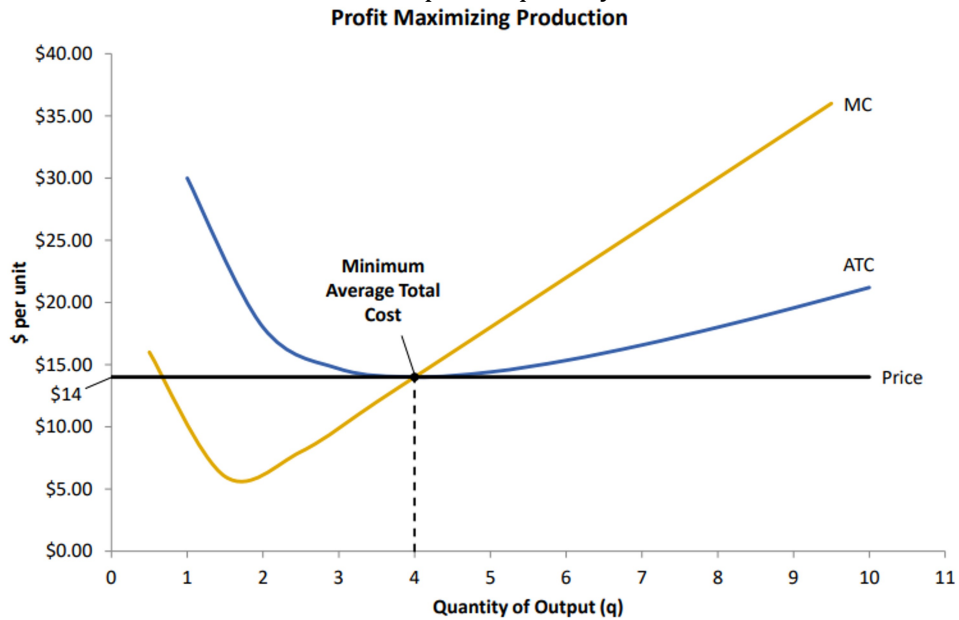
- Price $>$ ATC $\Rightarrow$ profitable
- Price = ATC $\Rightarrow$ breaks even
- Price $<$ ATC $\Rightarrow$ incurs a loss

Profitable

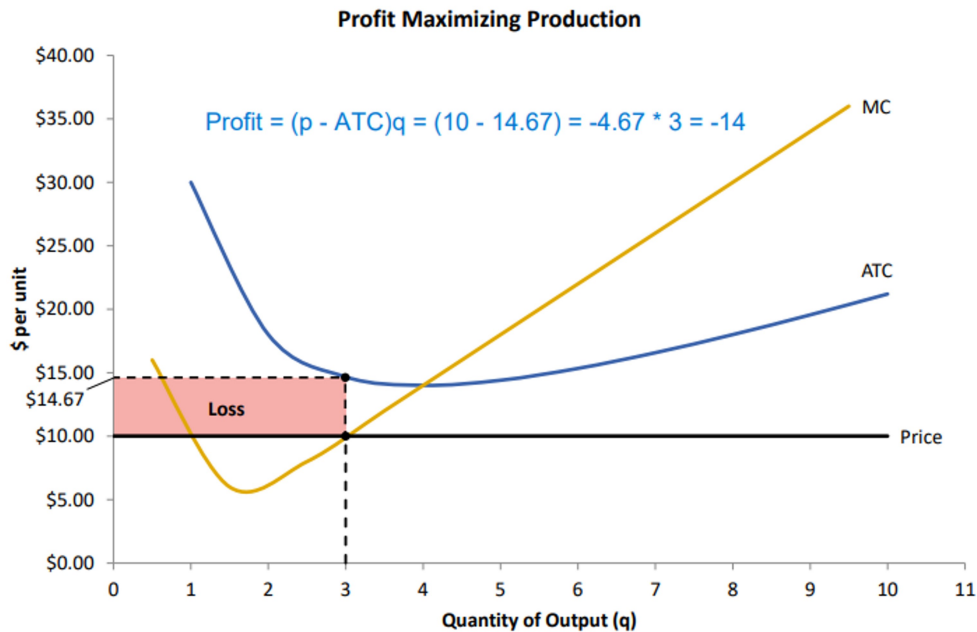


Breaks even

In perfect competition, the profit maximizing q occurs where price intersects MC. Break even occurs where price intersects ATC. This means at this specific quantity, **Price = ATC = MC**, which is the **minimum ATC**.



Incurs a loss



Choosing Output (in the short run)

In the long run, the firms exit when taking a loss and enter where profit is possible.

To produce:

- Profit = Total Revenue - Variable - Fixed Cost

To shutdown:

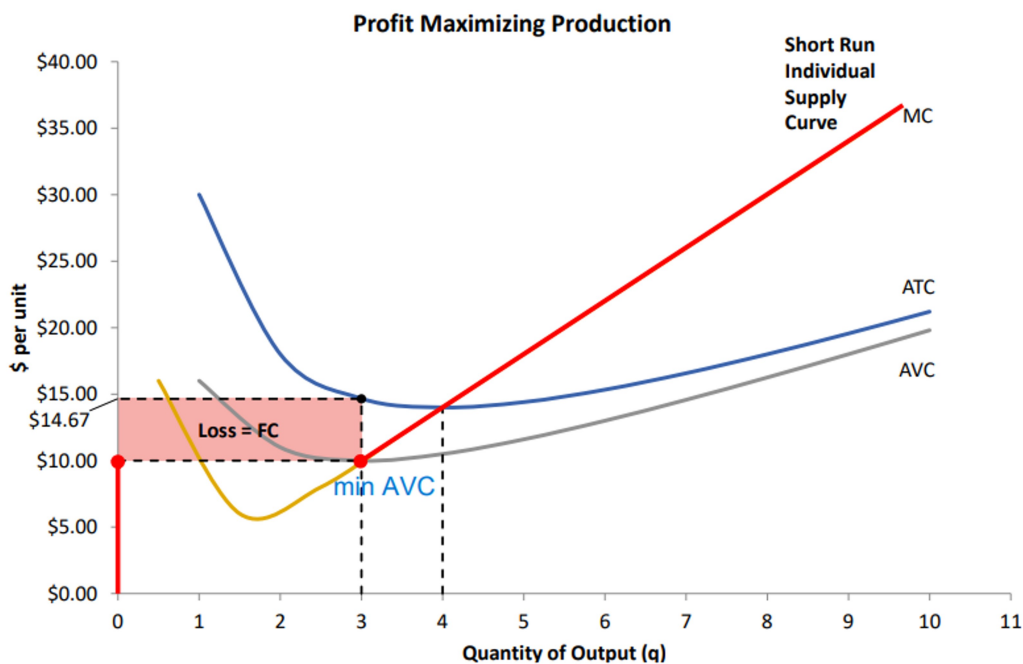
- Profit = 0 - 0 - Fixed Cost = - Fixed Cost

When will the firm shutdown?

- If producing means: $TR < VC \Rightarrow P < AVC$
 - Profit = Total Revenue - Variable Cost - Fixed Cost
 - Losses in producing would be greater than a loss of Fixed Cost
- $P < AVC \Rightarrow$ shutdown
- $P > AVC \Rightarrow$ produce
- $P = AVC \Rightarrow$ indifferent (loss in producing = fixed cost)

* π maximizing q in perfect competition when price intersects with MC $\Rightarrow$ shutdown price $\Rightarrow$ minimum AVC

The short Run Production Decision



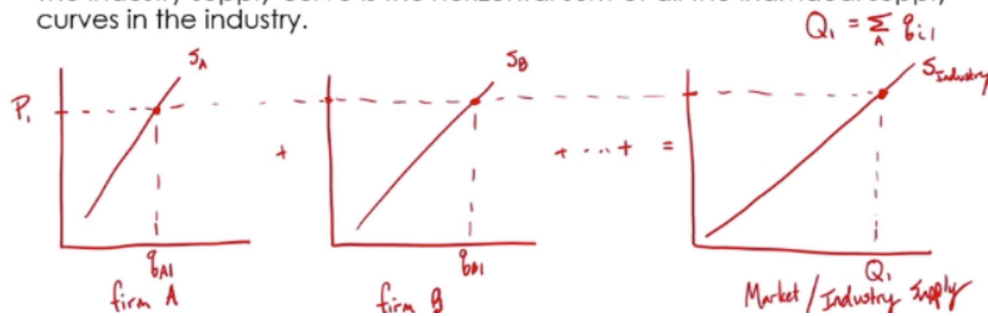
Industry Supply Curve



Industry Supply Curve

The **industry supply curve** shows the relationship between the price of a good and the total output of the industry as a whole.

The industry supply curve is the *horizontal sum* of all the individual supply curves in the industry.

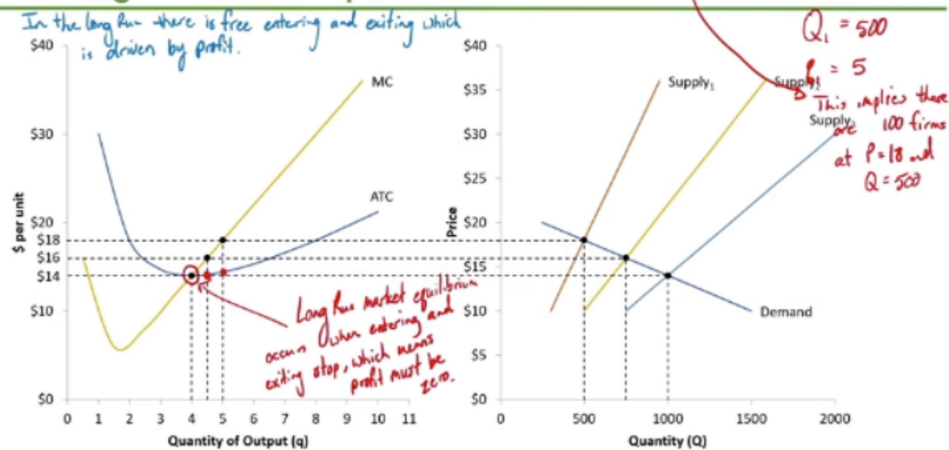


The Long-Run Market Equilibrium (Assume all firms are identical)

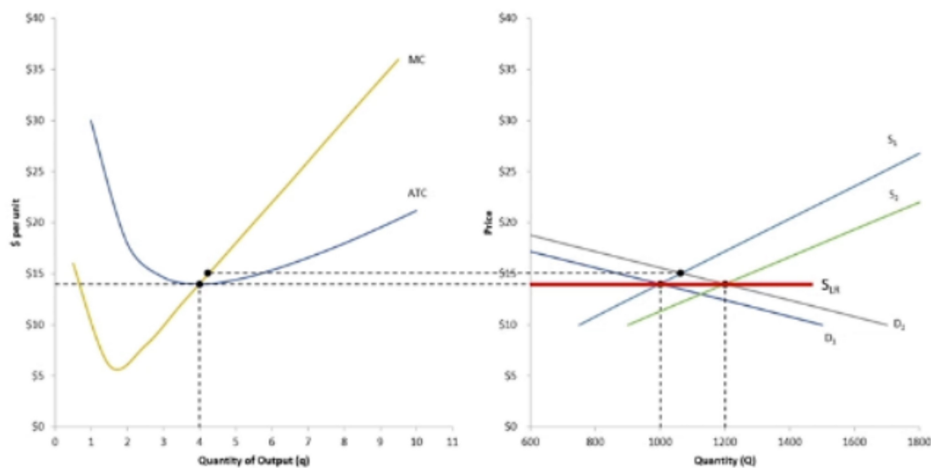


The Long-Run Market Equilibrium

Assume all firms are identical



Changing Demand in the Long-Run



Short-Run versus Long-Run Supply

