AS.180.102 (04): Elements of Microeconomics

Chapter 14 - The Costs of Production

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Outline

Main Takeaway

This is technical and a little mundane but is the basis of how we will think about firms decisions in different types of markets

Types of Costs

Cost Type	Defintion	Notation
Explicit cost	Costs requiring monetary payment	
Implicit cost	Costs without monetary payment	
Fixed cost	Do not vary with quantity	FC
Variable cost	Do vary with quantity	VC
Total cost	All costs	$TC = FC + VC$
Average fixed cost	Fixed cost divided by quantity	$AFC = FC/Q$
Average variable cost	Average Cost divided by quantity	$AVC = VC/Q$
Average total cost	Total cost divided by quantity	$ATC = TC/Q$
Marginal cost	Increase in cost from one more unit of output	$MC = \Delta TC/\Delta Q$

Table: Types of Costs

Accounting vs Economics

- Accountants only consider **explicit** costs whereas economists care about both explicit and **implicit** costs
- You take your bike to get repaired at a bike shop.
  - What are some explicit costs?
  - What are some implicit costs?
- Will the accounting profit or economic profit be higher?

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    - ★ Payment to mechanic, bike parts
  - What are some implicit costs?
    - ★ Time spent traveling to shop, payment you could have put towards a different bike
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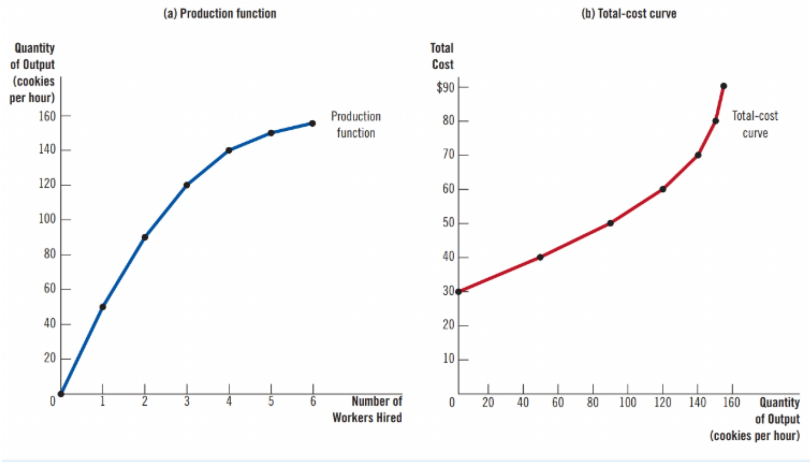
- Will the fixed cost be the same for each unit of output?
  - Yes
- Will the variable cost be the same for each unit of output?
  - Not necessarily

Fixed and Variable Costs



Typical shapes of cost curves

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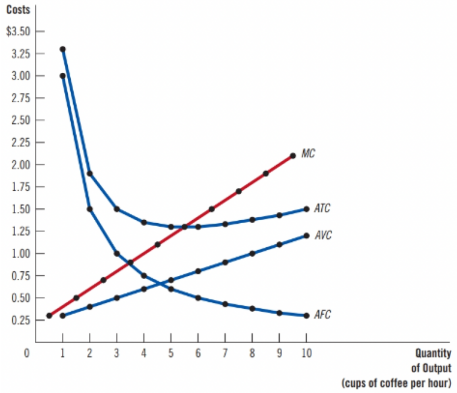

Relationship Between Cost Curves

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- If the ATC of 3 units of output is \$8, and the MC of the 4th unit is \$10, what is the ATC of 4 units?

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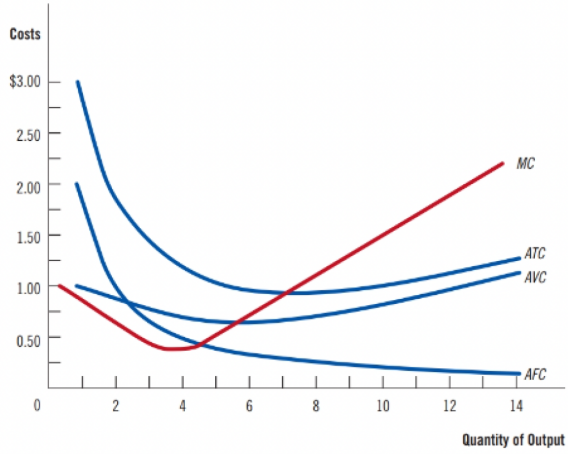
  - \$24+\$10=\$34 $\Rightarrow$ \$34/4=\$8.50

Typical shapes of cost curves



Application

Fill in the blanks. **We have a fixed cost of $10**.

Q	MC	TC	AVC	AFC	ATC
1	3				
2	2				
3	3				
4	4				
5	5				
6	6				

Application

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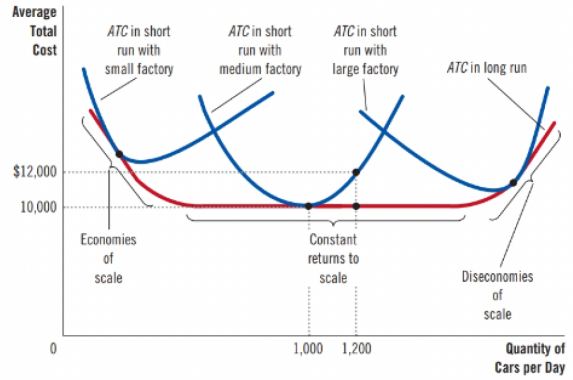
Q	MC	TC	AVC	AFC	ATC
1	3	13	3	10	13
2	2	15	2.5	5	7.5
3	3	18	2.67	3.33	6
4	4	22	3	2.5	5.5
5	5	27	3.4	2	5.4
6	6	33	3.83	1.67	5.5

Short-run vs Long-run

- **Economies of scale**: *Long-run* average total cost falls as quantity increases
- **Diseconomies of scale**: *Long-run* average total cost rises as quantity increases
- **Constant returns to scale**: *Long-run* average total costs stay the same as quantity rises

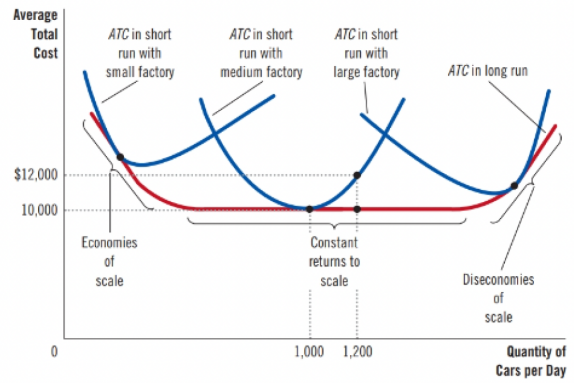
Short-run vs Long-run

- Why does the short run ATC curve differ from the long run ATC curve?



Short-run vs Long-run

- Why does the short run ATC curve differ from the long run ATC curve?
  - The fixed costs are only fixed in the short run. Everything is a variable cost in the long run.



Application

- Which of the three firms below experience economics of scale, diseconomies of scale, and constant returns to scale?

Table: Long run total costs

Quantity	**1**	**2**	**3**	**4**	**5**	**6**
Firm A	\$60	\$70	\$80	\$90	\$100	\$110
Firm B	\$11	\$10	\$10	\$10	\$10	\$10
Firm C	\$2.10	\$4.20	\$6.30	\$8.40	\$10.50	\$12.60

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Table: Long run marginal costs

ATC	**1**	**2**	**3**	**4**	**5**	**6**
Firm A	\$60	\$65	\$70	\$75	\$80	\$85
Firm B	\$11	\$10.50	\$10.33	\$10.25	\$10.20	\$10.17
Firm C	\$2.10	\$2.10	\$2.10	\$2.10	\$2.10	\$2.10