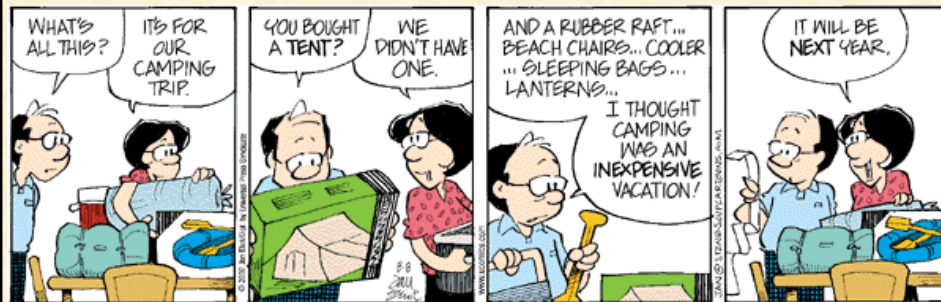


Chapter 8: Business Costs & Production



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Costs in Jennifer Lopez's, “Love Don't Cost A Thing”

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Business Decision-Making

- You're a manager of a fast food restaurant. What operation decisions do you need to make?

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Calculating Profit and Loss

- Profit is the difference between revenue & costs.
- Total Revenue (TR)
 - The amount a firm receives from the sale of goods and services
- Total Cost (TC)
 - The amount a firm spends in order to produce and sell those goods and services

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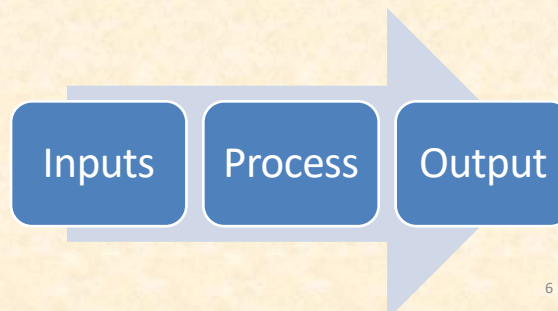
Accounting and Economic Profits

Item	Cost Type	Amount (\$)
Revenues		\$8,000
Workers' Wages	Explicit	\$4,000
Insurance and Rent	Explicit	\$2,500
Food Ingredients	Explicit	\$1,000
Accounting Profits		\$8,000 – \$7,500 = \$500
Opportunity Cost of Owner's Time	Implicit	\$300
Opportunity Cost of Owner's Capital	Implicit	\$400
Economic Profits		\$8,000 – \$8,200 = -\$200

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Production Function

- Production Function:
 - Relationship between
- Factors of production:



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Marginal Product

- Change in output divided by the change in input.
- Marginal product of labor (MPL).
- Marginal product of capital (MPK)
- Mathematically:

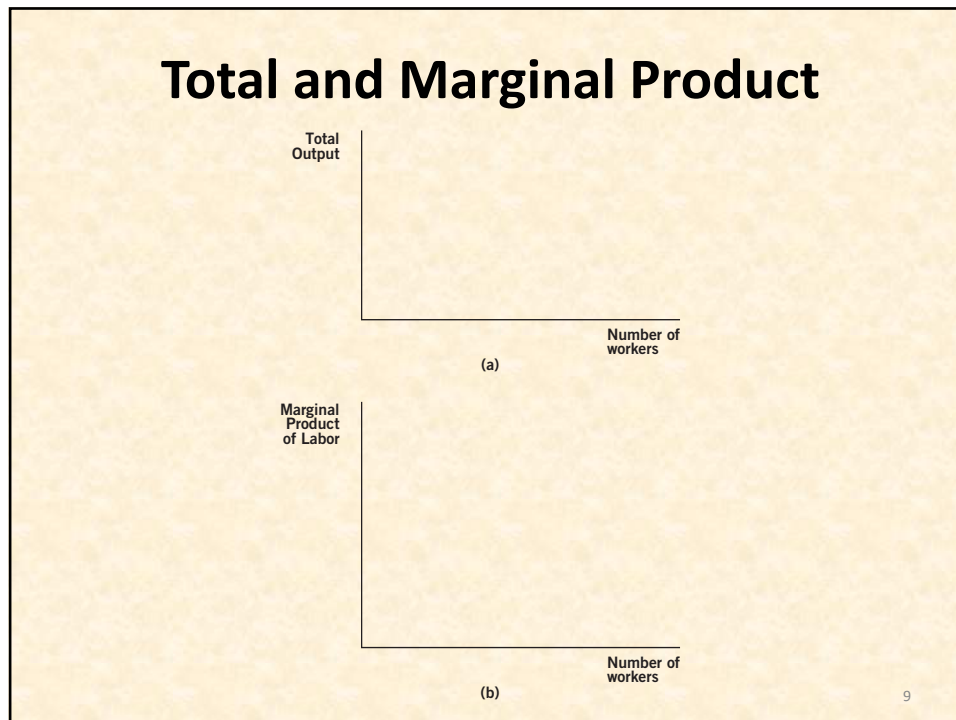
$$MPL = \frac{\Delta Q}{\Delta L}$$

$$MPK = \frac{\Delta Q}{\Delta K}$$

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Number of Workers	Total Output (Number of Meals Served per Hour)	Marginal Product of Labor
0	0	
1	5	
2	15	
3	30	
4	42	
5	52	
6	60	
7	65	
8	67	
9	63	
10	55	

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Diminishing Marginal Product

- Law of Diminishing Marginal Product
 - Successive increases in an input eventually cause to increase at a rate.
- Assuming capital (K) is fixed, we *eventually* get to a point where a new worker (L) adds output than the previous worker.

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The Firm in *The Big Bang Theory*, “Work Song Nanocluster”

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Production Costs & Diminishing Returns

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Poll Everywhere Question

Where does diminishing marginal product begin?

Workers	Total Product
0	---
1	3
2	8
3	10
4	11
5	9
6	6

After 1st worker
After 2nd worker
After 3rd worker
After 4th worker

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What Costs Do Firms Consider in the Short Run and the Long Run?

- From production decisions to costs.
- Short run
 - Period of production in which at least
- Long run
 - Period of production in which all

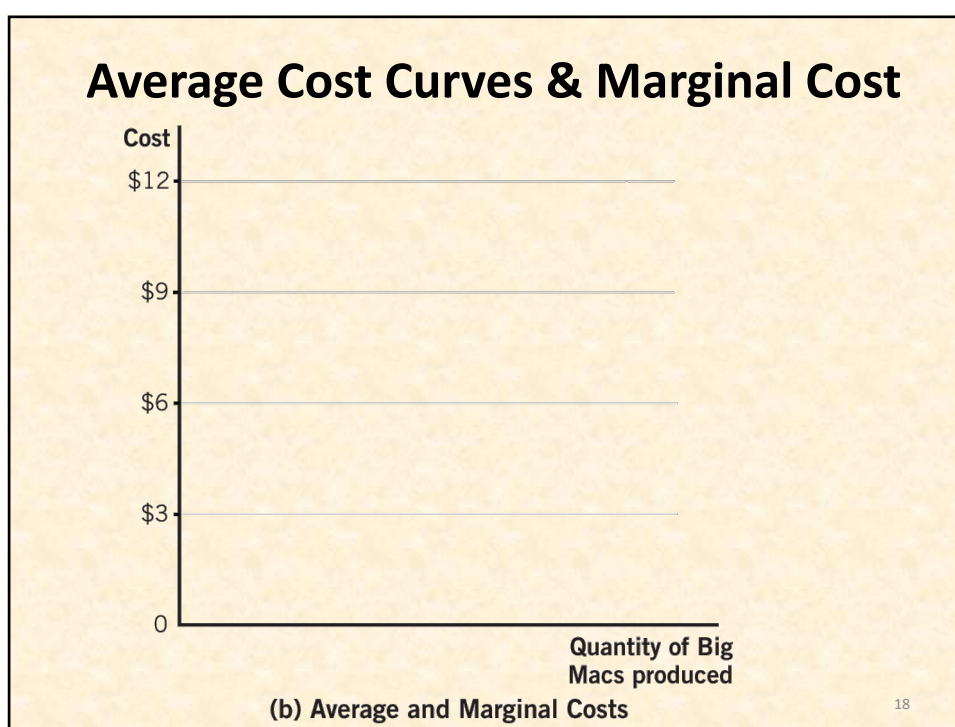
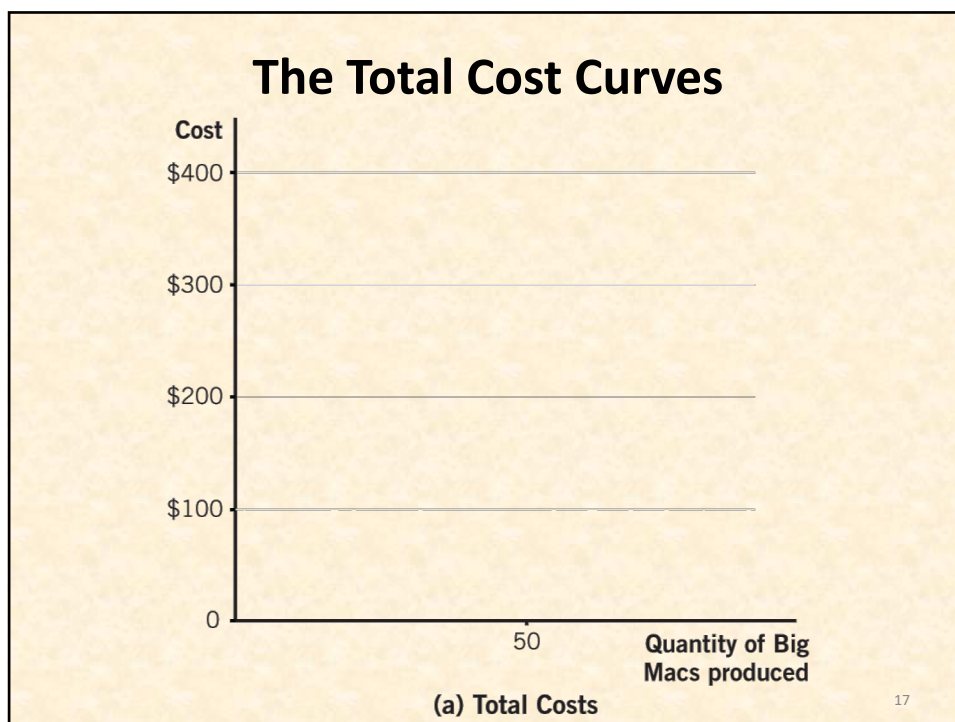
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Costs in “Breaking Bad”

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Q	TVC	TFC	TC TVC + TFC	AVC TVC ÷ Q	AFC TFC ÷ Q	ATC TC ÷ Q or AVC + AFC	MC $\Delta \text{TVC} \div \Delta Q$ or $\Delta \text{TC} \div \Delta Q$
0	\$0.00	\$100.00	\$100.00				
10	30.00	100.00	130.00	\$3.00	\$10.00	\$13.00	\$3.00
20	50.00	100.00	150.00	2.50	5.00	7.50	2.00
30	65.00	100.00	165.00	2.17	3.33	5.50	1.50
40	77.00	100.00	177.00	1.93	2.50	4.43	1.20
50	87.00	100.00	187.00	1.74	2.00	3.74	
60	100.00	100.00	200.00		1.67	3.34	1.30
70	120.00	100.00	220.00	1.71	1.43		2.00
80	160.00	100.00	260.00	2.00	1.25	3.25	4.00
90	220.00	100.00	320.00	2.44	1.11	3.55	6.00
100	300.00	100.00	400.00	3.00		4.00	8.00

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Average & Marginal Costs

- MC reaches its minimum before AVC & ATC
- Marginal always intersects average up/down
- AFC falls as Q rises
- Minimum point of ATC: corresponds to minimum scale of production

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Review Question

($TC = TFC + TVC$, $AFC = TFC/Q$, $AVC = TVC/Q$, $ATC = TC/Q$, $MC = \text{change in } TC$)

Fill out in groups of 4!

Q	TVC	TFC	TC	AVC	AFC	ATC	MC
0			100	—	—	—	—
1	5						
2			112				
3				10			
4						37.5	

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Broke in “The Office”

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Marginal v Average

- Key rule: average follows the margin.
- If marginal (next game) is _____ average:
average
- If marginal (next game) is _____ average:
average

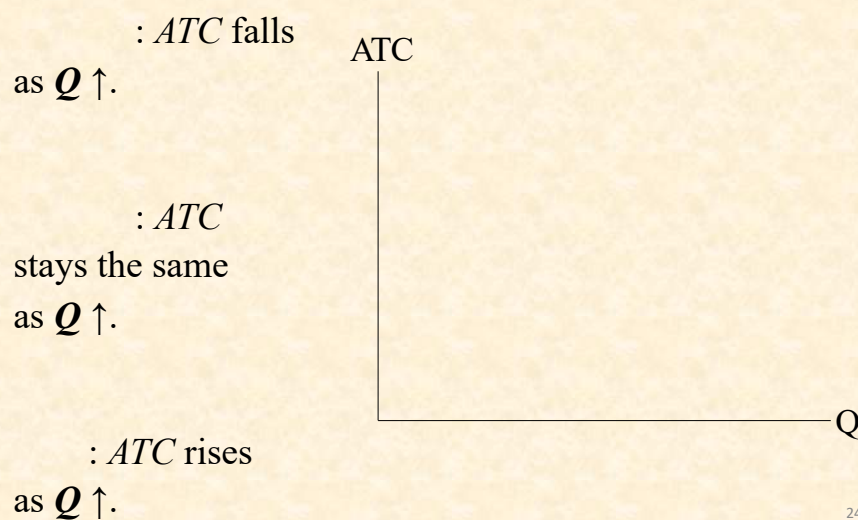
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Costs in the Long-Run

- Economies of Scale
 - ATC falls when production expands
 - Larger firm has lower ATC than a smaller firm
- Diseconomies of Scale
 - ATC rises when production expands
 - Very large firm has to deal with additional management, coordination, logistics expenses
- Constant Returns to Scale
 - ATC stays the same when production expands

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Costs in the Long Run



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