From Short-run Productivity to Short-run Costs

Q (output)	Q_L (#workers)	TVC ($Q_L \times WR$)	MP ($\frac{\Delta Q}{\Delta Q_L}$)	MC ($\frac{\Delta TVC}{\Delta Q}$)	AP ($\frac{Q}{Q_L}$)	AVC ($\frac{TVC}{Q}$)
0	0	0	—	—	—	—
100	6					
200	10					
300	13					
400	17					
500	23					
600	32					
700	44					
800	62					

C P — Costs and Productivity

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2.4  40
2.1  35
1.8  30
1.5  25
1.2  20
 .9  15
 .6  10
 .3   5
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1   2   3   4   5   6   7   8

Quantity (hundreds)

Questions:

1. Why does the number of workers needed to produce each additional hundred units change as output increase?

2. Over what range of output do marginal returns of labor increase? Explain why this happens.

3. Beyond what level of output does the firm begin experiencing diminishing marginal returns? Explain why this happens.

4. Describe the relationship between marginal product and marginal cost in your graph. Explain this relationship.

5. Describe the relationship between average product and average variable cost. Explain this relationship.

6. Describe the relationship between marginal cost and average variable cost. Explain this relationship.

7. Does the table and graph above show a firm's short-run costs or its long-run costs? Explain.

8. Beyond what level of output does this firm experiencing rising average variable costs of production?

9. Besides the wages firms pay their workers, what other costs do firms face?

10. Identify one additional variable cost and two costs a firm faces that could be considered fixed costs.

11. Define fixed costs. Define average fixed costs. What happens to a firm's average fixed costs as its level of output increases? Why?

12. Assume this firm has a total fixed cost of $2. On the graph below, re-draw the MC and AVC curves from your graph above, and add a line showing the firm's average TOTAL cost.

13. Besides its short-run costs of production, what other information must we know to determine the optimal level of output for the firm below?

C

Costs and Productivity

2.4
2.1
1.8
1.5
1.2
.9
.6
.3

1   2   3   4   5   6   7   8

Quantity (hundreds)