

AS.180.102 (04): Elements of Microeconomics

Chapter 15 - Firms in Competitive Markets

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Look ahead

- Problem Set 4 due **Sunday Nov 10th**
- Midterm 2 is in just under two weeks on **Thursday Nov 14th**
 - ▶ Please send me questions and come to office hours if you're unsure on any of the material!

Outline

Main Takeaway

Competitive firms are **price takers** and have extremely limited market power making the competitive market the simpler place to start

Market Characteristics

- Competitive markets have distinct characteristics
 - ① The market has many buyers and many sellers
 - ② The sellers are producing identical (or almost identical) goods
 - ③ There are no (or very limited) barriers to entry or exit
 - ④ All producers are price takers
- What do these characteristics mean for producers' average revenue?

Revenues

$$TR = P \cdot Q$$

$$AR = \frac{TR}{Q} = \frac{P \cdot Q}{Q} = P$$

$$MR = \frac{\Delta TR}{\Delta Q} = \frac{PQ_2 - PQ_1}{Q_2 - Q_1} = \frac{P(Q_2 - Q_1)}{(Q_2 - Q_1)} = P$$

Therefore $P = MR = AR$

Profit Maximization

Fill in the following table

Quantity	TC	TR	Profit	MC	MR
0	3	0			
1	5	6			
2	8	12			
3	12	18			
4	17	24			
5	23	30			
6	30	36			
7	38	42			

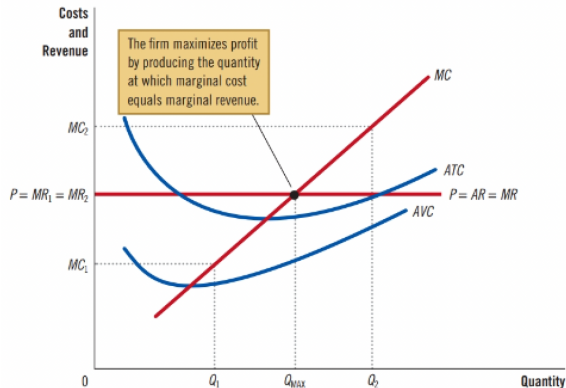
Profit Maximization

Fill in the following table

Quantity	TC	TR	Profit	MC	MR
0	3	0	-3	3	6
1	5	6	1	2	6
2	8	12	4	3	6
3	12	18	6	4	6
4	17	24	7	5	6
5	23	30	7	6	6
6	30	36	6	7	6
7	38	42	4	8	6

Note that profit is maximized when $MC = MR$. Why does this make intuitive sense?

Profit Maximization



Application

- You are a producer of eggs in a perfectly competitive market. The price of a carton of eggs in the market is \$8.

Quantity	TC	TR	AR	ATC	MC	MR
1	9	8				
2	10	16				
3	12	24				
4	15	32				
5	19	40				
6	27	48				
7	42	56				

Application

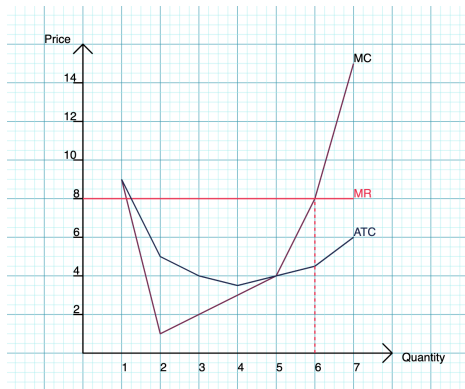
- You are a producer of eggs in a perfectly competitive market. The price of a carton of eggs in the market is \$8.

Quantity	TC	TR	AR	ATC	MC	MR
1	9	8	8	9	9	8
2	10	16	8	5	1	8
3	12	24	8	4	2	8
4	15	32	8	3.75	3	8
5	19	40	8	3.8	4	8
6	27	48	8	4.5	8	8
7	42	56	8	6	15	8

- What is the market quantity?

Application

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Producing away from equilibrium

- You are still a seller in the egg market and the market price for eggs is still \$8.
 - ▶ Let's assume that you want to sell your eggs at \$9. Intuitively, why is this not possible?

Short-run versus Long-run

- In the short run we are stuck with our fixed cost regardless of the quantity we produce
- In the long run, we can choose not to pay the fixed cost if we do not want to participate in the market

Short-run versus Long-run

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- In the long run, we can choose not to pay the fixed cost if we do not want to participate in the market
- Our fixed cost to fix bikes at our bike shop is \$100. It costs \$20 to fix the first bike and \$30 to fix the second bike. The market price for bike fixes is \$35.
 - ① Is profit positive or negative if we fix these two bikes?

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 - ① Is profit positive or negative if we fix these two bikes?
 - ★ Negative ($TR=70$, $TC=20+30+100=150$, $\pi = 70 - 150 = -80$)
 - ② Will we still fix these two bikes?

Short-run versus Long-run

- We require our *total revenue* to cover our *variable costs* to operate in the short run. Otherwise we shut down.
 - ▶ Shut down if $TVC > TR$
 - ▶ Shut down if $\frac{TVC}{Q} > \frac{TR}{Q}$
 - ▶ Shut down if $AVC > P$
- Note in previous example:
 - ▶ $P = \$35$
 - ▶ $AVC = \frac{\$20 + \$30}{2} = \$25$

Application

Assume that the market for pumpkins is perfectly competitive and you are a pumpkin producer. You have a fixed cost of \$10 and the total variable cost to produce a given quantity of pumpkins is given below.

Quantity	1	2	3	4	5	6	7
TVC	6	8	11	16	24	36	56

- The market price for pumpkins in the fall is \$5 while the market price for pumpkins in the spring is \$3. Using the numbers given to you, explain mathematically why you will produce pumpkins in the fall but you will shut down and not produce pumpkins in the spring.
- We need to work out AVC and the quantity we will produce given price

Application

Quantity	1	2	3	4	5	6	7
TVC	6	8	11	16	24	36	56
AVC							
MC							

Application

Quantity	1	2	3	4	5	6	7
TVC	6	8	11	16	24	36	56
AVC	6	4	3.7	4	4.8	6	8
MC	6	2	3	5	8	12	20

- If $P = 5$ in the fall, we produce what quantity? Will we shut down or not?

Application

Quantity	1	2	3	4	5	6	7
TVC	6	8	11	16	24	36	56
AVC	6	4	3.7	4	4.8	6	8
MC	6	2	3	5	8	12	20

- If $P = 5$ in the fall, we produce what quantity? Will we shut down or not?
 - ▶ 4
 - ▶ No shutdown as $P > AVC$
- If $P = 3$ in the spring, we produce what quantity? Will we shut down or not?

Application

Quantity	1	2	3	4	5	6	7
TVC	6	8	11	16	24	36	56
AVC	6	4	3.7	4	4.8	6	8
MC	6	2	3	5	8	12	20

- If $P = 5$ in the fall, we produce what quantity? Will we shut down or not?
 - ▶ 4
 - ▶ No shutdown as $P > AVC$
- If $P = 3$ in the spring, we produce what quantity? Will we shut down or not?
 - ▶ 3
 - ▶ Shut down because $P < AVC$