Lecture 7

Price discrimination

Monopolistic Competition

Outline

- Describe what is meant by price discrimination
- Give examples of:
  - *First degree price discrimination*
  - *Second degree price discrimination*
  - *Third degree price discrimination*
- Describe monopolistic competition and describe short and long run outcomes in such a market structure

Outline

- Reading – Ch. 13 NW (pp. 112 onwards)
- Reading – Ch. 14 NW

What is price discrimination?

- Recall what a single price monopolist does
- Price discrimination is *charging a different price for different units of output that are not related to the cost of production*
- The how and why of price discrimination
- *Why?...its obvious*
- *The how?.. requires some market power*
- The intuition is straightforward – *try and charge a higher price to those who have a higher willingness to pay*

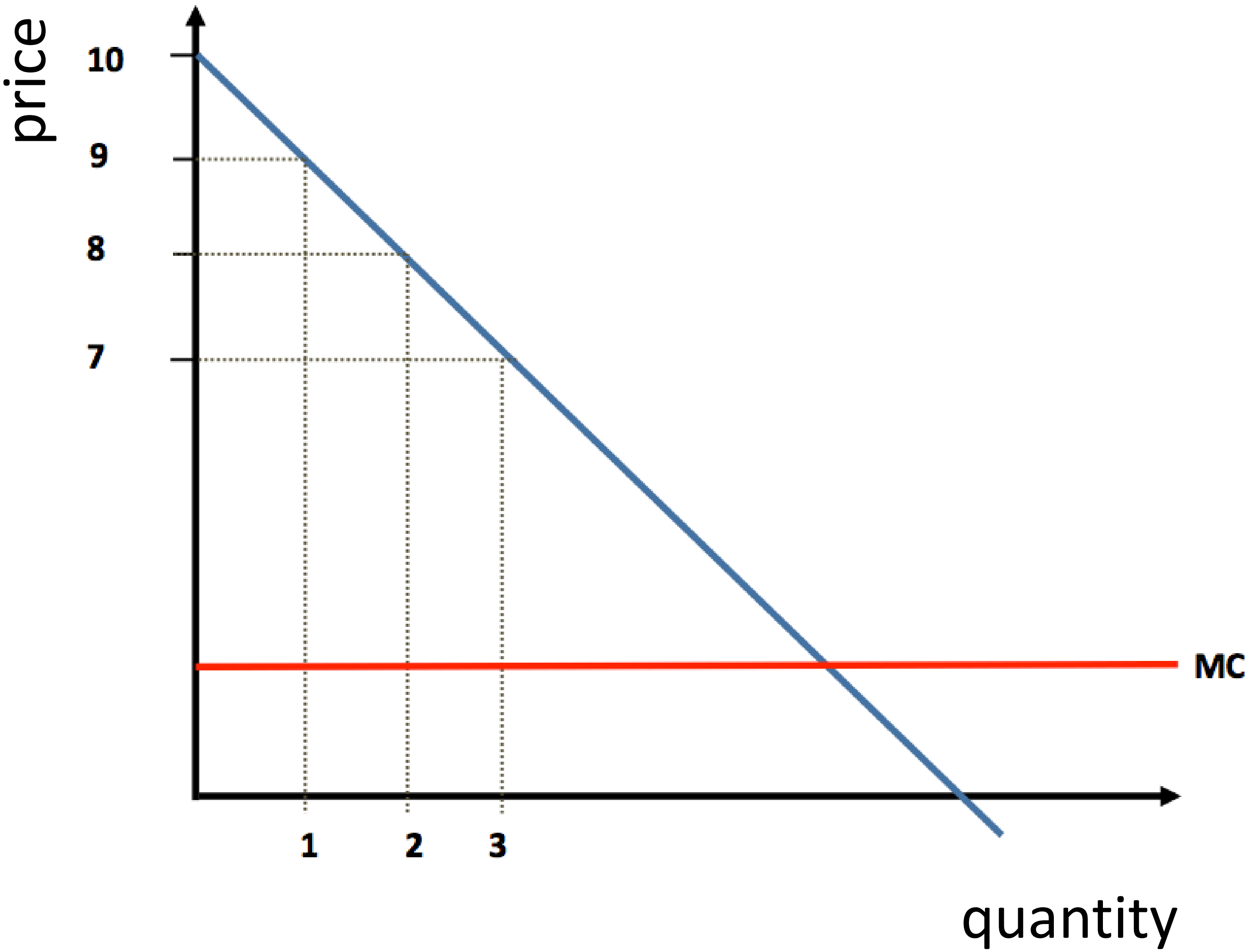
What is price discrimination?

- Types of price discrimination
  - *First degree or perfect price discrimination*
  - *Second degree price discrimination*
  - *Third degree price discrimination*
- Consider each of these in turn …

First degree price discrimination

- Monopolist charges different price for each unit sold
- Monopolist charges maximum willingness to pay
- Monopolist extracts all consumer surplus
- Requires knowledge of willingness to pay for every unit consumed by every consumer
- Alternatively, the monopolist can use a two-part tariff

First degree price discrimination



Question

What is the monopolist’s MR curve in the first degree price discrimination?

A. It is below the demand curve
B. It is the same as demand curve
C. There is no MR curve
D. I do not know

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Answer

What is the monopolist’s MR curve in the first degree price discrimination?

A. It is below the demand curve
B. It is the same as demand curve *because the monopolist sells each unit exactly at the consumer’s willingness to pay*
C. There is no MR curve
D. I do not know

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Question

Under first price discrimination:

A. There is no deadweight loss
B. Consumer surplus is maximised
C. A and B are true
D. Not sure

Answer

Under first price discrimination:

A. There is no deadweight loss
B. Consumer surplus is maximised
C. A and B are true
D. Not sure

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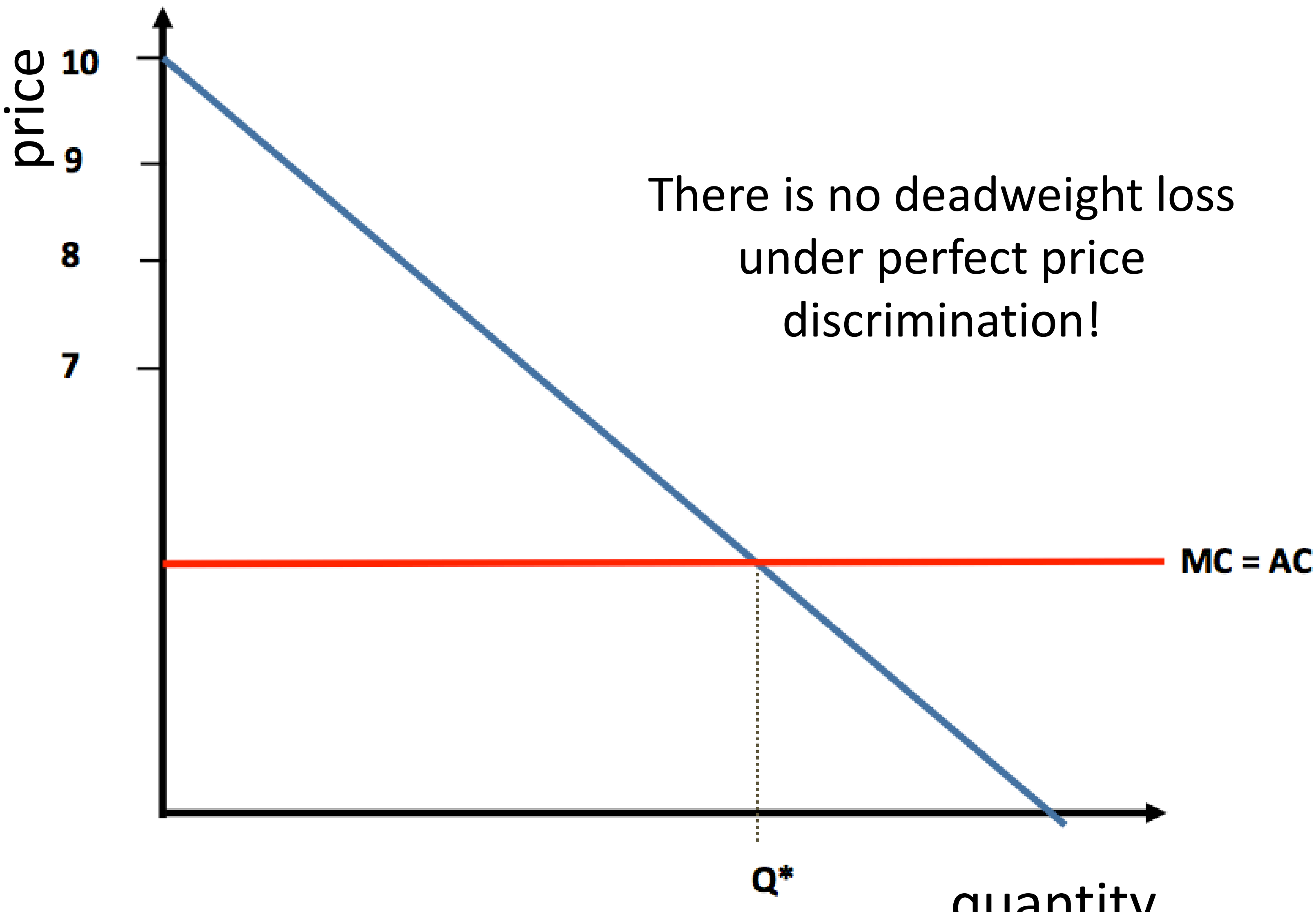
First degree price discrimination

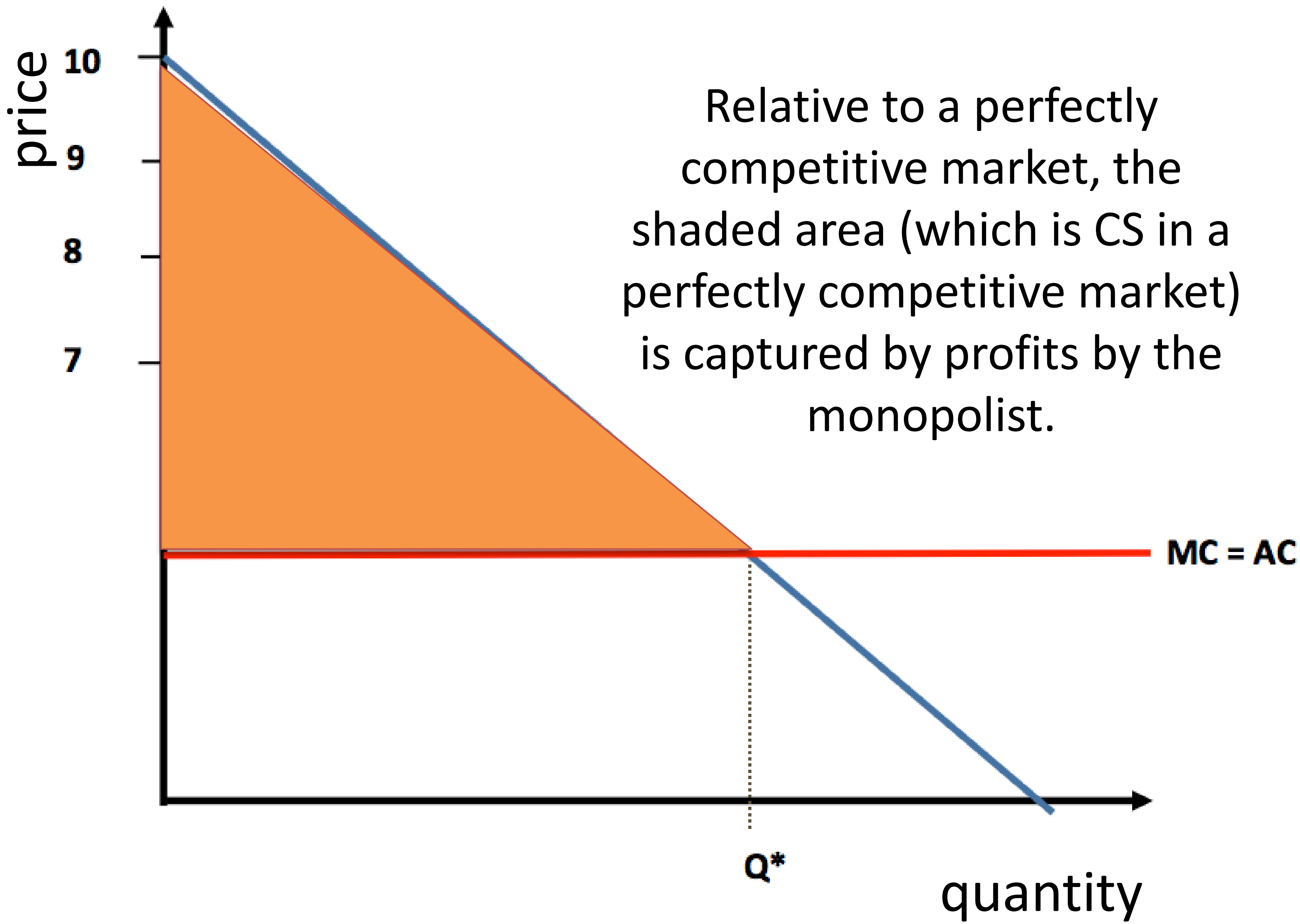
- In the example above, the monopolist would sell the first unit for $9, the second for $8, the third for $7 etc
- Q^n: What is the monopolists MR curve now?
- A: The demand curve! *Why?*
- Monopolist continues to sell units as long as MR>MC.
- Called perfect price discrimination because monopolist extracts all consumer surplus
- Implementable? knowledge of willingness to pay for every unit consumed

First degree price discrimination



There is no deadweight loss under perfect price discrimination!

First degree price discrimination



Relative to a perfectly competitive market, the shaded area (which is CS in a perfectly competitive market) is captured by profits by the monopolist.

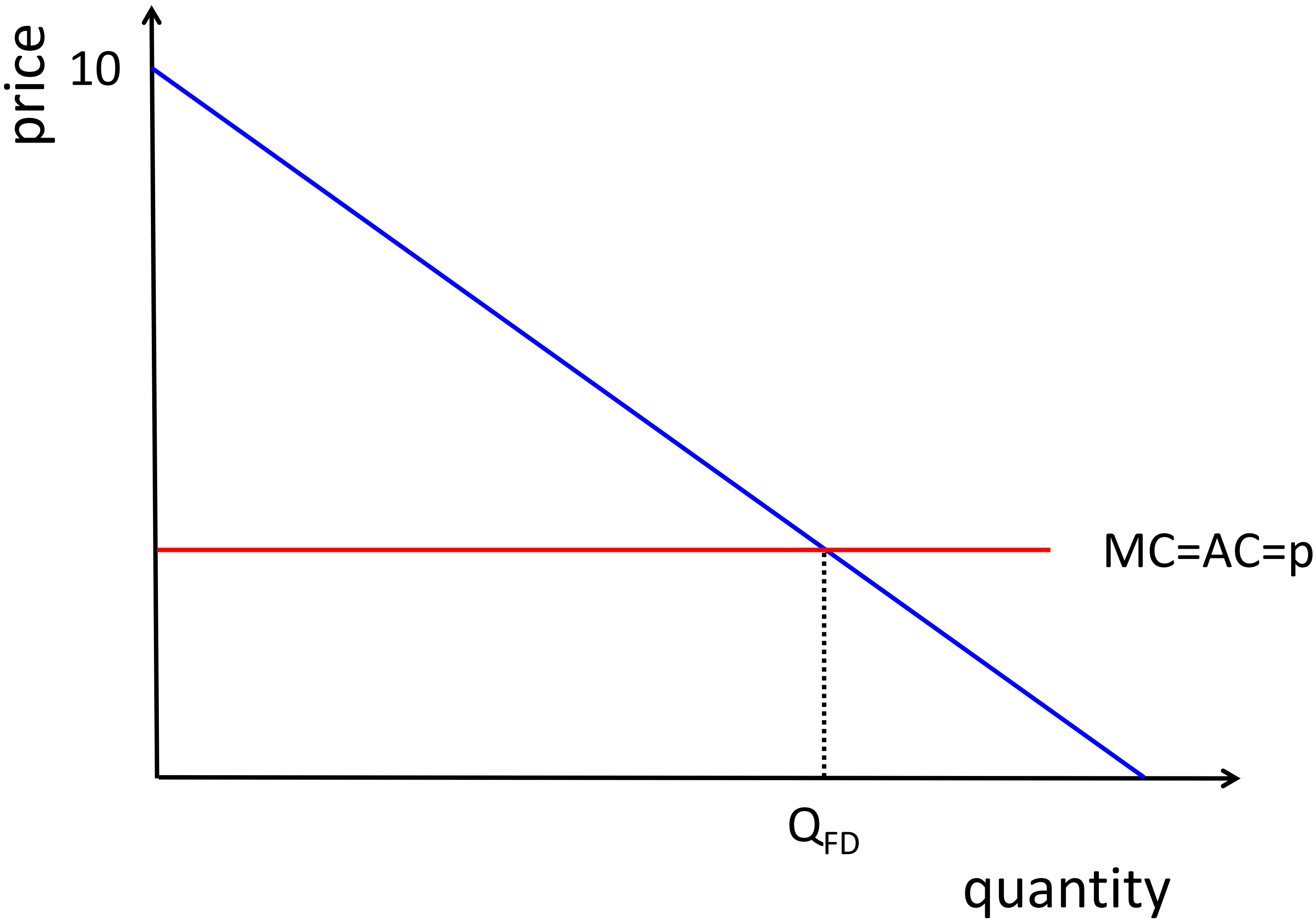
First degree price discrimination

- Just like in a perfectly competitive market, there is no deadweight loss from a perfectly price discriminating monopolist.
- *HOWEVER, the consumer surplus that exists in a perfectly competitive market is captured by the monopolist*
- It is critical that the monopolist is able to prevent arbitrage.
- ***WHY?***

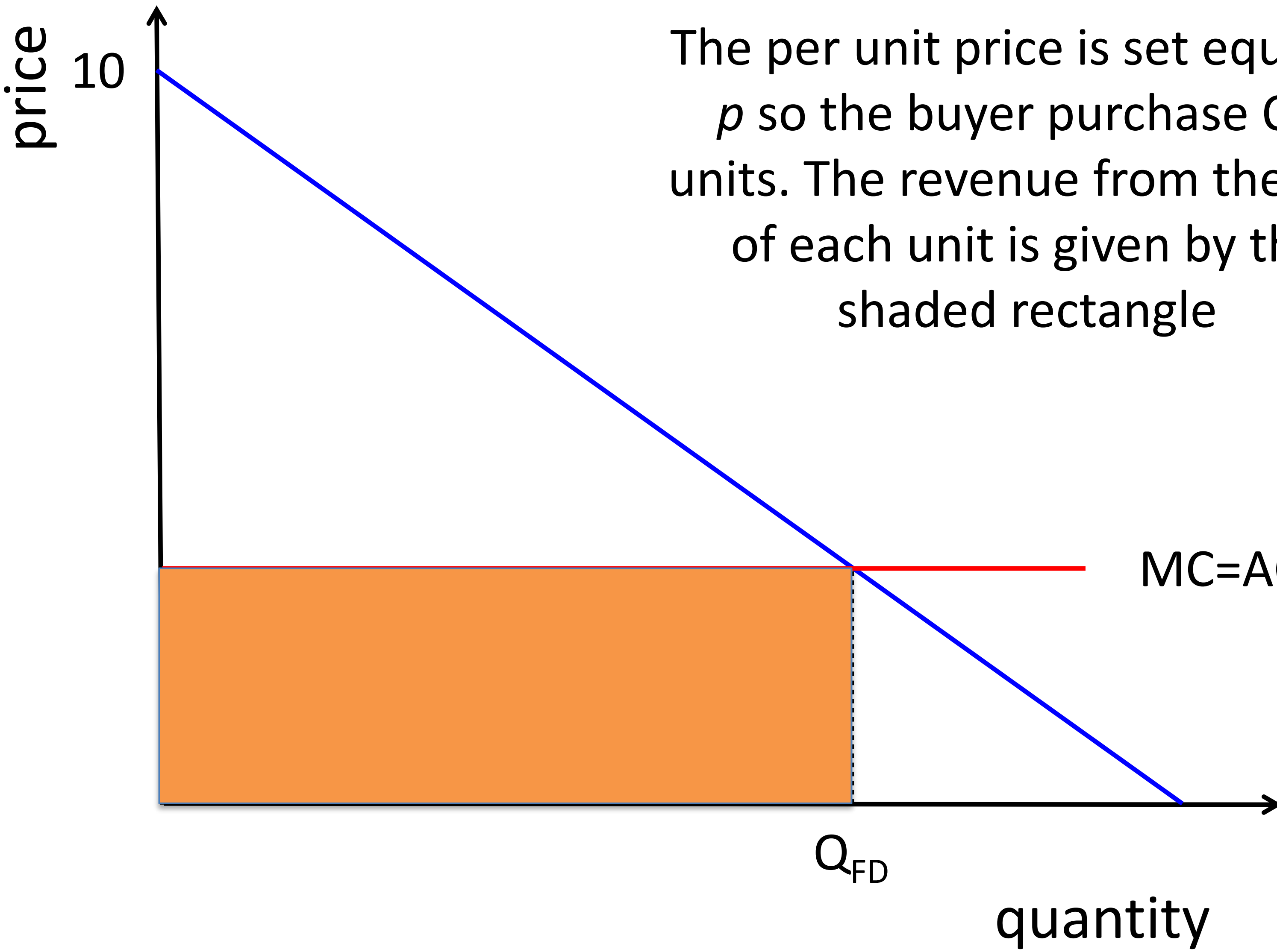
Two part tariff

- First degree price discrimination can also be implemented using a two-part tariff consisting of:
  - A fixed fee, F
  - A per unit fee, p
    - E.g. inc. electricity, gyms, razors, printers...
- Consider following simple example
  - *Demand curve is that for a single consumer and MC is (constant) marginal cost*
  - *Monopolist sets p=MC and uses F to extract consumer surplus*
  - *More difficult if consumers heterogeneous*

Two part tariff

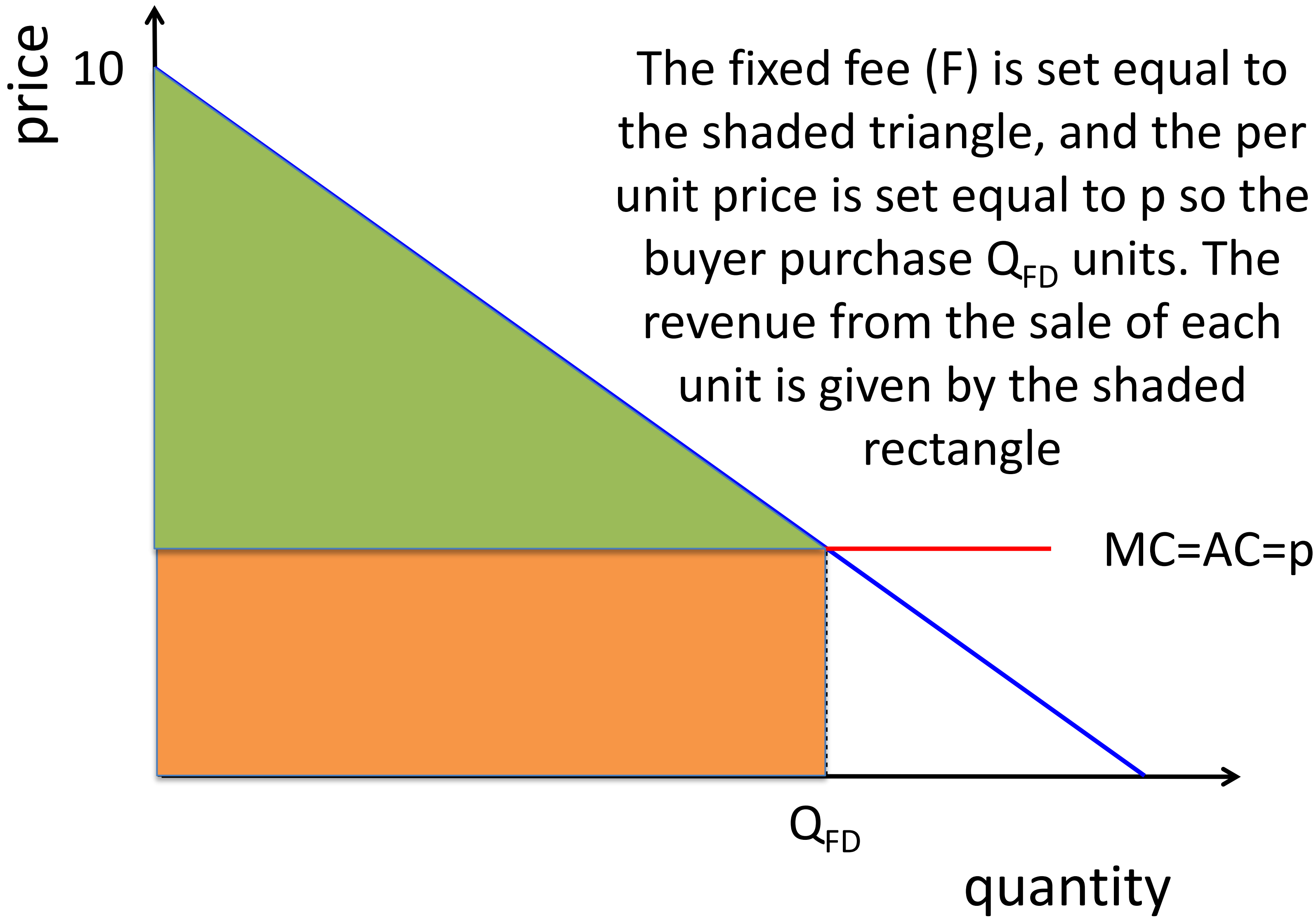


Two part tariff



The per unit price is set equal to *p* so the buyer purchase Q_{FD} units. The revenue from the sale of each unit is given by the shaded rectangle

Two part tariff



The fixed fee (F) is set equal to the shaded triangle, and the per unit price is set equal to p so the buyer purchase Q_{FD} units. The revenue from the sale of each unit is given by the shaded rectangle

Question

Consider a firm selling Ancient Spring Water sourced from the Great Artesian Basin. The demand curve faced by the firm is given by:

$$Q=240-P$$

Assume that AC=MC=20. If the firm can practice first degree price discrimination, which of the following is true?

A. The firm will earn profits of 24,200
B. The firm will set price equal to 130 and earn profits of 12,100.
C. The firm will sell a quantity equal to 110 and earn profits of 12,100.
D. The firm will set price equal to 20 and earn zero economic profit.
E. Both (b) and (c) are correct.
F. I think more information is required to answer this question, but I do like the idea of water from the Great Artesian Basin

Answer

Consider a firm selling Ancient Spring Water sourced from the Great Artesian Basin. The demand curve faced by the firm is given by:

$$Q=240-P$$

Assume that AC=MC=20. If the firm can practice first degree price discrimination, which of the following is true?

A. The firm will earn profits of 24,200

A first degree price discriminating monopolist they will sell each unit at the buyer's willingness to pay or using a two part tariff.

That means that they will sell 220 units and earn total profit of 24,200.

Common mistake: answer it as though the monopolist was a single price monopolist and chose the point where MR=MC. For a single price monopolist the MR curve is given by MR = 240-2p.

Second degree price discrimination

- Monopolist offers a menu of pricing options to consumers and allows consumers to choose which one they want
- Monopolist cannot distinguish between groups
- Monopolist knows demand curve or wtp (willingness to pay) of different groups
- Need to design prices so as to induce more inelastic groups to pay higher prices
- Examples?

Second degree price discrimination

- Consider the following example:
  - Assume that the cost of production is zero
  - Buyers purchase only one unit of software (to do their tax for example).
  - They (the customer) choose the version that gives them the highest consumer surplus.
  - Essentially consumers are self-selecting

Second degree price discrimination

- Consider the following valuations placed on the software by different types of buyers and the alternative pricing options.

	Business	**Personal**
Standard	$35	$20
Deluxe	$100	$20

Second degree price discrimination

1. What is the ideal outcome?
2. What if P_D=\$84 and P_S=\$20?
3. What if P_D=\$86 and P_S=\$20?
4. What if P_D=\$100 only?
5. What if P_S=\$20 only?

Second degree price discrimination

	Business	Personal
Standard	\$35	\$20
Deluxe	\$100	\$20

Pricing	Standard sold	Deluxe sold	TR
P_D=\$100 P_S=\$20			
P_D=\$84 P_S=\$20			
P_D=\$86 P_S=\$20			
P_D=\$100			
P_S=\$20			

Second degree price discrimination

	Business	Personal
Standard	$35	$20
Deluxe	$100	$20

Pricing	Standard sold	Deluxe sold	TR
P_D=$100 P_S=$20	2	0	40
P_D=$84 P_S=$20	1	1	104
P_D=$86 P_S=$20	2	0	40
P_D=$100	0	1	100
P_S=$20	2	0	40

Second degree price discrimination

- Classic examples include airlines, offering business class tickets & economy tickets
  - Note that each product is differentiated
  - Buyers choose the type of seat that best suits them
- Other examples include: quantity discounts, hard cover & soft cover versions of books – in each case there is temporal price variation
- No need to worry about arbitrage here

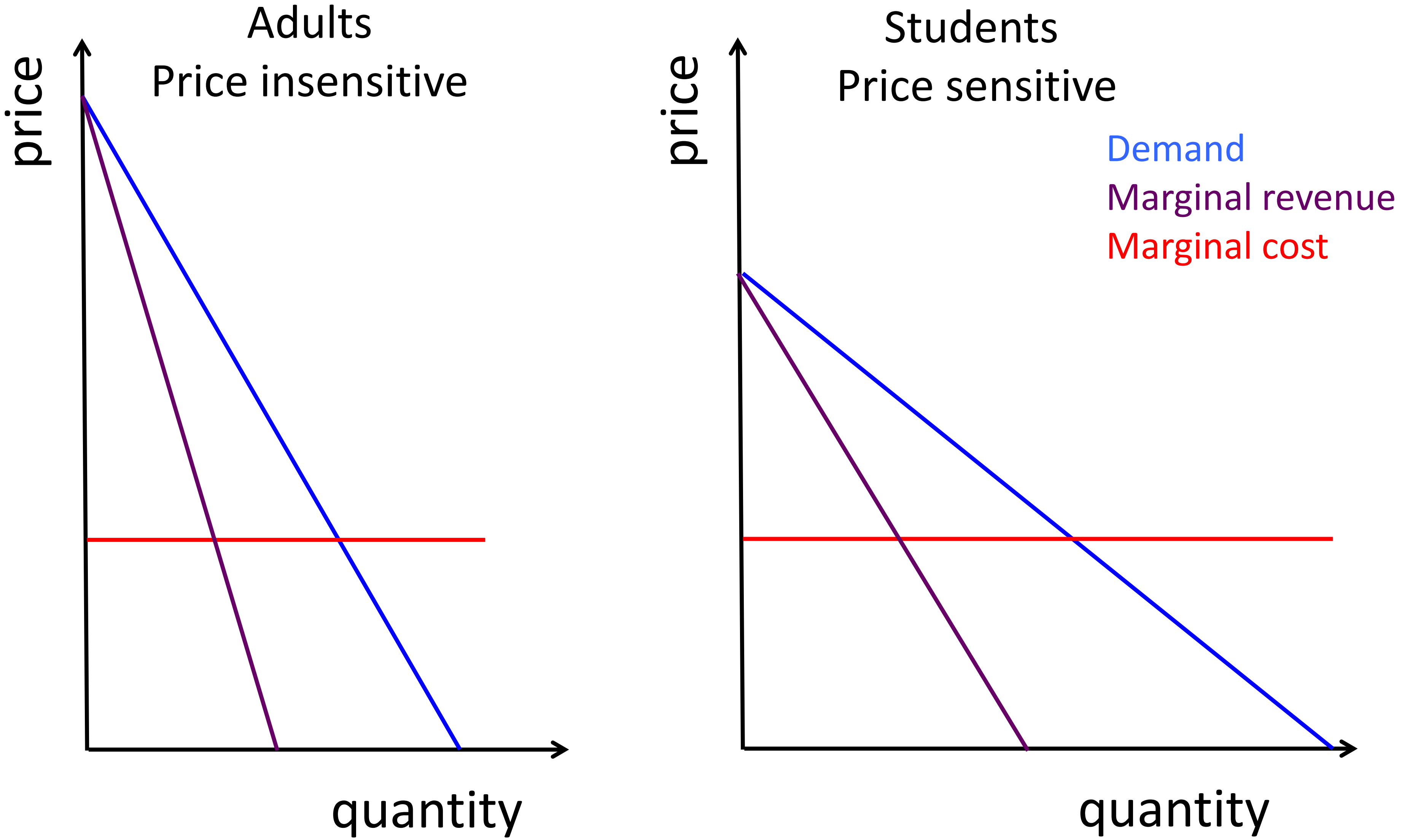
Soren Reichelt's haircut cost $67 while Monique Fabris paid $92 for a basic trim.
Source: Herald Sun

A WAR of the sexes has broken out over the huge difference in cost for similar haircuts for men and women.

Third degree price discrimination

- Monopolist charges different prices to different groups of consumers
- Monopolist must be able to distinguish between groups
- Monopolist knows demand curve of different groups
- Intuition is that you pay a charge a higher price to the more inelastic segment of the market
- Examples – student or pensioner discounts for movies, haircuts

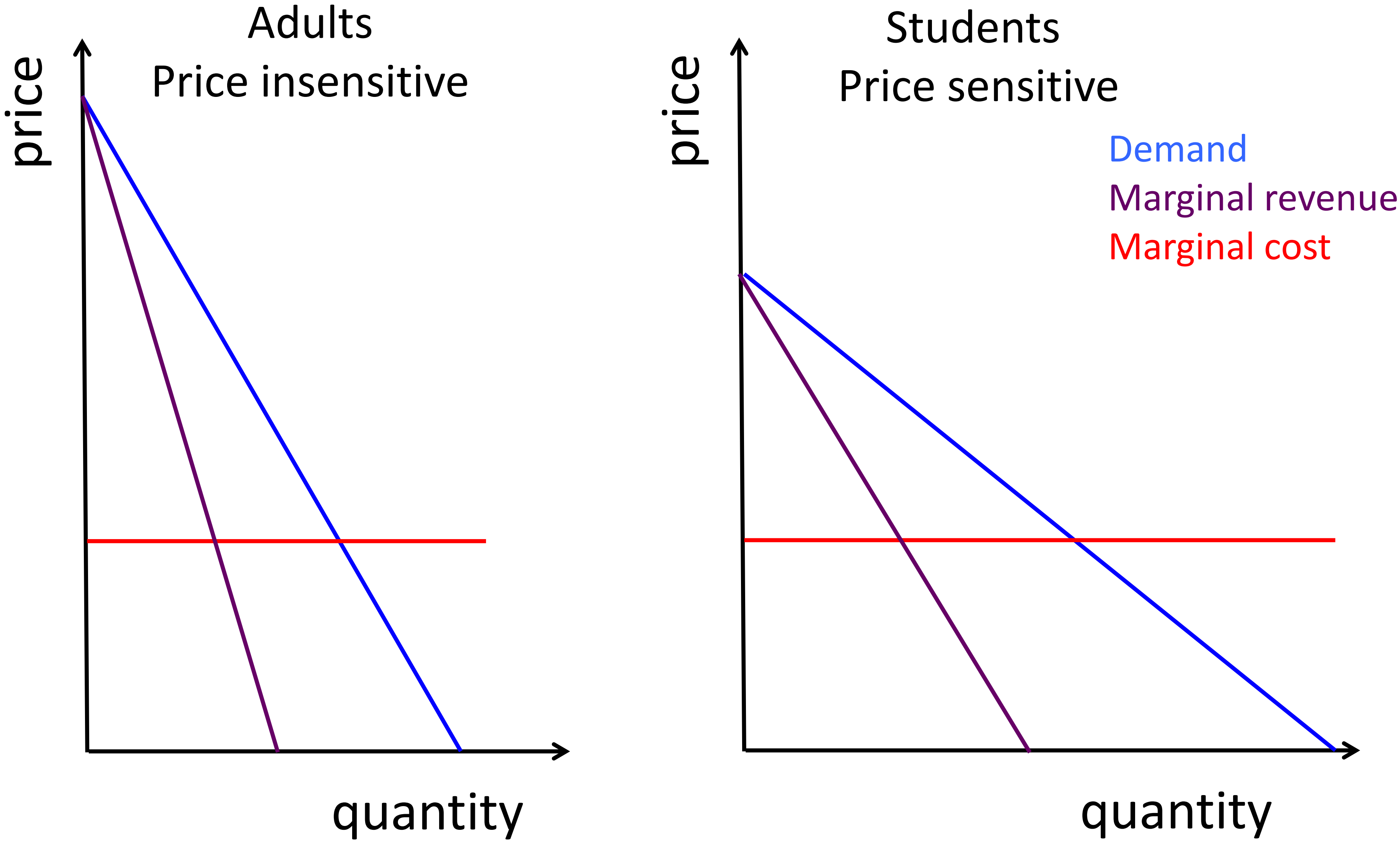
Third degree price discrimination



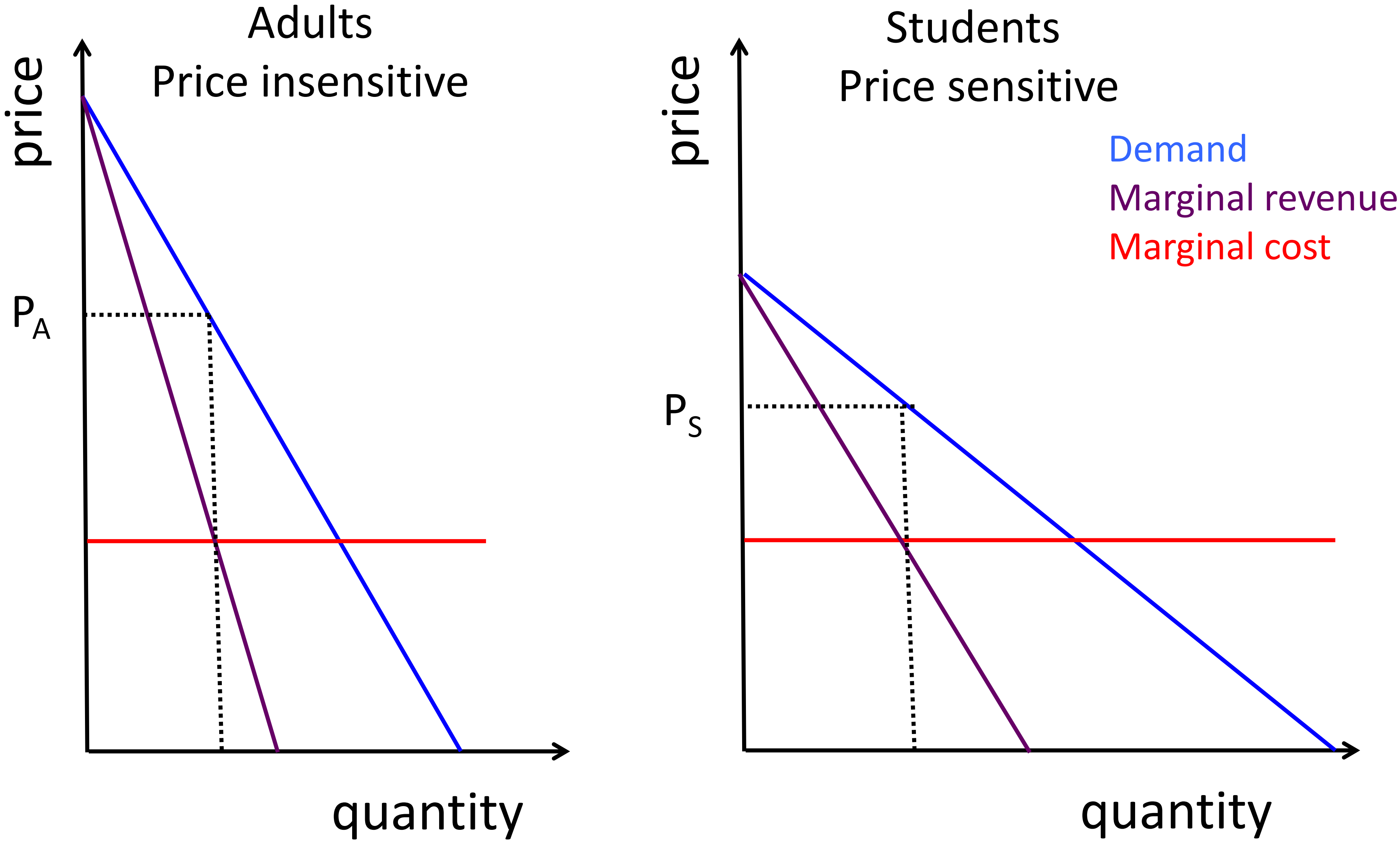
Third degree price discrimination

- Effectively what the monopolist wants to do is to maximise profits
- This requires that they 'act like a monopolist in each of the separate markets'
- That is, the monopolist should equate marginal cost and marginal revenue in each of the markets in which they operate.

Third degree price discrimination



Third degree price discrimination



Third degree price discrimination

- Example
  - Consider student with demand given by the following:

$$p_s = 8 - Q_s$$

  - Consider adult with demand given by the following:

$$p_A = 10 - Q_A$$

  - Further, assume MC=2 (constant and = to AC)
- How should a price discriminating monopolist set prices to maximise profit?

Third degree price discrimination

- Student

$$p_s = 8 - Q_s \quad \rightarrow \quad MR_S = 8 - 2Q_S$$

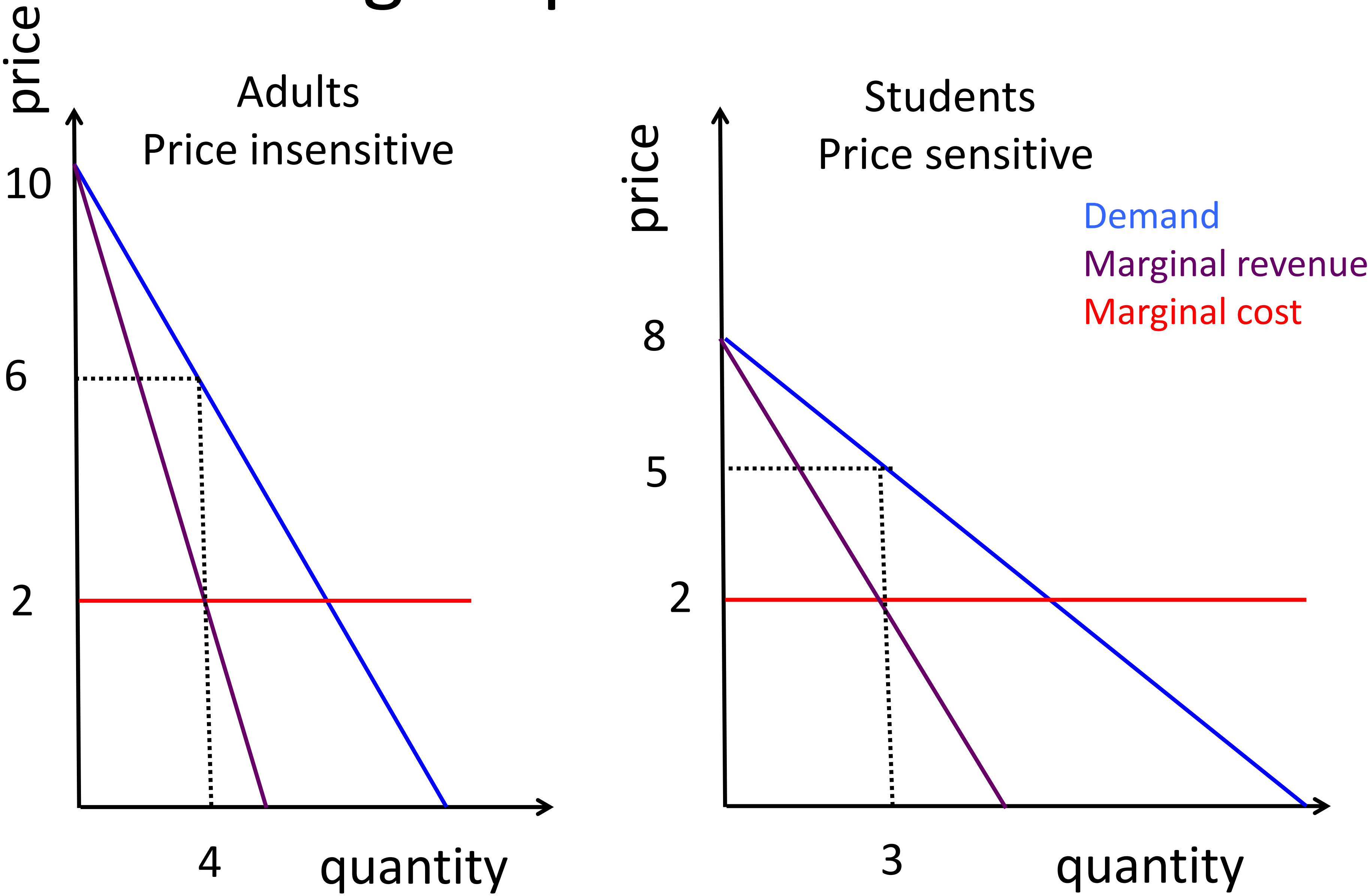
- Adult

$$p_A = 10 - Q_A \quad \rightarrow \quad MR_A = 10 - 2Q_A$$

- MC=2 (constant and = to AC)

- The monopolist sets MR=MC for each consumer:
  - $MR_A = 10 - 2Q_A = 2 \quad \rightarrow \quad Q_A = 4$ & $p_A = 6$
  - $MR_S = 8 - 2Q_S = 2 \quad \rightarrow \quad Q_S = 3$ & $p_S = 5$
- Total profit=$Q_A * p_A + Q_S * p_s - AC(Q_A + Q_S) =$
  $= 24 + 15 - 14 = 25$

Third degree price discrimination



Third degree price discrimination

- Classic examples include movies, public transport, haircuts and clothes
- Important to be able to identify different groups – sometimes this is easy
- Preventing arbitrage important - sometimes easy, sometimes difficult
- When?

Question

Which of the following statements is true?

A. Firms practicing price discrimination must ***always*** be able to prevent arbitrage

B. Firms practicing price discrimination must ***always*** be able to distinguish the type of customer they are selling to

C. Firms practicing price discrimination must ***always*** exhibit some market power

D. All of the above are correct

E. Not sure, but I think haircuts are priced too high

Answer

Which of the following statements is true?

A. Firms practicing price discrimination must ***always*** be able to prevent arbitrage — *false because not necessary under second degree price discrimination*

B. Firms practicing price discrimination must ***always*** be able to distinguish the type of customer they are selling to — *false because firms cannot distinguish customers under second degree price discrimination*

C. Firms practicing price discrimination must ***always*** exhibit some market power

D. All of the above are correct

E. Not sure, but I think haircuts are priced too high

The story so far…

- Perfect competition:
  - Large number of atomistic firms compete
  - Firms produce homogeneous products
  - Entry and exit ensures zero LR profits
- Monopoly
  - Single firm with market power, i.e. no close substitutes and barrier to entry
  - Firm generally earns economic profit in LR

Monopolistic competition

- In monopolistic competition:
  - Many buyers and sellers
  - Firms produce similar but differentiated products
  - There is freedom of entry and exit
- As a result
  - No one firm can influence what others do
  - Firms face a downward sloping d curve
  - Firms earn zero economic profit in LR

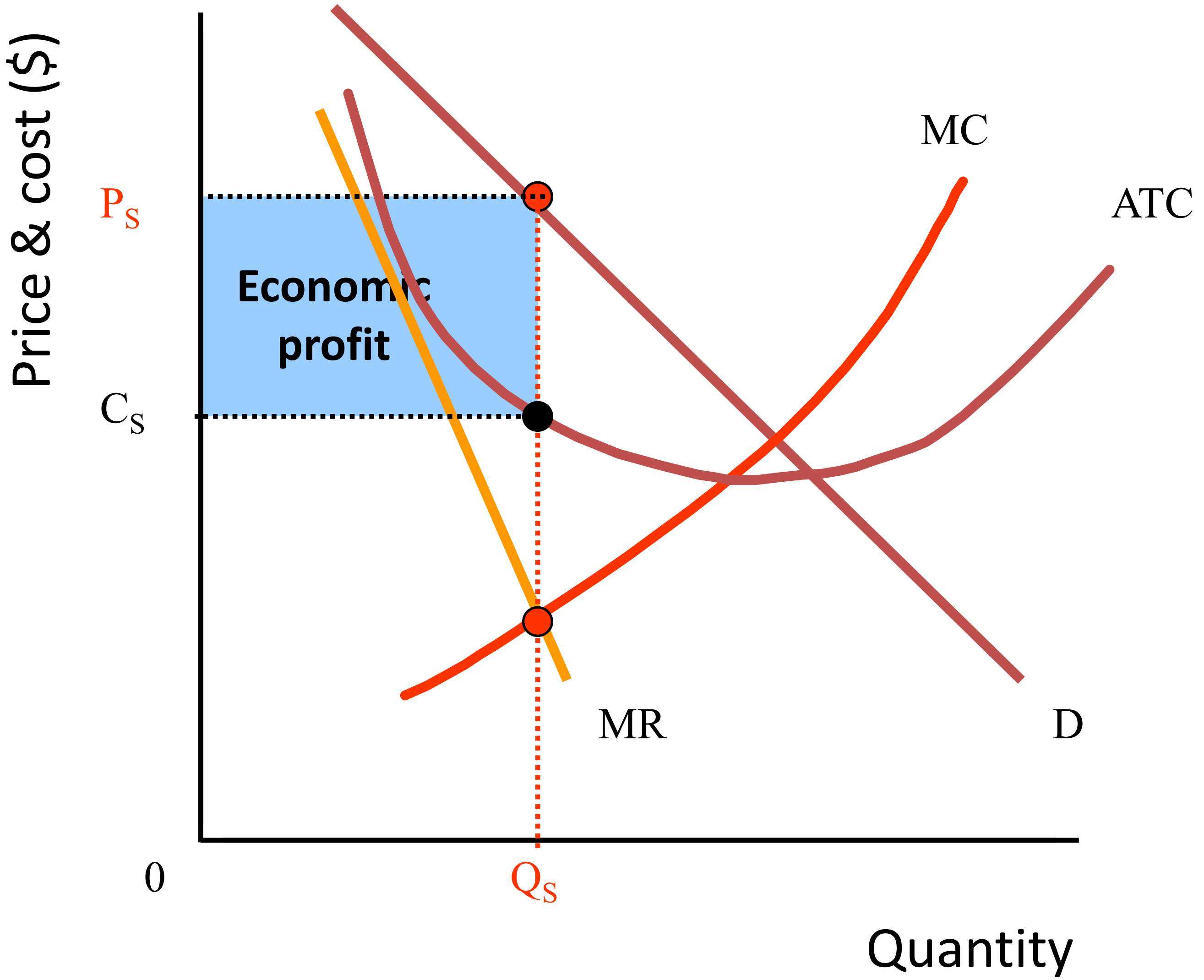
Monopolistic competition

- Some of the Thai restaurants in Newtown:
  - Thairiffic
  - Chedi Thai
  - Thai Potong
  - Thai La Ong
- Each faces a downward sloping demand curve , i.e. they sell a differentiated product
  - Unlike monopoly, demand curve is not market demand curve

Monopolistic competition: short run

- Firms behave like monopolists
  - Produce where MR=MC
  - Firm can earn short run economic profit
  - Produces less than capacity – *that is less than the level of output that minimises average total cost*

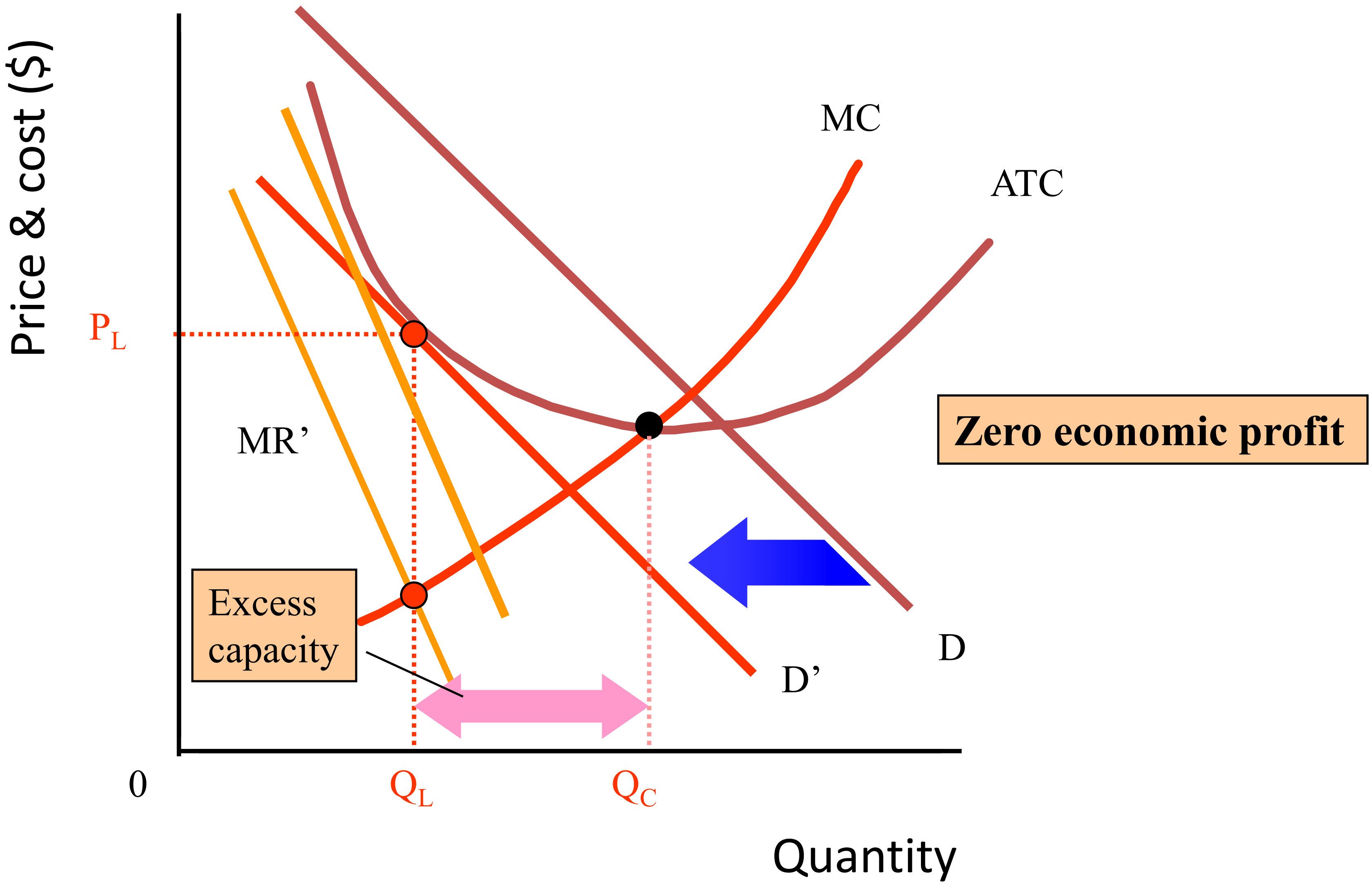
Monopolistic competition: short run



Monopolistic competition: long run

- In the LR, economic profit must equal zero
  - Economic profit attracts new entrants
  - When firms enter the industry, the firms demand curve and marginal revenue curve start to shift leftward
  - That is, we expect a decrease in demand and for demand to become more elastic
  - The profit maximising quantity and price fall

Monopolistic competition: long run



Monopolistic competition: long run

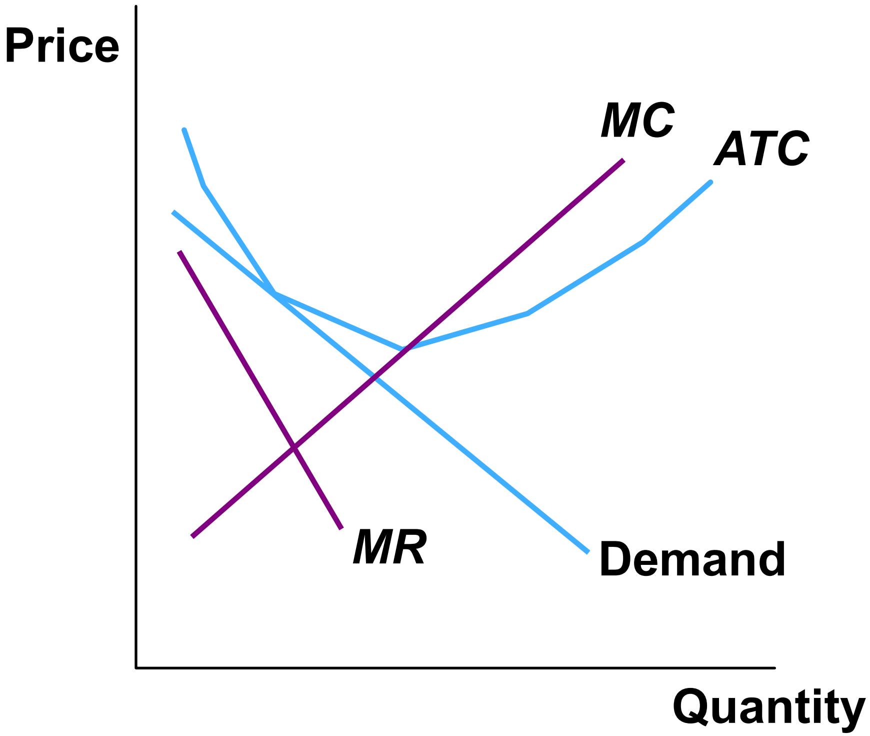
- In the LR, economic profit must equal zero
  - Economic profit attracts new entrants
  - When firms enter the industry, the firms demand curve and marginal revenue curve start to shift leftward
  - The profit maximising quantity and price fall
- You might want to ask yourself whether we ever get to the LR and if not, why not?

Monopolistic competition: mark up

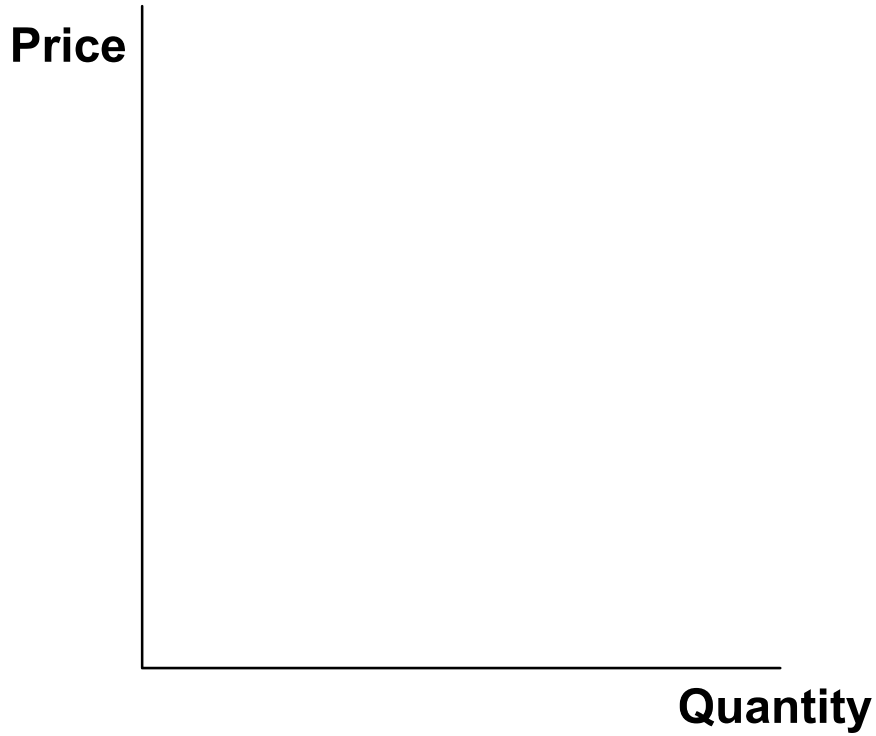
- In a competitive market, firms charge price equal to marginal cost.
- In a monopolistically competitive market, firms charge a mark-up over marginal costs.

Monopolistic competition: mark up

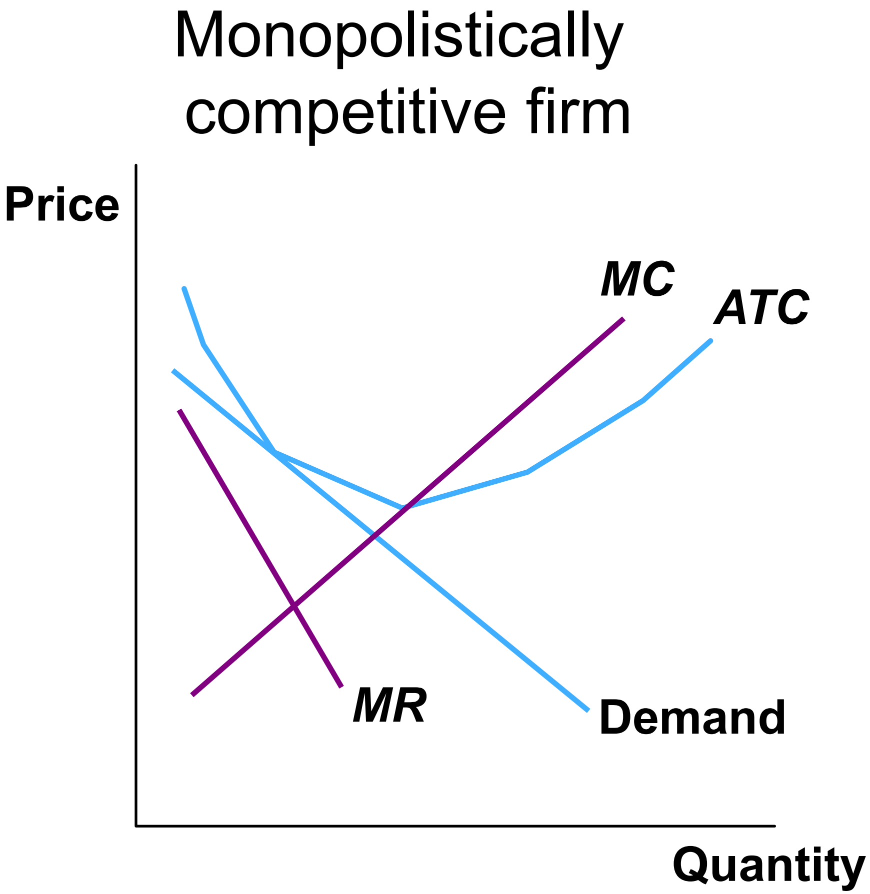
Monopolistically competitive firm

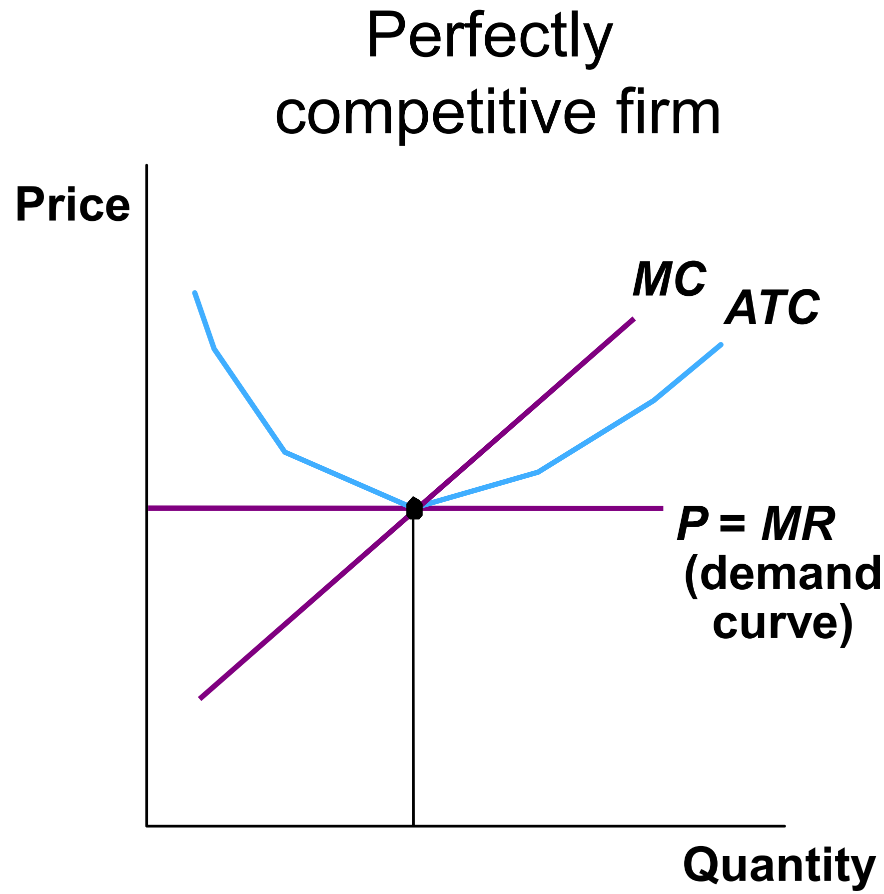


Perfectly competitive firm

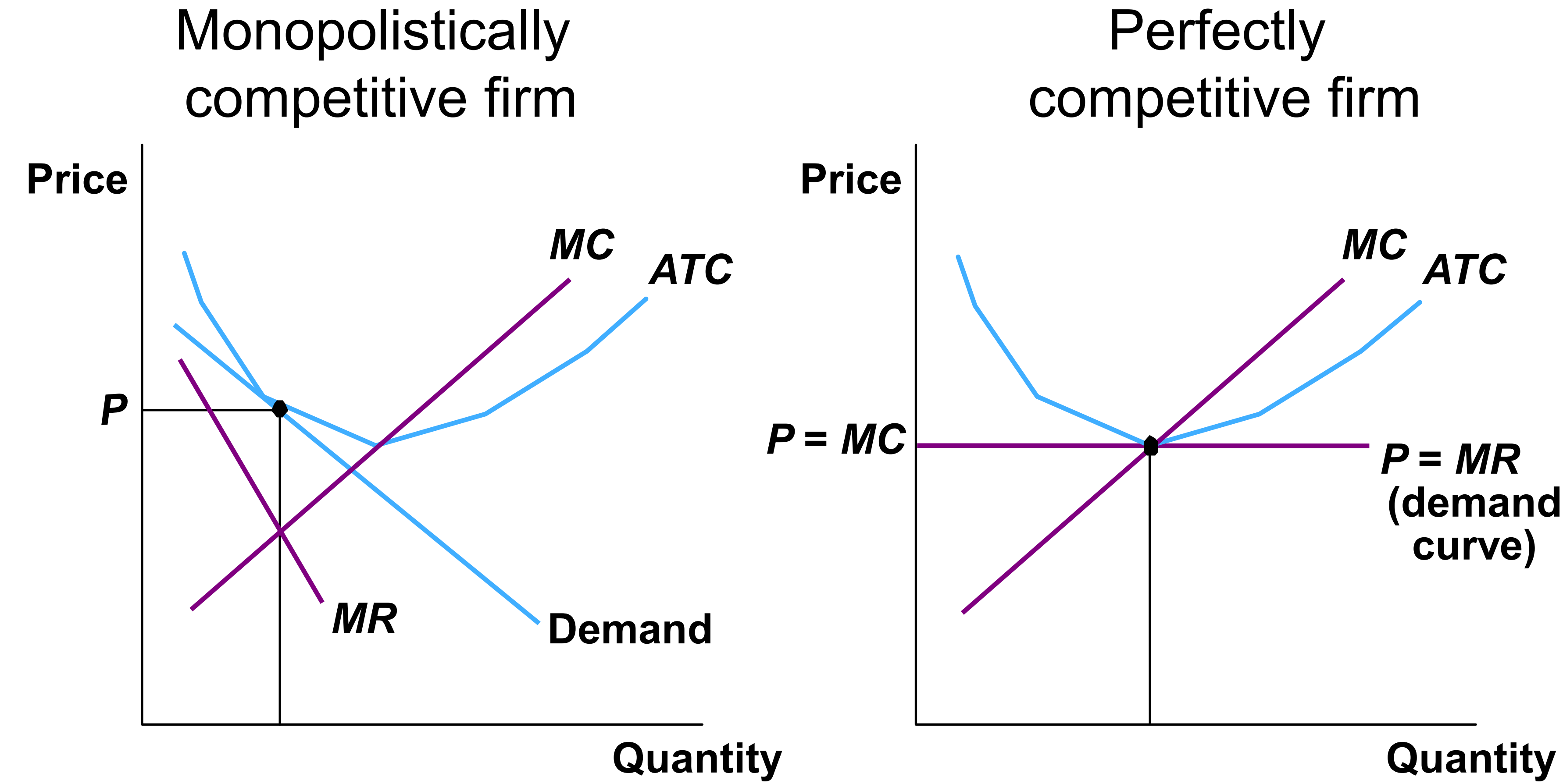


Monopolistic competition: mark up



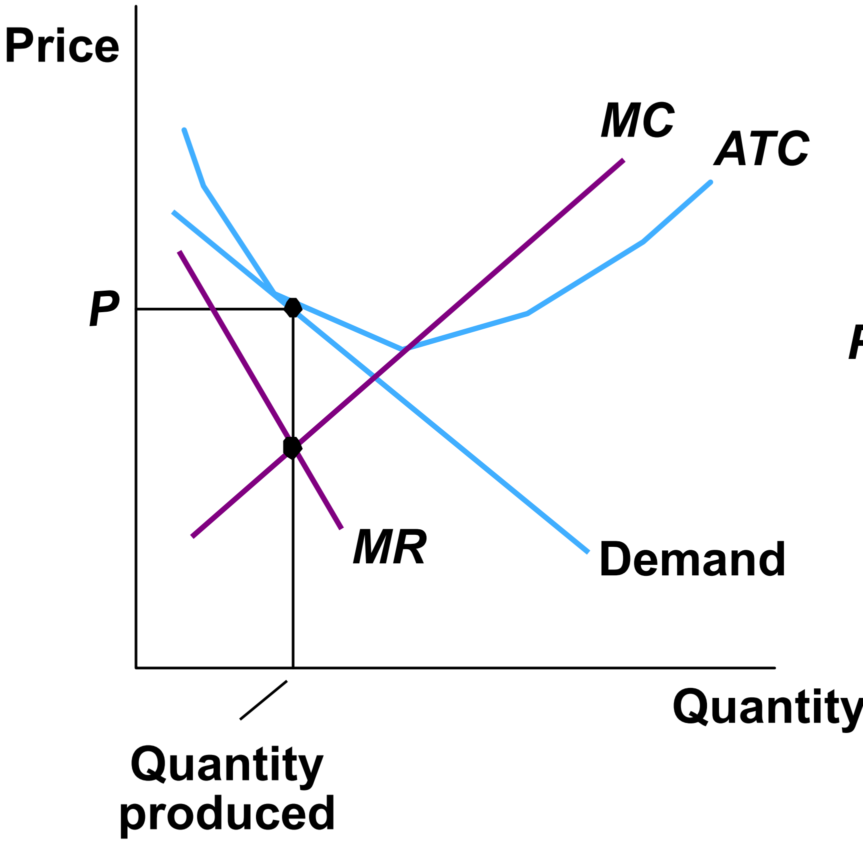


Monopolistic competition: mark up



Monopolistic competition: mark up

Monopolistically competitive firm



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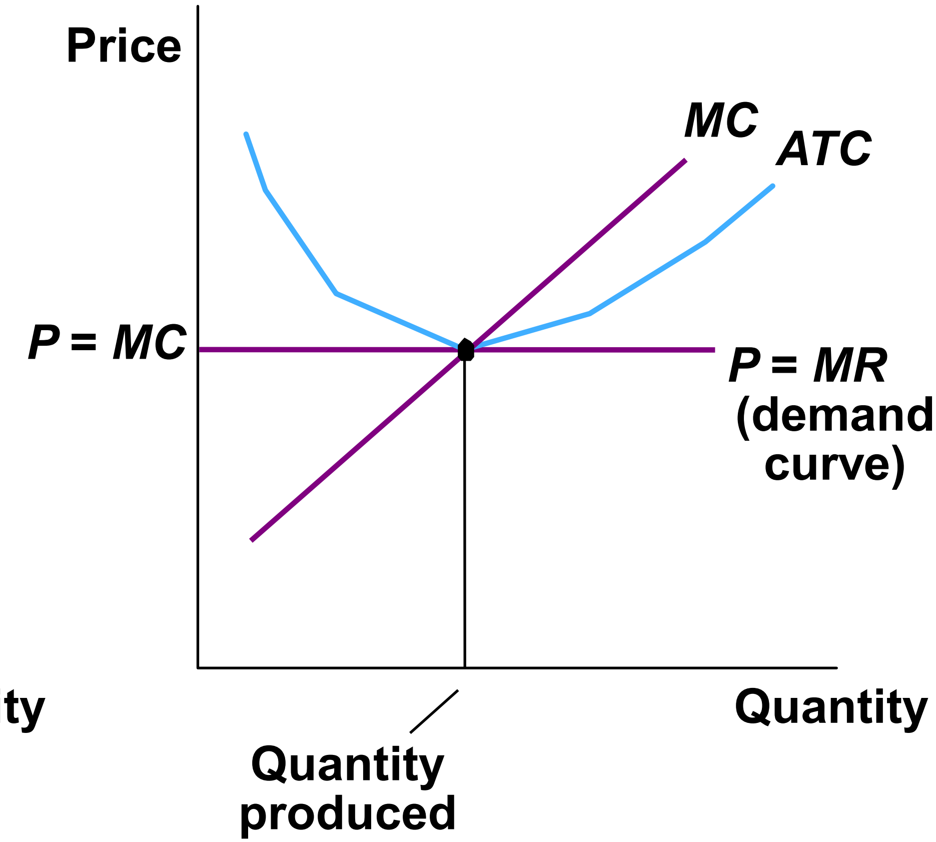
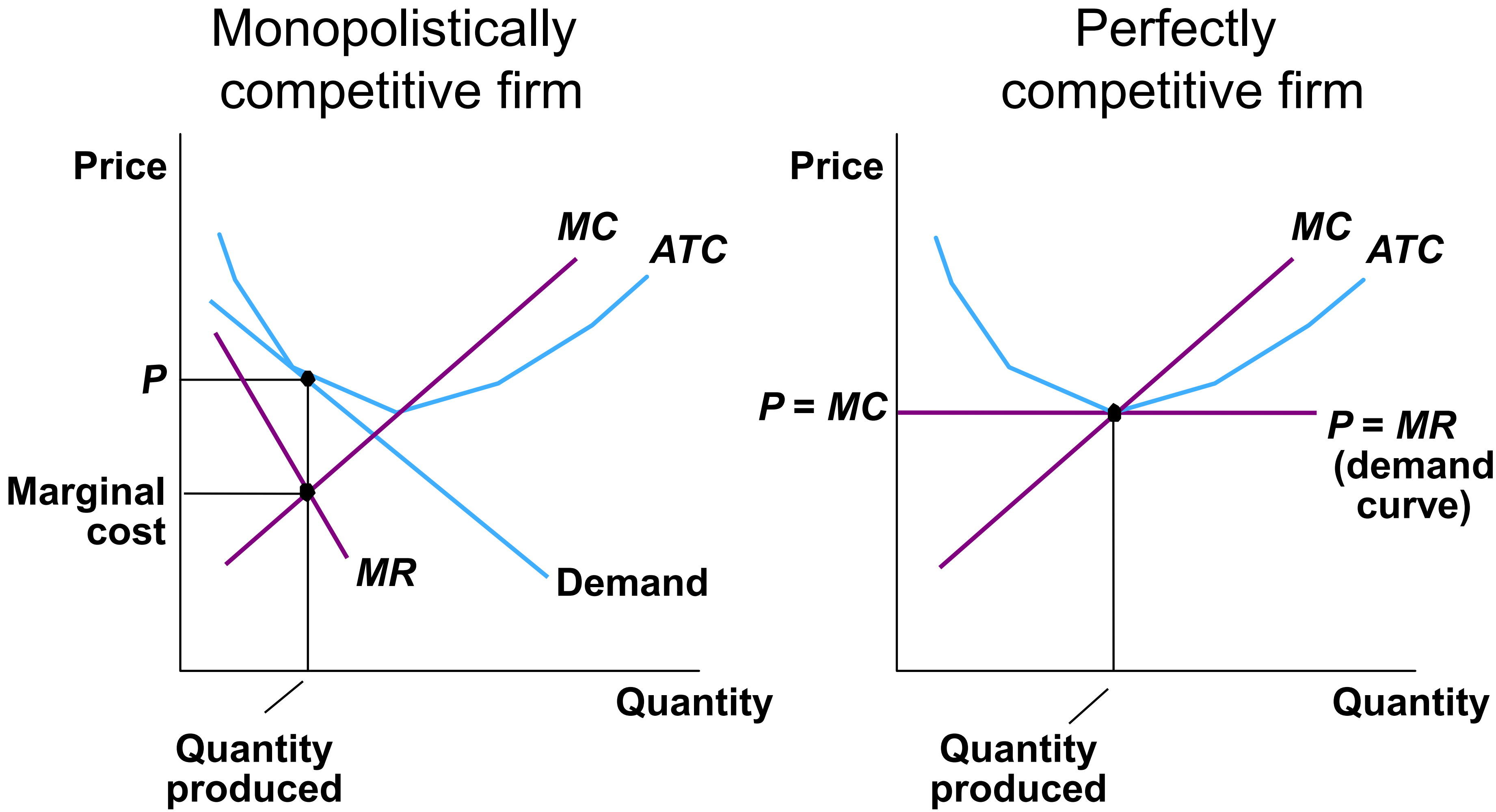
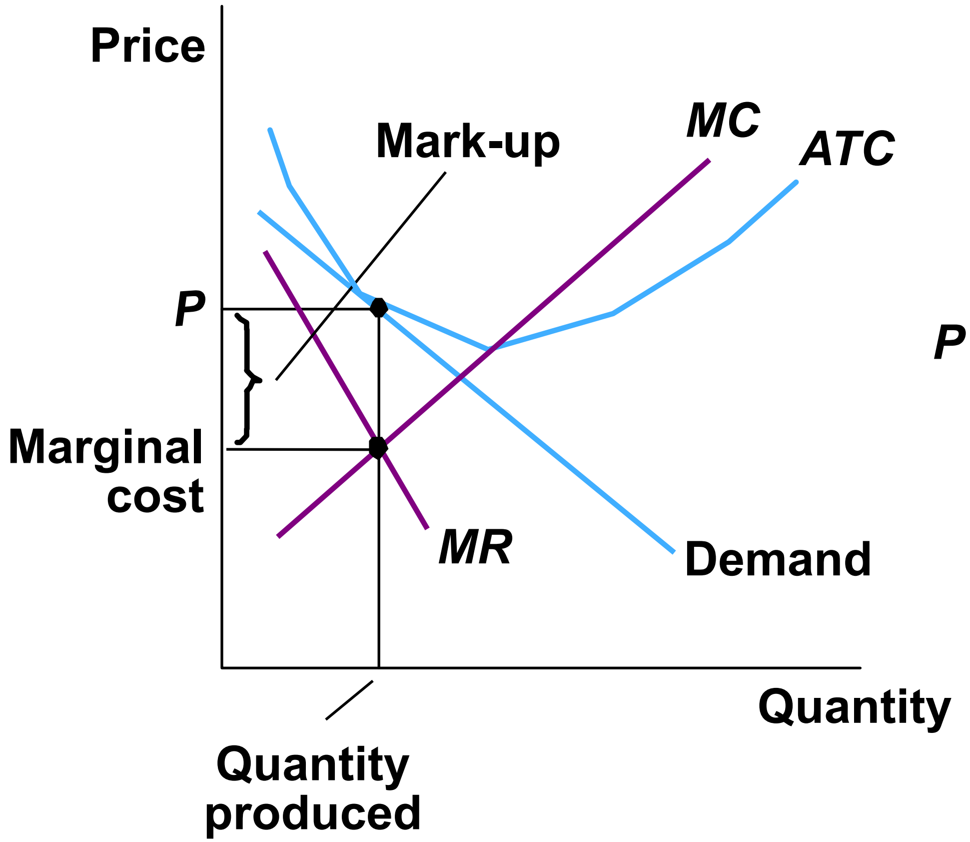


Monopolistic competition: mark up

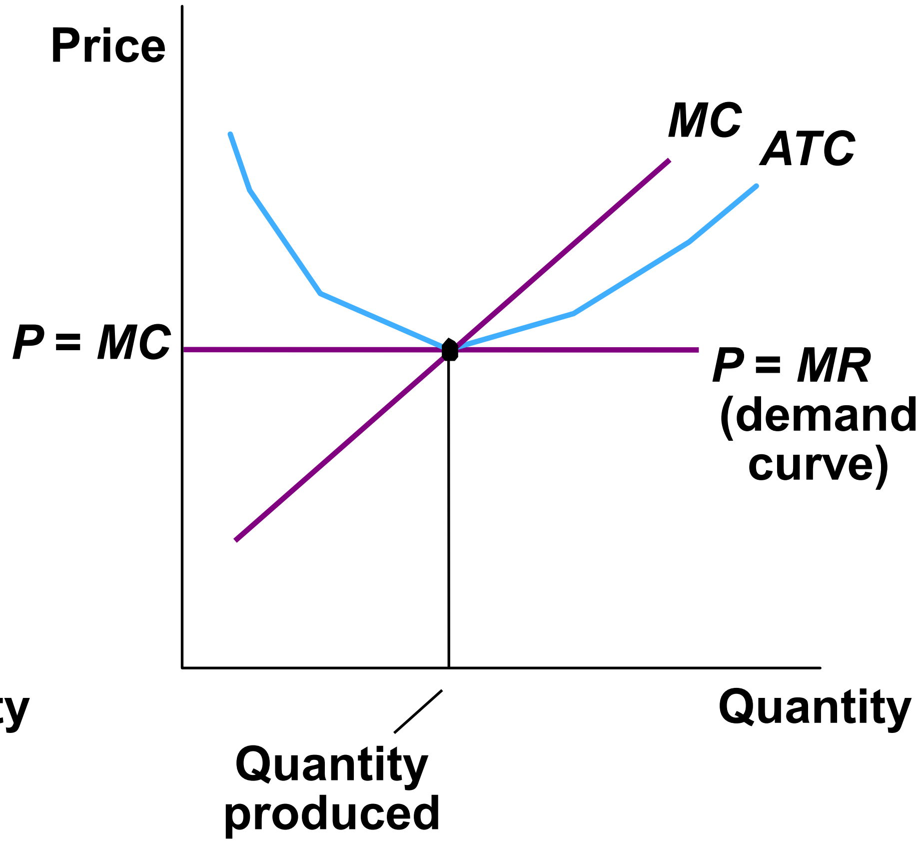


Monopolistic competition: mark up

Monopolistically competitive firm



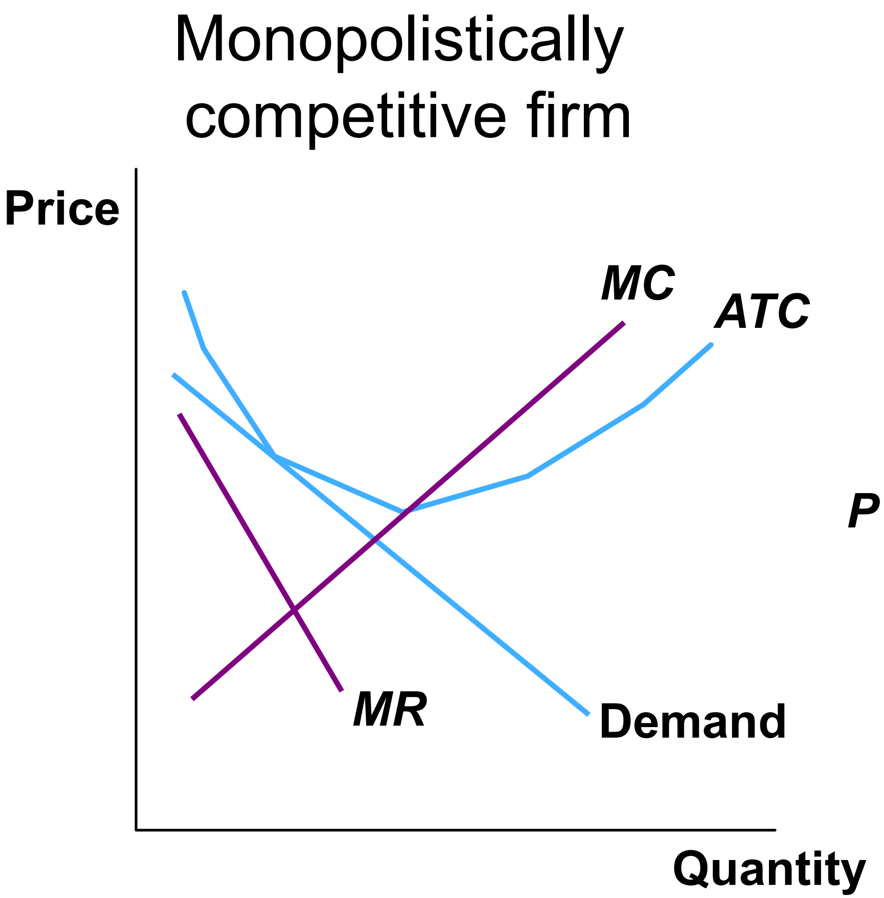
Perfectly competitive firm

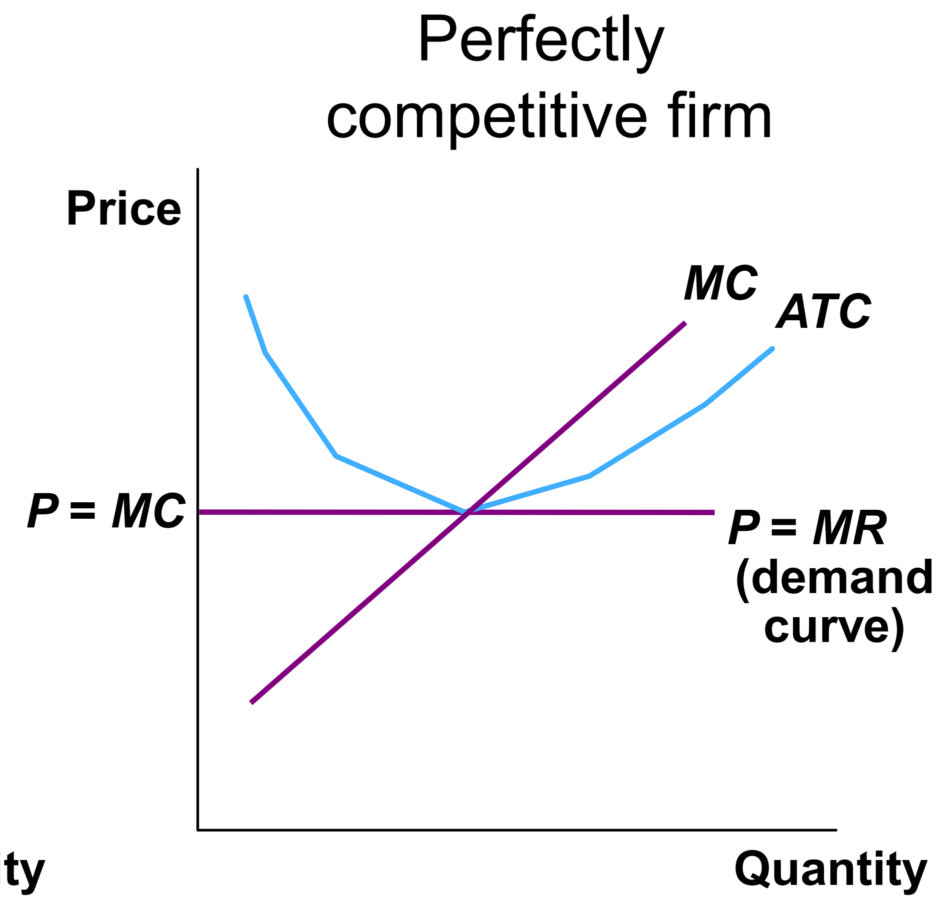


Excess capacity

- In the LR, in a perfectly competitive industry firms produce at the minimum of average cost
  - That is, firms produce as the minimum efficient scale
- In a monopolistic competitive industry, costs exceed minimum of average cost
  - Firms produce less than the minimum efficient scale

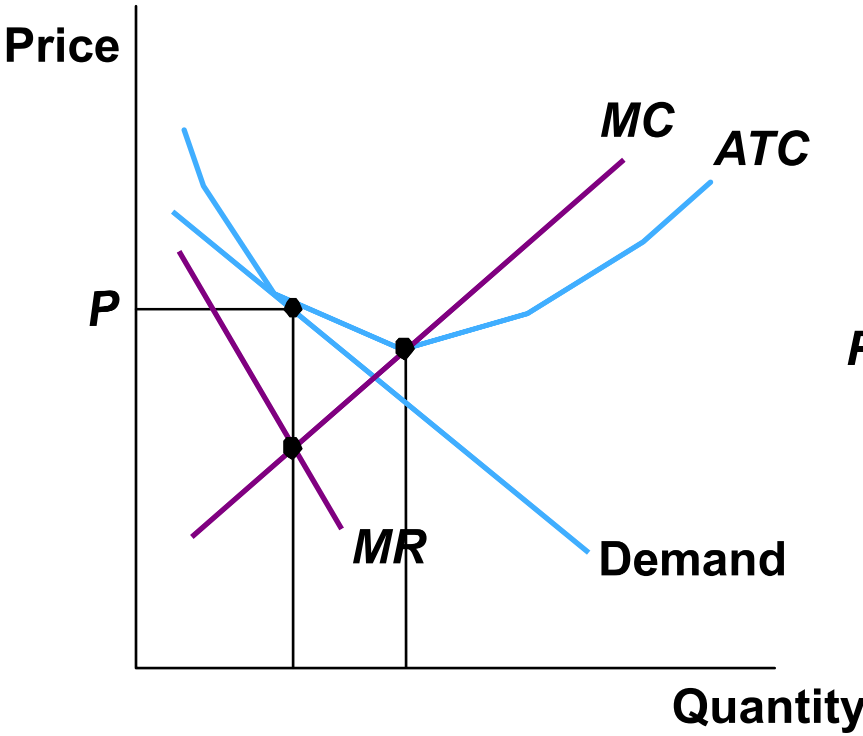
Excess capacity



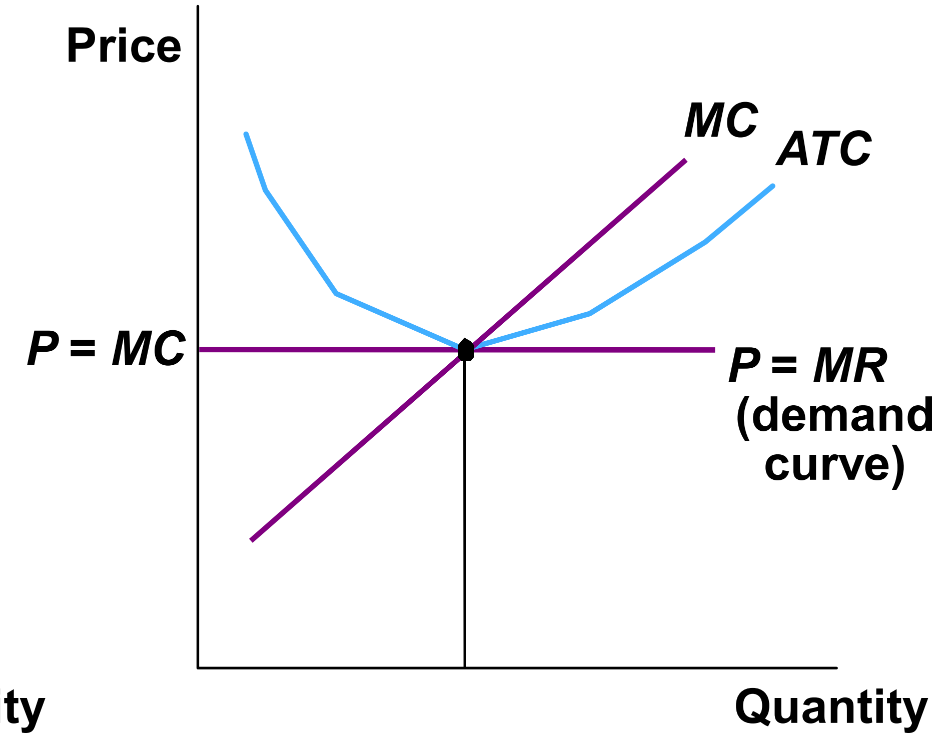


Excess capacity

Monopolistically competitive firm

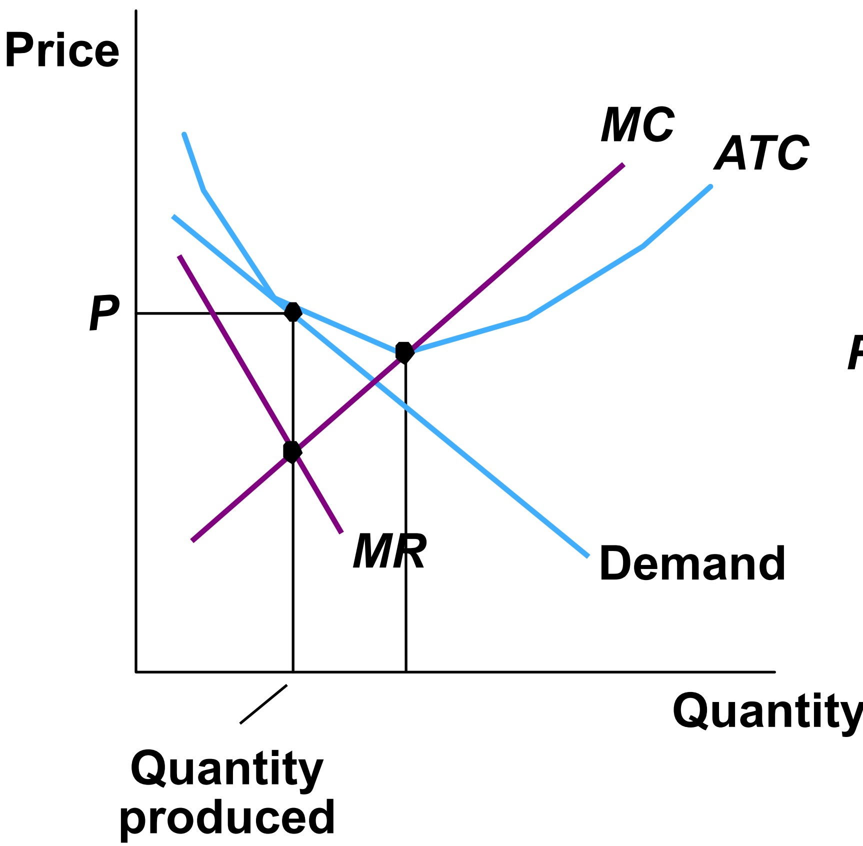


Perfectly competitive firm

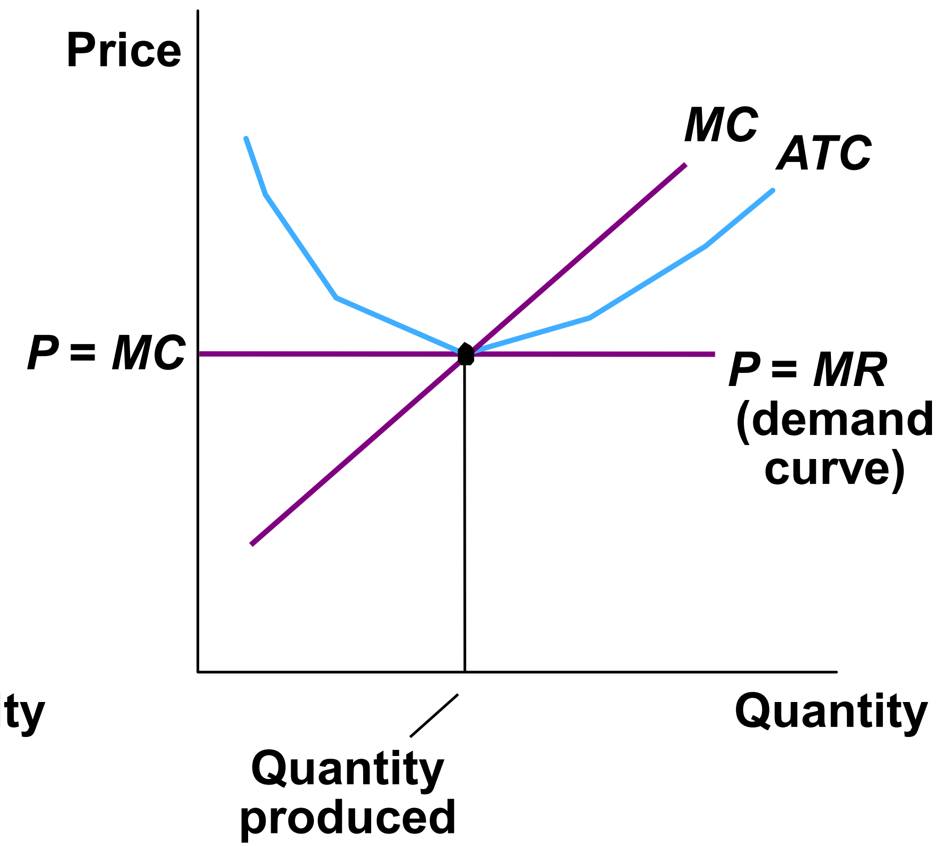


Excess capacity

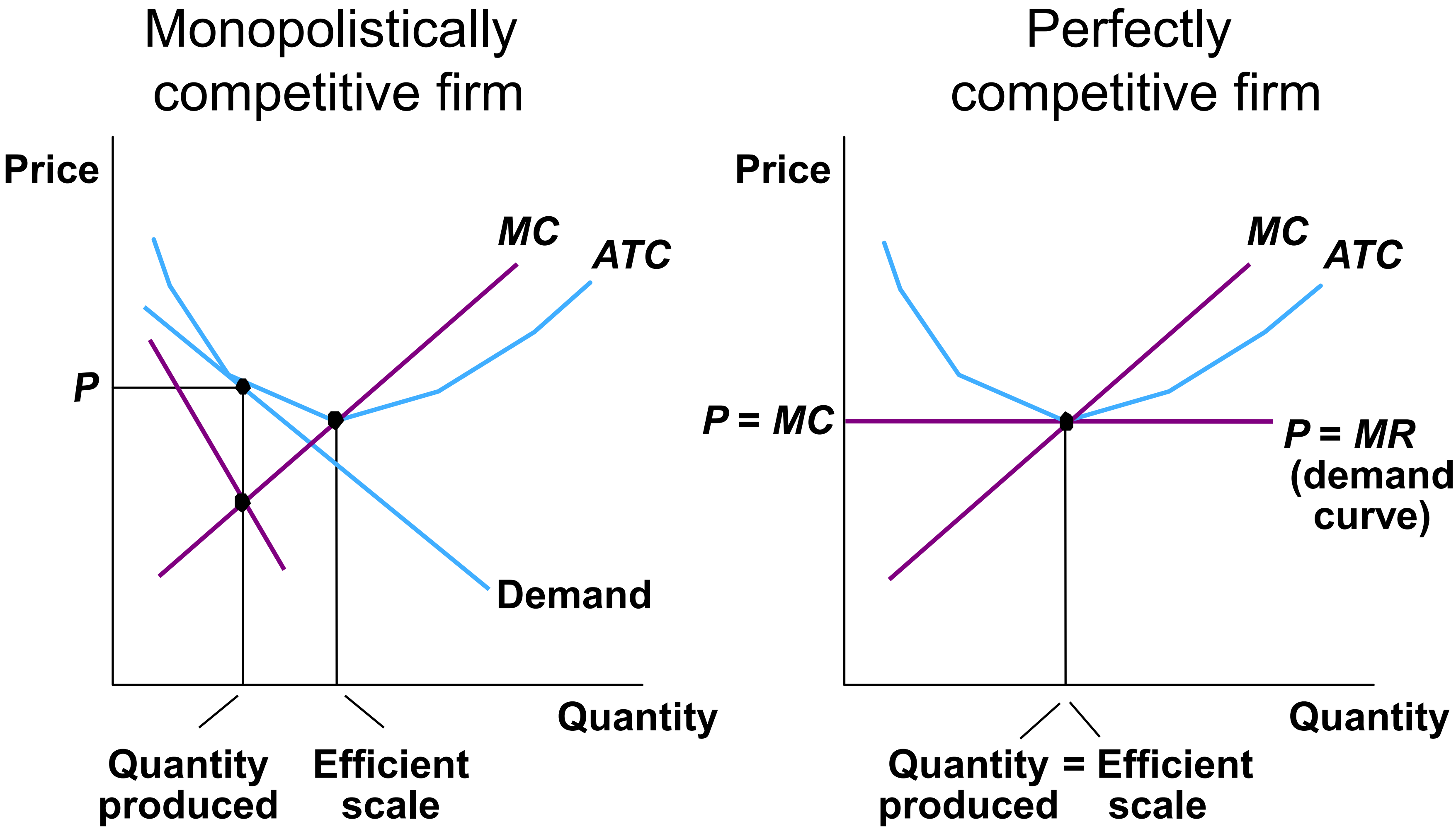
Monopolistically competitive firm



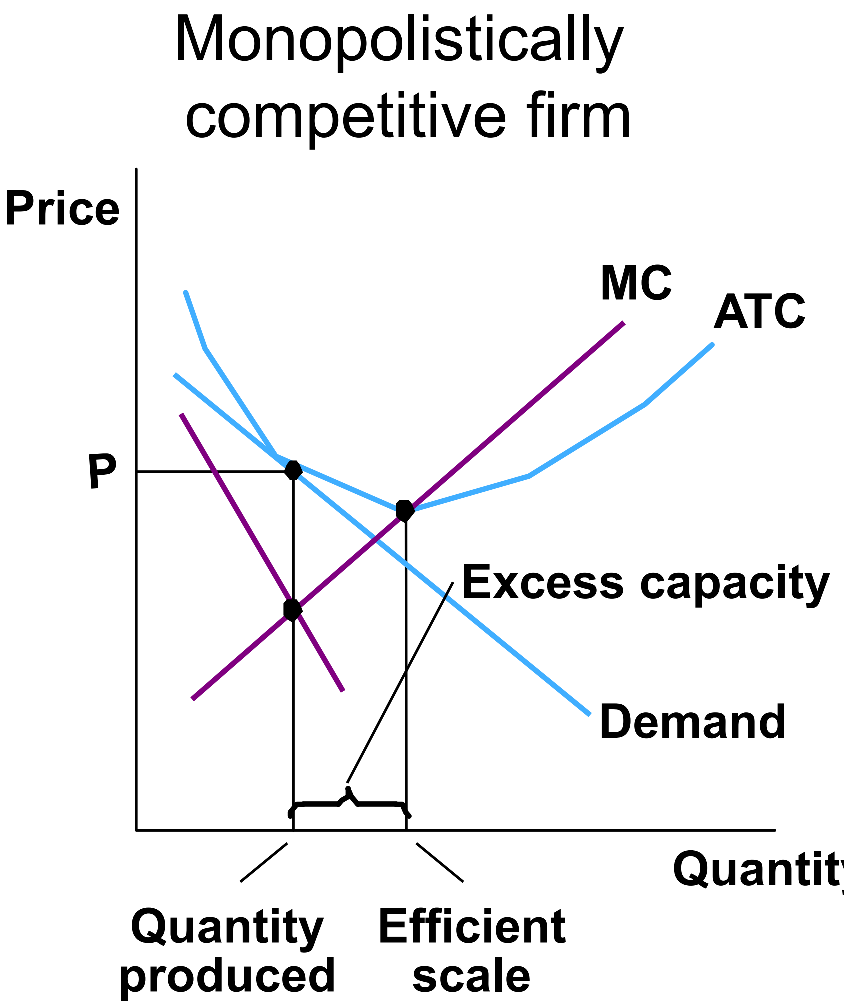
Perfectly competitive firm

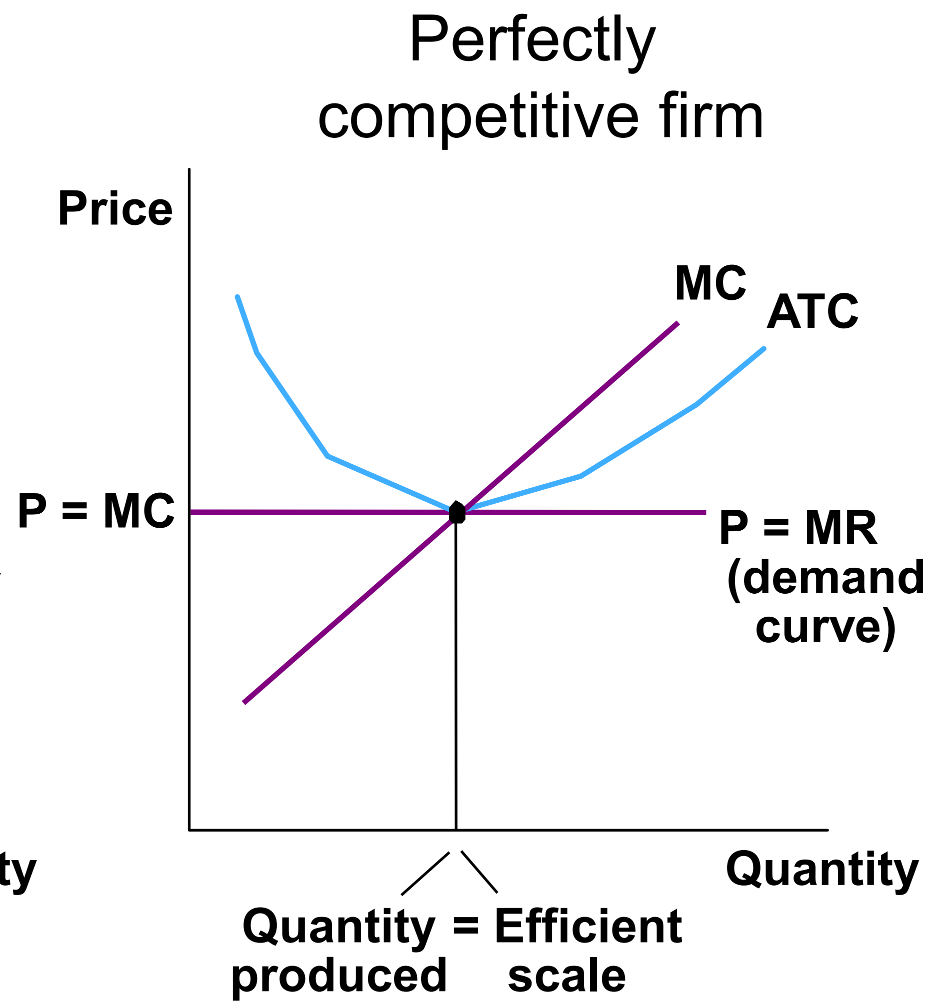


Excess capacity



Excess capacity



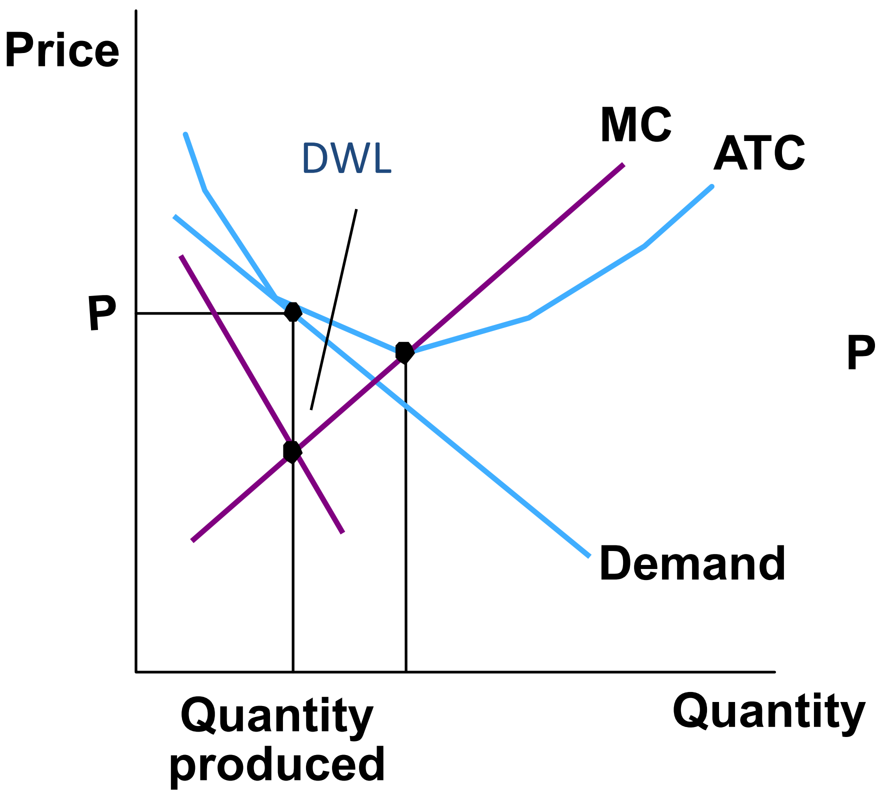


Monopolistic competition: efficiency

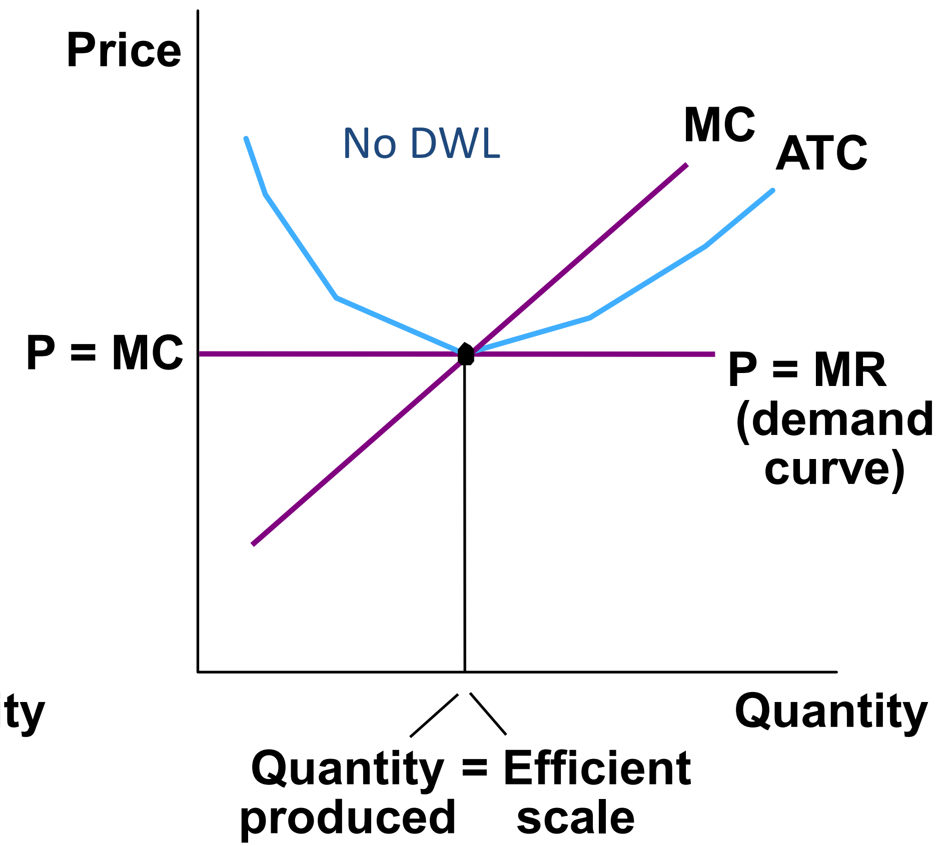
- Firms charge a price that exceeds marginal cost
  - This leads to a deadweight loss
- But consumers do gain variety
- The loss in efficiency needs to be weighed up against the gain of greater product variety

Monopolistic competition: efficiency

Monopolistically competitive firm



Perfectly competitive firm



Monopolistic competition: efficiency

- Does this means that monopolistically competitive firms are inefficient?
- Maybe, … maybe not ..
  - Monopolistically competitive firms are likely to innovate to stay ahead of rivals.
  - Also, monopolistically competitive markets offer a greater range of products to consumers

Monopolistic competition: efficiency

- Are zero economic profits in the LR inevitable?
  - Maybe you can stay one step ahead of your rivals
  - For example – innovate by offering new products (and thereby differentiating yourself from rivals), or reducing costs quicker than rivals.

Recap today

- Price Discrimination
  - First, second and third degree
  - Make sure you understand how each differs, and what is required to implement successfully.
- Monopolistic Competition
  - Features of perfect competition, features of monopoly.
  - Make sure you understand what the short and long run outcomes look like under monopolistic competition

Comparison of models

Model type	Price	Deadweight loss	ATC minimised?	LR profits?
Perfect Competition	P=MC	no	yes	no
Monopolistic Competition	P>MC	yes	no	no
Monopoly	P>MC	yes	no	yes