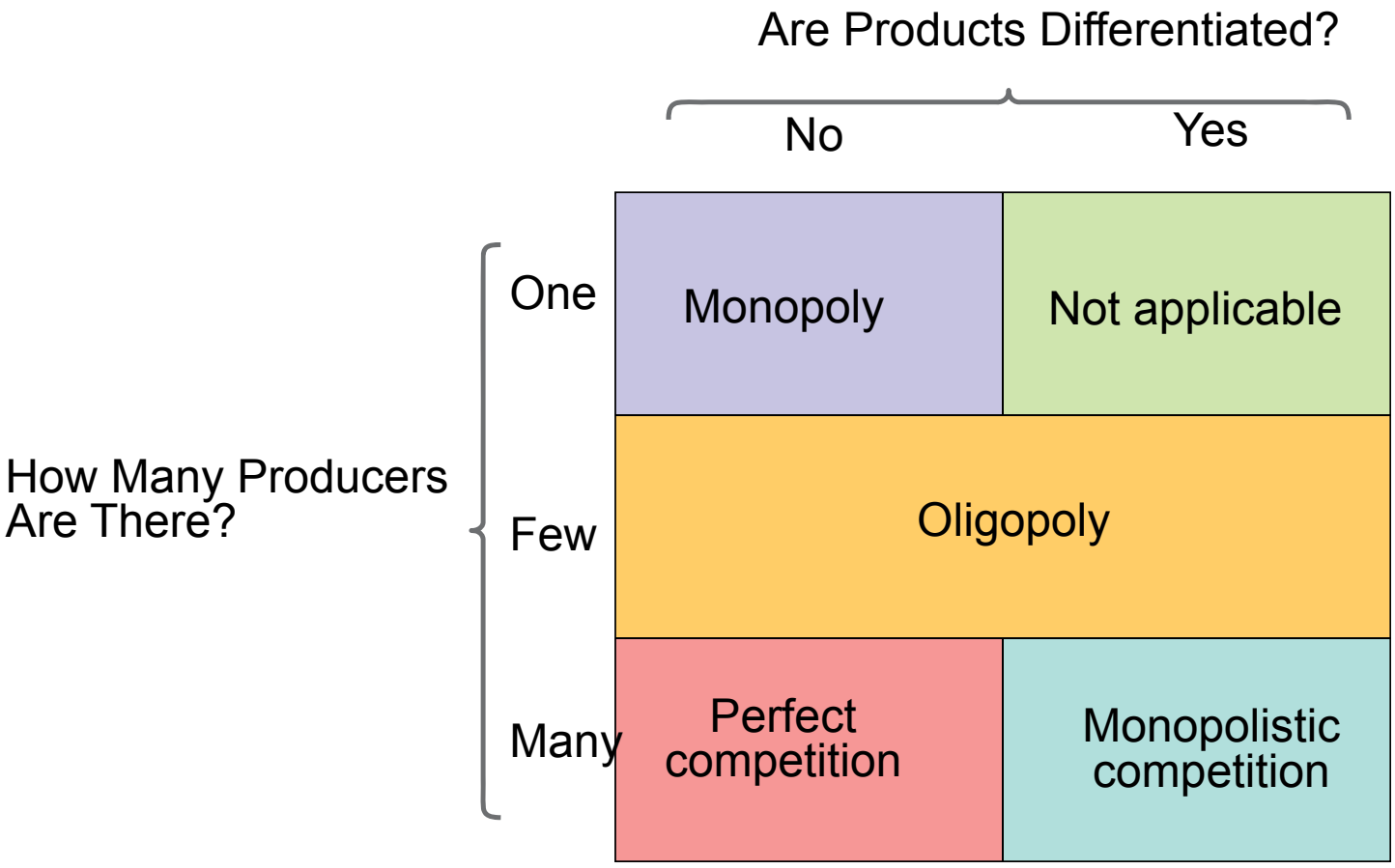
MONOPOLY

EE 211

- The significance of **monopoly,** where a single **monopolist** is the only producer of a good
- How a monopolist determines its profit-maximizing output and price
- The difference between monopoly and perfect competition, and the effects of that difference on society's welfare
- How policy makers address the problems posed by monopoly

TYPES OF MARKET STRUCTURE



THE MEANING OF MONOPOLY

A **monopolist** is a firm that is the only producer of a good that has no close substitutes. An industry controlled by a monopolist is known as a **monopoly.** *e.g. De Beers*

The ability of a monopolist to raise its price above the competitive level by reducing output is known as **market power.**

WHY DO MONOPOLIES EXIST?

- A ***monopolist*** has *market power* and as a result will charge higher prices and produce less output than a competitive industry. This generates profit for the monopolist in the short run and long run.

- Profits will not persist in the long run unless there is a **barrier to entry**. This can take the form of
  - Control of natural resources or inputs
  - Increasing returns to scale
  - Technological superiority
  - Government-created barriers including patents and copyrights.

ECONOMIES OF SCALE AND NATURAL MONOPOLY

- A **natural monopoly** exists when increasing returns to scale provide a large cost advantage to a single firm that produces all of an industry's output**.**
-
- It arises when increasing returns to scale provide a large cost advantage to having all of an industry's output produced by a single firm.

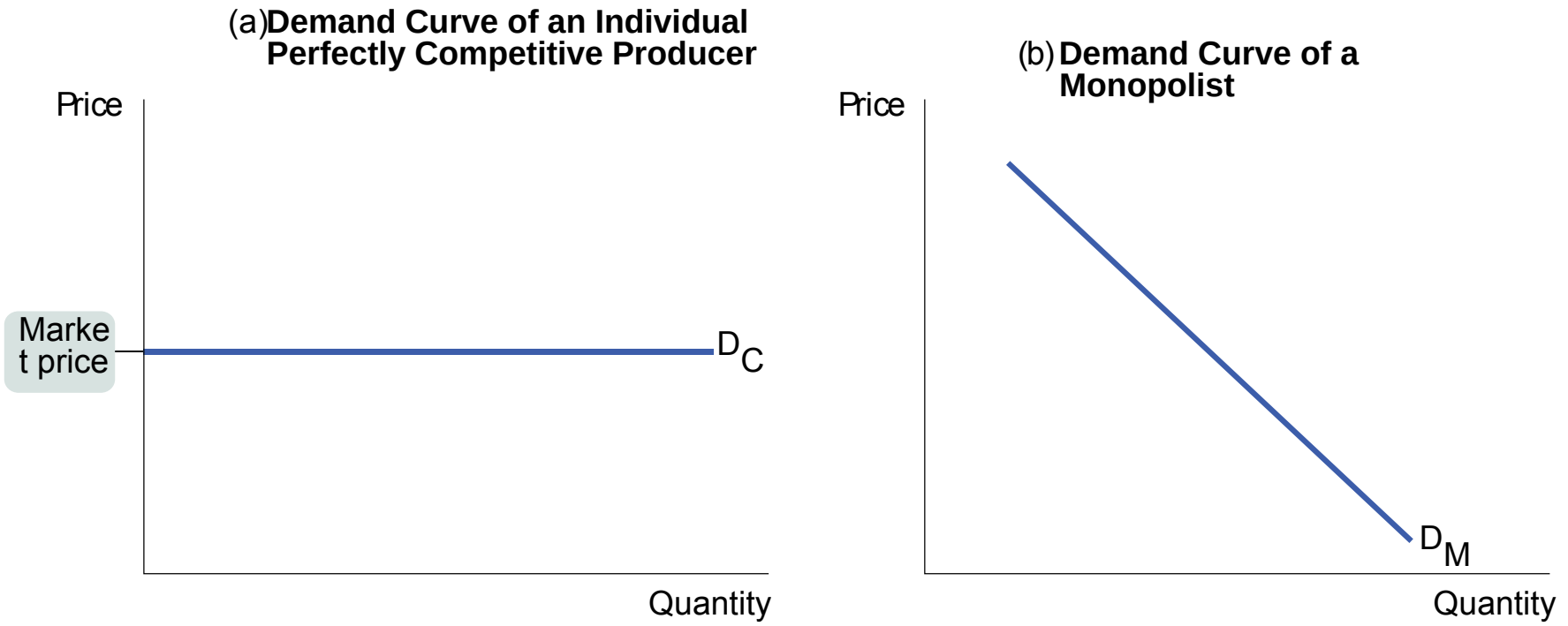
- Under such circumstances, average total cost is declining over the output range relevant for the industry.

- This creates a barrier to entry because an established monopolist has lower average total cost than any smaller firm.

HOW A MONOPOLIST MAXIMIZES PROFIT

- The price-taking firm's optimal output rule is to produce the output level at which the marginal cost of the last unit produced is equal to the market price.
- A monopolist, in contrast, is the sole supplier of its good. So its demand curve is simply the market demand curve, which is downward sloping.
- This downward slope creates a "wedge" between the price of the good and the marginal revenue of the good—the change in revenue generated by producing one more unit.

Comparing the Demand Curves



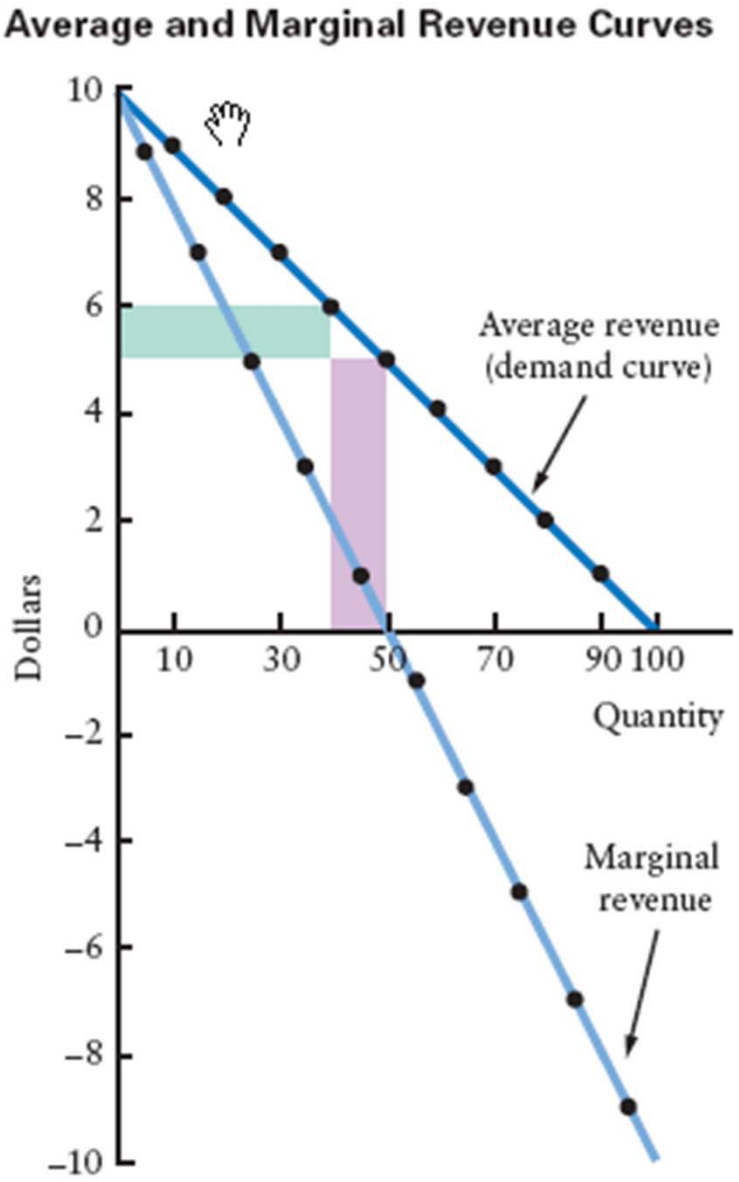
An individual perfectly competitive firm cannot affect the market price of the good → it faces a horizontal demand curve *DC* , as shown in panel (a).

A monopolist, on the other hand, can affect the price (sole supplier in the industry) → its demand curve is the market demand curve, *DM,* as shown in panel (b). To sell more output it must lower the price; by reducing output it raises the price.

A MONOPOLIST'S AVERAGE AND MARGINAL REVENUE

Computing Average and Marginal Revenue

(1) Price (average revenue)	(2) Quantity Sold Q	(3) Total Revenue ($p \times Q$)	(4) Change in Total Revenue (ΔTR)	(5) Marginal Revenue ($\Delta TR/\Delta Q$)
10	0	0		
9	10	90	90	9
8	20	160	70	7
7	30	210	50	5
6	40	240	30	3
5	50	250	10	1
4	60	240	−10	−1
3	70	210	−30	−3
2	80	160	−50	−5
1	90	90	−70	−7
0	100	0	−90	−9



HOW A MONOPOLIST MAXIMIZES PROFIT

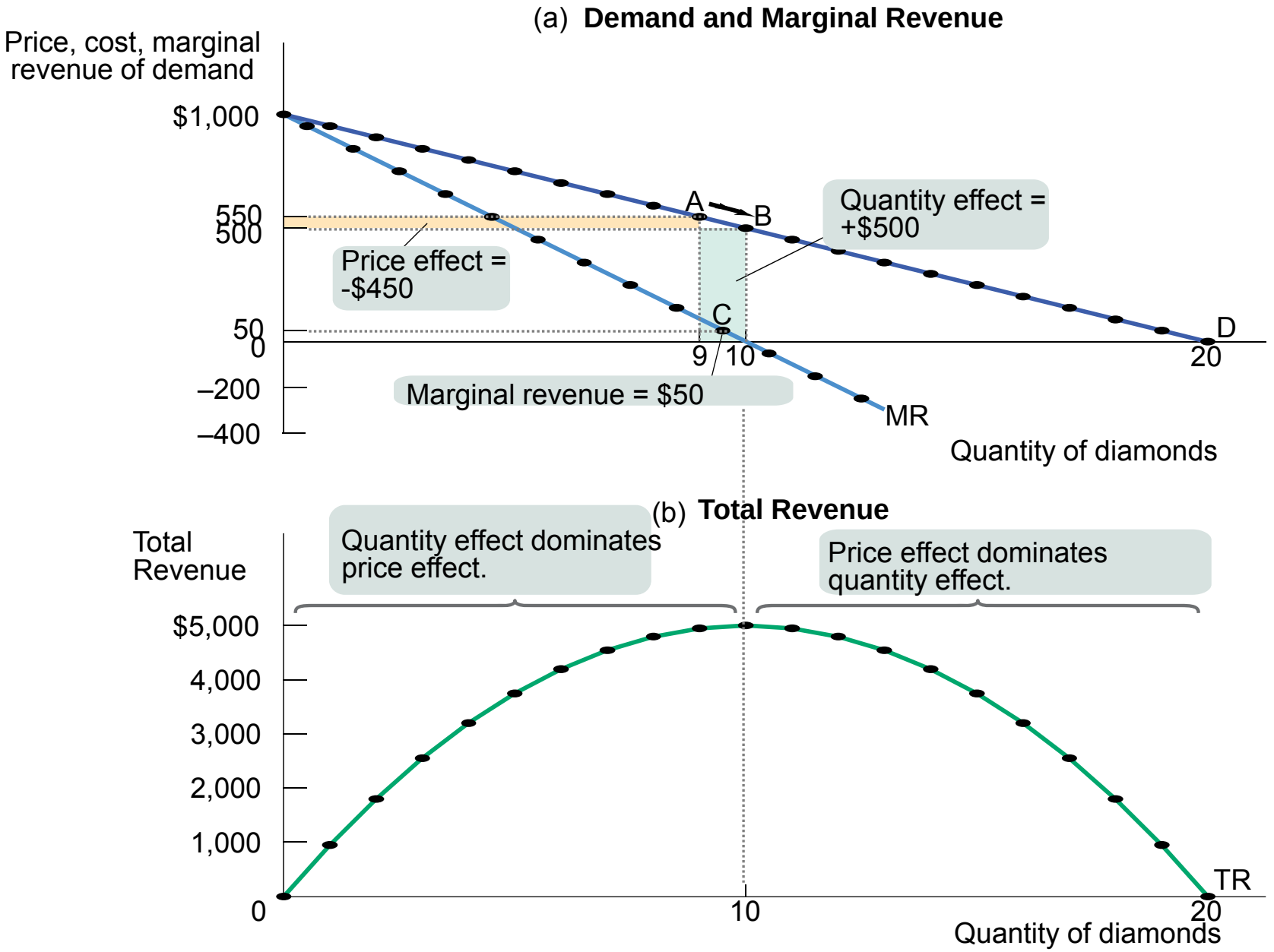
- An increase in production by a monopolist has two opposing effects on revenue:
- *A **quantity effect***. One more unit is sold, increasing total revenue by the price at which the unit is sold.
- *A **price effect***. In order to sell the last unit, the monopolist must cut the market price on *all* units sold. This decreases total revenue.
- The quantity effect and the price effect are illustrated by the two shaded areas in panel (a) of the following figure based on the numbers on the table accompanying it.

A MONOPOLIST'S DEMAND, TR, AND MR CURVES

Demand, Total Revenue, and Marginal Revenue for the De Beers Monopoly

Price of diamond P	Quantity of diamonds Q	Total revenue $TR = P \times Q$	Marginal revenue $MR = \Delta TR/\Delta Q$
$1,000	0	$0	
			$950
950	1	950	
			850
900	2	1,800	
			750
850	3	2,550	
			650
800	4	3,200	
			550
750	5	3,750	
			450
700	6	4,200	
			350
650	7	4,550	
			250
600	8	4,800	
			150
550	9	4,950	
			50
500	10	5,000	
			−50
450	11	4,950	
			−150
400	12	4,800	
			−250
350	13	4,550	
			−350
300	14	4,200	
			−450
250	15	3,750	
			−550
200	16	3,200	
			−650
150	17	2,550	
			−750
100	18	1,800	
			−850
50	19	950	
			−950
0	20	0	

MONOPOLIST'S DEMAND, TR, AND MR CURVES



MONOPOLIST'S DEMAND CURVE AND MARGINAL REVENUE

- Due to the price effect of an increase in output, the marginal revenue curve of a firm with market power always lies below its demand curve. So a profit-maximizing monopolist chooses the output level at which marginal cost is equal to marginal revenue—*not* to price.
- As a result, the monopolist produces less and sells its output at a higher price than a perfectly competitive industry would. It earns a profit in the short run and the long run.

MONOPOLIST'S DEMAND CURVE AND MARGINAL REVENUE

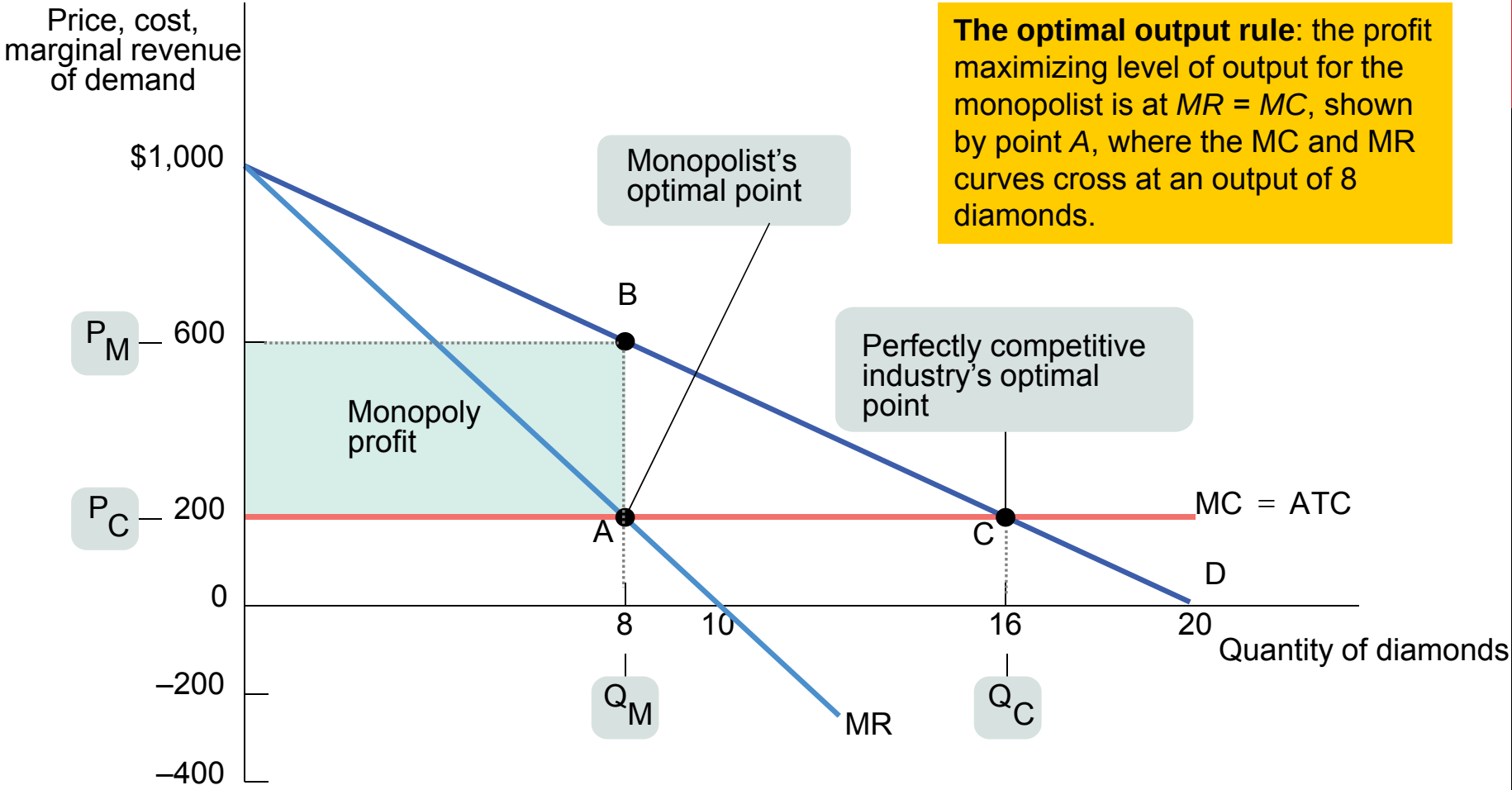
- To emphasize how the quantity and price effects offset each other for a firm with market power, notice the hill-shaped total revenue curve:
- This reflects the fact that *at low levels of output, the quantity effect is stronger than the price effect:* as the monopolist sells more, it has to lower the price on only very few units, so the price effect is small.
- As output rises beyond 10 diamonds, total revenue actually falls. This reflects the fact that *at high levels of output, the price effect is stronger than the quantity effect:* as the monopolist sells more, it now has to lower the price on many units of output, making the price effect very large.

MONOPOLIST'S PROFIT-MAXIMIZING OUTPUT AND PRICE

- To maximize profit, the monopolist compares marginal cost with marginal revenue.
- If marginal revenue exceeds marginal cost, De Beers increases profit by producing more; if marginal revenue is less than marginal cost, De Beers increases profit by producing less. So the monopolist maximizes its profit by using the optimal output rule:
- At the monopolist's profit-maximizing quantity of output,

$$MR = MC$$

MONOPOLIST'S PROFIT-MAXIMIZING OUTPUT AND PRICE



The optimal output rule: the profit maximizing level of output for the monopolist is at *MR* = *MC*, shown by point *A*, where the MC and MR curves cross at an output of 8 diamonds.

The price De Beers can charge per diamond is found by going to the point on the demand curve directly above point *A*, (point *B* here) —a price of $600 per diamond. It makes a profit of $400 × 8 = $3,200.

Is there a Monopoly Supply Curve?

Given how a monopolist applies its optimal output rule, you might be tempted to ask what this implies for the supply curve of a monopolist. But this is a meaningless question: monopolists don't have supply curves.

Remember that a supply curve shows the quantity that producers are willing to supply for any given market price. A monopolist, however, does not take the price as given; it chooses a profit-maximizing quantity, taking into account its own ability to influence the price.

Monopoly Behavior and the Price Elasticity of Demand

A monopolist faces marginal revenue that is less than the market price. But how much lower? The answer depends on price elasticity of demand.

When a monopolist increases output by one unit, it must reduce the market price in order to sell that unit. If the price elasticity of demand is less than 1, this will actually reduce revenue- that is, marginal revenue will be negative.

The monopolist can increase revenue by producing more only if the price elasticity of demand is greater than 1; the higher the elasticity, the closer the additional revenue is to the initial market price. The difference between monopoly behavior and perfectly competitive behavior depends on the price elasticity of demand.

A monopolist that faces highly elastic demand will behave almost like a firm in a perfectly competitive industry.

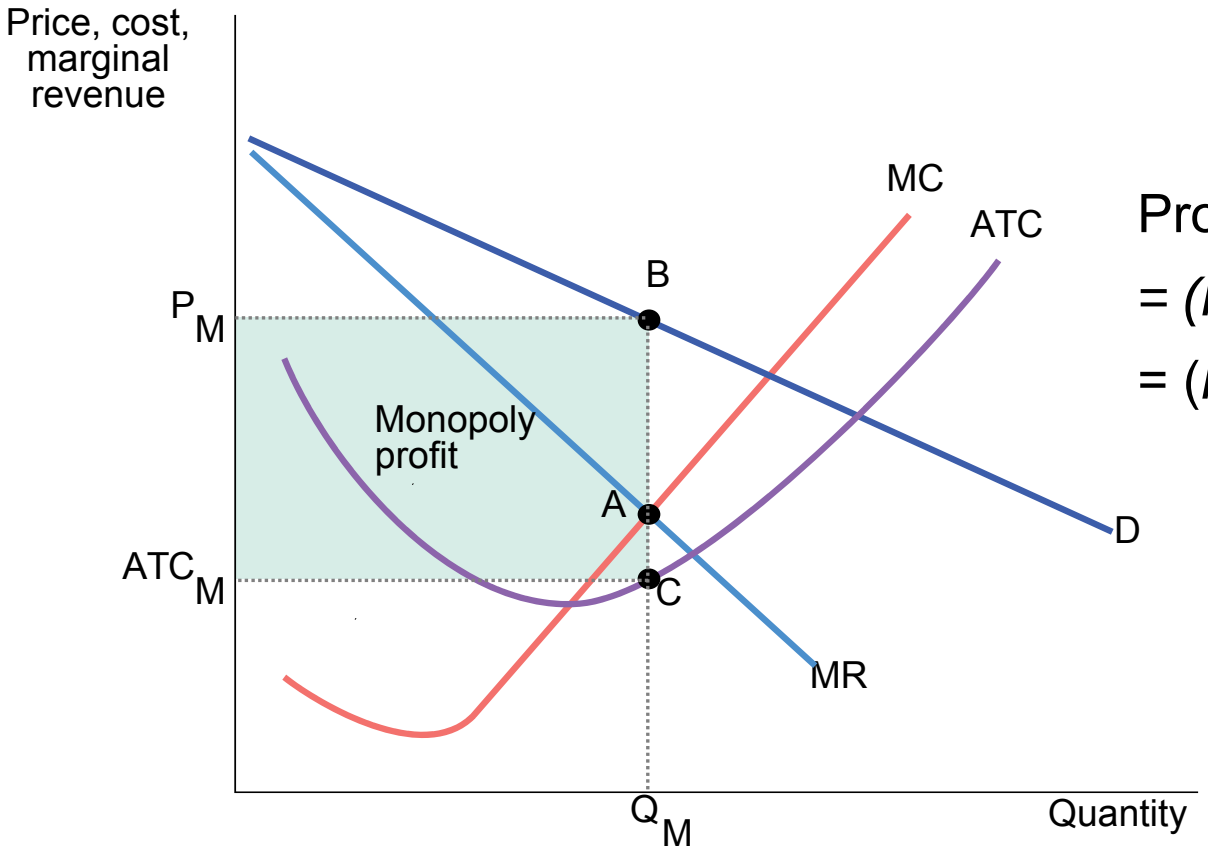
MONOPOLY VERSUS PERFECT COMPETITION

- *P = MC at the perfectly competitive firm's profit-maximizing quantity of output*
- *P > MR = MC at the monopolist's profit-maximizing quantity of output*

Compared with a competitive industry, a monopolist does the following:

- Produces a smaller quantity: *QM* < QC
- Charges a higher price: *PM* > PC
- Earns a profit

THE MONOPOLIST'S PROFIT



Profit = $TR - TC$

$= (P_M \times Q_M) - (ATC_M \times Q_M)$

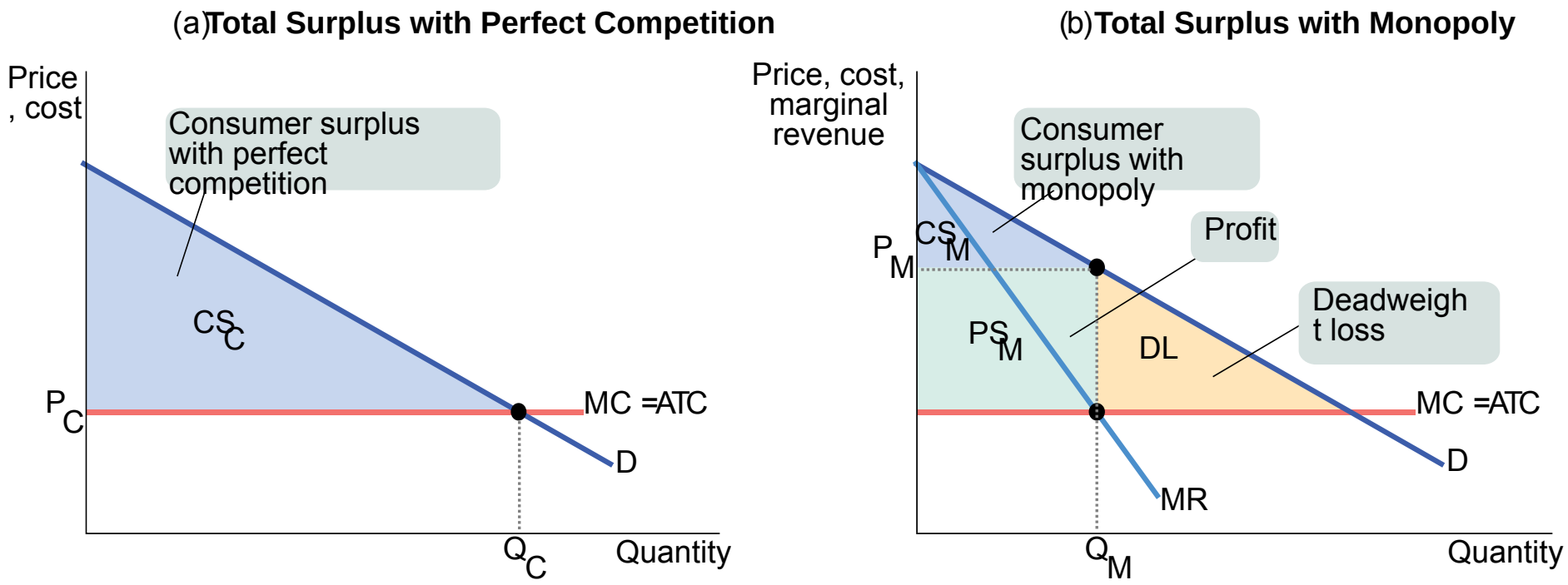
$= (P_M - ATC_M) \times Q_M$

In this case, the MC curve is upward sloping and the ATC curve is U-shaped. The monopolist maximizes profit by producing the level of output at which $MR = MC$, given by point A, generating quantity Q_M. It finds its monopoly price, P_M , from the point on the demand curve directly above point A, point B here. The average total cost of Q_M is shown by point C. Profit is given by the area of the shaded rectangle.

MONOPOLY AND PUBLIC POLICY

- By reducing output and raising price above marginal cost, a monopolist captures some of the consumer surplus as profit and causes deadweight loss. To avoid deadweight loss, government policy attempts to prevent monopoly behavior.
- When monopolies are “created” rather than natural, governments should act to prevent them from forming and break up existing ones.
- The government policies used to prevent or eliminate monopolies are known as *antitrust policy*.

MONOPOLY CAUSES INEFFICIENCY



Panel (b) depicts the industry under monopoly: the monopolist decreases output to *QM* and charges *PM*. Consumer surplus (blue triangle) has shrunk because a portion of it is has been captured as profit (light blue area). Total surplus falls: the deadweight loss (orange area) represents the value of mutually beneficial transactions that do not occur because of monopoly behavior.

SOURCE:

Krugman, P. and Robin Wells (2008)