CLASS SLIDES

Basic Competition Economics

Merger Antitrust Law

Fall 2017 Georgetown University Law Center

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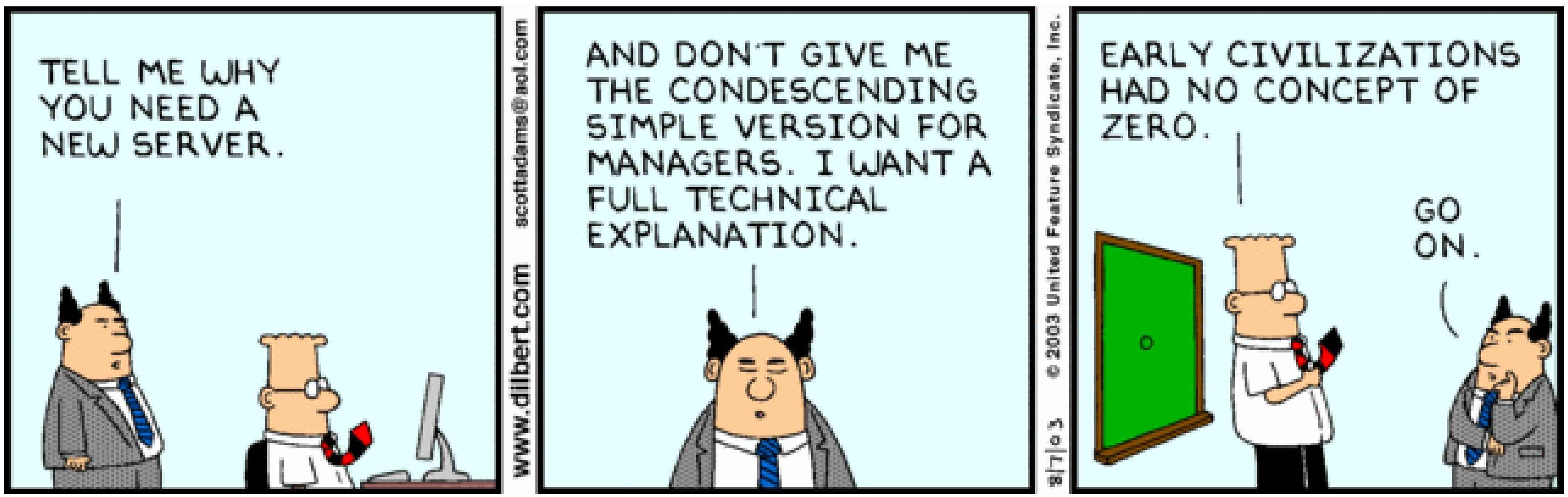
Central questions

1. How does a firm price its product and choose its level of production?
2. What are the social welfare implications of these determinations?
3. How can firms coordinate their behavior—through a price-fixing agreement or a merger—to increase their aggregate profits?
4. Why is competitive pricing socially better than monopoly pricing?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AND DON'T GIVE ME THE CONDESCENDING SIMPLE VERSION FOR MANAGERS. I WANT A FULL TECHNICAL EXPLANATION.
EARLY CIVILIZATIONS HAD NO CONCEPT OF ZERO.
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Price formation models

- Standard assumptions (neo-classical model)
  - Consumers
    - Individually maximize preferences (utility) subject to their individual budget constraints
    - Yields a consumer demand function, which gives the quantity demanded $q_i^{demanded}$ by consumer *i* for a given market price *p*
  - Firms
    - Individually maximize profits subject to their available production technology (production possibility sets)
    - Yields a production function that gives the quantity produced $q_j^{produced}$ by firm *j* for a given market price *p*
  - Equilibrium condition
    - No price discrimination (all purchases are made at the single market price)
    - Market clears at the market price (i.e., demand equals supply):

$$\sum_i q_i^{demanded} = \sum_j q_j^{produced}$$

Σ simply means to add up the *q*'s

Consumers

Demand curves

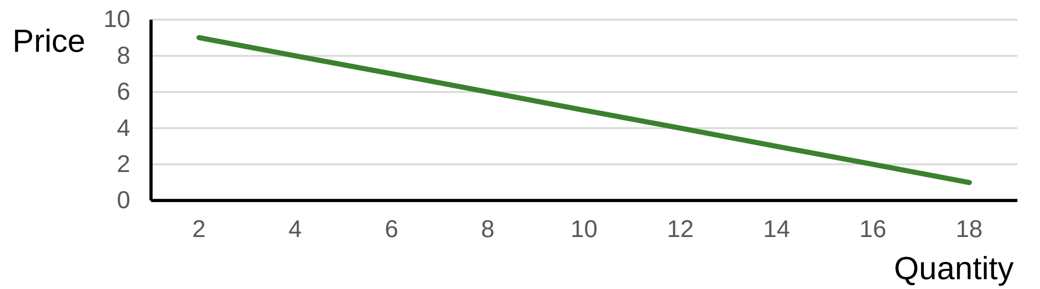
Demand: Number of units *q* customers are willing to purchase at a price *p*
Demand curve: Traces the relationship between *q* and *p*

Demand Curve

$$q = 20 - 2p$$

Inverse Demand Curve

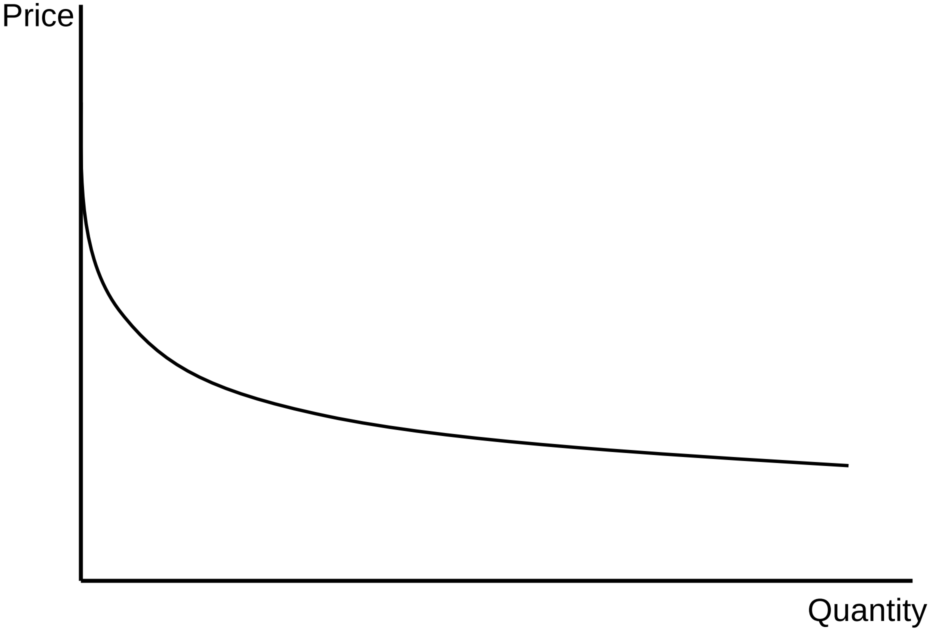
$$p = \frac{20 - 2q}{2} = 10 - \frac{1}{2}q$$



Query: Why is the demand curve downward sloping?

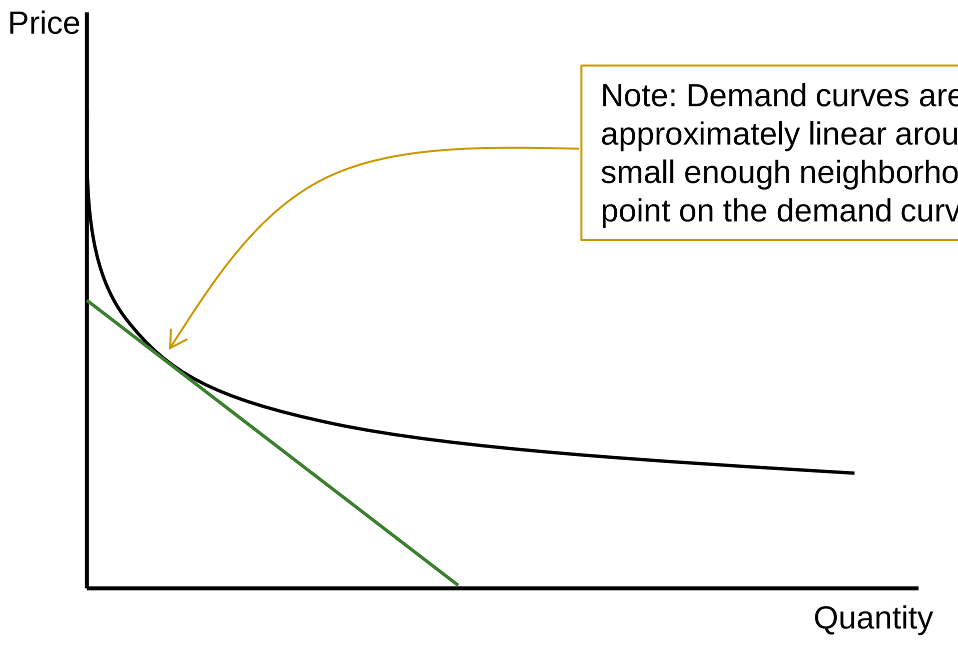
Demand curves

- Example: Nonlinear inverse demand curve with no x-axis intercept



Demand curves

- Example: Nonlinear inverse demand curve with no x-axis intercept



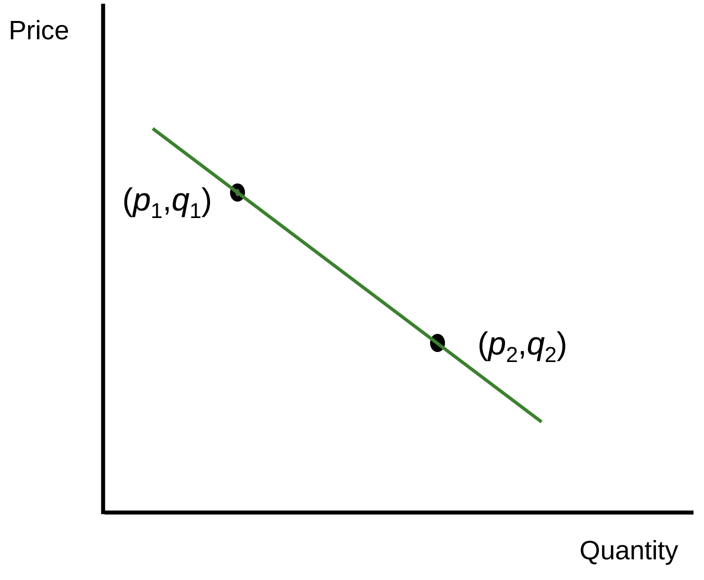
Demand curves

- Four technical points about demand curves and inverse demand curves
  - When economists and antitrust lawyers refer to the demand curve, they almost always mean the inverse demand curve
  - What I have called the "demand curve" is really the "demand function"
  - Demand curves are for aggregate demand in the marketplace, that is, the sum of demands by consumers on all firms in the marketplace
  - The demand curve for a single firm in the market is called the firm's *residual demand curve*

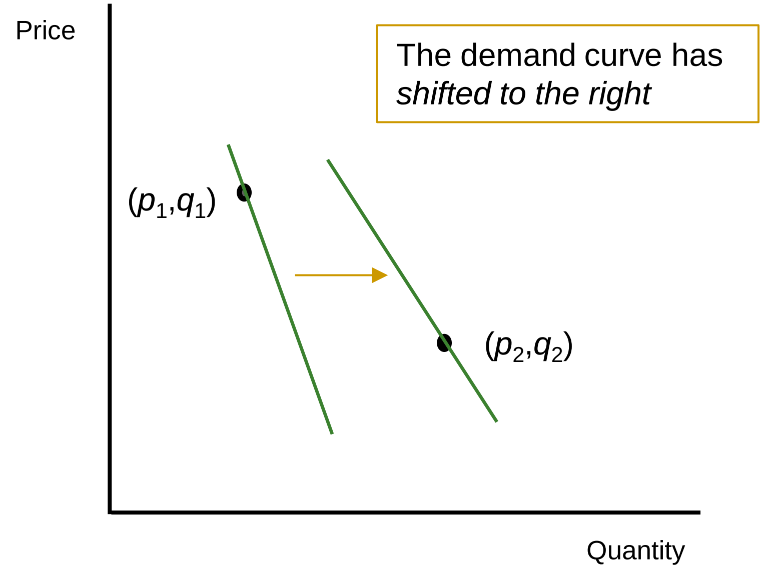
Demand curves

- Two observations do not necessarily define a demand curve

Two points on the same demand curve



Two points on different demand curves



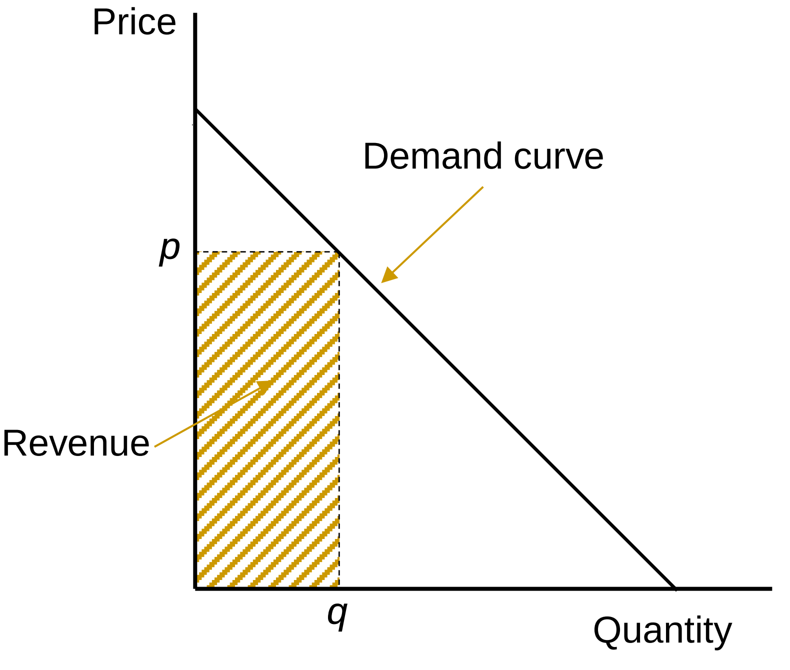
Producers

Producers

- *Assumption*: Firms maximize their profits subject to the technology available to them
  - Profits (π) = Revenues (r) – Costs (c)
- To analyze the conditions under which a firm maximizes it profit, need to look at:
  - Revenues and revenue functions
  - Costs and cost functions
  - The relationship between revenues and costs when the firm maximizes its profit

Revenues

Revenue = *p* times *q* (= *pq*)



Revenues

Marginal revenue (mr) = Revenue gain from incremental sales (the sale of one additional unit) – revenue loss from lower price on preexisting sales

$$\equiv \frac{\Delta r}{\Delta q} = \underbrace{(p + \Delta p)\Delta q}_{\text{Gain}} + \underbrace{\Delta pq}_{\text{Loss}}$$

NB: If Δ*q* is positive, the Δ*p* will be negative since demand curves are downward sloping. So Δ*pq* is a negative number, reflecting a loss.

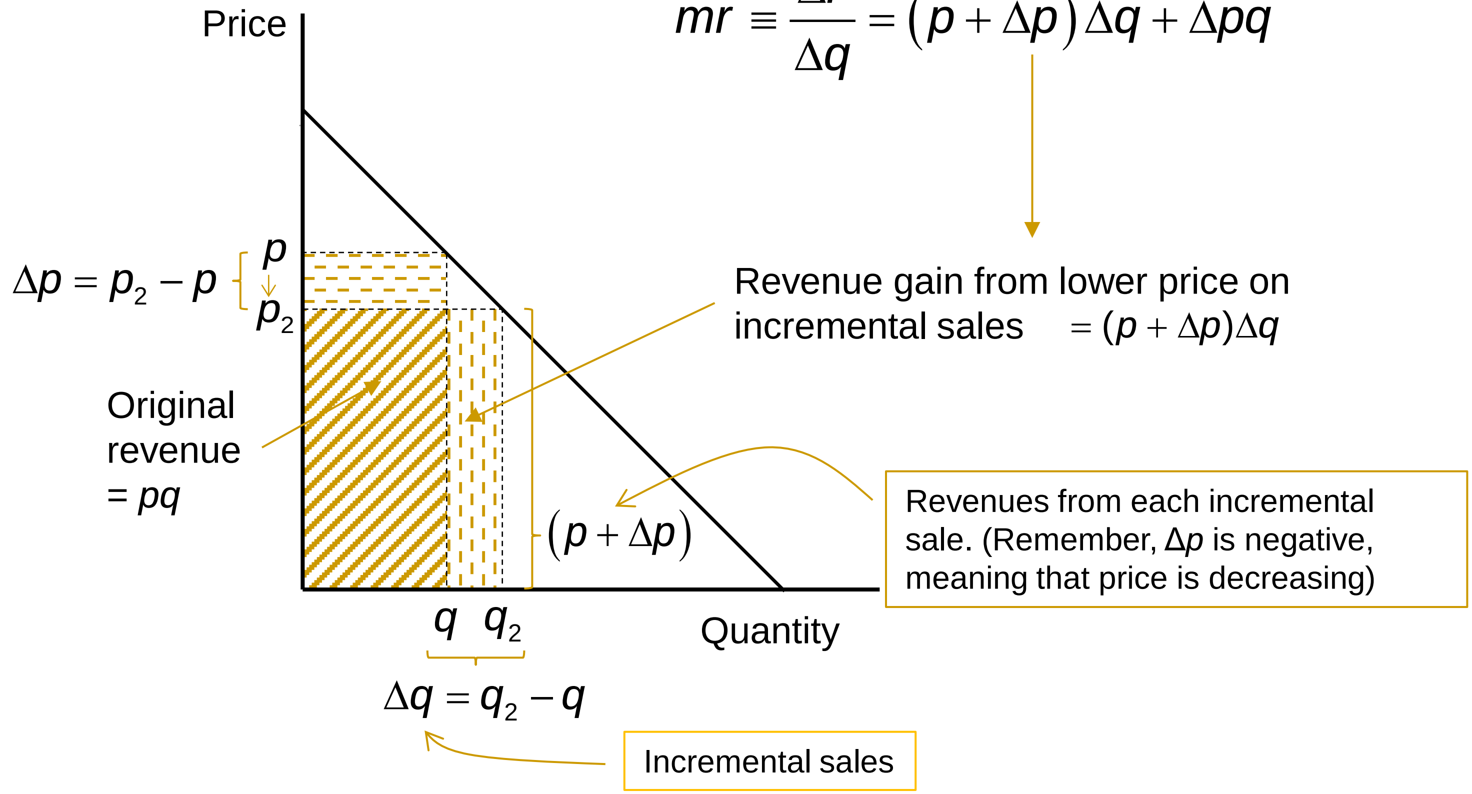
The next three slides demonstrate this

Revenues

Marginal revenue (mr) = Revenue gain from incremental sales (the sale of one additional unit)
– revenue loss from lower price on preexisting sales

Revenue gain:

$$mr \equiv \frac{\Delta r}{\Delta q} = (p + \Delta p)\Delta q + \Delta pq$$

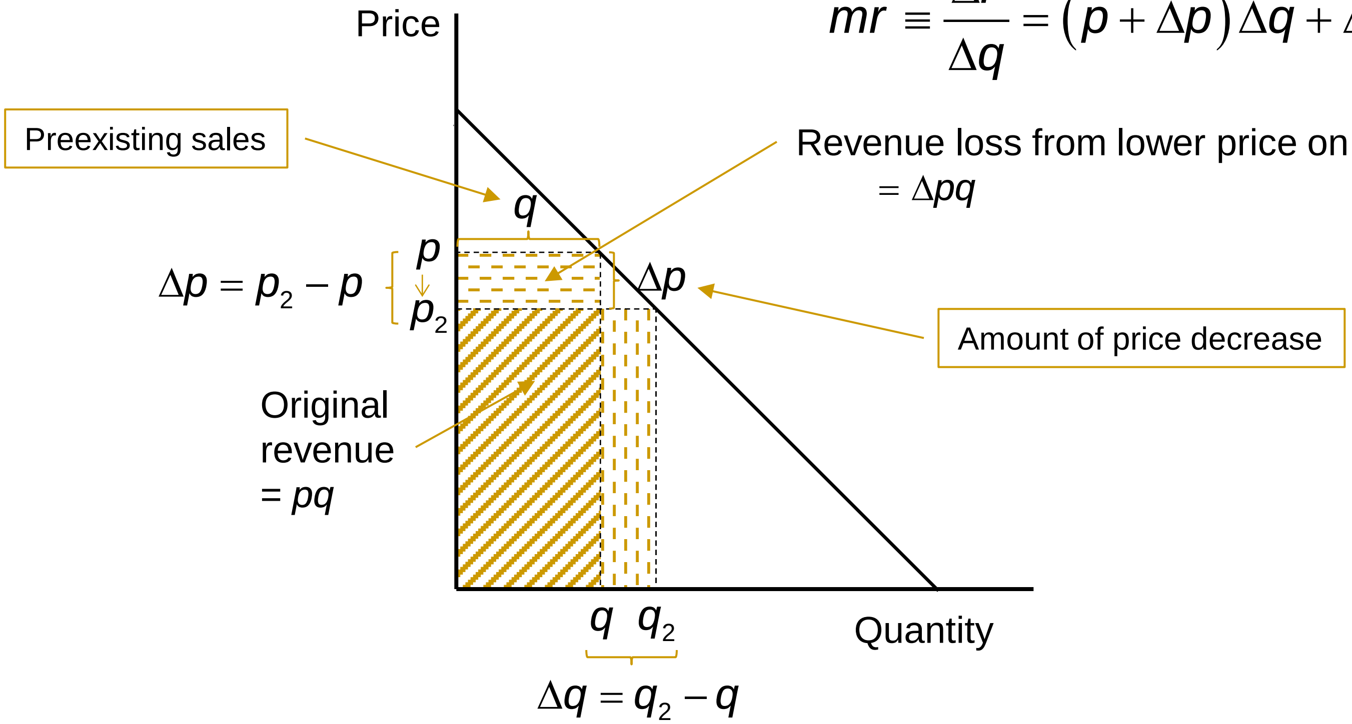


Revenues

Marginal revenue (mr) = Revenue gain from incremental sales (the sale of one additional unit)
– revenue from lower price on preexisting sales

Revenue loss:

$$mr \equiv \frac{\Delta r}{\Delta q} = (p + \Delta p)\Delta q + \Delta p q$$



Revenues

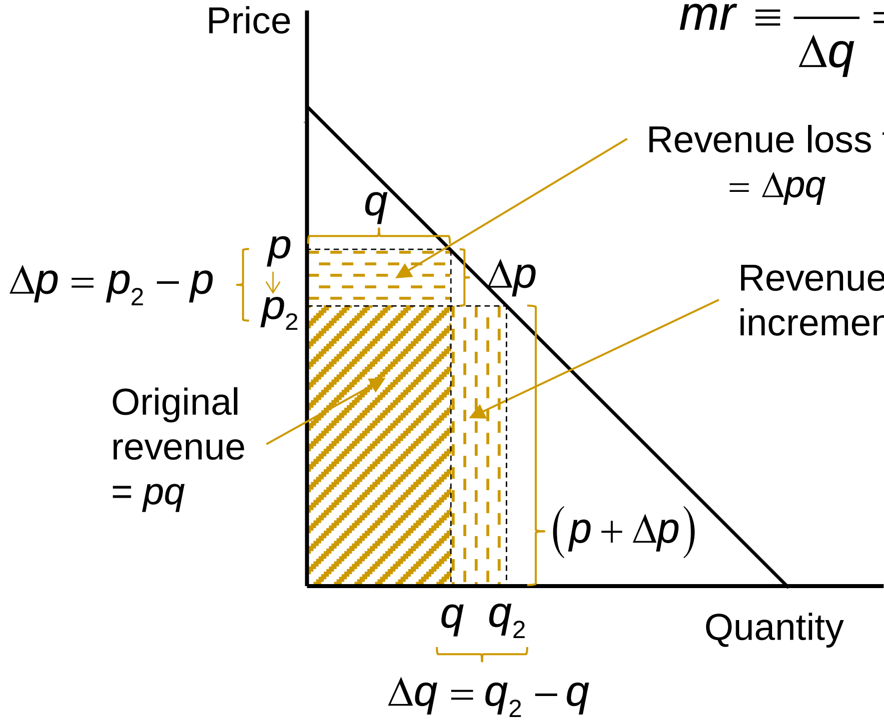
Marginal revenue (mr) = Revenue gain from incremental sales (the sale of one additional unit)
– revenue loss from lower price on preexisting sales

Putting it together:

$$mr \equiv \frac{\Delta r}{\Delta q} = (p + \Delta p)\Delta q + \Delta pq$$

Revenue loss from lower price on preexisting sales $= \Delta pq$

Revenue gain from lower price on incremental sales $= (p + \Delta p)\Delta q$



Revenues

- Relationship between revenues and marginal revenue (discrete case)

Read this " *r* of *q*": This is the revenues at production level *q*.

$$r(q) = \sum_{i=1}^{q} mr_i$$

  - That is, total revenues for a production level *q* is equal to the sum of the marginal revenues for units 1 to *q*

Revenues

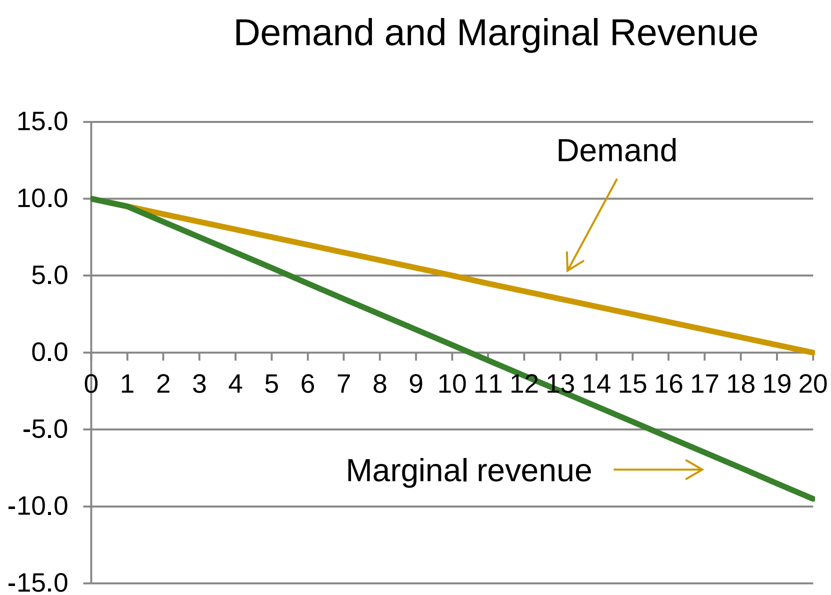
$$r(q) = \sum_{i=1}^{q} mr_i$$

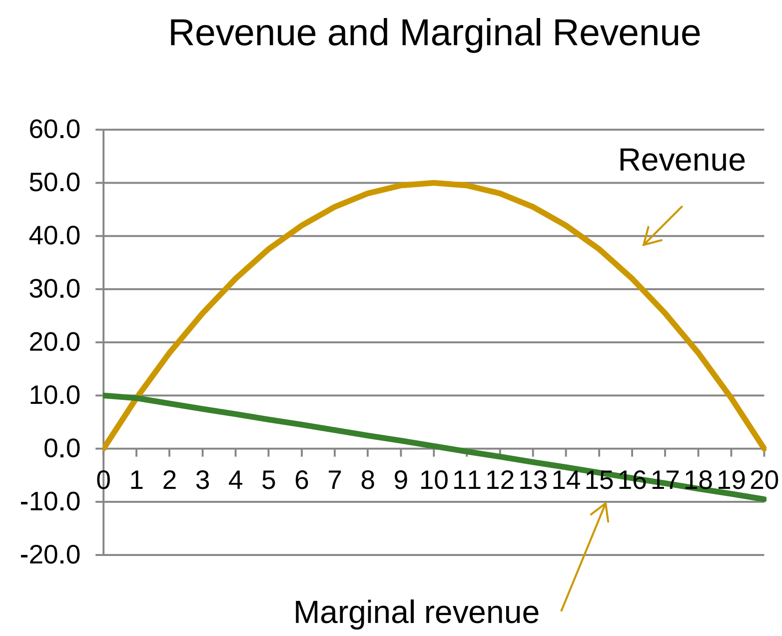
- Numerical example
  - Demand: $p = 10 - \frac{1}{2}q$

Quantity q	Price p	Revenue r	Marginal Quantity Δq	Change Price Δp	Marginal Gain (p+Δp)Δq	Marginal Loss Δpq	Marginal Revenue (p+Δp)Δq+Δpq	Sum mr
0	10.0	0.0					10.0	
1	9.5	9.5	1	-0.5	10.0	-0.5	9.5	9.5
2	9.0	18.0	1	-0.5	9.5	-1.0	8.5	18.0
3	8.5	25.5	1	-0.5	9.0	-1.5	7.5	25.5
4	8.0	32.0	1	-0.5	8.5	-2.0	6.5	32.0
5	7.5	37.5	1	-0.5	8.0	-2.5	5.5	37.5
6	7.0	42.0	1	-0.5	7.5	-3.0	4.5	42.0
7	6.5	45.5	1	-0.5	7.0	-3.5	3.5	45.5
8	6.0	48.0	1	-0.5	6.5	-4.0	2.5	48.0
9	5.5	49.5	1	-0.5	6.0	-4.5	1.5	49.5
10	5.0	50.0	1	-0.5	5.5	-5.0	0.5	50.0
11	4.5	49.5	1	-0.5	5.0	-5.5	-0.5	49.5
12	4.0	48.0	1	-0.5	4.5	-6.0	-1.5	48.0
13	3.5	45.5	1	-0.5	4.0	-6.5	-2.5	45.5
14	3.0	42.0	1	-0.5	3.5	-7.0	-3.5	42.0
15	2.5	37.5	1	-0.5	3.0	-7.5	-4.5	37.5
16	2.0	32.0	1	-0.5	2.5	-8.0	-5.5	32.0
17	1.5	25.5	1	-0.5	2.0	-8.5	-6.5	25.5
18	1.0	18.0	1	-0.5	1.5	-9.0	-7.5	18.0
19	0.5	9.5	1	-0.5	1.0	-9.5	-8.5	9.5
20	0.0	0.0	1	-0.5	0.5	-10.0	-9.5	0.0

Revenues

- Graphing revenue and marginal revenue curves
  - Demand: $p = 10 - \frac{1}{2}q$





Notes:

1. When demand is linear, the slope of the marginal revenue curve is twice as steep as the demand curve.
2. When marginal revenue equals zero (here, a q = 10), revenues are at their maximum.

Revenues

OPTIONAL

- Marginal revenues
  - Discrete version

$$mr \equiv \frac{\Delta r}{\Delta q} = \left(p - \Delta p\right)\Delta q - \Delta pq$$

  - Calculus version

$$mr = \lim_{\Delta q \to 0} \frac{\left(p - \Delta p\right)\Delta q - \Delta pq}{\Delta q} = \frac{dr}{dq}$$

Taking the limit:

$$mr = p + q\frac{dp}{dq}$$

Costs

- Some useful terms and relationships
  - *Total cost (*TC or C*)*
  - *Fixed cost* (FC)
  - *Variable cost* (VC)
  - *Average total cost* (ATC)
  - *Average variable cost* (AVC)
  - *Marginal cost* (MC)

$$TC(q) \equiv C(q)$$

$$TC(q) = FC + VC(q)$$

$$ATC(q) = \frac{TC(q)}{q}$$

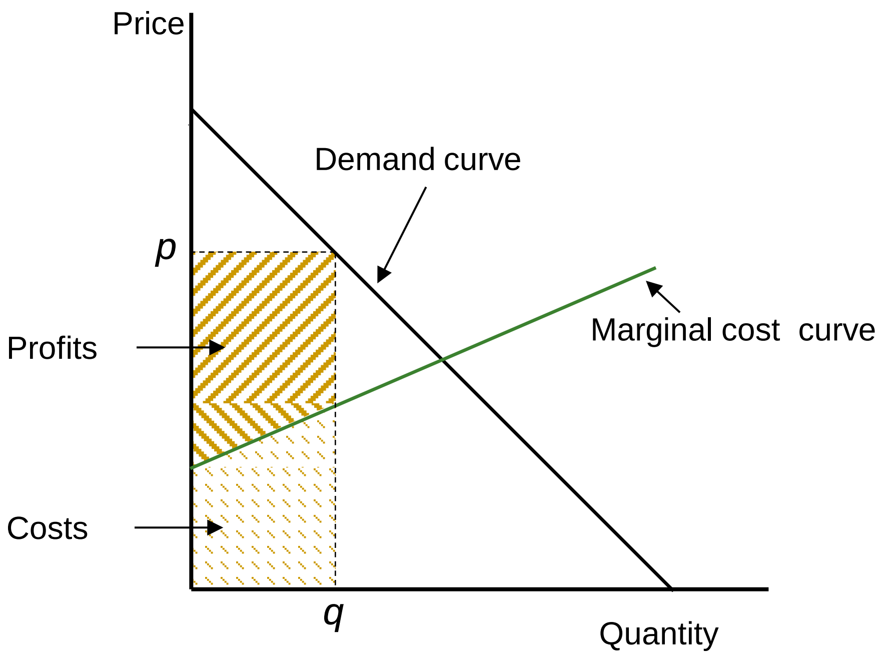
$$AVC(q) = \frac{AC(q)}{q}$$

$$\begin{aligned} MC(q) &= C(q) - C(q-1) \\ &= \frac{\Delta C}{\Delta q} \text{ where } \Delta q = 1 \\ &= \frac{dC}{dq} \end{aligned}$$

Δq means the change in q is read "delta q"

Marginal costs

Marginal cost (*mc*): The cost *mc* of producing the (*n* + 1)th unit after producing *n* units
Marginal cost curve: Traces the relationship between *n* and *mc*



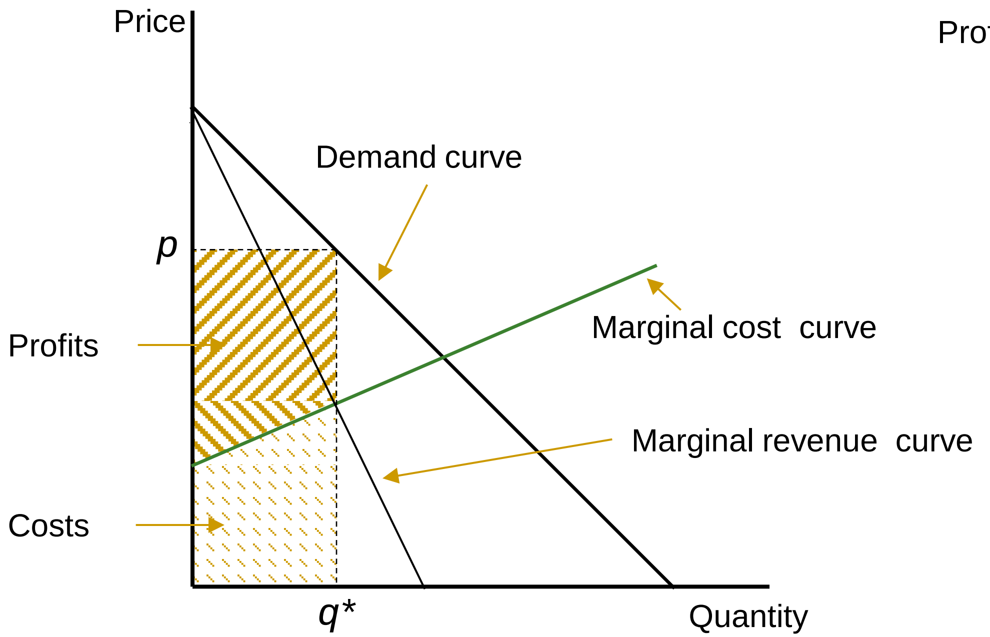
Query: The marginal cost curve is shown upward sloping. Why might that be?
Can the marginal cost curve be flat or even downward sloping?

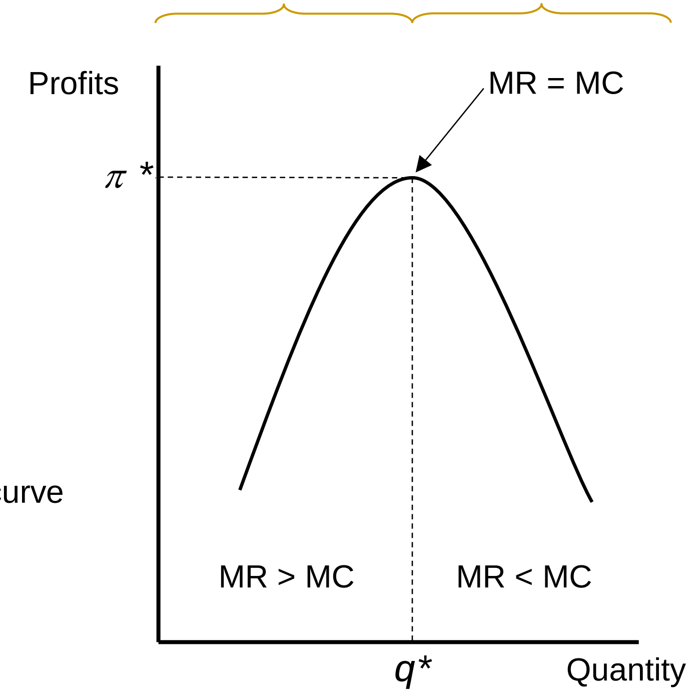
Profit maximization

- Firms maximize profits when *mr = mc*

Firm can make more profits by increasing *q*, since incremental revenue gains exceed incremental costs

Firm can make more profits by decreasing *q*, since incremental costs exceed incremental revenue gains





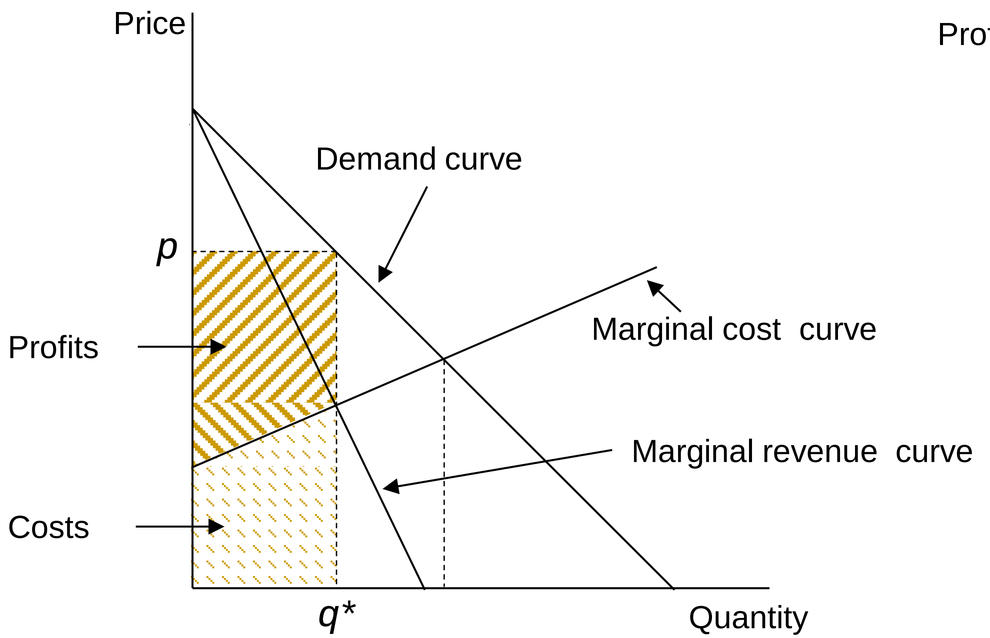
Profit maximization

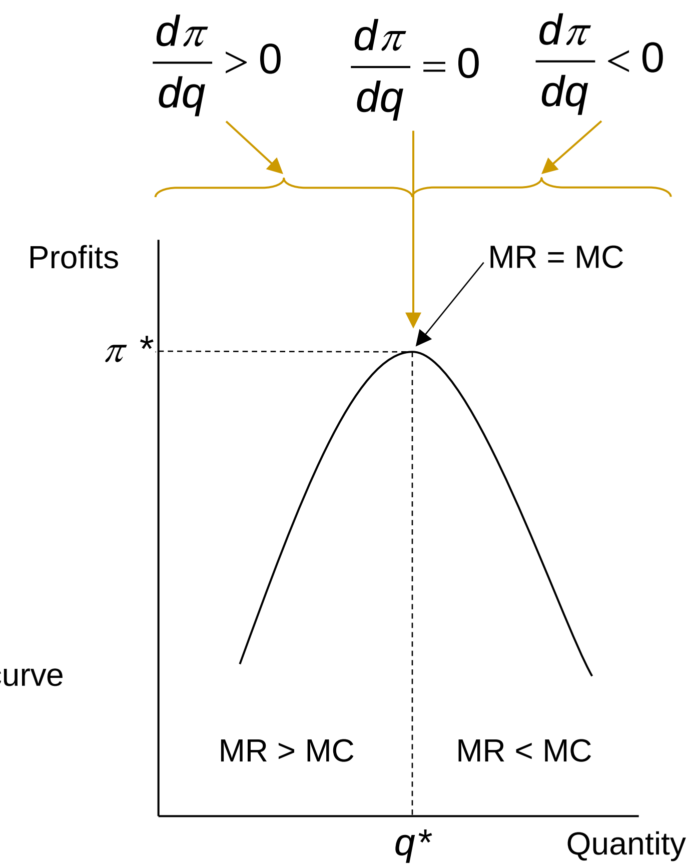
- The calculus version

Profits = Revenues - Costs

$$\max_q \pi(q) = R(q) - C(q)$$

$$\frac{d\pi}{dq} = \frac{dR}{dq} - \frac{dC}{dq} = 0$$

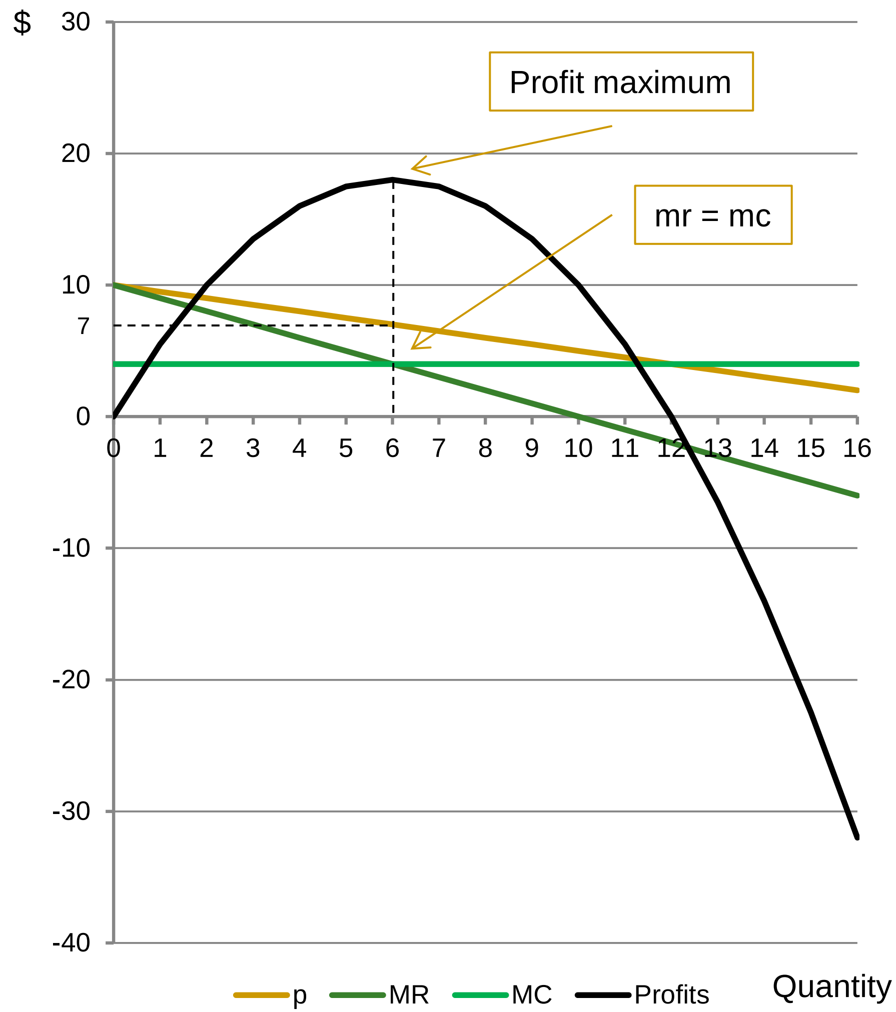




Profit maximization

- Numerical version

Quantity q	Price p	Revenue r	Marginal Revenue mr	Marginal Costs mc	Total Costs c	Profits Π
0	10.0	0.0			0.0	0.0
1	9.5	9.5	9.5	4.0	4.0	5.5
2	9.0	18.0	8.5	4.0	8.0	10.0
3	8.5	25.5	7.5	4.0	12.0	13.5
4	8.0	32.0	6.5	4.0	16.0	16.0
5	7.5	37.5	5.5	4.0	20.0	17.5
6	7.0	42.0	4.5	4.0	24.0	18.0
7	6.5	45.5	3.5	4.0	28.0	17.5
8	6.0	48.0	2.5	4.0	32.0	16.0
9	5.5	49.5	1.5	4.0	36.0	13.5
10	5.0	50.0	0.5	4.0	40.0	10.0
11	4.5	49.5	-0.5	4.0	44.0	5.5
12	4.0	48.0	-1.5	4.0	48.0	0.0
13	3.5	45.5	-2.5	4.0	52.0	-6.5
14	3.0	42.0	-3.5	4.0	56.0	-14.0
15	2.5	37.5	-4.5	4.0	60.0	-22.5
16	2.0	32.0	-5.5	4.0	64.0	-32.0
17	1.5	25.5	-6.5	4.0	68.0	-42.5
18	1.0	18.0	-7.5	4.0	72.0	-54.0
19	0.5	9.5	-8.5	4.0	76.0	-66.5
20	0.0	0.0	-9.5	4.0	80.0	-80.0



Profit maximization

- Example (calculus version):

Demand: $p = 10 - \frac{1}{2}q$

Revenue: $r = pq = 10q - \frac{1}{2}q^2$

Marginal revenue: $mr = \frac{dr}{dq} = 10 - q$

Marginal cost: $mc = 4$

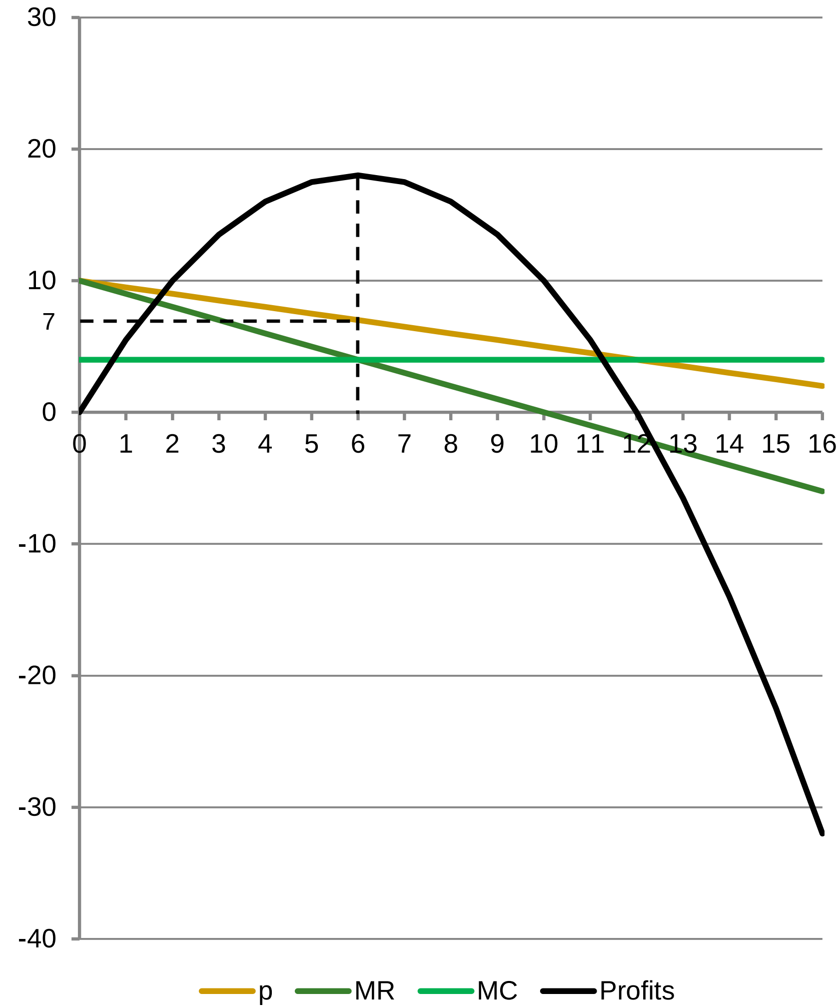
Profit max: $mr = mc$

$$10 - q = 4$$

$$q = 6$$

$$p = 7$$

Profits: $\pi = r - (mc)q = 42 - (4)6 = 18$



Cournot competition

- Consider a firm's profit-maximizing function when it competes in *quantities*:

$$\max_q \pi = p(q)q - c(q)$$

Here, the production quantity is the control variable. Economists call this *Cournot competition*.

- First order condition (FOC) for a profit maximum:

$$\frac{d\pi}{dq} = \underbrace{p + q\frac{dp}{dq}}_{\text{Marginal revenue}} - \underbrace{\frac{dc}{dq}}_{\text{Marginal cost}} = 0$$

So marginal revenue equals marginal cost at a profit maximum

Cournot competition

- With a little mathematical manipulation:

$$\frac{d\pi}{dq} = \left(p - \frac{dc}{dq}\right) + q\frac{dp}{dq} = 0$$

Or

$$\underbrace{\left(p - \frac{dc}{dq}\right)} + \underbrace{q\frac{dp}{dq}} = 0$$

Gross margin (*p-mc*)

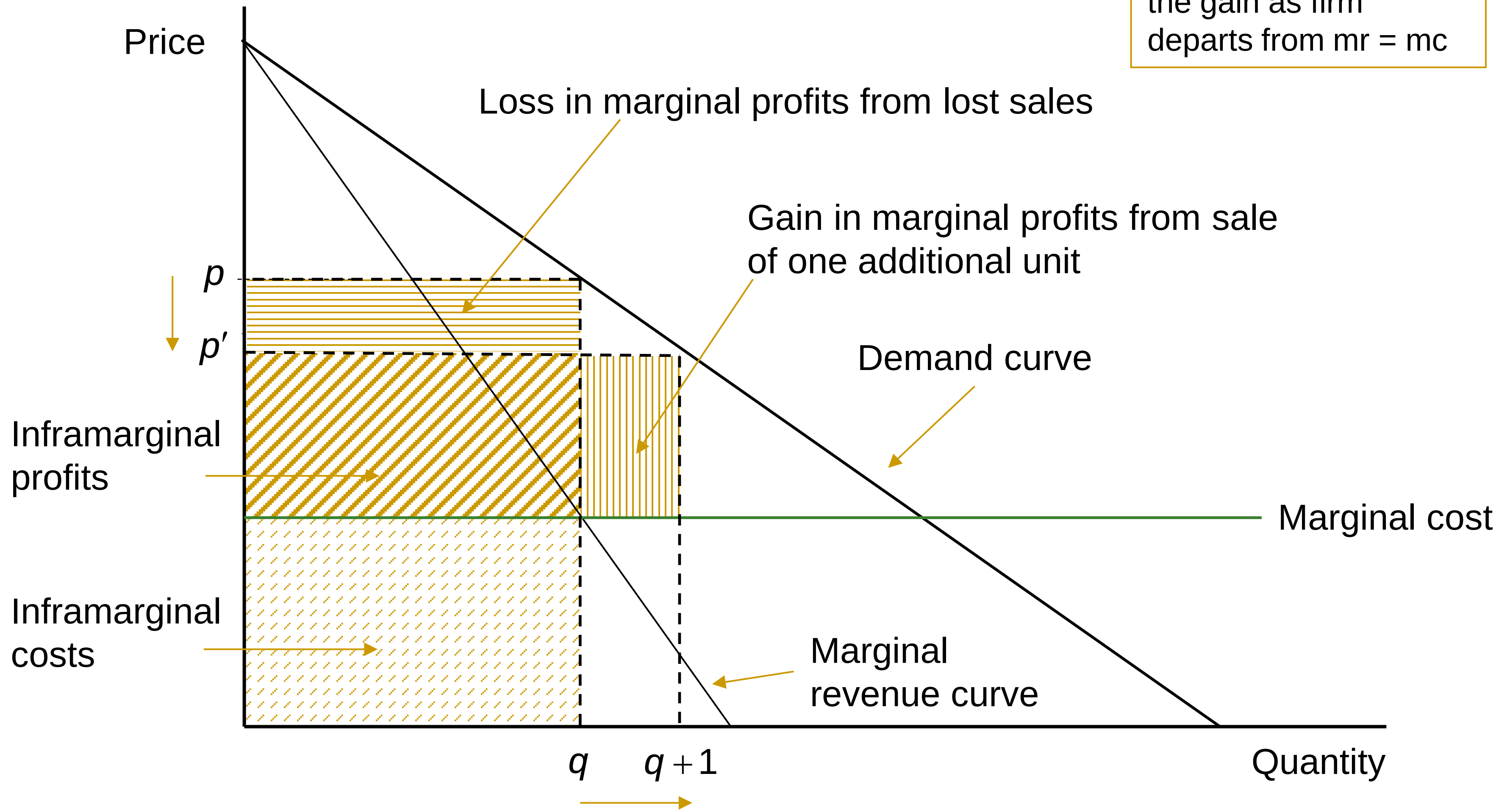
Margin loss on preexisting sales from decrease in price

So, at a profit maximum, the gain of the gross margin of an incremental sale is equal to the margin loss on preexisting sales *q* resulting from the price decrease *dp*/*pq* necessary to clear the market

Cournot competition

- Profit maximization under Cournot competition

Loss is greater than the gain as firm departs from mr = mc



Bertrand competition

- Consider a firm's profit-maximizing function when it competes in *price*:

$$\max_p \pi = pq(p) - c(q(p))$$

Here, firms compete using firm price as the control variable. Economists call this *Bertrand competition*.

- First order condition for a profit maximum:

$$\frac{d\pi}{dp} = q + p\frac{dq}{dp} - \frac{dc}{dq}\frac{dq}{dp} = 0$$

$$= q + \left(p - \frac{dc}{dq}\right)\frac{dq}{dp} = 0$$

Price minus marginal cost = Gross margin

Change in market-clearing quantity with an increase in price (i.e., loss of sales due to a price increase)

Gross revenue gain from selling *q* units when the price increases by 1

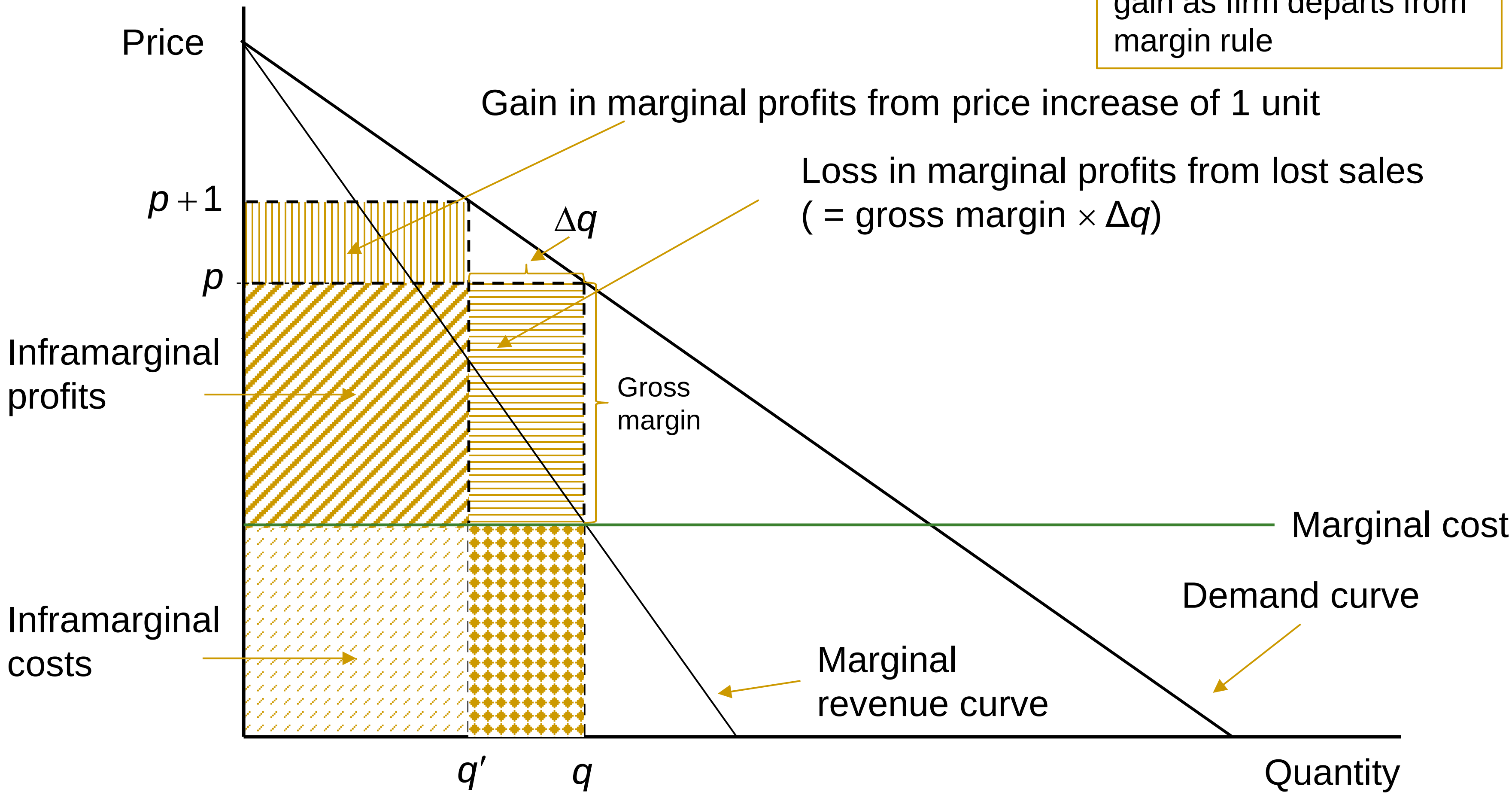
Gross margin times the loss of sales = gross revenue loss from lost sales

- So at a profit maximum, the gross profit gain from increased prices on retained sales equals the gross profit loss from losing the entire gross margin on lost sales

Bertrand competition

- Profit maximization under Bertrand competition

Loss is greater than the gain as firm departs from margin rule



Summary: Cournot and Bertrand competition

- Cournot competition
  - Firms compete in quantities
  - Most useful in homogenous product markets
  - *FOC*: Marginal revenue = marginal cost

$$mr = mc$$

$$p + q\frac{dp}{dq} = \frac{dc}{dq}$$

- Bertrand competition
  - Firms compete in prices
  - Most useful in differentiated product markets
  - FOC: Gross revenue gain from selling *q* units when the price increases by 1 = gross margin times the loss of sales

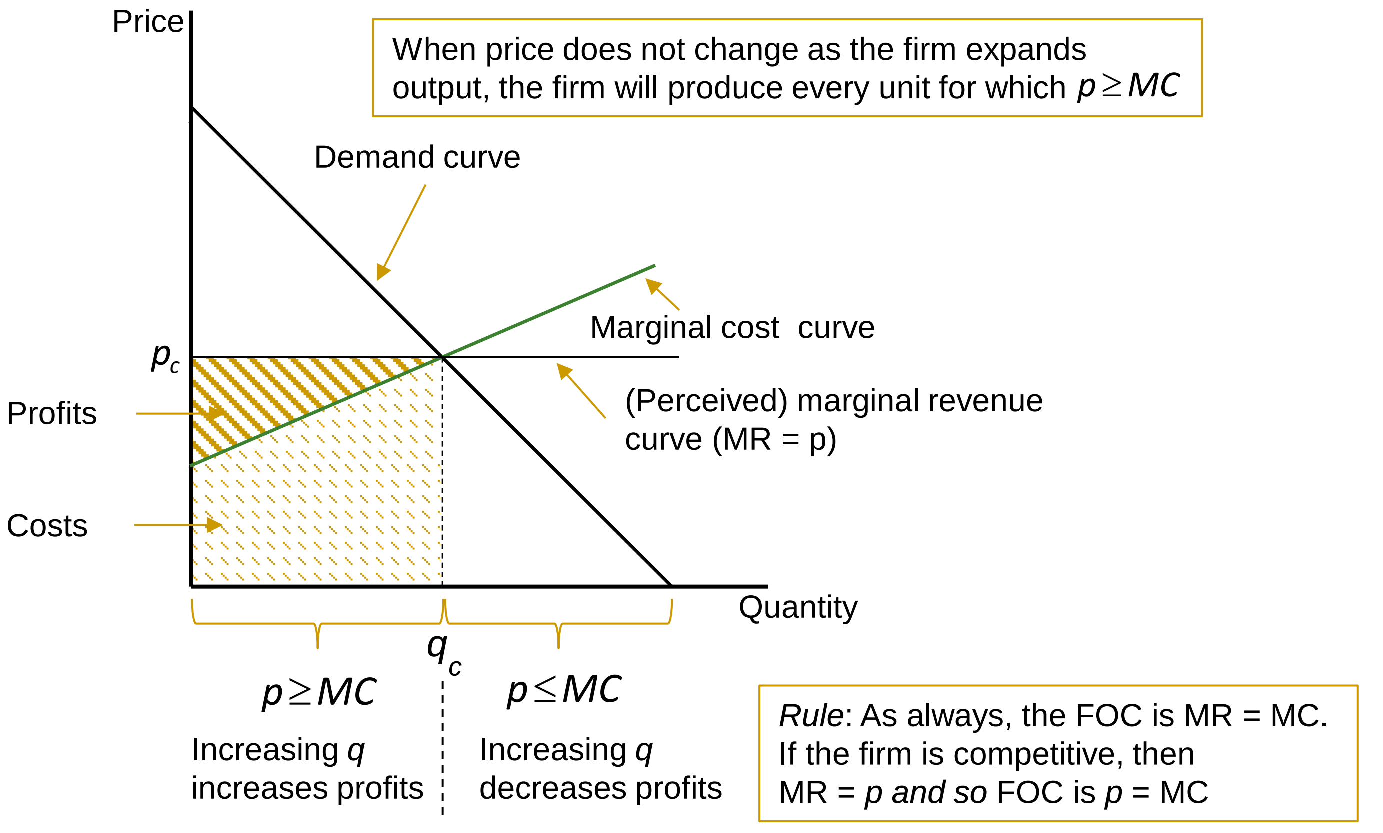
$$\text{Gross revenue gain} = \text{Gross revenue loss}$$

$$q = \left(p - \frac{dc}{dq}\right)\frac{dq}{dp}$$

Perfect Market Equilibria

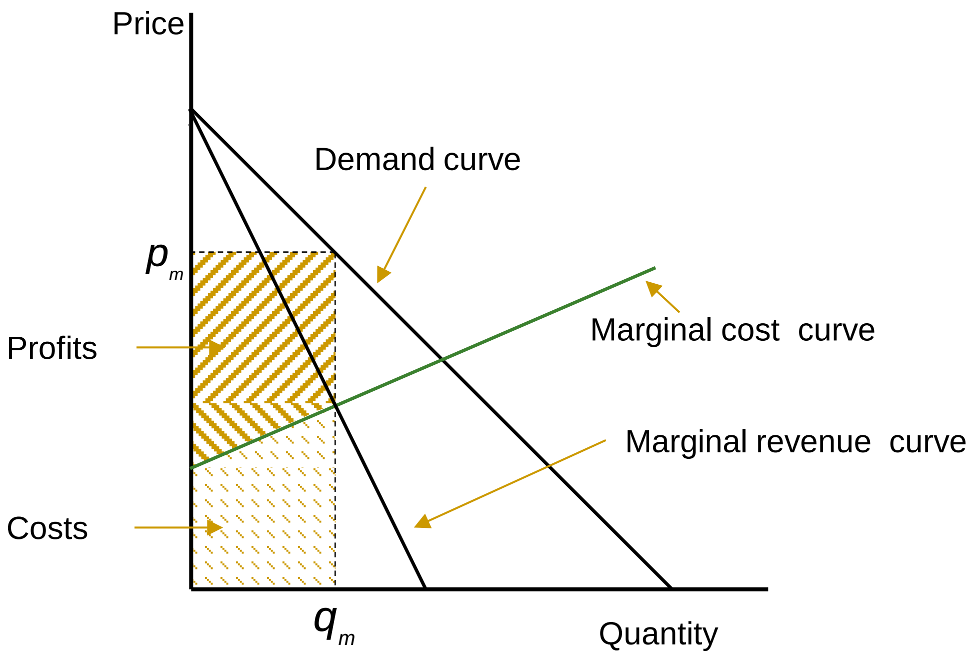
Competitive firms

- Competitive firms take prices as given
  - → Individual output decisions do not affect the market-clearing price



Monopolist Firm

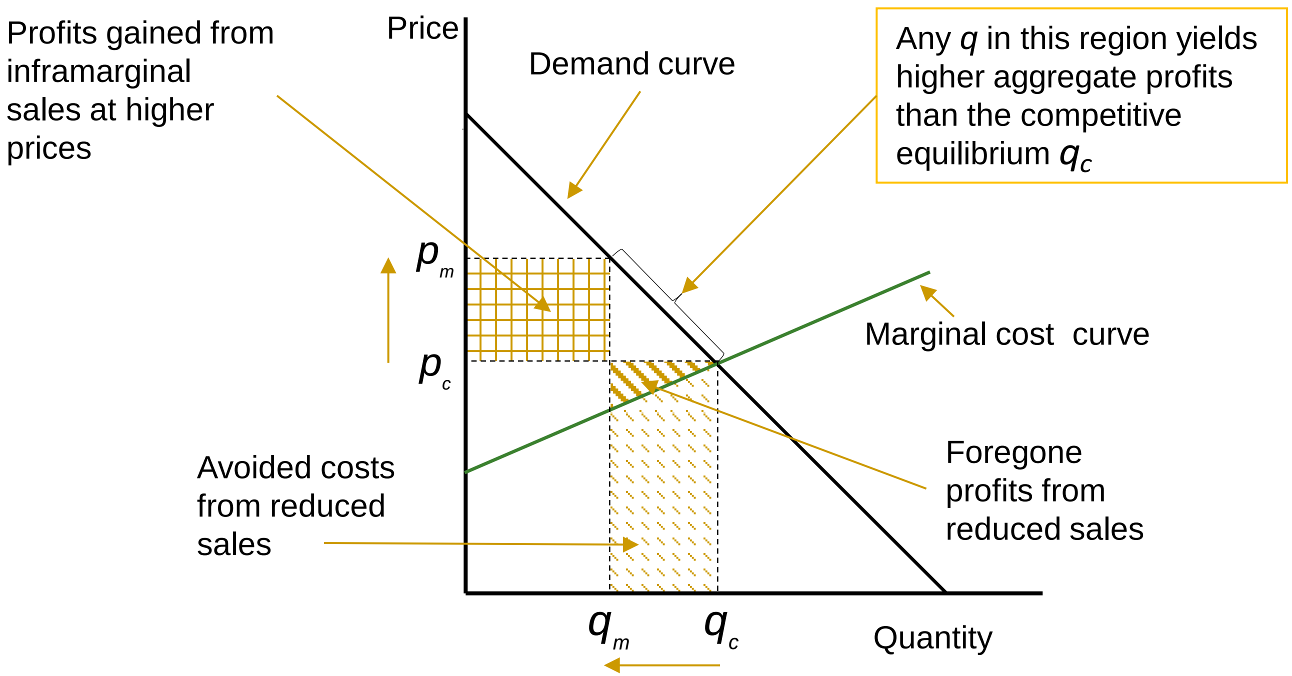
- A monopolist choice of output *q* affects the market-clearing price *p*



Rule: Monopolists price at MR = MC, where marginal revenue is determined by the aggregate demand curve

Gains from Coordination

- Why firms in a competitive market have an incentive to coordinate



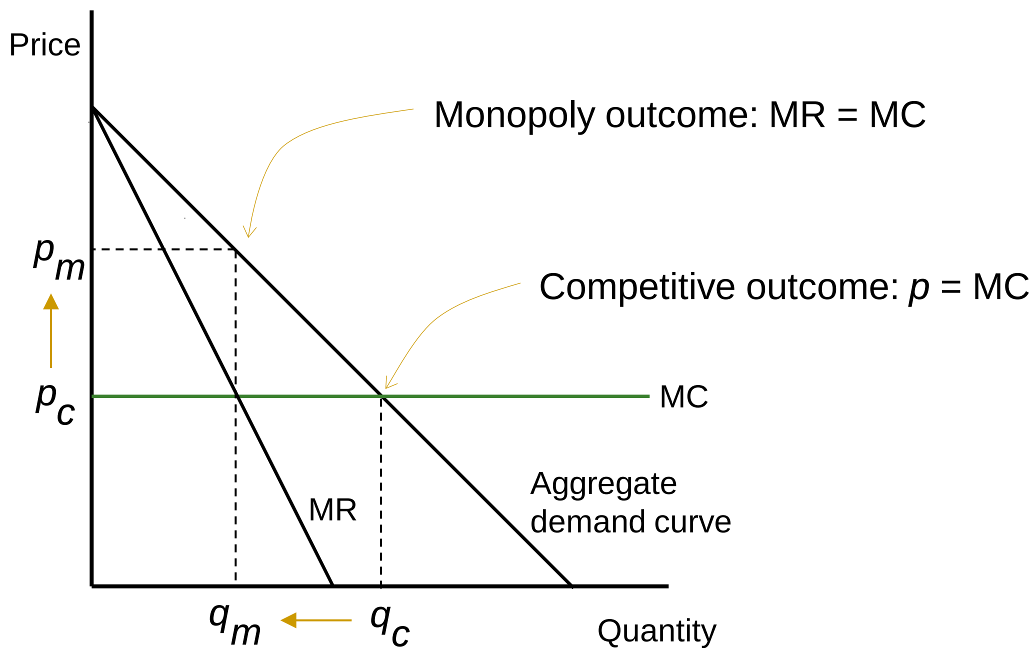
Public policy on monopolies

- Modern view on why monopolies are bad:
  - Increase price and decrease output
  - Shift wealth from consumers to producers
  - Create economic inefficiency (“deadweight loss”)

  - May (or may not) have other socially adverse effects
    - Decrease product or service quality
    - Decrease the rate of technological innovation or product improvement
    - Decrease product choice

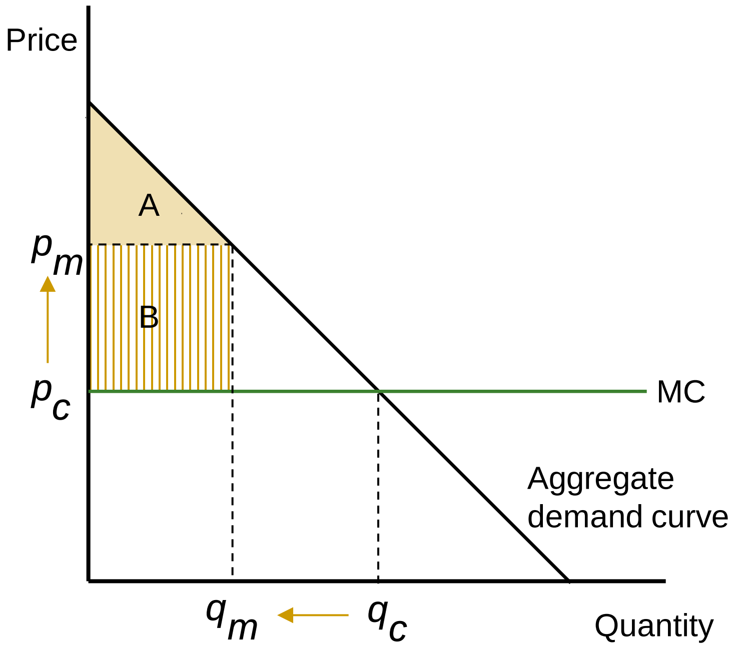
Public policy on monopolies

- Output decreases: $q_c \searrow q_m$
- Prices increase: $p_c \nearrow p_m$



Public policy on monopolies

- Shift in wealth from inframarginal consumers to producers*
  - Total wealth created ("surplus"): A + B
  - Sometimes called a "rent redistribution"

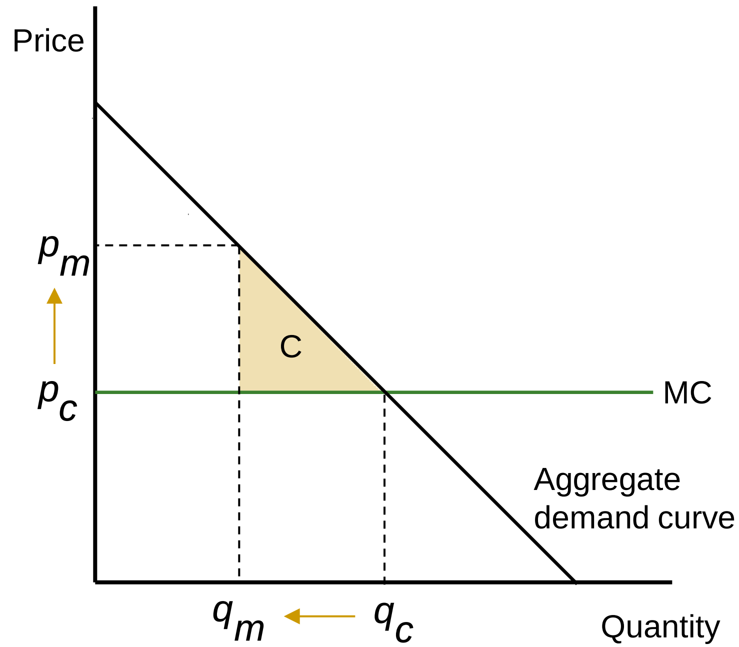


	Competitive	Monopoly
Consumers	A + B	A
Producers	0	B

* Inframarginal customers here means customers that would purchase at both the competitive price and the monopoly price

Public policy on monopolies

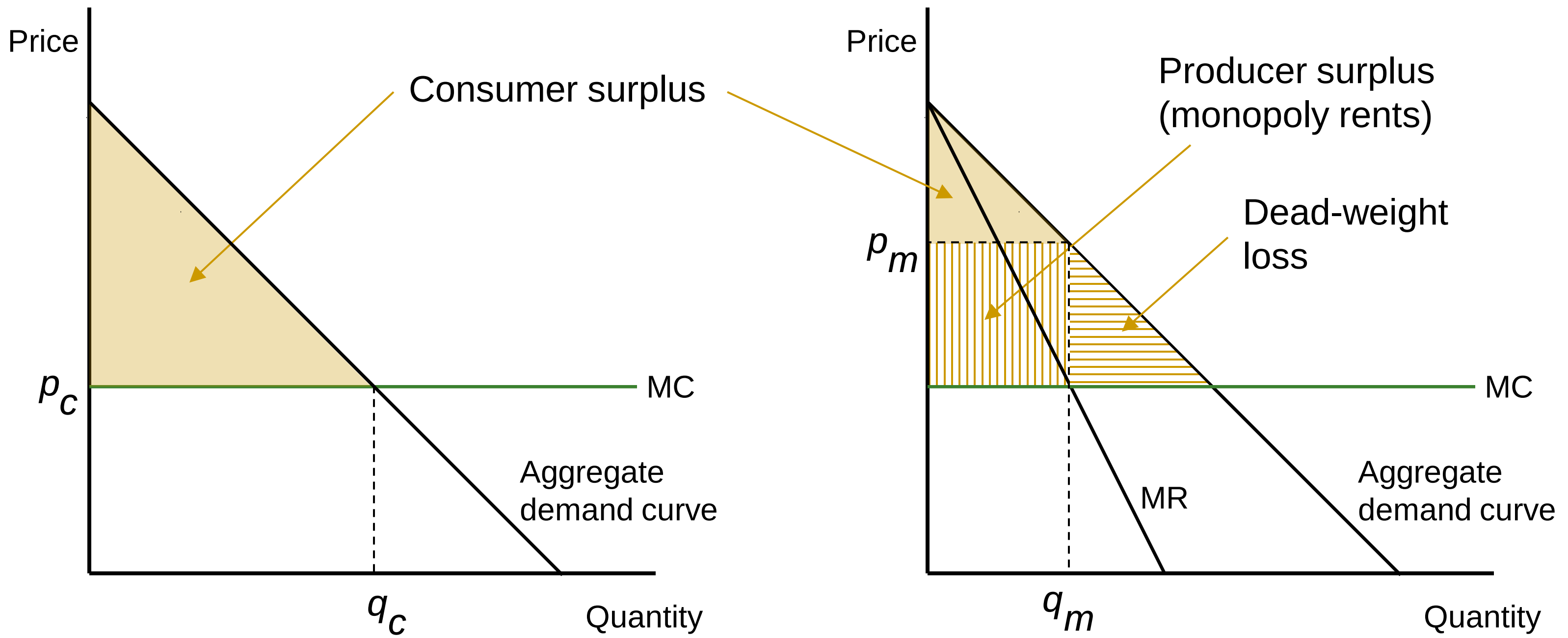
- “Deadweight loss” of surplus of marginal customers*
  - Surplus C just disappears from the economy
  - Creates “allocative inefficiency” because it does not exhaust all gains from trade



* Marginal customers here means customers that would purchase at both the competitive price and the monopoly price

Public policy on monopolies

1. Shift in wealth from consumers to producers
2. Deadweight loss
3. May retard innovation

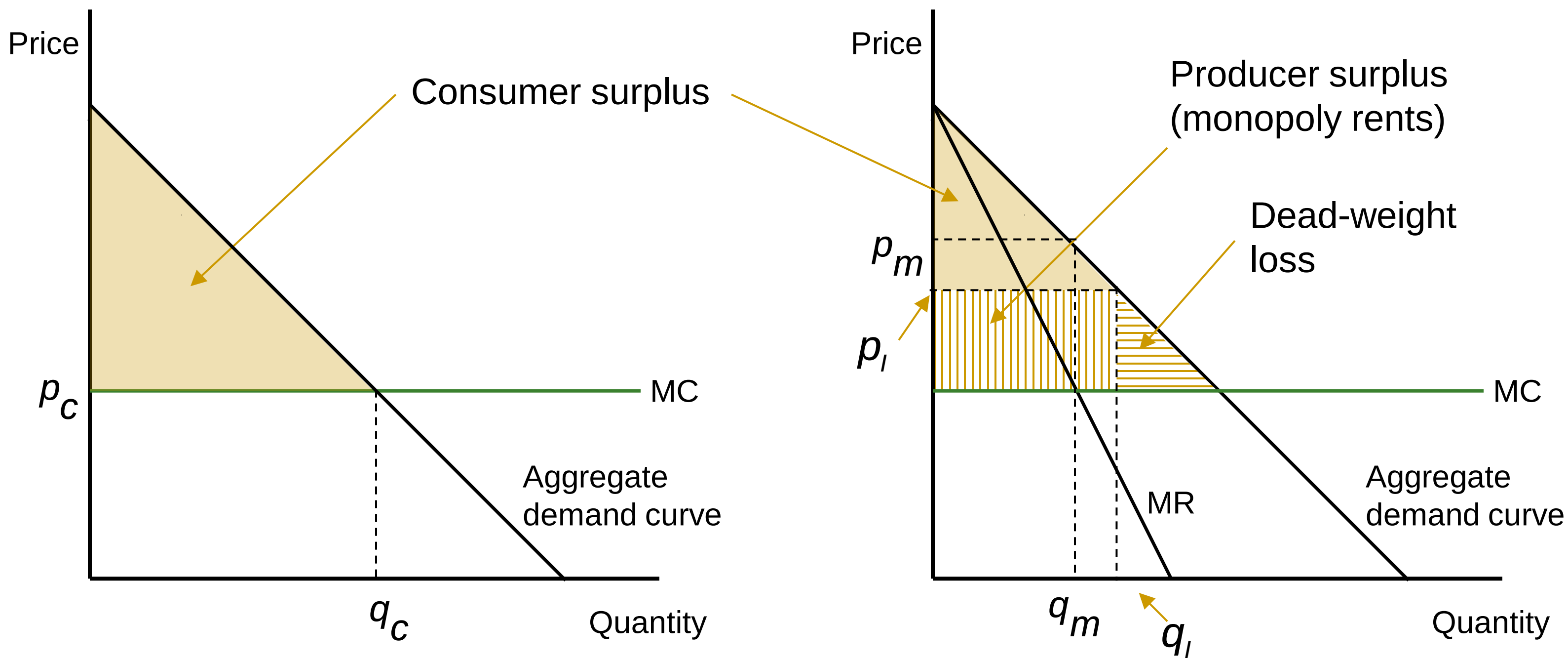


Perfectly Competitive Market

Perfect Monopoly Market

Oligopolies

- What if the merger does yields something less than a monopoly?
  - Can result in the shift of wealth and deadweight loss, only smaller in magnitude



Perfectly Competitive Market | Oligopolistic Market

Some oligopoly models

- Cournot oligopoly
  - Shown in the notes:

$$\sum_{i=1}^{N} \frac{p - c_i'}{p} s_i = \frac{HHI}{\varepsilon}$$

- Bertrand oligopoly
- Dominant firm with a competitive fringe

Other Concepts

Market power

- Some definitions
  - "As an economic matter, market power exists whenever prices can be raised above the levels that would be charged in a competitive market."
  - "Market power is usually stated to be the ability of a single seller to raise price and restrict output, for reduced output is the almost inevitable result of higher prices."
  - "Market power generally is defined as the power of a firm to restrict output and thereby increase the selling price of its goods in the market."
  - Market power means "by definition, means that the defendant can produce anticompetitive effects."
  - "A merger enhances market power if it is likely to encourage one or more firms to raise price, reduce output, diminish innovation, or otherwise harm customers as a result of diminished competitive constraints or incentives."

Measuring market power

- The Lerner index
  - Recall that in a competitive market, firms set price equal to marginal cost
  - The traditional measure of market power is the *price-cost margin* or *Lerner index L*, which is a measure of how much price has been marked up:

$$L = \frac{p - mc}{p}$$

  - *L* is the gross margin as a fraction of price
  - Note that in a competitive market $L = 0$ and that *L* increases as price increases relative to marginal cost

Substitutes

- Definition
  - Two products or services are *substitutes* if, when consumer demand increases for one product, it will decrease for the other product
    - Firms compete with each other when they offer substitute products
    - *Horizontal mergers* involve combinations of firms that offer substitute products

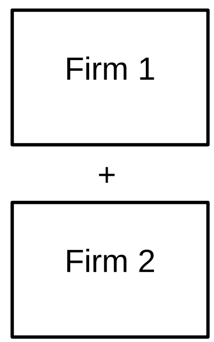
Firm 1 + Firm 2

- Mathematically,

$$\frac{\partial q_2}{\partial q_1} < 0 \quad \text{or equivalently} \quad \frac{\partial q_1}{\partial p_1}\frac{\partial q_2}{\partial q_1} = \frac{\partial q_2}{\partial p_1} < 0 \Rightarrow \frac{\partial q_2}{\partial p_1} > 0$$

Complements

- Definition
  - Two products are *complements* if, when a consumer demand increases for one product, consumer demand also will increase for the other product
    - *Vertical mergers* involve complement products and services that are in the same chain of manufacturing and distribution



- Mathematically,

$$\frac{\partial q_2}{\partial q_1} > 0 \quad \text{or equivalently} \quad \frac{\partial q_1}{\partial p_1}\frac{\partial q_2}{\partial q_1} = \frac{\partial q_2}{\partial p_1} > 0 \Rightarrow \frac{\partial q_2}{\partial p_1} < 0$$

Elasticities

- Elasticity of demand
  - *Problem*: Changes in the absolute quantities demanded can vary with changes in the unit of measure
    - Example: You get different numbers for the change in demand for razor blades with an increase in demand for razor if razor blades are measured in (a) units or (b) ounces
  - *Solution*: Find a measure of change that is dimensionless (free of units)
    - The percentage change in the quantity demanded for a given percentage change in price will do this. This is called an *elasticity of demand*.
    - The elasticity of demand will not change with a change in the unit of measure of either prices or quantities

Elasticities

- Own-elasticity of demand
  - *Definition*: The percentage change in the quantity demanded divided by the percentage change in the price of that *same* product.

$$\varepsilon = \frac{\dfrac{\Delta q_i}{q_i}}{\dfrac{\Delta p_i}{p_i}}$$

Percentage change q_i in the quantity of product *i* demanded

Percentage change p_i in the price of product *i*

- Using a little algebra:

$$\varepsilon = \frac{\dfrac{\Delta q_i}{q_i}}{\dfrac{\Delta p_i}{p_i}} = \frac{\dfrac{p_i}{\Delta p_i}}{\dfrac{p_i}{\Delta p_i}} = \frac{\Delta q_i}{\Delta p_i}\frac{p_i}{q_i}$$

Slope of the (residual) demand curve: Always negative

- Own-elasticities are negative, due to the downward-sloping nature of the demand curve

Elasticities

- Cross-elasticity of demand
  - *Definition*: The percentage change in the quantity demanded for product *j* divided by the percentage change in the price of product *i*.

$$\varepsilon_{ij} = \frac{\dfrac{\Delta q_j}{q_j}}{\dfrac{\Delta p_i}{p_i}}$$

Percentage change q_j in the quantity of product *j* demanded

Percentage change p_i in the price of product *i*

- Cross-elasticities are positive for substitutes and negative for complements

$$\varepsilon_{ij} = \frac{\dfrac{\Delta q_i}{q_i}}{\dfrac{\Delta p_j}{p_j}} = \frac{\dfrac{p_j}{\Delta p_j}}{\dfrac{p_j}{\Delta p_j}} = \frac{\Delta q_i}{\Delta p_j}\frac{p_j}{q_i}$$

Positive for substitutes
Negative for complements

Elasticities

- Some conventions and definitions
  - By convention, economists speak of elasticities in terms of their absolute values
- Own-elasticities
  - *Inelastic demand*: Own demand where the quantity demanded does not change significantly with changes in the product's price. *Not price sensitive*. $\left(|\varepsilon| < 1\right)$

This means take the "absolute value ((so, for example $|-0.5| = 0.5$), and so makes own-elasticities positive numbers.

$$|\varepsilon| = \frac{\text{%change in quantity}}{\text{%change in price}} < 1$$

Inelastic demand

  - *Unit elasticity*: Where a 1% change in the product's price results in a 1% decrease in the quantity demanded $\left(|\varepsilon| = 1\right)$

$$|\varepsilon| = \frac{\text{%change in quantity}}{\text{%change in price}} = 1$$

Unit elasticity

  - *Elastic demand*: Own demand where the quantity demanded drops rapidly with small changes in price. *Very price sensitive*. $\left(|\varepsilon| > 1\right)$

$$|\varepsilon| = \frac{\text{%change in quantity}}{\text{%change in price}} > 1$$

Elastic demand

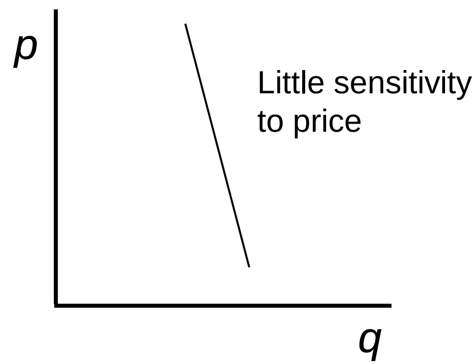
Elasticities

- Elasticity of demand—More definitions
  - Cross-elasticities
    - *High cross-elasticity of demand*: A small change in the price of product *i* will cause a large shift of demand to product *j*
      - As a result, product *j* brings a lot of competitive pressure on product *i*
    - *Low cross-elasticity of demand*: A large change in the price of product *i* will cause only a small shift of demand to product *j*
      - As a result, product *j* brings little competitive pressure on product *I*

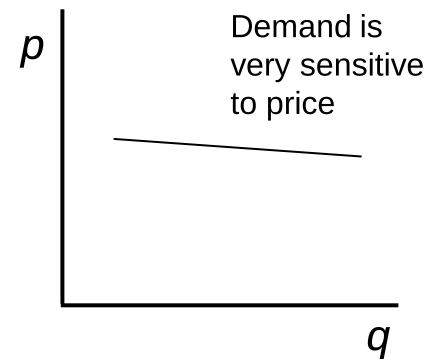
Elasticities

- Own-elasticities and linear demand curves
  - Some (erroneous) graphics for the intuition:

Very inelastic demand



Very elastic demand



  - Why are these diagrams erroneous?
    - Remember:

$$\varepsilon = \frac{\frac{\Delta q_i}{q_i}}{\frac{\Delta p_i}{p_i}} = \frac{\frac{p_i}{\Delta p_i}}{\frac{p_i}{\Delta p_i}} = \frac{\Delta q_i}{\Delta p_i} \frac{p_i}{q_i}$$

Slide of the (residual) demand curve

Elasticities are measured at a particular point (p,q) on the demand curve

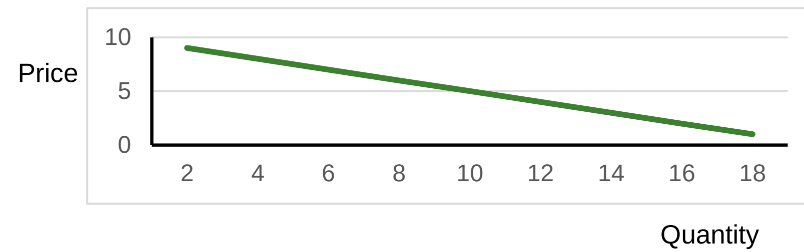
    - The slope of the demand curve is constant, but the ratio p_i/q_i changes along the curve. Therefore, the elasticity is not constant on a linear demand curve.

Elasticities

- Elasticity of demand and the slope of the demand curve
  - *Example:*
    - Demand curve: $q = 20 - 2p$ → Inverse demand curve: $p = 10 - \frac{1}{2}q$

Inelastic portion of the demand curve

Elastic portion of the demand curve



Elastic

Inelastic

p	q	Slope	p/q	ε	
1	18	-2	0.0556	-0.1111	Inelastic demand
2	16	-2	0.1250	-0.2500	
3	14	-2	0.2143	-0.4286	
4	12	-2	0.3333	-0.6667	
5	10	-2	0.5000	-1.0000	Unit elasticity
6	8	-2	0.7500	-1.5000	Elastic demand
7	6	-2	1.1667	-2.3333	
8	4	-2	2.0000	-4.0000	
9	2	-2	4.5000	-9.0000	

Rule for linear demand curves: Elasticity increases as price increases

Elasticities

- Elasticity of demand and the slope of the demand curve

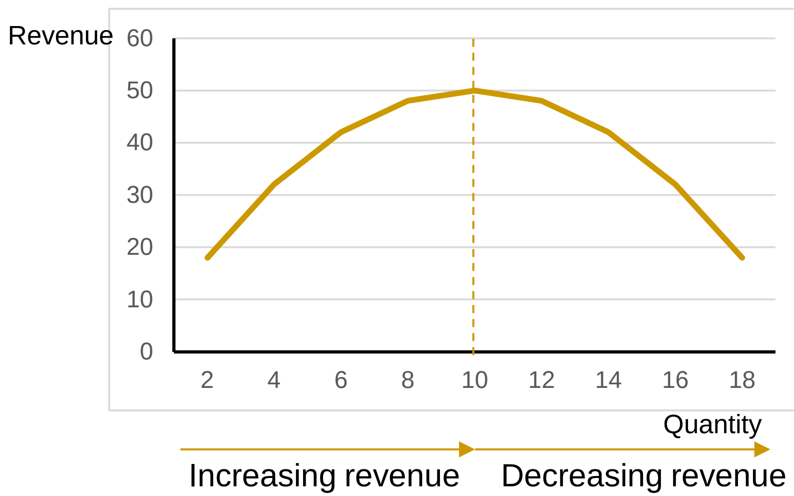
Demand curve:
$p = 20 - 2q$

p	q	Slope	p/q	ε	Total revenue
1	18	-2	0.0556	-0.1111	18
2	16	-2	0.1250	-0.2500	32
3	14	-2	0.2143	-0.4286	42
4	12	-2	0.3333	-0.6667	48
5	10	-2	0.5000	-1.0000	50
6	8	-2	0.7500	-1.5000	48
7	6	-2	1.1667	-2.3333	42
8	4	-2	2.0000	-4.0000	32
9	2	-2	4.5000	-9.0000	18

Inelastic demand (rows 1–4) — Increasing revenue

Unit elasticity (row 5)

Elastic demand (rows 6–9) — Decreasing revenue



This is why elasticities are meaningful

Elasticities