Economics for Business Environment

Unit 3

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Lecture Outline

Intended Learning Outcomes

Today we take the second step towards understanding how markets work.

After this lecture you should be able to understand and analyse:

- How the behaviour of firms and their economic interactions form supply.
- How the supply side of the economy works.
- Firm Theory and the Supply Curve.

The law of Supply

Law of Supply

The law of supply states a positive relationship between price and quantity supplied. A higher price leads to a higher quantity supplied and a lower price leads to a lower quantity supplied.

- Supply refers to the amount of some good or service firms are willing and able to supply at each price.
- **Supply curves** (graphs) and **supply schedules** (tables) are tools used to summarize the relationship between quantity supplied and price.

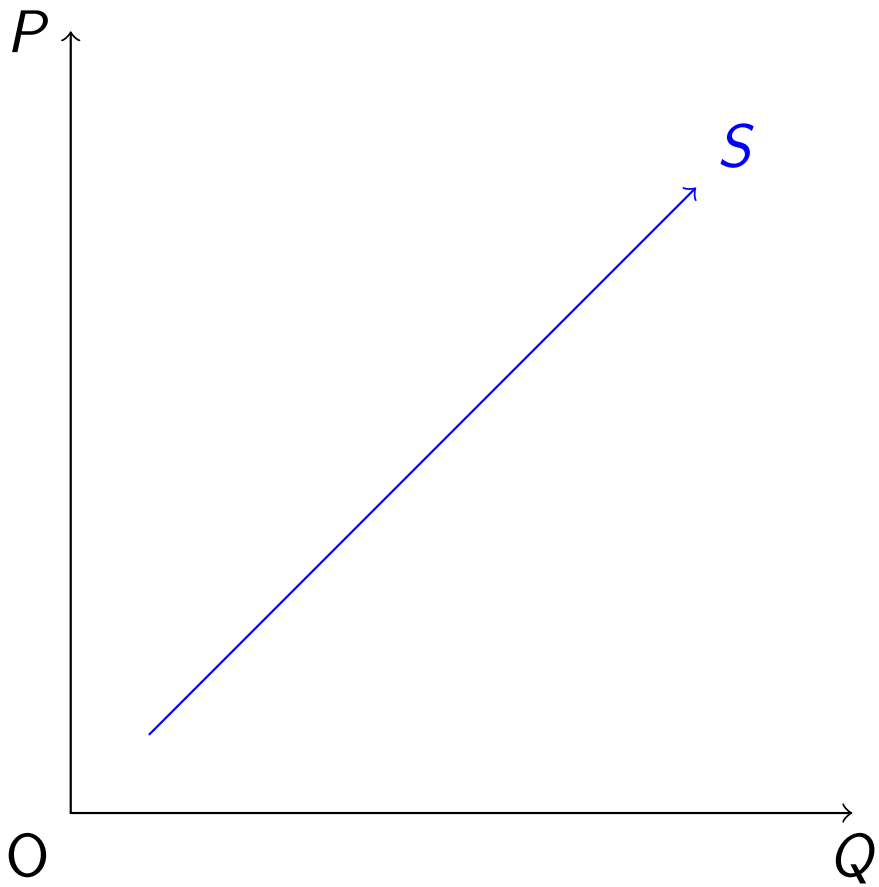
Supply curves and schedules

- The supply curve and the supply schedule are different representations of the same thing.
- The **supply equation**

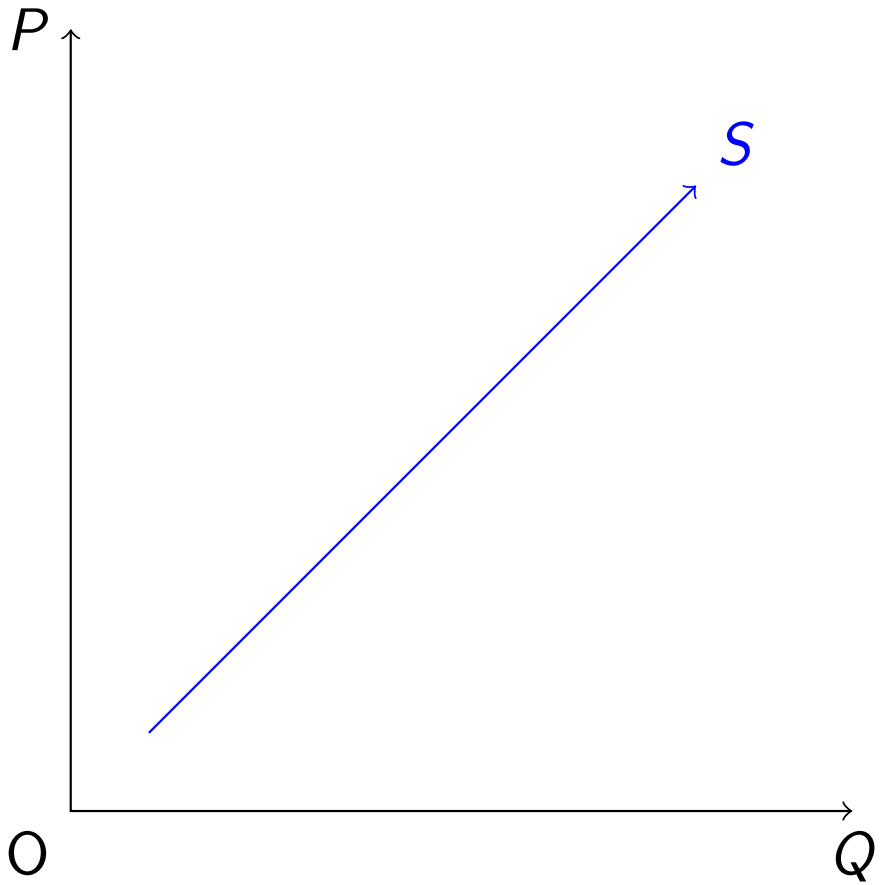
$$Q_S = a + b * P$$

Where Q_s is the quantity supplied, P is the price of the good, a is the intercept and b is the slope parameter

Supply curves and schedules



Supply curves and schedules



Price	Quantity
£1	3
£2	6
£3	9
£4	12
£5	15
£6	18

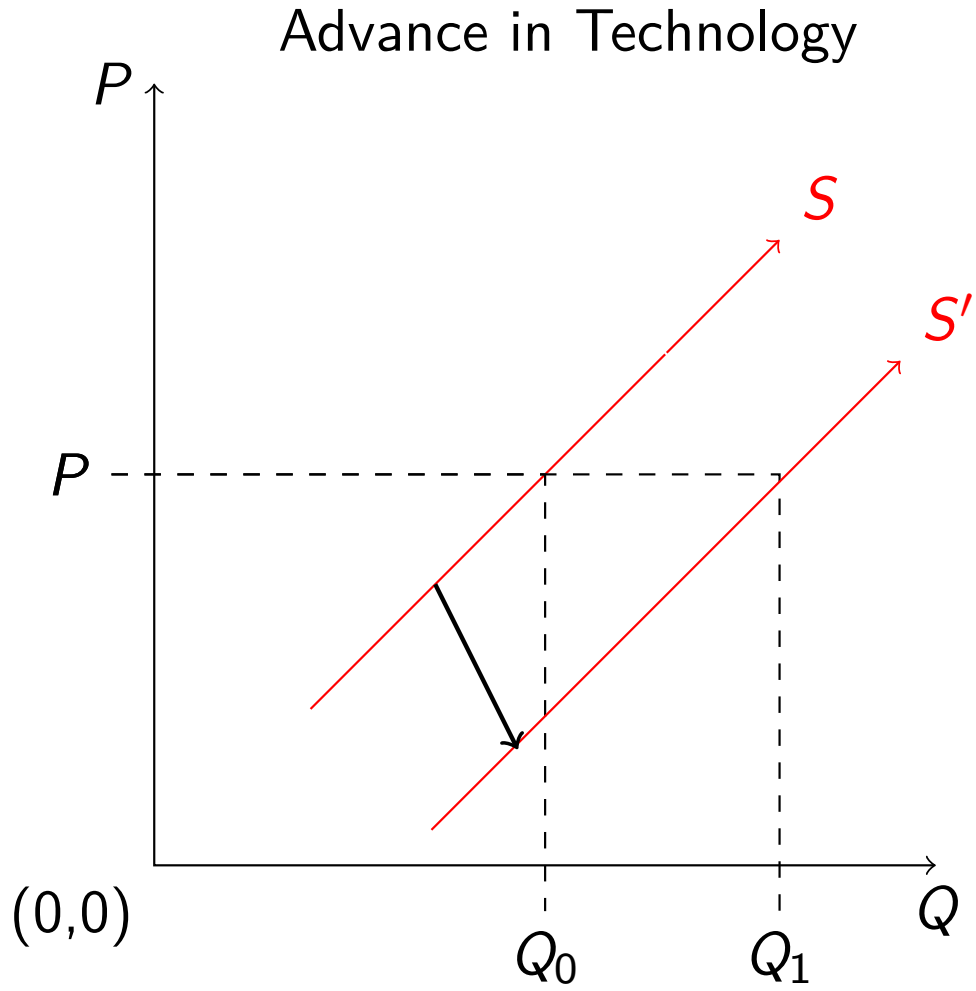
Table: Supply schedule

Factors that influence supply

Any change in price level represents a movement along the same supply curve. The supply curve will shift if any other factor that affects supply changes.

- Cost of the factors of production (land, labour, capital).
- Technology.
- External shocks, such as weather, war etc.
- Number of producers. As the number of firms producing a product increases, we would expect more supply to be available.

Supply and Technology



How is the supply curve derived?

- What determines the shape of the supply curve?
- How do firms decide about their supply?
- What is the relationship between input and output?
- How do costs vary with output?
- How do we measure profit, and how do we maximize it?

Profit

Profit

Profit is the main economic goal of any company. Every firm wants to maximize profits.

It is computed by deducting total cost from total revenue.

Formula

$$\pi = TR - TC$$

Total Revenue

Total Revenue is calculated by multiplying the price with the quantity of the good sold at that particular price.

Total Revenue

$$TR = P * Q$$

Total Cost

Total cost consists of:

- **Total Fixed Cost** (TFC), that are not dependent on the level of goods or services produced by the firm, such as rents or labour not associated with production.
- **Total Variable Cost** (TVC), costs associated with producing a good or service that change in direct proportion to the quantity produced or provided, such as raw materials, packaging or labour directly associated with production.

Total Cost

$$TC = TFC + TVC$$

Factors of Production

Factors of production:

- Land
- Labour
- Capital
- Entrepreneurship

- Rent
- Wages
- Interest
- Profit

Fixed or Variable factors ?

Example: Factors of Production

Bakery

- *Fixed factors*: cannot be increased in supply within a given time period
- The building that the bakery rents
- Capital, such as ovens used to bake goods
- *Variable factors*: can be increased in supply within a given time period
- Flour and other raw materials
- Utility bills depend on the quantity produced, e.g. ovens use electricity.

Short-run vs long-run

How is the operating period defined?

- **Short-run**
  - Period of time over which at least one factor is fixed
  - *Fixed cost is a short-run concept*
- **Long-run**
  - Period of time over which all factors are variable
  - *All costs are variable in the long-run*

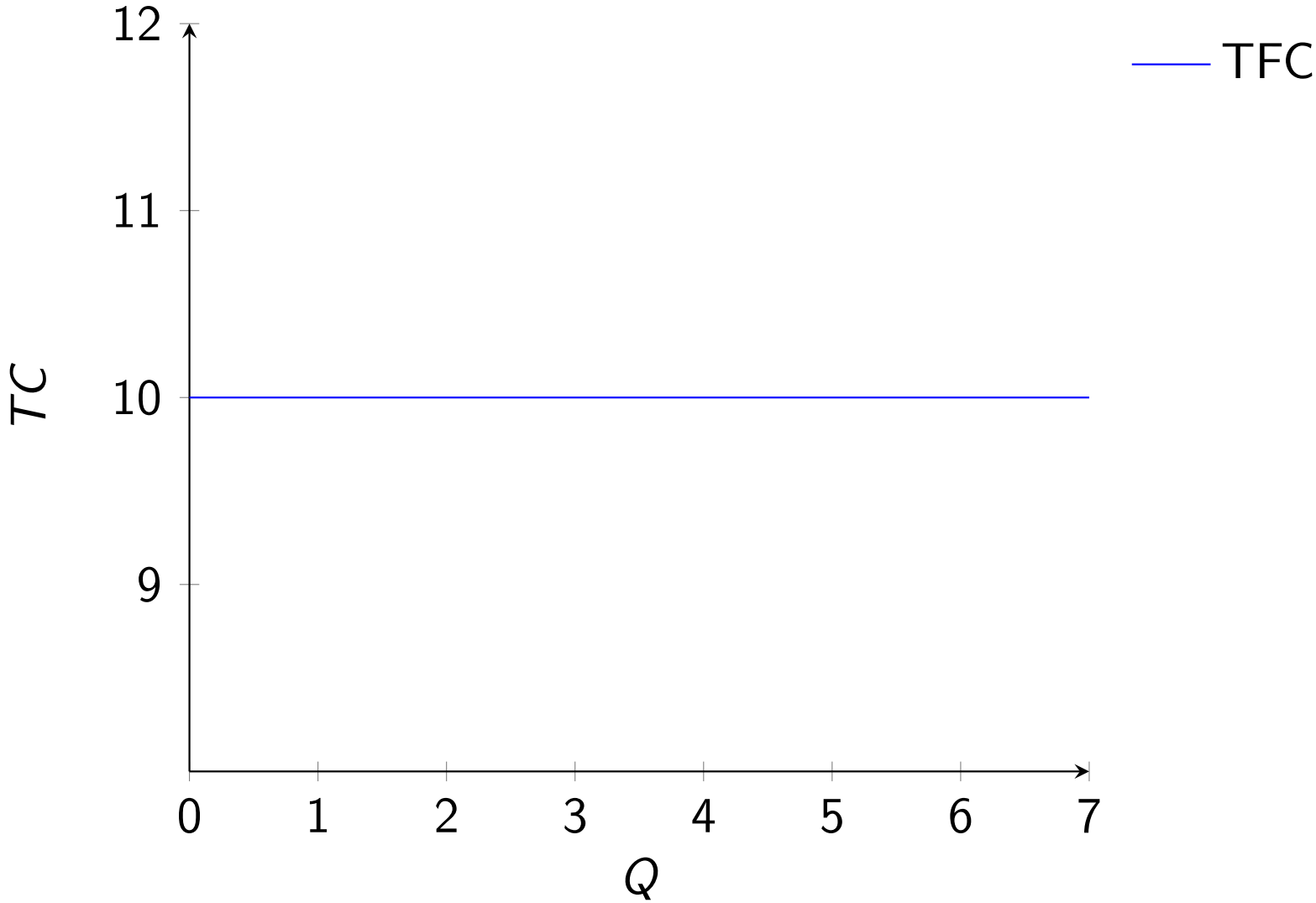
Short-run cost categories

Total cost $(TC) = TFC + TVC$

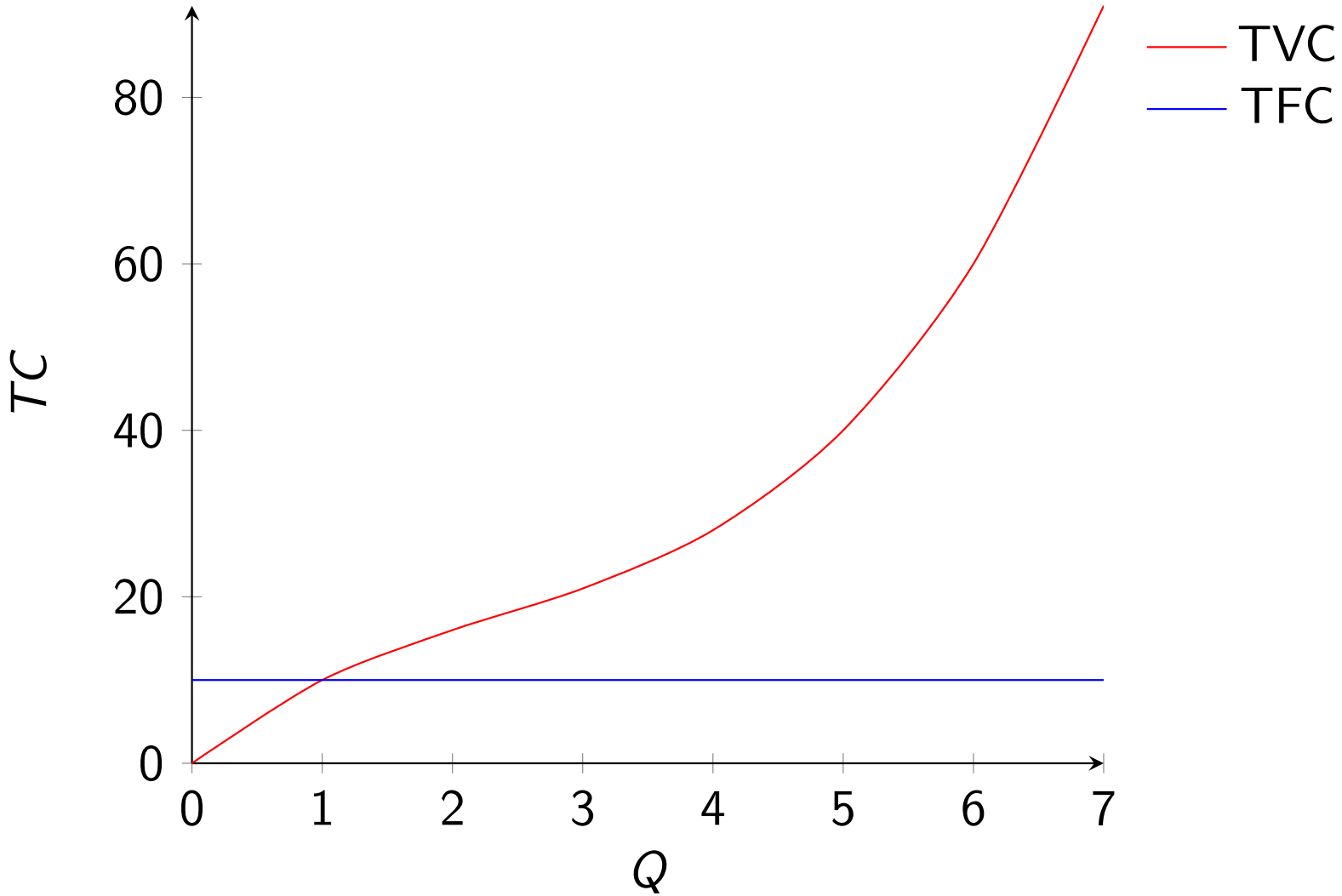
- *Total fixed costs (TFC)*, do not vary with amount of output produced
- *Total variable costs (TVC)*, do vary with amount of output produced

- Marginal cost: The cost of producing one more unit. $MC = \frac{\Delta TC}{\Delta Q}$
- Average total cost: Total cost per unit of output. $ATC = \frac{TC}{Q}$

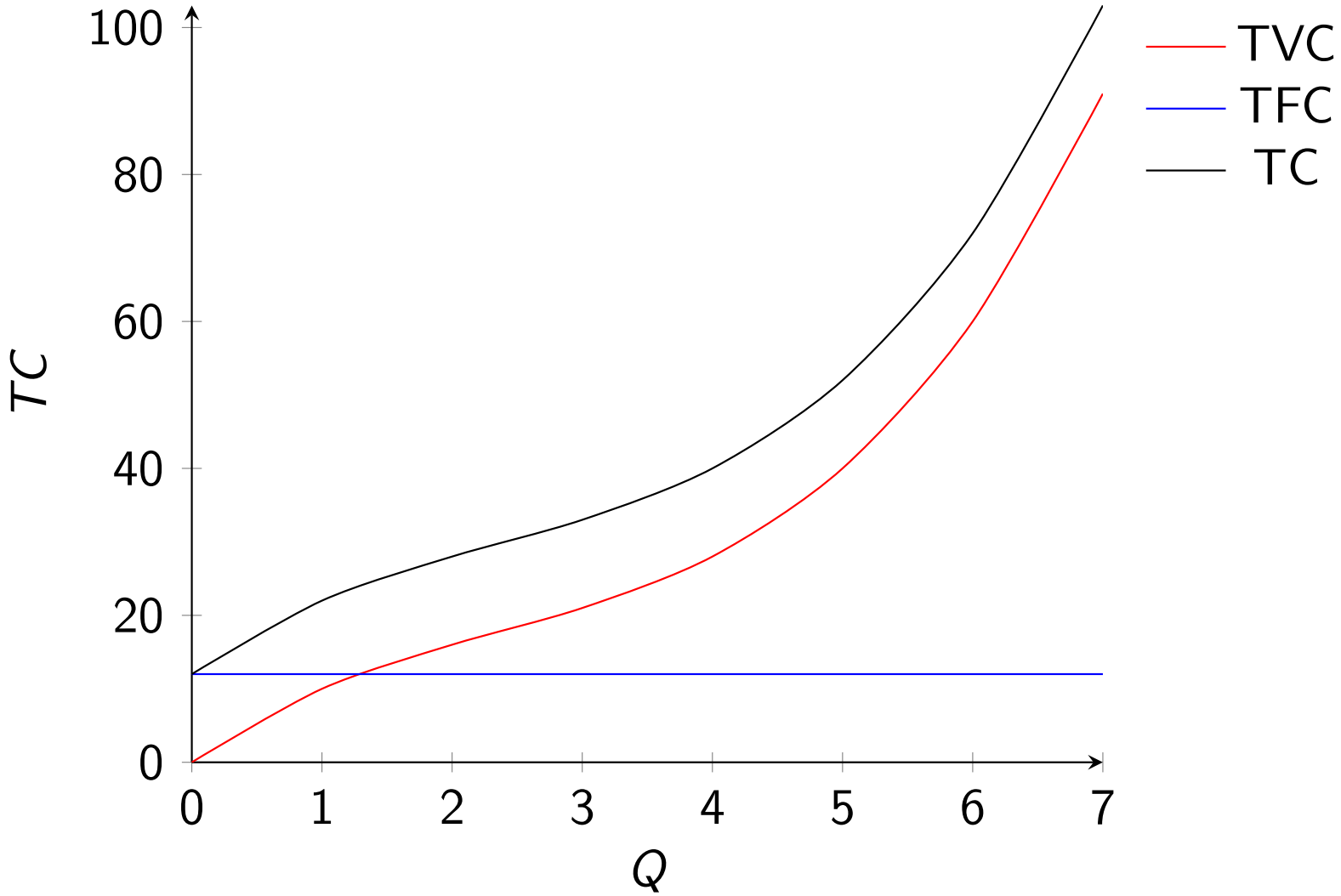
Fixed Cost Curve



TVC Curve



TVC Curve

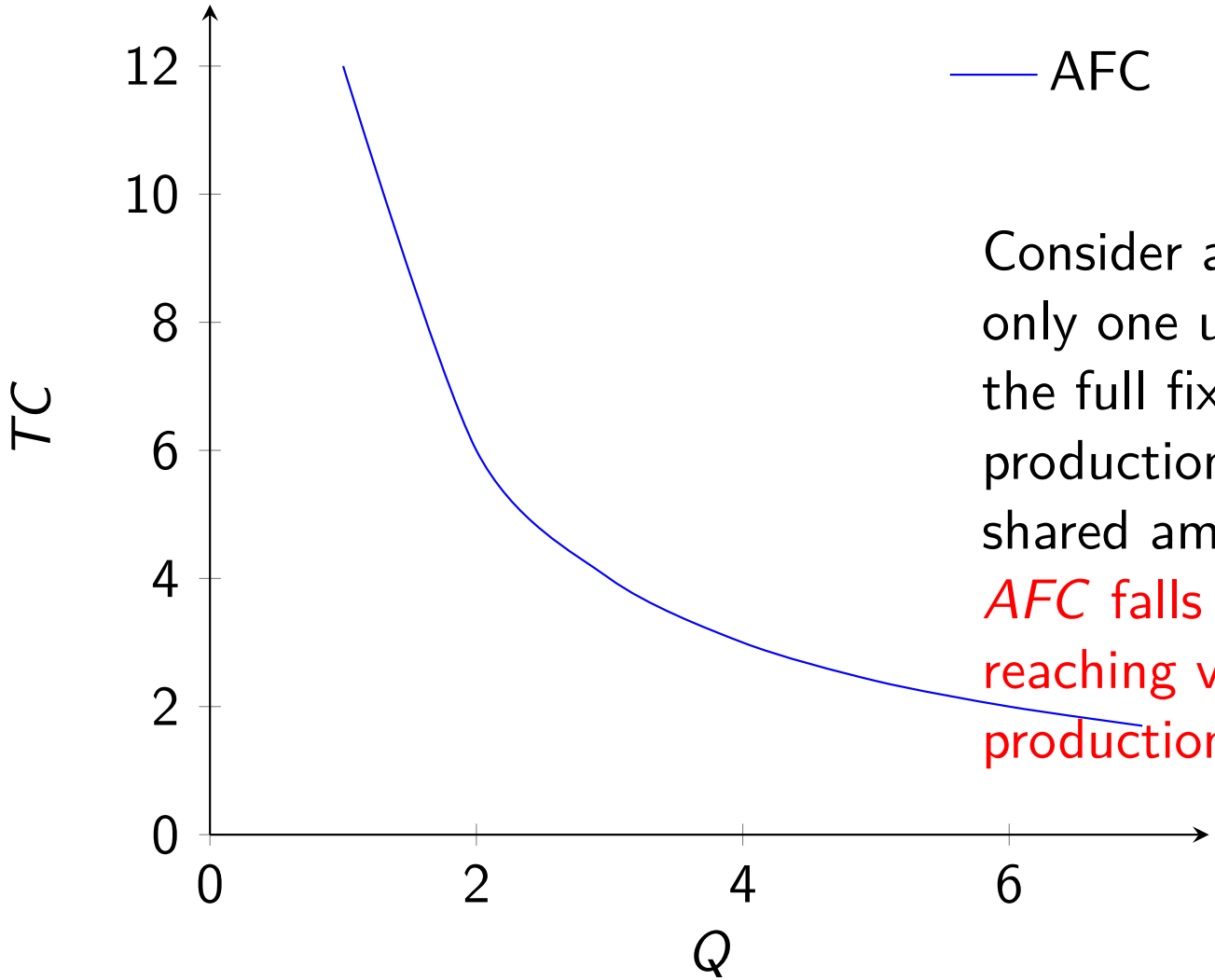


Costs in the Short-run

Table: Total, Marginal and Average Costs.

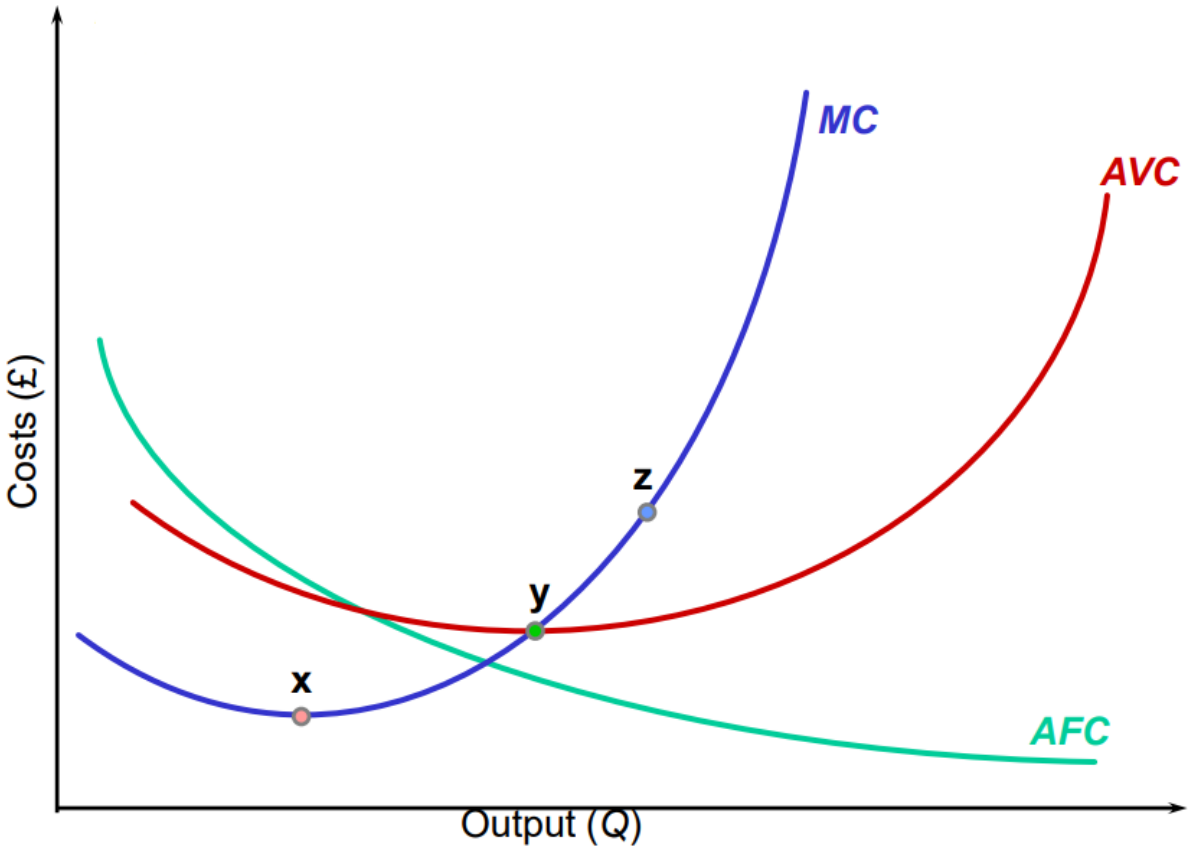
Output	TFC	TVC	TC	MC	AFC
0	12	0	12		
1	12	10	22	10	12
2	12	16	28	6	6
3	12	21	33	5	4
4	12	28	40	7	3
5	12	40	52	12	2.4
6	12	60	72	20	2
7	12	91	103	31	1.7

Average Fixed Cost and Quantity



Consider a firm that produces only one unit. This unit will bear the full fixed cost. But as production increases, the TFC is shared amongst more units. *AFC* falls rapidly at first, reaching very low levels as production increases.

Marginal and Average Costs



- The MC line crosses the *AVC* line at its lowest point (y) $MC = AVC$
- At point x the *MC* is minimized and AVC is decreasing.
- At point z *AVC* is increasing and $MC > AVC$

Marginal and Average Costs

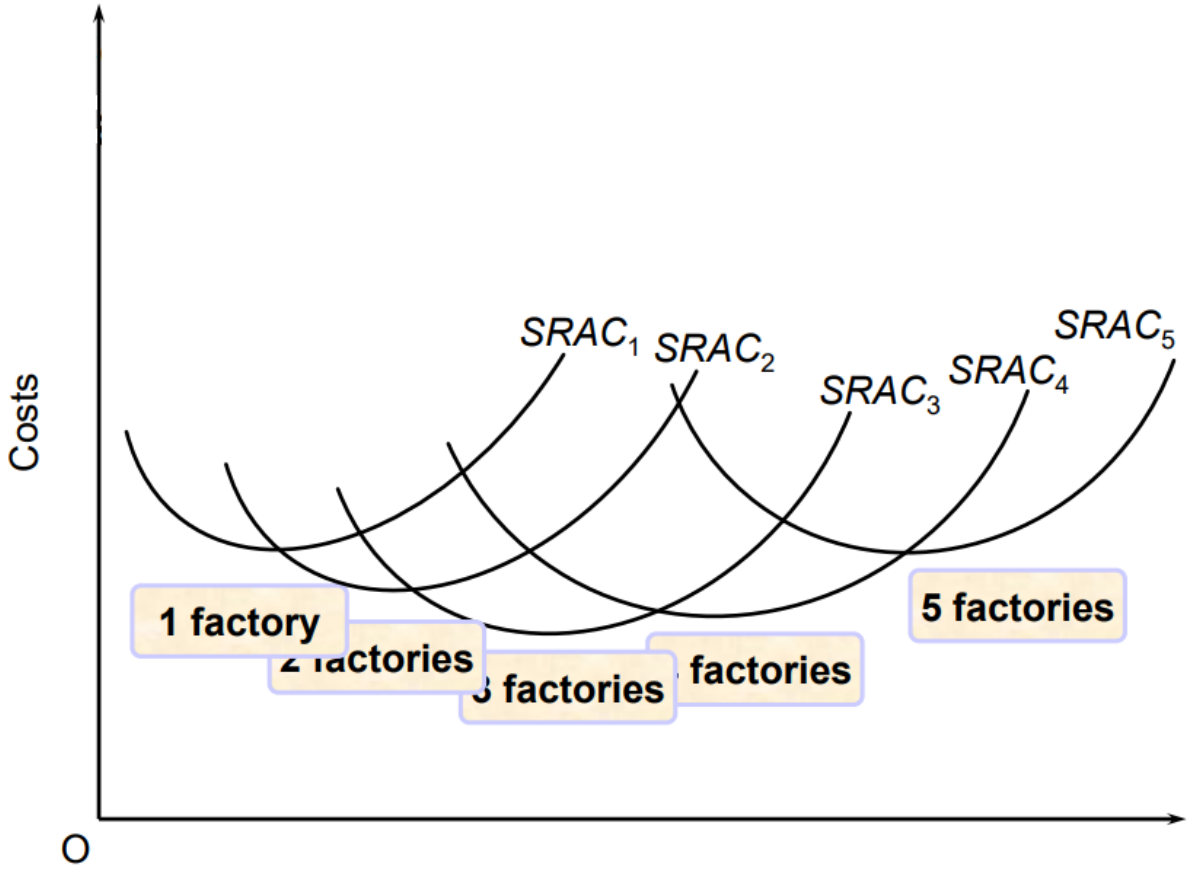
$$ATC = AFC + AVC$$

- The ATC is the sum of the AFC and the AVC
- The ATC is U-shaped. At first it falls and then starts increasing.
- At first, it falls because the TFC is shared between more units and MC is decreasing due to division of labour.
- Then, it rises due to diminishing marginal returns.

Economies and diseconomies of scale

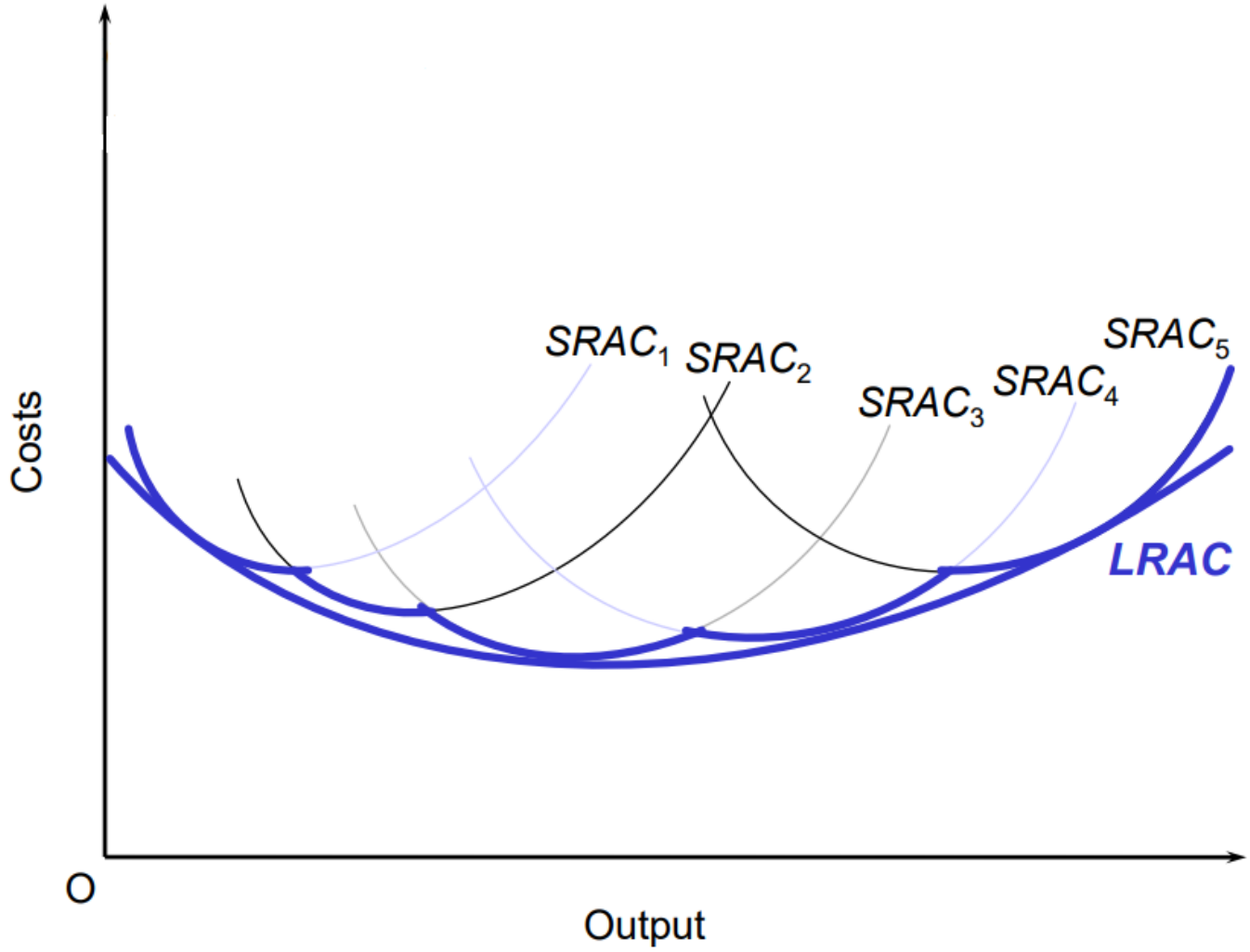
- Increasing returns to scale, or economies of scale: An increase in a firm's scale of production leads to lower costs per unit produced.
- Constant returns to scale: An increase in a firm's scale of production has no effect on costs per unit produced.
- Decreasing returns to scale, or diseconomies of scale: An increase in a firm's scale of production leads to higher costs per unit produced.

Deriving the LRAC

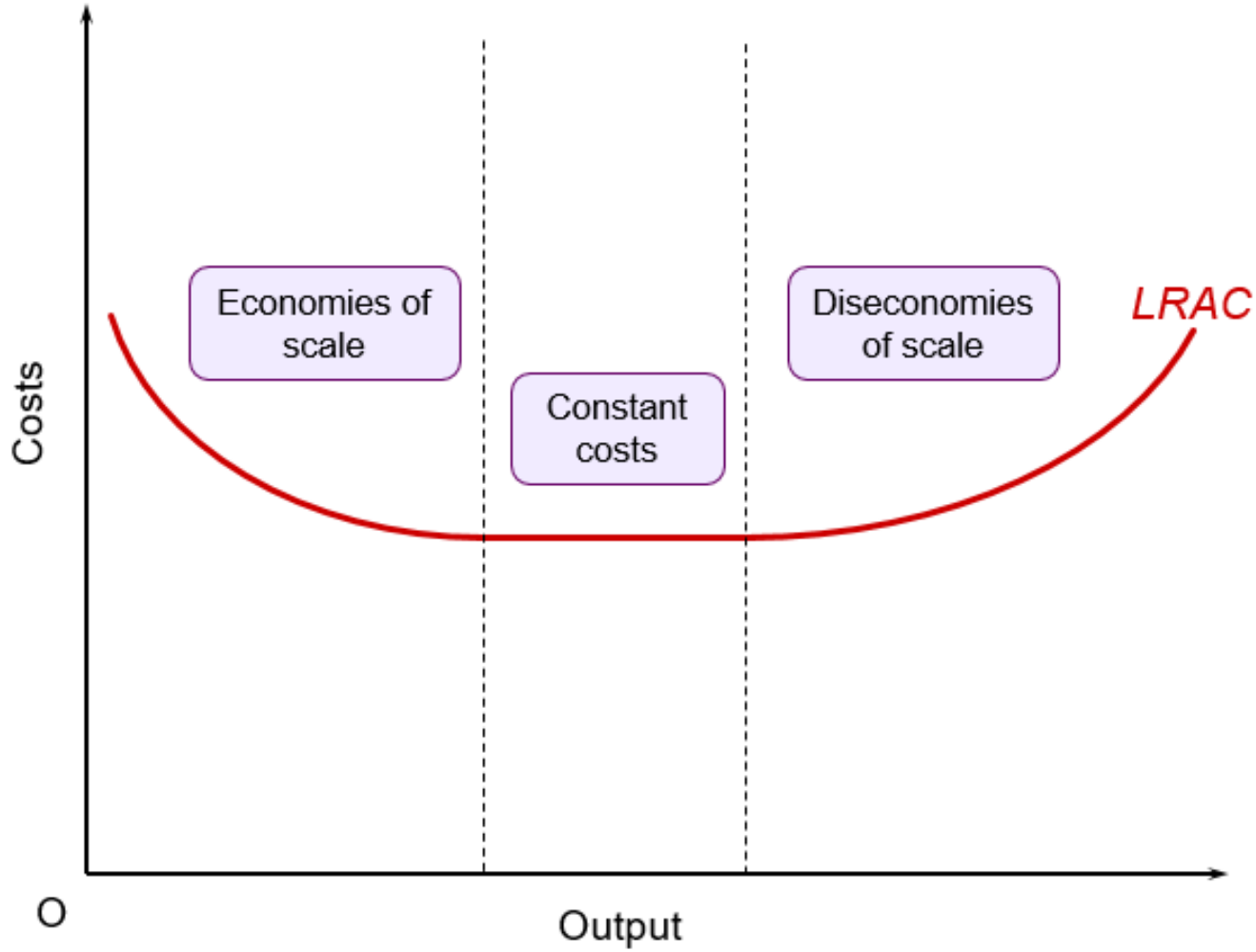


- Factories of fixed size.
- Additional factories increase the average cost in the market as the quantity increases.

Deriving the LRAC



Deriving the LRAC



Firm's Revenue

- Total revenue: total amount a firm earns from its sales in a given time period.

$$TR = P * Q$$

- Average revenue: total revenue per unit. $AR = \frac{TR}{Q}$, i.e. $AR = P$. The AR curve will be the same as the demand curve for the firm's product.
- Marginal revenue: extra revenue earned from the sale of one more unit per time period.

$$(MR) = \frac{\Delta TR}{\Delta Q}$$

Firm's Profit

- Total cost: is the cost that the firm faces when producing a certain level of output.

$$TC = TFC + TVC$$

- Total revenue: total amount a firm earns from its sales in a given time period.

$$TR = P * Q$$

- Profit is the difference of the two.

$$\pi = TR - TC$$

Profit Maximization

- Every firm wants to maximize profits.

$$\max \pi = TR - TC$$

Step 1:

$$\frac{\partial \pi}{\partial Q} = 0$$

Step 2:

$$MR - MC = 0 \Rightarrow MR = MC$$

Profit Maximization

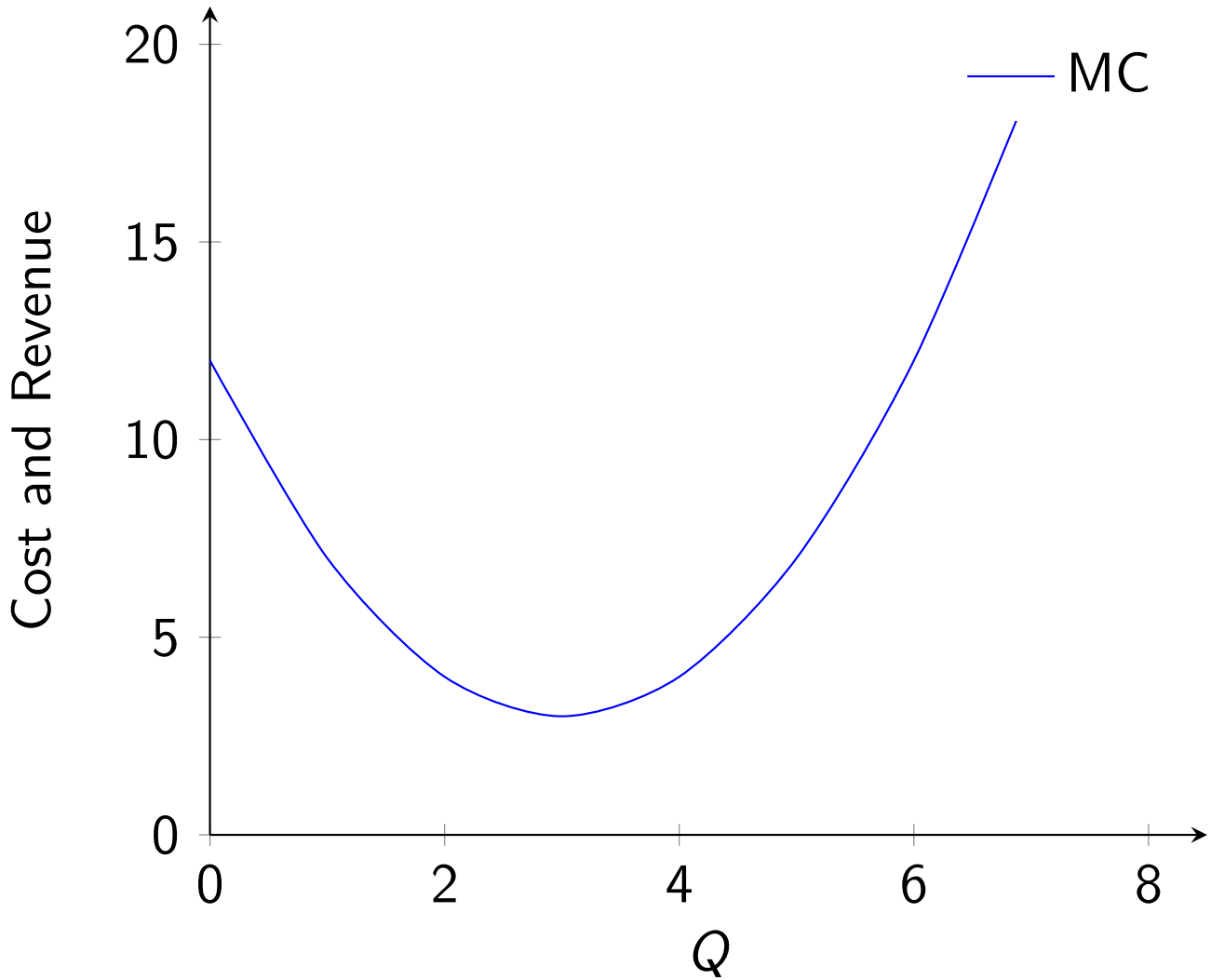
- The profit maximizing quantity is the one that yields $MR = MC$
- the firm's **marginal benefit** is its **marginal revenue**: the addition to revenue from producing one more unit
- **Marginal cost**: addition to cost from producing one more unit

Profit Maximization

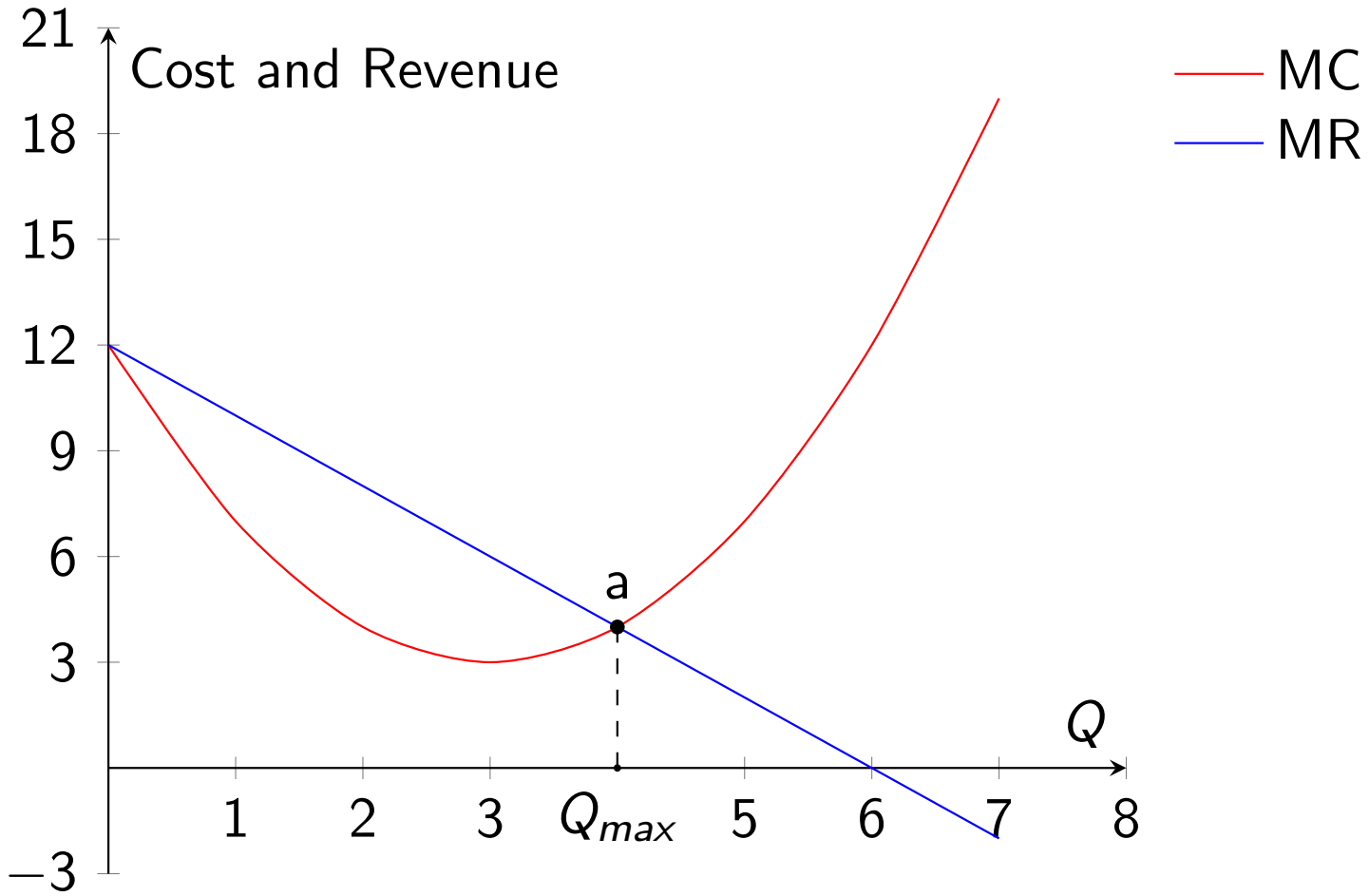
Intuition

- If $MR > MC$, you are not profit maximizing, producing more will add more to your revenue than your cost (i.e. profit);
- If $MR < MC$, you are not profit maximizing, producing less will add to your profit
- Therefore, you can only profit maximized when $MR = MC$

Profit Maximizing - Graph



Profit Maximizing - Graph



Profit Maximization

Normal profit and Supernormal profit

Normal profit is:

- an economic condition occurring when the difference between a firm's total revenue and total cost is equal to zero.
- it is the minimum level of profit needed for a company to remain competitive in the market.

Supernormal profit is:

- Any excess profit over normal profit.

What We Learned Today

- How the Supply curve is determined
- Short-run costs (TC, TFC, TVC, ATC, AFC, AVC, MC)
- Deriving the long-run cost
- Profit Maximization

Conclusion

- Review today's lesson.
- Read the relevant chapters in the book (Ch.3, pg.38-42 and Ch.6, including all boxes and case studies)
- Search online for more sources.
- Ask questions in seminar if anything is unclear.
- Do self-test questions at the end of the chapter and online.