WJEC (Eduqas)
Economics A-level
Microeconomics

Topic 5: Costs, Revenue and Profits

5.1 Costs, revenues and profits

Notes

The difference between the short run and the long run

- In the short run, the scale of production is fixed (there is at least one fixed cost). For firms, the quantity of labour might be flexible, whilst the quantity of capital is fixed.
- In the long run, the scale of production is flexible and can be changed. All costs are variable.

The difference between marginal, average and total returns

- The marginal return of a factor, such as labour, is the extra output derived per extra unit of the factor employed. For labour, it is the extra output per unit of labour employed. For example, employing more staff in a small shop will make it overcrowded and the extra output per unit of labour falls.
- The average return of a factor is the output per unit of input. This is output per worker over a period of time.
- The total return of a factor is the total output produced by a number of units of factors (e.g. labour) over a period of time. The amount of capital is fixed.

The law of diminishing returns

- Diminishing returns only occur in the short run.
- The variable factor could be increased in the short run. For example, firms might employ more labour. Over time, the labour will become less productive, so the marginal return of the labour falls. An extra unit of labour adds less to the total output than the unit of labour before.
- Therefore, total output still rises, but it increases at a slower rate.
- This is linked to how productive labour is.

  The law assumes that firms have fixed factor resources in the short run and that the state of technology remains constant. However, the rise of things like out-sourcing means that firms can cut their costs and their production can be flexible

Short-run cost function

- Total costs are how much it costs to produce a given level of output. An increase in output results in an increase in total costs. **Total costs = total variable costs + total fixed costs**

- **Total fixed cost:**

- In the short run, at least one factor of production cannot change. This means there are some **fixed costs**. Fixed costs do not vary with output. For example, rents, advertising and capital goods are fixed costs. They are indirect costs.

- **Total variable cost:**

- In the long run, all factor inputs can change. This means all costs are **variable**. For example, the production process might move to a new factory or premises, which is not possible in the short run. Variable costs change with output. They are direct costs. For example, the cost of raw materials increases as output increases.

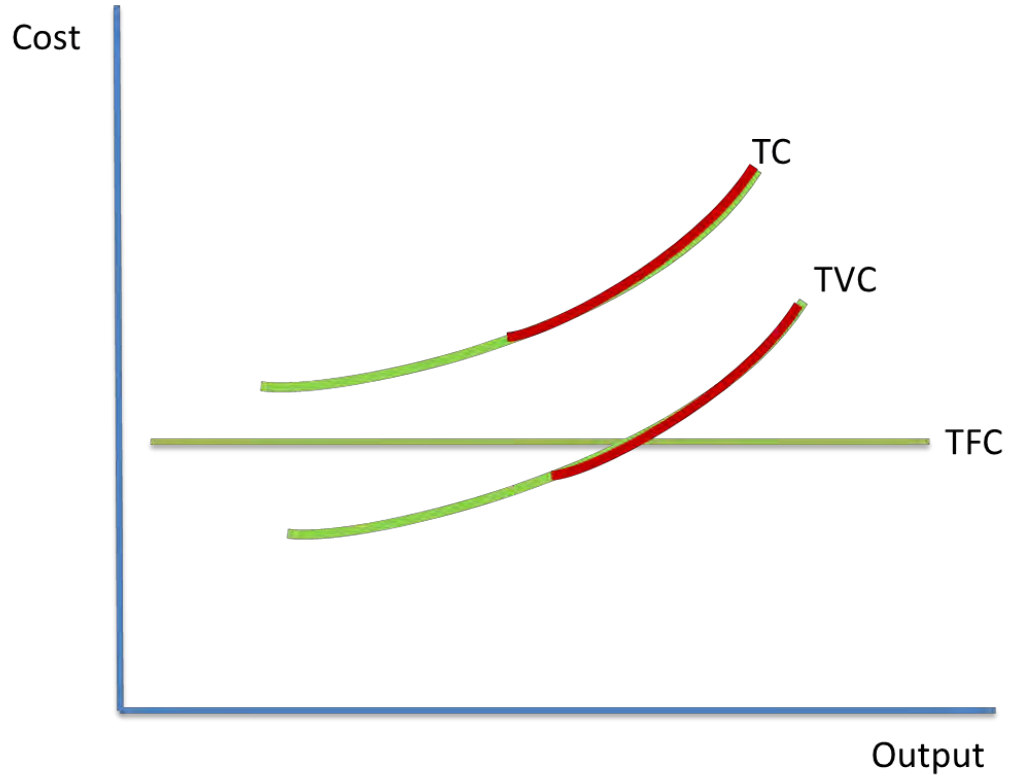
- **Marginal cost and average cost**

- **Average (total) costs (ATC) = total costs / quantity produced. ATC = AVC + AFC.** This is the cost per unit of output produced.
- **Average fixed costs (AFC) = total fixed costs/quantity.**
- **Average variable costs (AVC) = total variable costs/quantity.**

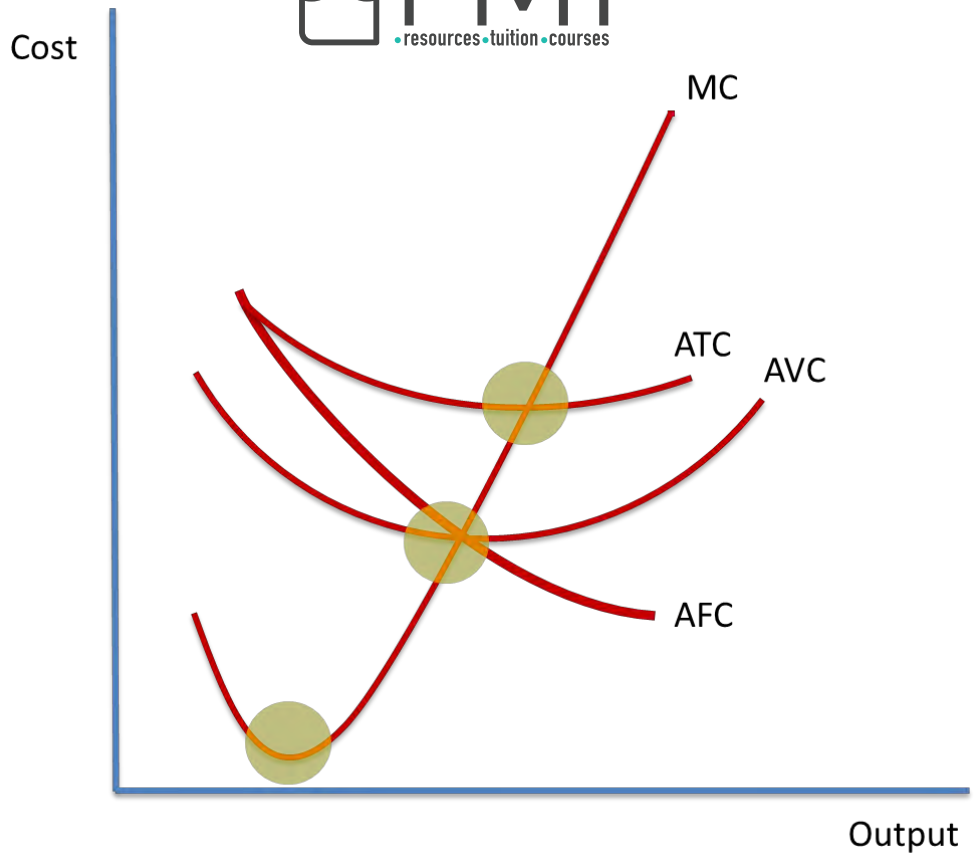
- **Marginal costs** are how much it costs to produce one extra unit of output. It is calculated by $\Delta TC \div \Delta Q$.

Explanation of shape of Short-Run Average Cost (SRAC)

- The measure of the short run varies with industry. There is no standard. For example, the short run for the pharmaceutical industry is likely to be significantly longer than the short run for the retail industry. In the short run, there are some fixed costs. In the long run, all costs are variable. In the very long run, the state of technology can change, such as electronics.
- The **law of diminishing marginal productivity** states that adding more units of a variable input to a fixed input, increases output at first. However, after a certain number of inputs are added, the marginal increase of output becomes constant. Then, when there is an even greater input, the marginal increase in output starts to fall.
- In other words, at some point in the production process, adding more inputs leads to a fall in marginal output.
- This could be due to labour becoming less efficient and less productive, for example. At this point, total costs start to increase.



- On the diagram, the red parts show diminishing returns, where the cost of production starts to rise with increased output.
- Marginal costs rise with increasing diminishing returns.



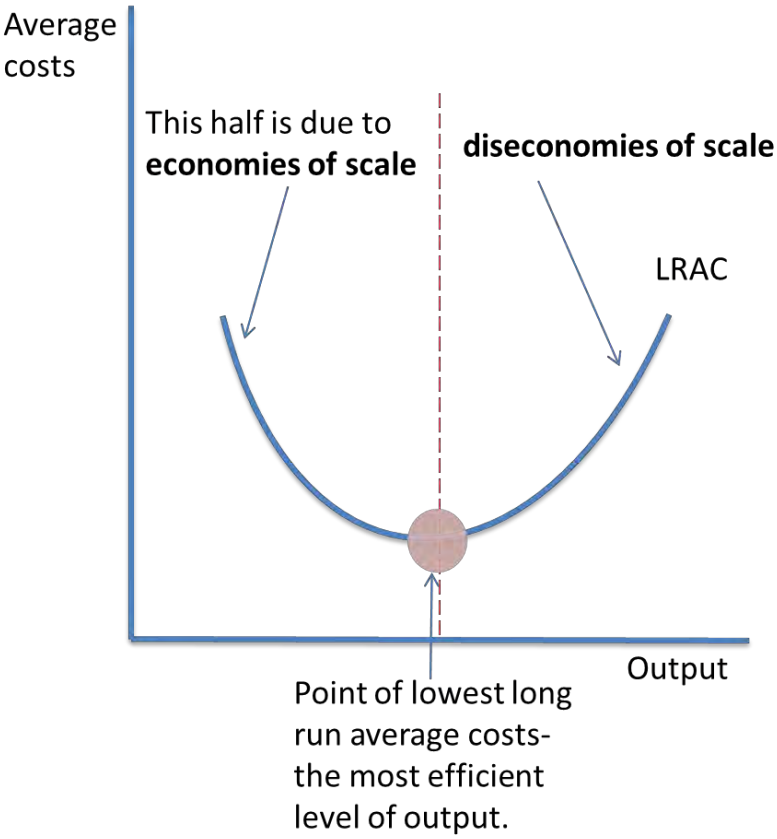
- The diagram above shows cost curves. MC, ATC and AVC rise with diminishing returns. AFC falls with increasing output.
- The lowest points on the curves, as shown by the yellow highlighted circles, are the points where diminishing marginal productivity sets in. Before this, average costs are falling. After this, average costs are rising.
- The MC curve cuts through the lowest points on the ATC and AVC curves.

Long-run production function

- **Returns to scale**
- Returns to scale refers to the change in output of a firm after an increase in factor inputs.
- Returns to scale increases when the output increases by a greater proportion to the increase in inputs. For example, if input doubles, and output quadruples, there is said to be increasing returns to scale.
- If, on the other hand, a doubling of input leads to a 1.5 times increase in output, there are decreasing returns to scale. This is linked to diseconomies of scale, since it occurs when the firm becomes less productive.
- Constant returns to scale are when output increases by the same amount that input increases by.

- **Long-Run Average Cost (LRAC)**

- The LRAC curve is shown in the diagram below. The point of lowest LRAC is the **minimum efficient scale.** This is where the optimum level of output is since costs are lowest.



- If fixed costs are high, average costs are lowered as output increases. When diseconomies of scale set in, average costs increase. This is shown on the long run average cost curve because **economies of scale are only applicable in the long run.**
- Initially, average costs fall, since firms can take advantage of **economies of scale.** This means average costs are falling as output increases.
- After the **optimum level of output,** where average costs are at their lowest, average costs rise due to **diseconomies of scale.**
- The point of lowest LRAC is the **minimum efficient scale.** This is where the optimum level of output is since costs are lowest, and the economies of scale of production have been fully utilised.

- **Internal economies of scale:**

- These occur when a firm becomes larger. Average costs of production fall as output increases.

- Examples of internal economies of scale can be remembered with the mnemonic **Really Fun Mums Try Making Pies**

- **Risk-bearing:** When a firm becomes larger, they can expand their production range. Therefore, they can spread the cost of uncertainty. If one part is not successful, they have other parts to fall back on.
- **Financial:** Banks are willing to lend loans more cheaply to larger firms, because they are deemed less risky. Therefore, larger firms can take advantage of cheaper credit.
- **Managerial:** Larger firms are more able to specialise and divide their labour. They can employ specialist managers and supervisors, which lowers average costs.
- **Technological:** Larger firms can afford to invest in more advanced and productive machinery and capital, which will lower their average costs.
- **Marketing:** Larger firms can divide their marketing budgets across larger outputs, so the average cost of advertising per unit is less than that of a smaller firm.
- **Purchasing:** Larger firms can bulk-buy, which means each unit will cost them less. For example, supermarkets have more buying power from farmers than corner shops, so they can negotiate better deals.

- There are also **network economies of scale.** These are gained from the expansion of ecommerce. Large online shops, such as eBay, can add extra goods and customers at a very low cost, but the revenue gained from this will be significantly larger.

- **External economies of scale:**

- These occur within the industry.
- For example, local roads might be improved, so transport costs for the local industries will fall.
- Also, there might be more training facilities or more research and development, which will also lower average costs for firms in the local area.

- **Diseconomies of scale:**

- These occur when output passes a certain point and average costs start to increase per extra unit of output produced.
- Examples include:
- **Control:** It becomes harder to monitor how productive the workforce is, as the firm becomes larger.
- **Coordination:** It is harder and complicated to coordination every worker, when there are thousands of employees.
- **Communication:** Workers may start to feel alienated and excluded as the firm grows. This could lead to falls in productivity and increases in average costs, as they lose their motivation.

- **The relationship between returns to scale and economies or diseconomies of scale**

- Returns to scale increases when the output increases by a greater proportion to the increase in inputs. For example, if input doubles, and output quadruples, there is said to be increasing returns to scale. This occurs where there are economies of scale and factor inputs become more productive.
- If, on the other hand, a doubling of input leads to a 1.5 times increase in output, there are decreasing returns to scale. This is linked to diseconomies of scale, since it occurs when factor inputs become less productive.

Revenue: total, average and marginal

- Total revenue (TR) is calculated by **price times quantity sold**. This is the revenue received from the sale of a given level of output.

- Average revenue (AR) is the average receipt per unit. This is calculated by **TR / quantity sold**. In other words, this is the price each unit is sold for.

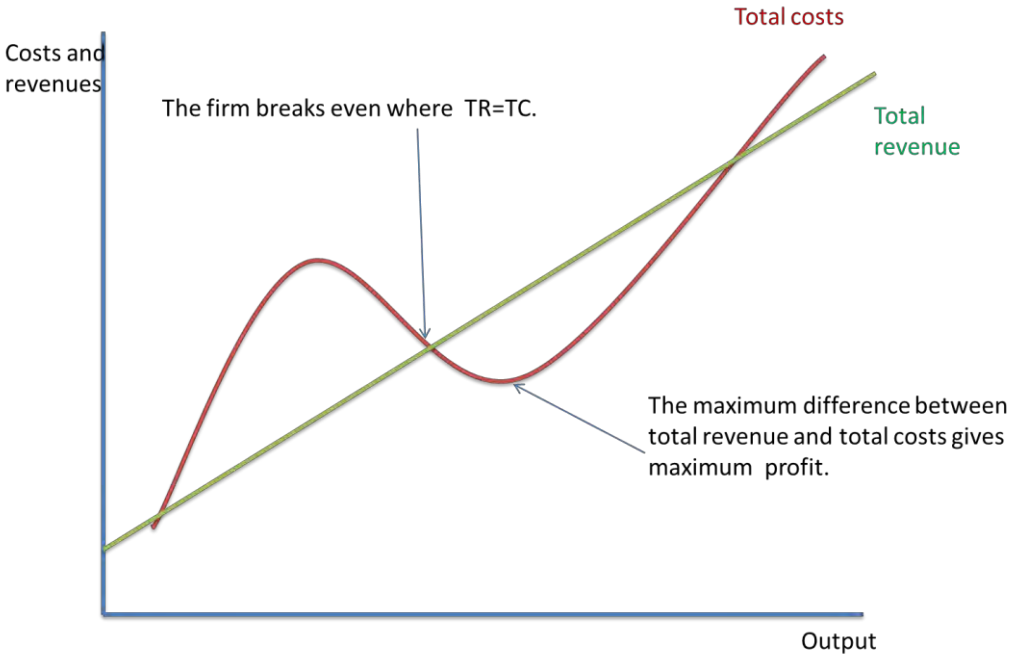
- Marginal revenue is the extra revenue earned from the sale of one extra unit. It is the difference between total revenue at different levels of output.

Profit maximisation

- Profit is an important objective of most firms. Models that consider the traditional theory of the firm are based upon the assumption that firms aim to maximise profits.
- However, firms can have other objectives which affect how they behave.
- Profit is the difference between total revenue and total cost. It is the reward that entrepreneurs yield when they take risks.

- Firms break even when TR = TC.

- A firm's profit is the difference between its total revenue (TR) and total costs (TC). A firm profit maximises when they are operating at the price and output which derives the greatest profit. Profit maximisation occurs where **marginal cost (MC) = marginal revenue (MR).** In other words, each extra unit produced gives no extra loss or no extra revenue.



- Profits increase when MR > MC. Profits decrease when MC > MR.
- Some firms choose to profit maximise because:
  - It provides greater wages and dividends for entrepreneurs
  - Retained profits are a cheap source of finance, which saves paying high interest rates on loans
  - In the short run, the interests of the owners or shareholders are most important, since they aim to maximise their gain from the company.
  - Some firms might profit maximise in the long run since consumers do not like rapid price changes in the short run, so this will provide a stable price and output.

- PLCs are particularly keen to profit maximise, because they could lose their shareholders if they do not receive a high dividend. They are more likely to have **short run profit maximisation** as an objective, because they need to keep their shareholders happy.

- **Normal profit:** Normal profit is the minimum reward required to keep entrepreneurs supplying their enterprise. It covers the opportunity cost of investing funds into the firm and not elsewhere. This is when total revenue = total costs (TR = TC). Normal profit is considered to be a cost, so it is included in the costs of production.
- **Supernormal profit:** Supernormal profit (also called abnormal or economic profit) is the profit above normal profit. This exceeds the value of opportunity cost of investing funds into the firm. This is when TR > TC.