OCR Economics A-level

Microeconomics

Topic 3: Business Objectives

3.2 Costs and Economies of Scale

Notes

Types of costs

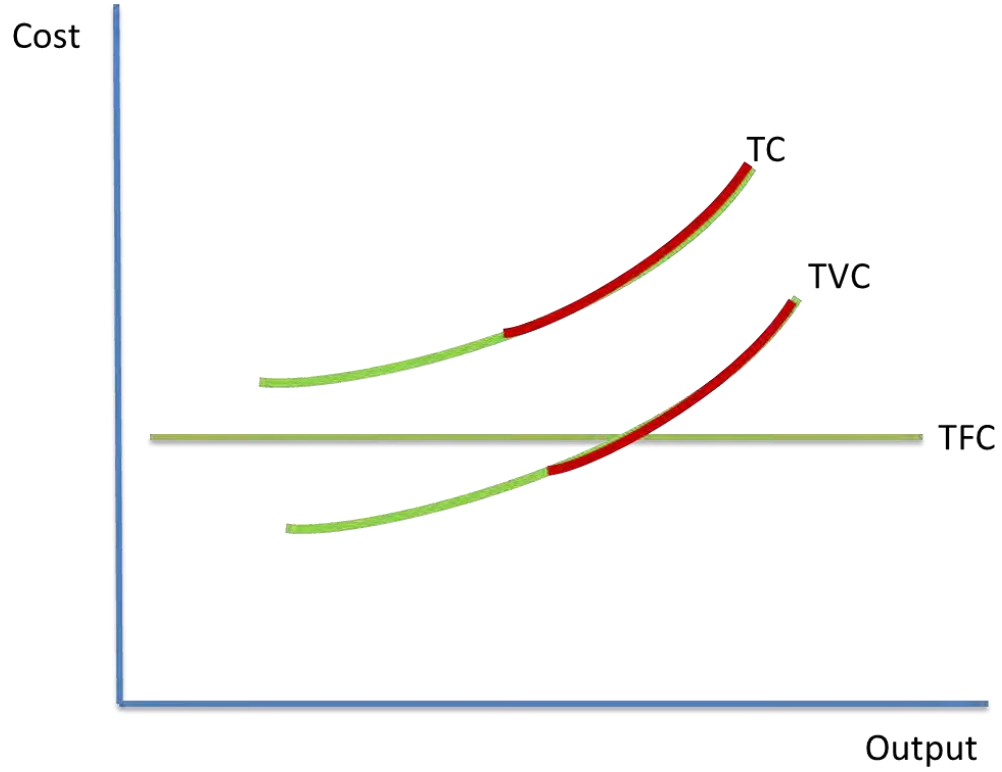
- **Fixed costs** are costs which do not vary with output. For example, rents, advertising and capital goods are fixed costs. They are indirect.
- **Variable costs** change with output. They are direct costs. For example, the cost of raw materials increases as output increases.
- The total cost is the cost to produce a given level of output and is calculated by:
  - **Total costs = total variable costs + total fixed costs**
- Average costs is the cost per unit and is calculated by:
  - **Average costs = total costs / quantity produced**
- **Marginal cost** is the cost of producing one extra unit.

Relationship between SRAC and LRAC

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

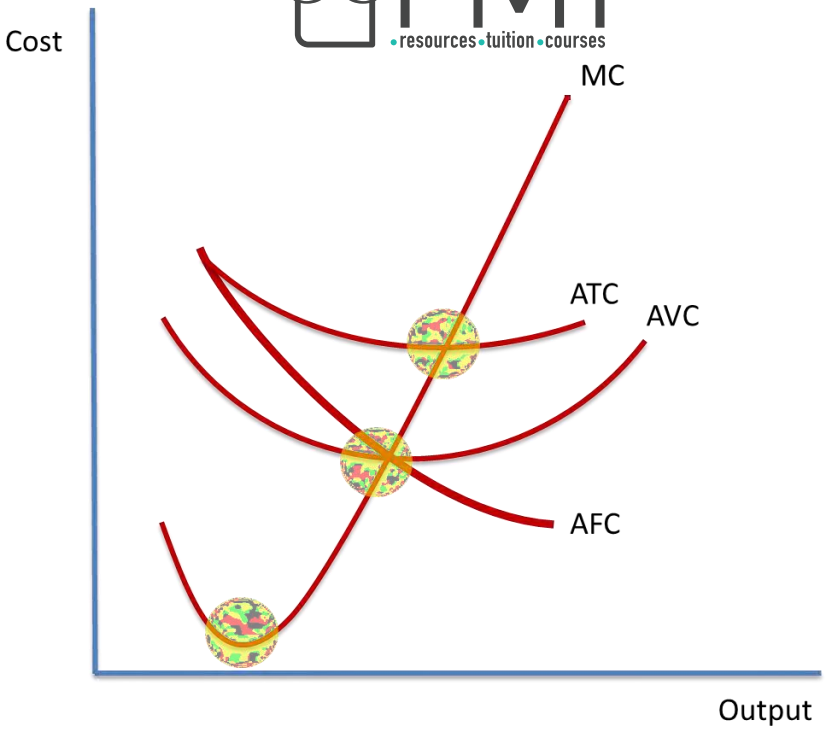
- The measure of the short run varies with industry. There is no standard. For example, the short run for the pharmaceutical industry is likely to be significantly longer than the short run for the retail industry. In the short run, there are some fixed costs. In the long run, all costs are variable. 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.

Short run and long run

- 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.
- 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.
- 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.

Explain the law of diminishing returns

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.

Returns to scale: increasing, decreasing and constant 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 production function

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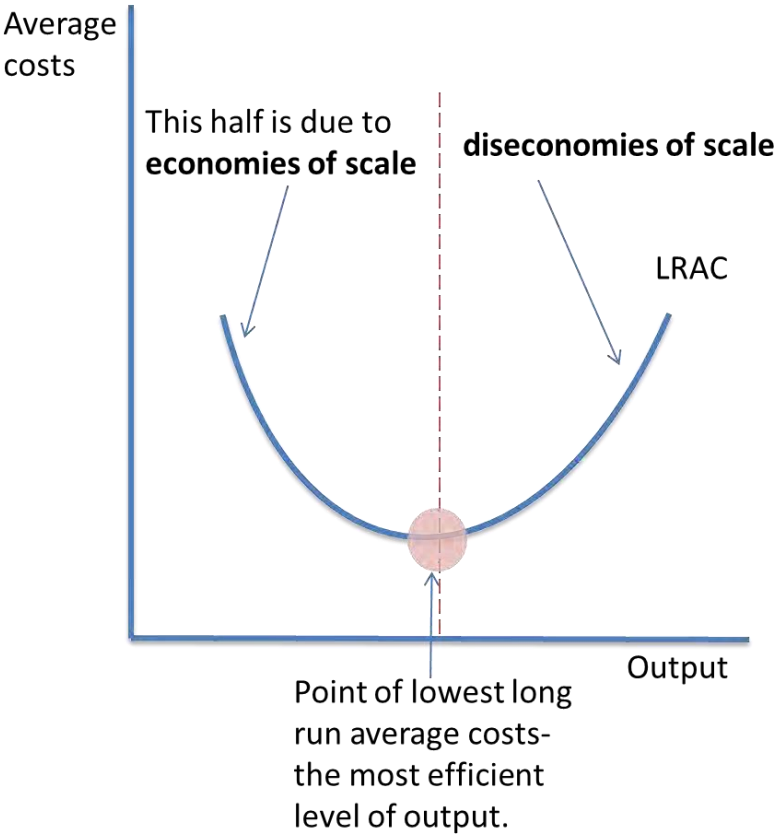
Long-Run Average Cost (LRAC)

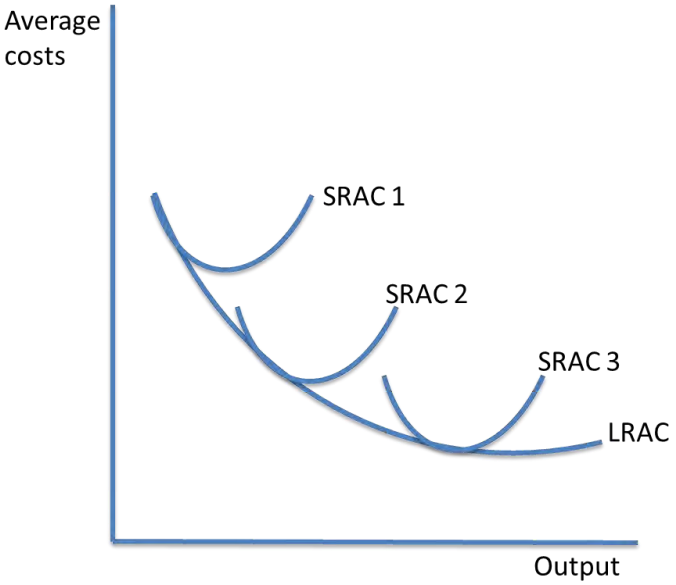
- The LRAC curve is shown in the diagram below.



- 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.

The L-shaped LRAC curve



- The diagram above shows the relationship between the SRAC curve and the LRAC curve. The LRAC curve envelopes the SRAC curve, and it is always equal to or below the SRAC curve. The LRAC curve shifts when there are external economies of scale,
  i.e. when an industry grows.
- SRAC falls at first, and then rises, due to diminishing returns. In the long run, costs change due to economies and diseconomies of scale.
- If SRAC = LRAC, the firm operates where it can vary all factor inputs.
- The L-shape curve is a development in cost theory from the traditional U-shaped curve. It suggests that to begin with, costs per unit fall as output increases, due to economies of scale.
- Even if there are diseconomies of scale within the firm, such as if managerial costs increase, they are offset by the economies of scale gained by technical or production factors.
- This means that in the long run, costs continue to fall, even if the pace of falling output costs slows (shown by the flat part of the curve).

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

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- **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.