Edexcel Economics AS-level

Unit 3: Business Behaviour

Topic 2: Revenue, Costs and Profit

2.2 Costs

Notes

Formulae to calculate types of costs

Total cost:

This is 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.

Average costs:

Average (total) costs (ATC) = total costs / quantity produced. ATC = AVC + AFC.
Average fixed costs (AFC) = total fixed costs/quantity.
**Average variable costs (AVC) = total variable costs/quantity.**

Marginal cost:

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

🖳 Derivation of short-run cost curves from the assumption of diminishing marginal productivity

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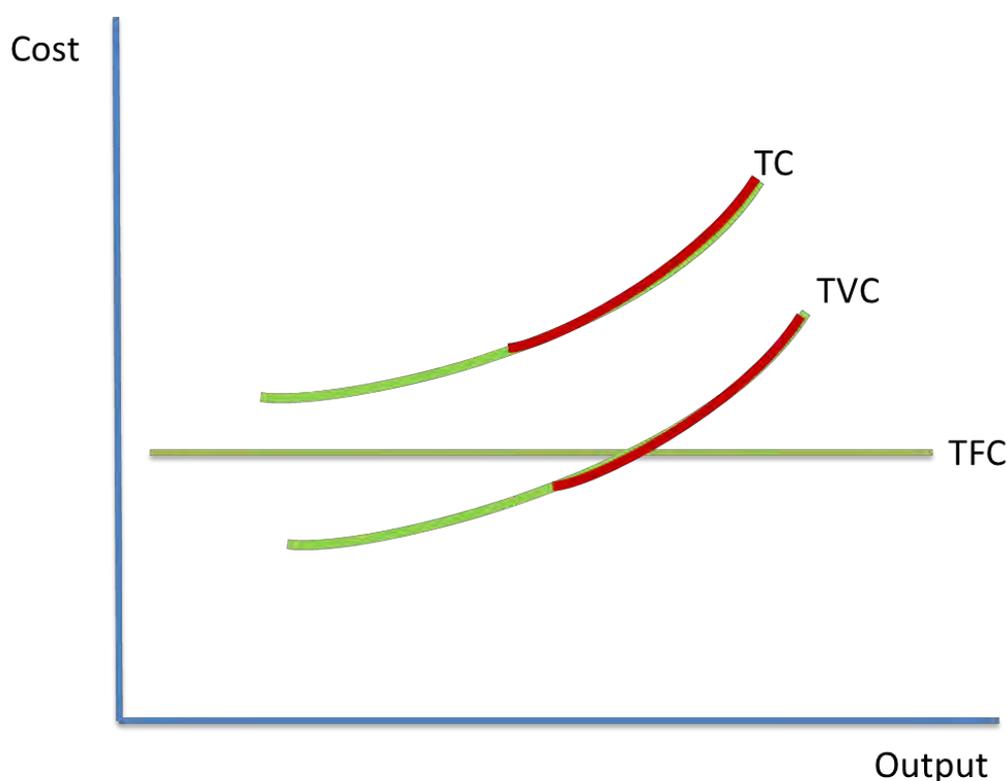
🖳 On the diagram, the red parts show diminishing returns, where the cost of production starts to rise with increased output.

🖳 Marginal costs rise with increasing diminishing returns.
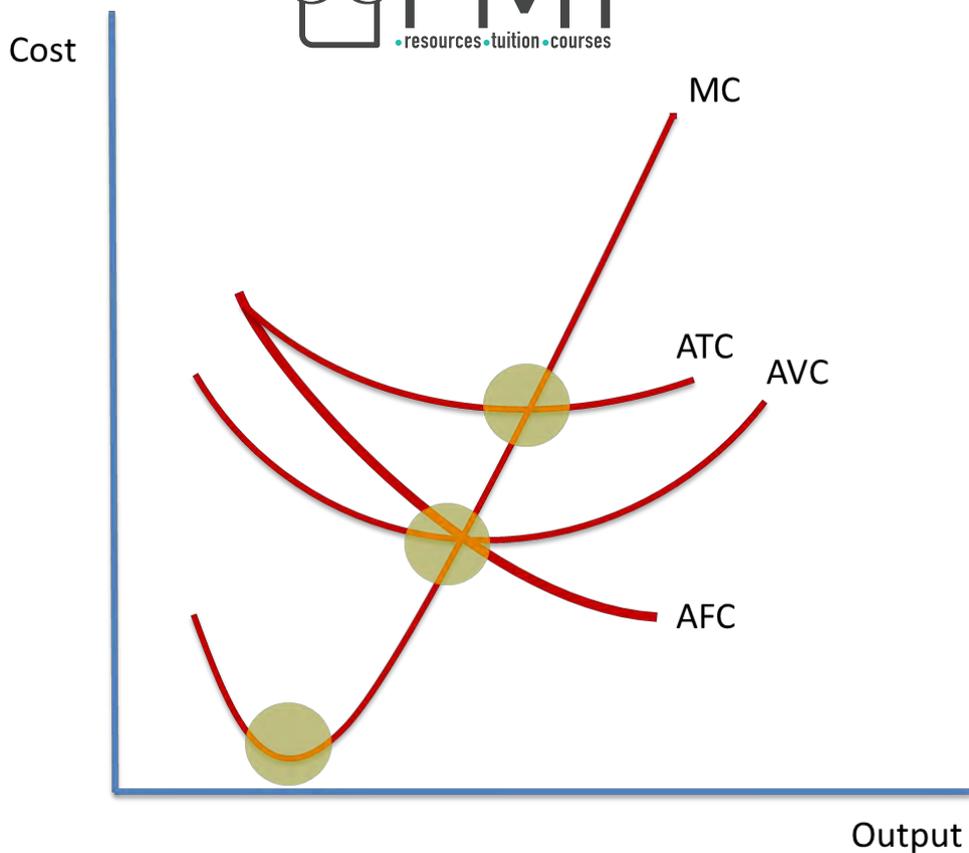
The diagram above shows cost curves. MC, ATC and AVC rise with diminishing returns. AFC falls with increasing output.

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.

## 🖳 Relationship between short-run and long-run average cost curves

🖳 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.
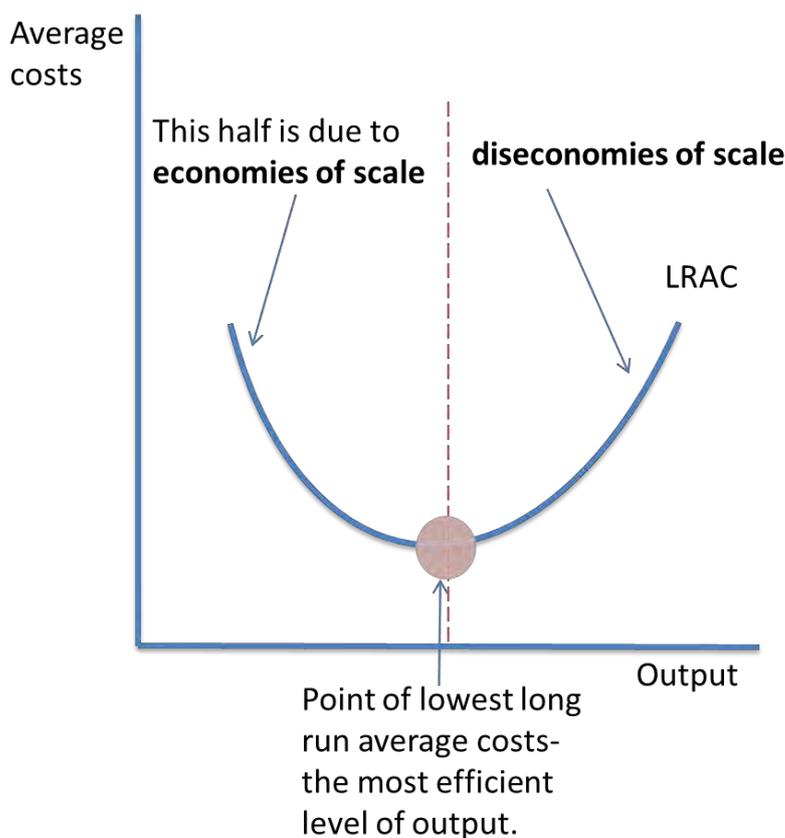
🖳 If fixed costs are high, average costs are lowered as output increases. When diseconomies of scale set in, average costs increase. This is shown on the long run average cost curve because **economies of scale are only applicable in the long run.**
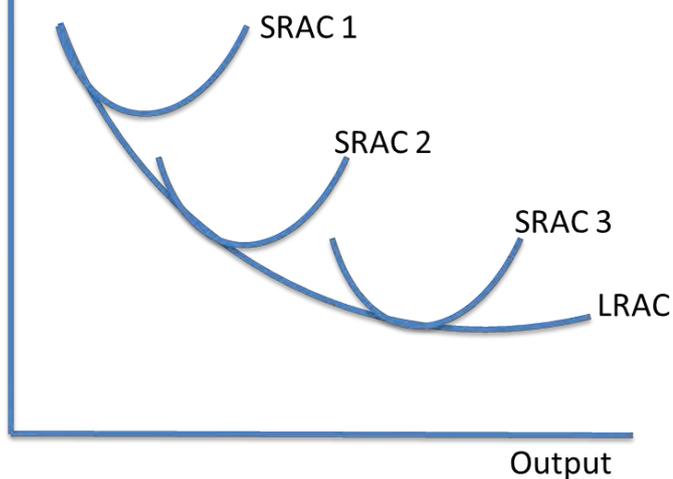
The diagram above shows the relationship between the SRAC curve and the LRAC curve. The LRAC curve envelopes the SRAC curve, and it is always equal to or below the SRAC curve. The LRAC curve shifts when there are external economies of scale, i.e. when an industry grows.

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.