

Revenue, Profit, Costs

Summary & Exercise

I- Revenue

Revenue is the income a firm retains from selling its products once it has paid indirect tax, such as VAT. Revenue provides the income which a firm needs to enable it to cover its **costs of production**, and from which it can derive a **profit**. Profit can be distributed to the owners, or shareholders, or retained in the business to purchase new capital assets or upgrade the firm's technology.

Revenue is measured in three ways:

1- Total revenue

Total revenue (TR), is the total flow of income to a firm from selling a given quantity of output at a given price, less tax going to the government. The value of TR is found by multiplying price of the product by the quantity sold.

2- Average revenue

Average revenue (AR), is revenue *per unit*, and is found by dividing TR by the quantity sold, Q. AR is equivalent to the price of the product, where $P \times Q/Q = P$, hence AR is also *price*.

3- Marginal revenue

Marginal revenue (MR) is the revenue generated from selling one extra unit of a good or service. It can be found by finding the change in TR following an increase in output of one unit. MR can be both positive and negative.

Revenue schedule

A revenue schedule shows the amount of revenue generated by a firm at different prices.

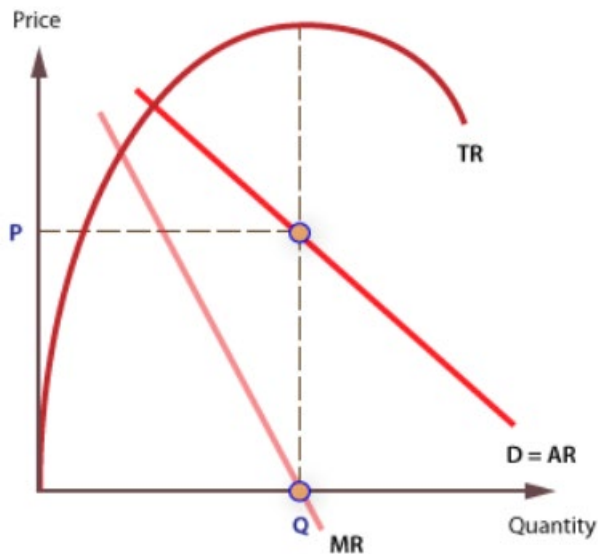
P(£)(£000)	Qd	TR (£000)	MR
10	1	$10 = 10 \times 1$	-
9	2	$18 = 9 \times 2$	8
8	3	$24 = 8 \times 3$	6
7	4	$28 = 7 \times 4$	4
6	5	$30 = 6 \times 5$	2
5	6	$30 = 5 \times 6$	0
4	7	$28 = 4 \times 7$	-2
3	8	$24 = 3 \times 8$	-4
2	9	$18 = 2 \times 9$	-6
1	10	$10 = 1 \times 10$	-8

4- Revenue curves

- **Total revenue**

Initially, as output increases total revenue (TR) also increases, but at a decreasing rate. It eventually reaches a maximum and then decreases with further output.

Less competition in a given market is likely to lead to higher prices and the possibility of higher super-normal profits.



- **Average revenue**

However, as output increases the average revenue (AR) curve slopes downwards. The AR curve is also the firm's demand curve.

- **Marginal revenue**

The marginal revenue (MR) curve also slopes downwards, but at twice the rate of AR. This means that when MR is 0, TR will be at its maximum. Increases in output beyond the point where $MR = 0$ will lead to a negative MR.

II- Costs of production

1- Fixed and variable costs

Fixed costs are those that do not vary with output and typically include rents, insurance, depreciation, set-up costs, and normal profit. They are also called *overheads*.

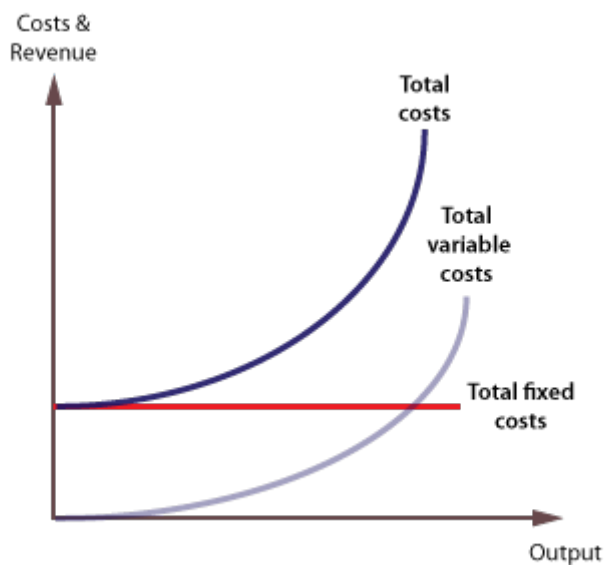
Variable costs are costs that do vary with output, and they are also called *direct costs*. Examples of typical variable costs include fuel, raw materials, and some labour costs.

Example:

Consider the following hypothetical example of a boat building firm. The total fixed costs, TFC, include premises, machinery and equipment needed to construct boats, and are £100,000, irrespective of how many boats are produced. Total variable costs (TVC) will increase as output increases.

OUTPUT	TOTAL FIXED COST	TOTAL VARIABLE COST	TOTAL COST
1	100	50	150
2	100	80	180
3	100	100	200
4	100	110	210
5	100	150	250
6	100	220	320
7	100	350	450
8	100	640	740

Plotting this gives us Total Cost, Total Variable Cost, and Total Fixed Cost.



- **Total fixed costs**

Given that *total fixed costs* (TFC) are constant as output increases, the curve is a horizontal line on the cost graph.

- **Total variable costs**

The *total variable cost* (TVC) curve slopes up at an accelerating rate, reflecting the [law of diminishing marginal returns](#).

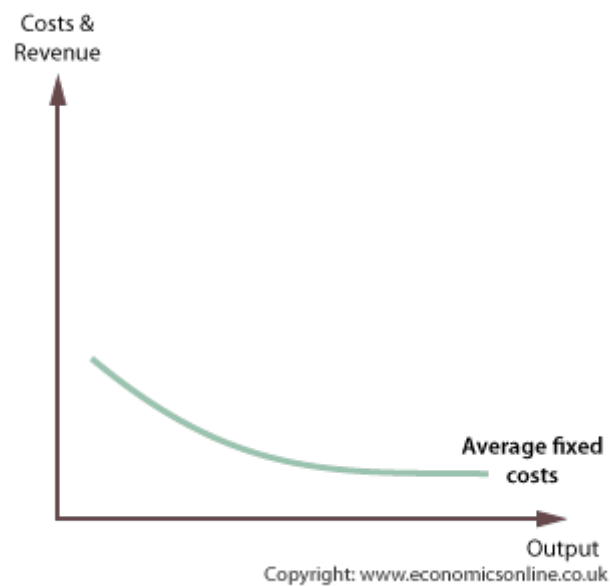
- **Total costs**

The *total cost* (TC) curve is found by adding total fixed and total variable costs. Its position reflects the amount of fixed costs, and its gradient reflects variable costs.

- **Average fixed costs**

Average fixed costs are found by dividing total fixed costs by output. As fixed cost is divided by an increasing output, average fixed costs will continue to fall.

OUTPUT	TOTAL FIXED COST (£000)	AVERAGE FIXED COST (£000)
1	100	100
2	100	50
3	100	33.3
4	100	25
5	100	20
6	100	16.6
7	100	14.3
8	100	12.5



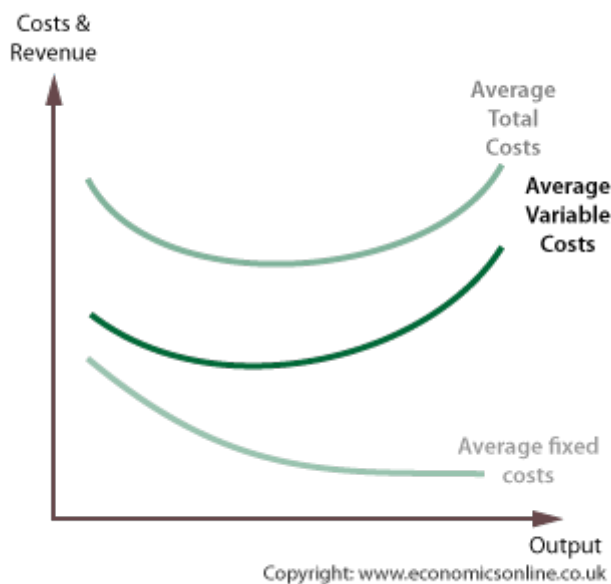
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The *average fixed cost* (AFC) curve will slope down continuously, from left to right.

- **Average variable costs**

Average variable costs are found by dividing total fixed variable costs by output

OUTPUT	TOTAL VARIABLE COST (£000)	AVERAGE VARIABLE COST (£000)
1	50	50
2	80	40
3	100	33.3
4	110	27.5
5	150	30
6	220	36.7
7	350	50
8	640	80



The *average variable cost* (AVC) curve will at first slope down from left to right, then reach a minimum point, and rise again.

AVC is 'U' shaped because of the principle of variable Proportions, which explains the three phases of the curve:

1. Increasing returns to the variable factors, which cause average costs to fall, followed by:
2. Constant returns, followed by:
3. Diminishing returns, which cause costs to rise.

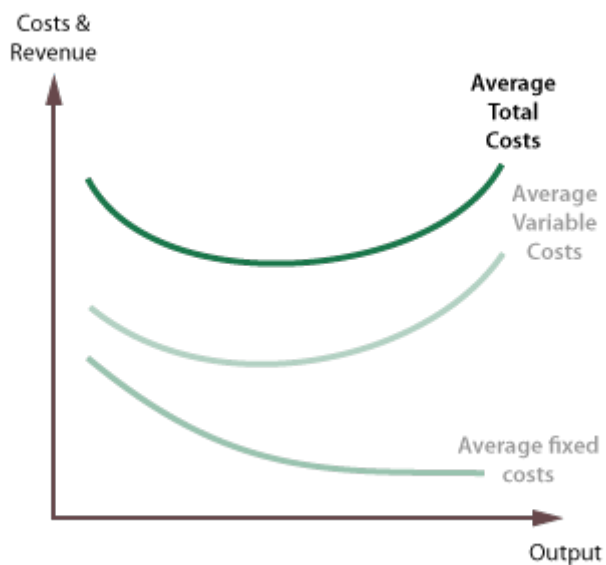
Average total cost

Average total cost (ATC) is also called average cost or *unit cost*.

Average total costs are a key cost in the theory of the firm because they indicate how efficiently scarce resources are being used.

Average variable costs are found by dividing total fixed variable costs by output.

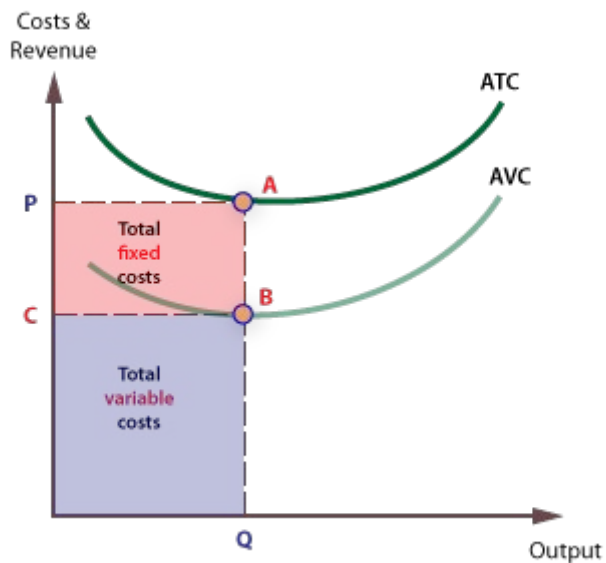
OUTPUT	AVERAGE FIXED COST (£000)	AVERAGE VARIABLE COST (£000)	AVERAGE TOTAL COSTS (£000)
1	100	50	150
2	50	40	90
3	33.3	33.3	67
4	25	27.5	52.5
5	20	30	50
6	16.6	36.7	53.3
7	14.3	50	64.3
8	12.5	80	92.5



Average total cost (ATC) can be found by adding average fixed costs (AFC) and average variable costs (AVC). The ATC curve is also 'U' shaped because it takes its shape from the AVC curve, with the upturn reflecting the onset of diminishing returns to the variable factor.

- **Areas for total costs**

Total Fixed costs and Total Variable costs are the respective areas under the Average Fixed and Average Variable cost curves.



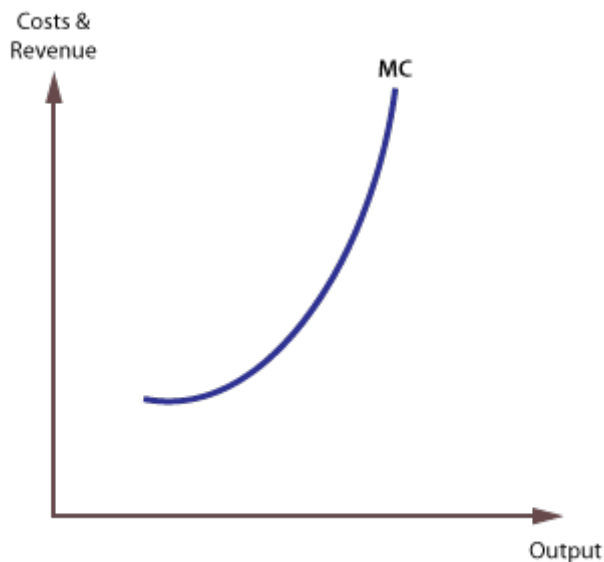
- **Marginal costs**

Marginal cost is the cost of *producing one extra* unit of output. It can be found by calculating the change in total cost when output is increased by one unit.

OUTPUT	TOTAL COST	MARGINAL COST
1	150	-
2	180	30
3	200	20
4	210	10
5	250	40
6	320	70
7	450	130
8	740	290

It is important to note that marginal cost is derived solely from variable costs, and not fixed costs.

The marginal cost curve falls briefly at first, then rises. Marginal costs are derived from variable costs and are subject to the principle of variable proportions.



- **The significance of marginal cost**

The marginal cost curve is significant in the theory of the firm for two reasons:

1. It is the *leading* cost curve, because changes in total and average costs are derived from changes in marginal cost.
2. The *lowest price* a firm is prepared to supply at is the price that just covers marginal cost.

- **ATC and MC**

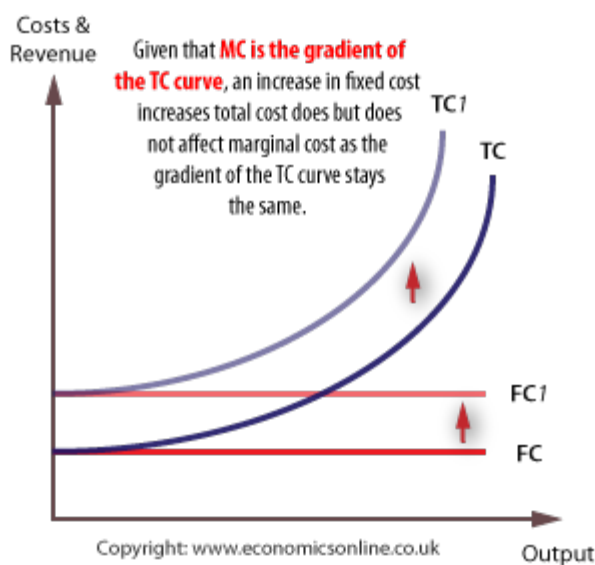
Average total cost and marginal cost are connected because they are derived from the same basic numerical cost data. The general rules governing the relationship are:

1. Marginal cost will always cut average total cost from below.
2. When *marginal cost is below average total cost*, average total cost will be *falling*, and when *marginal cost is above average total cost*, average total cost will be *rising*.

3. A firm is most *productively efficient* at the lowest average total cost, which is also where *average total cost* (ATC) = *marginal cost* (MC).

- **Total costs and marginal costs**

Marginal costs are derived exclusively from variable costs, and are unaffected by changes in fixed costs. The MC curve is the gradient of the TC curve, and the positive gradient of the total cost curve only exists because of a positive variable cost. This is shown below:



III- Profit

Profit has several meanings in economics. At its most basic level, profit is the reward gained by risk taking entrepreneurs when the revenue earned from selling a given amount of output exceeds the total costs of producing that output. This simple statement is often expressed as the *profit identity*, which states that:

$$\text{Total profits } \pi = \text{total revenue (TR)} - \text{total costs (TC)}$$

However, the concept of profit needs clarification because there is no standard definition of what counts as a cost.

- **Normal profit**

In markets which are perfectly competitive, the profit available to a single firm in the long run is called normal profit. This exists when total revenue, TR, equals total cost, TC. Normal profit is defined as the minimum reward that is just sufficient to keep the entrepreneur supplying their enterprise. In other words, the reward is just covering opportunity cost – that is, just better than the next best alternative.

To the economist, normal profit is a cost and is included in the total costs of production.

- **Super-normal (economic) profit**

If a firm makes more than normal profit it is called super-normal profit. Supernormal profit is also called economic profit, and abnormal profit, and is earned when total revenue is greater than the total costs. Total costs include a reward to all the factors, including normal profit. This means that, when total revenue equals total cost, the entrepreneur is earning normal profit, which is the minimum reward that keeps the entrepreneur providing their skill, and taking risks.

The level of super-normal profits available to a firm is largely determined by the level of competition in a market – the more competition the less chance there is to earn super-normal profits.

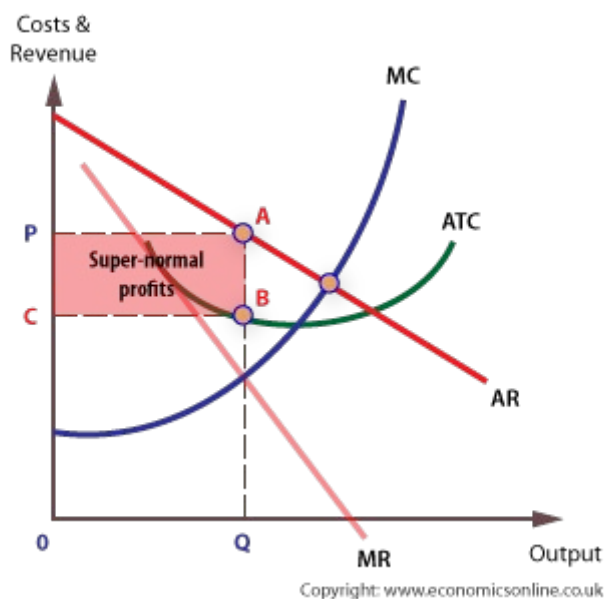
Super-normal profit can be derived in three general cases:

- **Marginal profits**

Marginal profit is the additional profit from selling one extra unit. A profit per unit will be achieved when marginal revenue (MR) is greater than marginal cost (MC). At profit maximisation, marginal profit is zero because $MC = MR$.

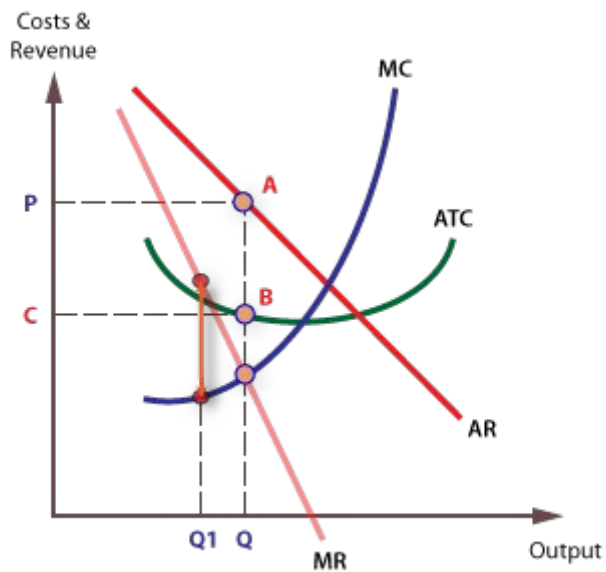
- **Profit maximisation**

Firms achieve maximum profits when marginal revenue (MR) is equal to marginal cost (MC), that is when the cost of producing one more unit of a good or service is exactly equal to the revenue derived from selling one extra unit.



➤ **If marginal profit is greater than zero**

If the firm stops short of producing Q, (at Q_1 below) then MR is greater than MC, and marginal profit is still greater than zero. Hence, the firm should increase output.



➤ If marginal profit is less than zero

If the firm produces greater than Q, (at Q2 below) MC is greater than MR and marginal profit is negative. Hence, the firm should reduce its output. Only when $MR = MC$, at Q, will total profits be maximised.

