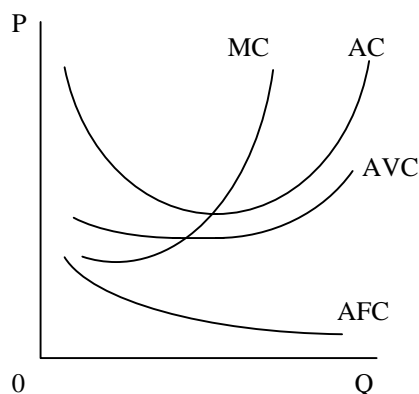


Of course, each time a unit of the variable factor is added a new cost is incurred. If this new cost allows output first to increase and then decrease, the marginal costs and average variable costs must first decrease and then increase. This results in the **marginal cost (MC)** and **average variable cost (AVC)** curves below. Marginal cost is *the cost of producing one extra unit of output*:



Fixed costs are *the cost of producing nothing*, and so average fixed costs (AFC) fall as output increases. **Total costs** are *the sum of fixed and variable costs*, and so **average total costs** are *the sum of average fixed costs and average variable costs*. In the diagram above, ATC is created by adding the AVC and AFC lines together.

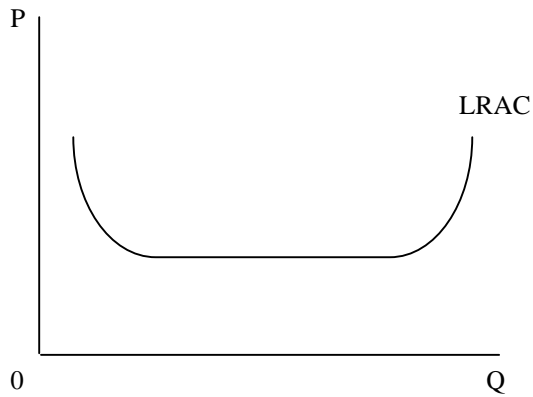
Costs in the Long Run

In the **long run**, *all factors are variable*, and therefore a firm can change its size (scale).

If a firm increases its size, then one of three things can happen to output:

1. Output can increase more than proportionately (increasing returns to scale).
2. Output can increase proportionately (constant returns to scale).
3. Output can increase less than proportionately (decreasing returns to scale).

1. will cause average costs to fall, 2. will cause average costs to remain constant, and 3. will cause average costs to rise, resulting in the long run average cost curve below.



It is **economies of scale** that cause average costs to fall in the long run, and **diseconomies of scale** that cause average costs to rise in the long run.

Economies of scale can be divided into the following categories:

- Financial economies
- Marketing economies
- Technical economies
- Purchasing economies
- Managerial economies

Diseconomies of scale tend to be very firm specific, but a classic problem is communication.

Multiple Choice

12.

Output	Total Cost
0	100
10	115
20	150
30	175
40	220

Using the table above, at an output level of 20 Average Variable Cost is calculated to be

- A. 2.5
- B. 7
- C. 14
- D. 130