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Topic : Long Run Average Total cost
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Long Run Average Total Cost under Traditional theory of cost

In the long run all factors are assumed to become variable. We said that the long run cost curve is a Planning curve , in the sense that *it is a guide to the entrepreneur in his decision to plan the future expansion of his output.*

- The long run average cost is derived from short run cost curves. Each point on the LAC corresponds to a point on a short- run cost curve, which is tangent to the LAC at that point.

- Long run average cost curve depicts the least possible average cost for producing all possible levels of output.

- Short run average cost curves are also called **Plant curves,** since in the short -run plant is fixed and each of the short-run average cost curve corresponds to a particular plants. In the short-run, the firm can be operating on any short-run average cost curve, given the size of plant.

In order to understand how the long - run average cost curve is derived , consider the three short-run average cost curves as shown in figure given below:

Suppose that only these three are technically possible sizes of plants and that no other size of the plant can be built.Given the size of the plant or short run average cost curve of the firm will increase or decrease its output by varying the amount of the variable inputs.But in the long run , the firm can choose among the possible sizes of plants as depicted by short run average cost curves SAC1, SAC2 , SAC3.

In the long the firm will examine that with which size of plant or on which short run average cost curve it should operate to produce a given levels of output at the minimum possible cost.
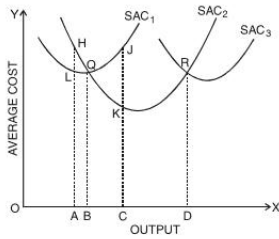
Fig. 1 : Short run Average Cost Curves

It will be seen from figure; that up to OB amount of output, the firm will operate on the short-run average cost curve SAC1, though it could also produce with short-run average cost curve SAC2, because upto OB amount of output, production on SAC1 curve entails lower cost than on SAC2. If the firm plans to produce an output which is larger than OB(but less than OD), then it will not be economical to produce on SAC1. It will be seen from figure that the outputs larger than OB(but Lower than OD), can be produced at a lower cost per unit on SAC2 than on SAC1. Thus, the output OC is produced on SAC1. Therefore, if the firm plans to produce between OB and OD, it will employ the plants corresponding to short-run average cost curve SAC2 . If the firm has to produce an output which exceeds OD , then the cost per unit will be Lower on SAC3 than on SAC2. Therefore, for outputs larger than OD, the firm will employ plant corresponding to the SAC3.
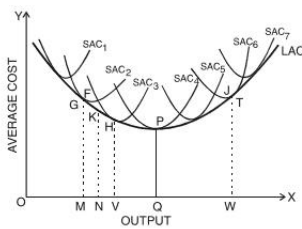

Fig.2 : Long run Average Cost Curves

In the above given figure, Output is taken on the OX- axis and AC is taken on the OY-axis. Here, the long run average curve LAC is not tangent to the minimum point of the SAC curves. When the LAC curve is declining , i.e; for output less than OQ , it is tangent to the falling portions of the SAC curves.
On the other hand, when the long run average cost curve is rising it will be tangent to the rising portions of the short run average cost curve.

In the traditional theory of the firm the LAC - curve is U-shaped and it often called the "envelope curve" , because it envelopes the SAC curve.