Cost of Production

A quick revision of concepts- inflexibility of short run curve- Long run cost curve- economies of scales v/s returns to scale- economies of scale and economies of scope.

Cost of production: A quick revision

- **Opportunity cost**: Cost of next best alternative foregone
- **Sunk cost**: Expenditure already made and can’t be recovered.
- Total cost
- **Fixed cost**- doesn’t vary as output varies
- **Variable cost-** cost that varies as output varies
- **Marginal cost-** incremental cost
- **Expansion path-** describes the combinations of labor and capital that the firm will choose to minimize costs at each output level
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Long Run Cost curves

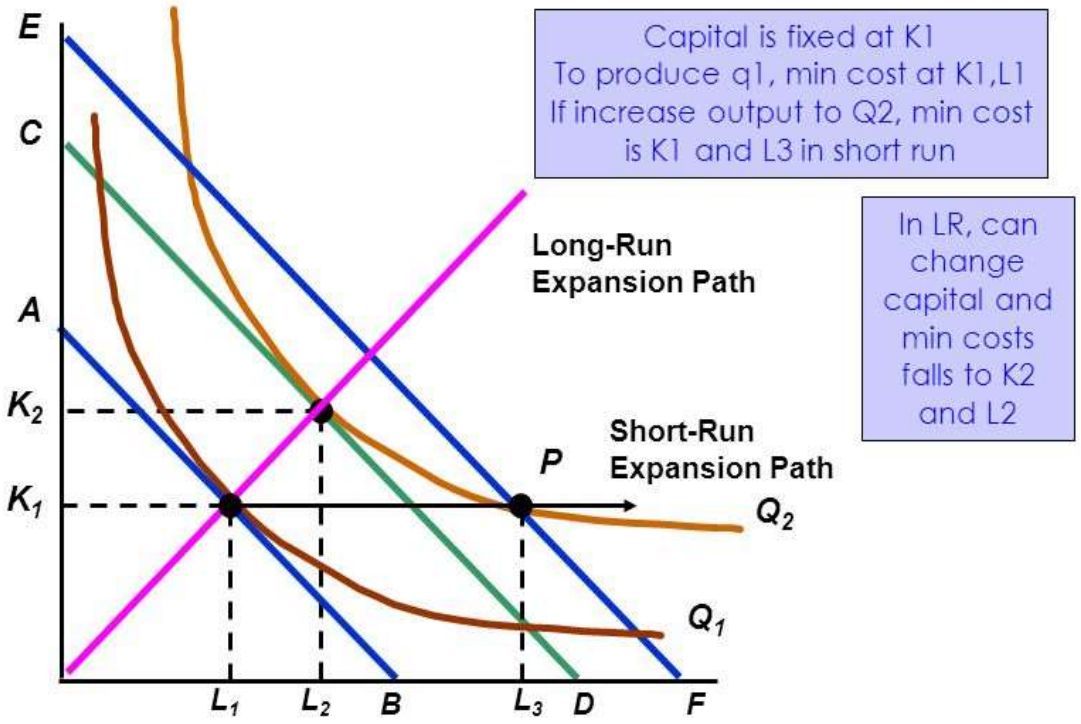
- Difference between short run and long run cost curves:
- In short run the FC is completely outside the control of firm.
- In long run, there are no fixed costs.

- Both are U shaped

- In the long run, the firm's planning horizon is long enough to allow for a change in plant size. This added flexibility allows the firm to produce at a lower average cost than in the short run. To see why, we might compare the situation in which capital and labor are both flexible to the case in which capital is fixed in the short run.

Inflexibility of short Run production

The Inflexibility of Short-Run Production



Why inflexibility?

- Because the firm is unable to substitute relatively inexpensive capital for more costly labor when it expands production

Long Run Average Cost [LRAC]

- Curve relating average cost of production to output when all inputs, including capital, are variable.

- The most important determinant of the shape of the long-run average and marginal cost curves is the relationship between the scale of the firm's operation and the inputs that are required to minimize its costs.

Economies & Diseconomies of scale

- ***Economies of Scale***: as volume increases, unit costs decrease to an optimal level
- ***Diseconomies of Scale***: unit costs increase as an operation's size increases

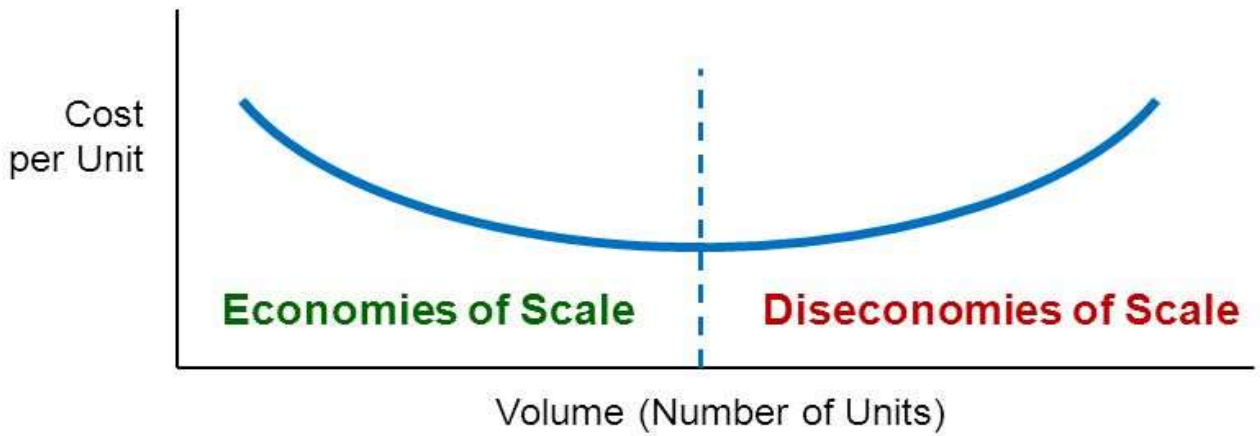
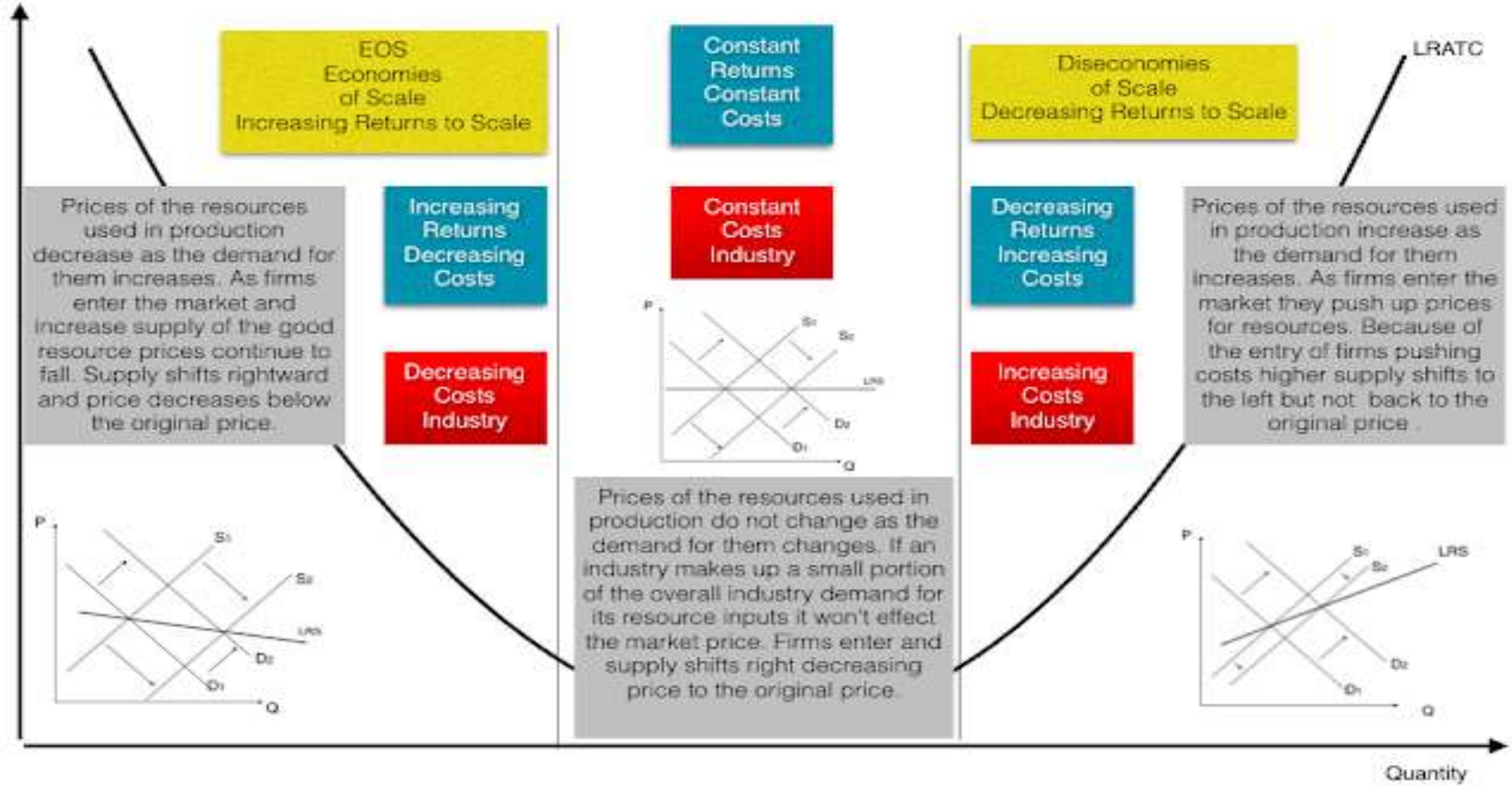


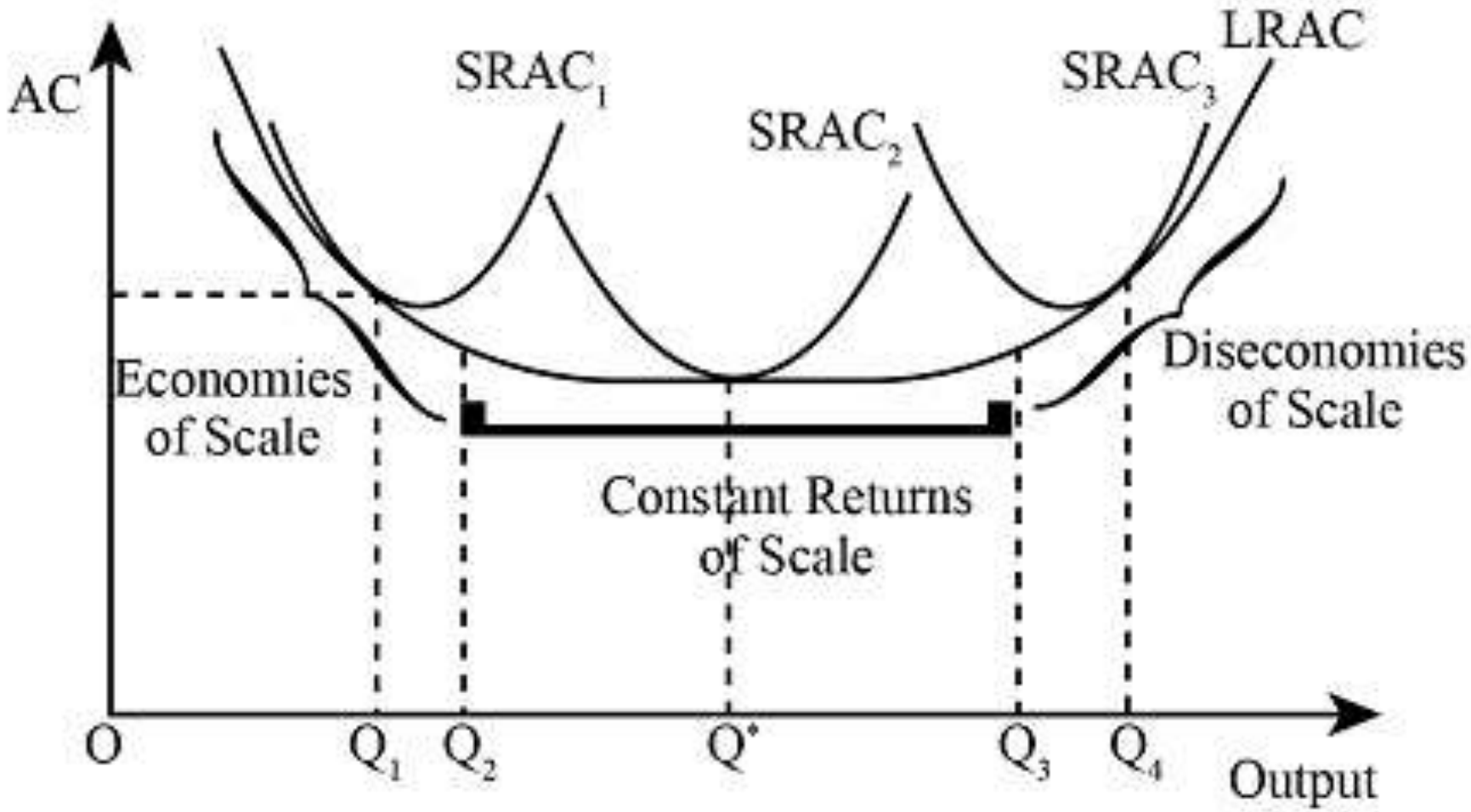
Figure 5-1


EOS
Economies
of Scale
Increasing Returns to Scale
Constant
Returns
Constant
Costs
Diseconomies
of Scale
Decreasing Returns to Scale
LRATC
Increasing
Returns
Decreasing
Costs
Constant
Costs
Industry
Decreasing
Returns
Increasing
Costs
Decreasing
Costs
Industry
Increasing
Costs
Industry
Prices of the resources used in production decrease as the demand for them increases. As firms enter the market and increase supply of the good resource prices continue to fall. Supply shifts rightward and price decreases below the original price.
Prices of the resources used in production do not change as the demand for them changes. If an industry makes up a small portion of the overall industry demand for its resource inputs it won't effect the market price. Firms enter and supply shifts right decreasing price to the original price.
Prices of the resources used in production increase as the demand for them increases. As firms enter the market they push up prices for resources. Because of the entry of firms pushing costs higher supply shifts to the left but not back to the original price .
P
Q
LRS
Quantity

Why LAC/LRAC curve is U shaped?

- U shape is the result of operation of returns to scale, that is firm experiences increasing returns to scale (diminishing cost) in the beginning followed by constant returns to scale and then by diminishing returns to scale (increasing cost).

- LAC first declines due to economies of scales and then rises due to diseconomies of scale.

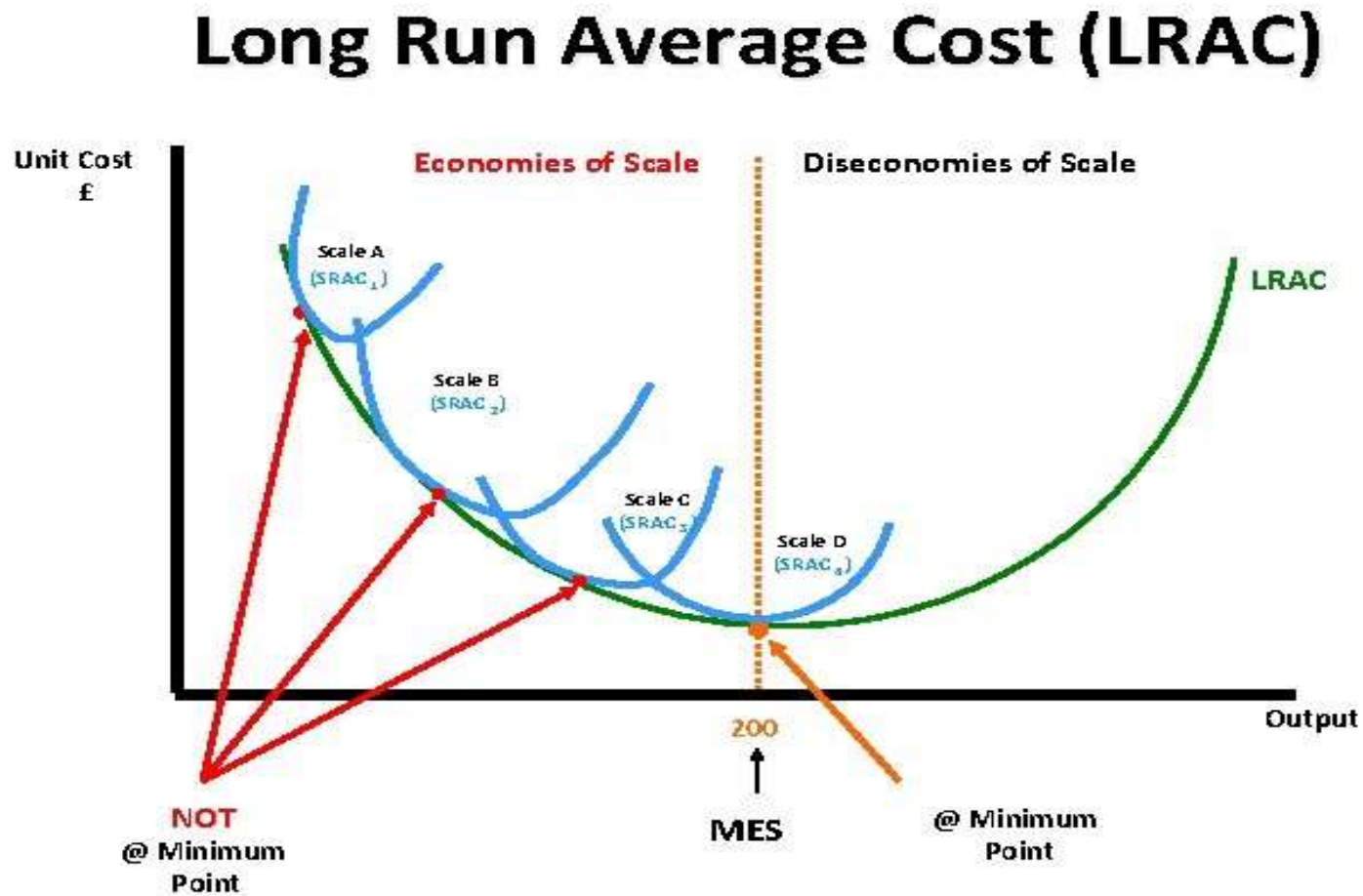

AC
SRAC1
SRAC2
SRAC3
LRAC
Economies of Scale
Constant Returns of Scale
Diseconomies of Scale
O
Q1
Q2
Q*
Q3
Q4
Output

Difference between returns to scale and economies of scale

- **returns to scale**: which inputs are used in constant proportions as output is increased.

- **economies of scale** : where input proportions are variable

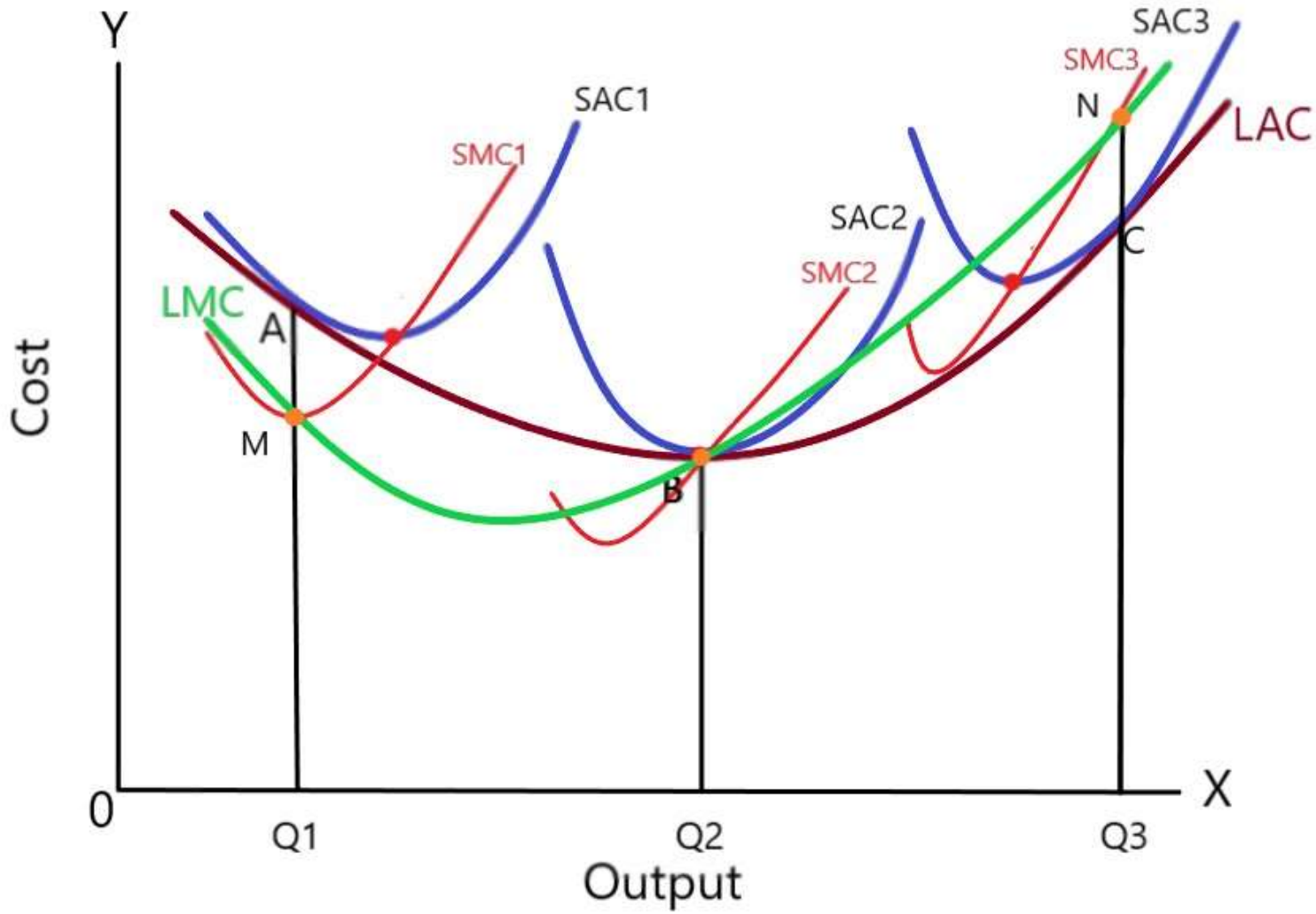
Envelope curve



Envelope curve

The LRAC curve is an "**envelope**" containing all possible short-run cost curves. Each average total cost (ATC) curve represents a manufacturing scale where the only way to increase output is to hire more workers. It is for this reason that the ATC curve lies above the LRAC curve except at one point of tangency. The **point of tangency is the cost minimizing point for that level of output.**

The short-run ATC curves represent different scales of plant that cannot be changed in the short run. They are all above the LRAC because firms have less flexibility in the short run and costs are higher. Each tangency point is the cost-minimizing point for that level of output.


Y
SAC3
SMC3
SAC1
N
LAC
SMC1
SAC2
C
SMC2
LMC
A
Cost
M
B
0
X
Q1
Q2
Q3
Output

Economies and diseconomies of scope

- **Economies of scope**:

  Situation in which joint output of a single firm is greater than output that could be achieved by two different firms when each produces a single product.

- **Diseconomies of scope** : Situation in which joint output of a single firm is less than could be achieved by separate firms when each produces a single product.

ECONOMIES OF SCOPE

RESULTS IN A DECREASE IN THE AVERAGE COST OF PRODUCTION

ECONOMIES OF SCALE

BY AN INCREASE IN VOLUME OF A SINGLE PRODUCT

Externalities & Market failure

- Market failure occurs when price mechanism fails to allocate scarce resources efficiently or when the operation of free market forces leads to net social welfare loss.
  - **Free market equilibrium quantity *> or <* Socially Optimum Quantity.**

Ways Free Market fails:

- **Externalities**
- Public good
- Information failure
- Monopoly power in markets

Externalities:

An externality is a cost or benefit caused by a producer that is not financially incurred or received by that producer

Production Externality: When production of a good creates spill over benefits or costs for a third party Eg. Air pollution

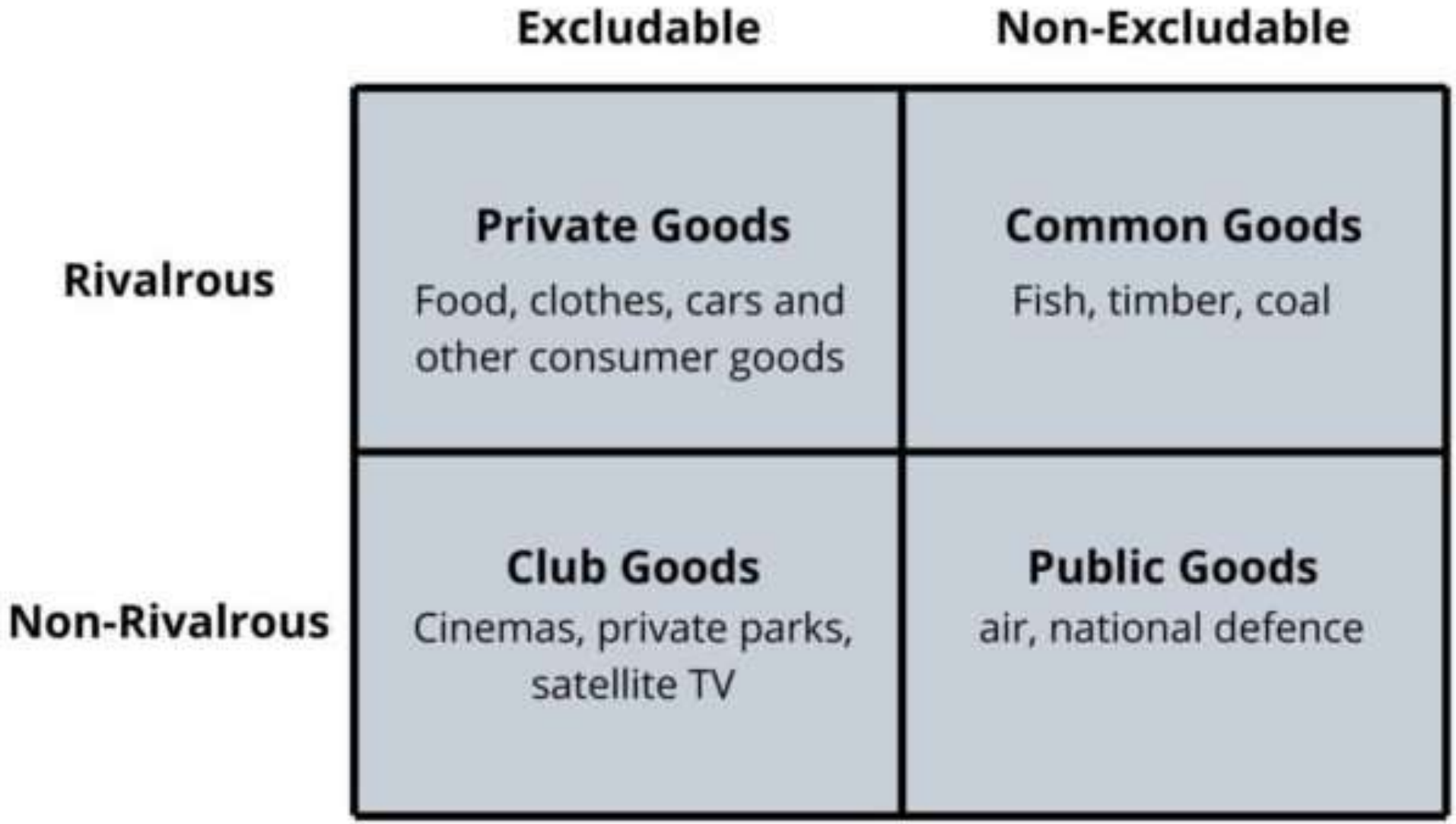
Consumption Externality: When consumption of a good creates spill over benefits or costs for a third party Eg. Ground water extraction for industry, Alcohol etc.

Public goods: They are non-rivalrous, non excludable goods which are not provided by free market. It causes a "free-rider problem”. An individual underreports his/her demand for a good but gets benefits from it once it’s available.

Common access resources: Resources that nobody owns but anybody can exploit like clean air, waterbody etc.

Asymmetric Information: When the buyer and seller of a good has different levels of information about the good. Eg: difference in quality, used cars

Monopoly power: When a single firm dominates the market they tend to produce less than socially optimum level and price would be higher than that would be charged in competitive market.

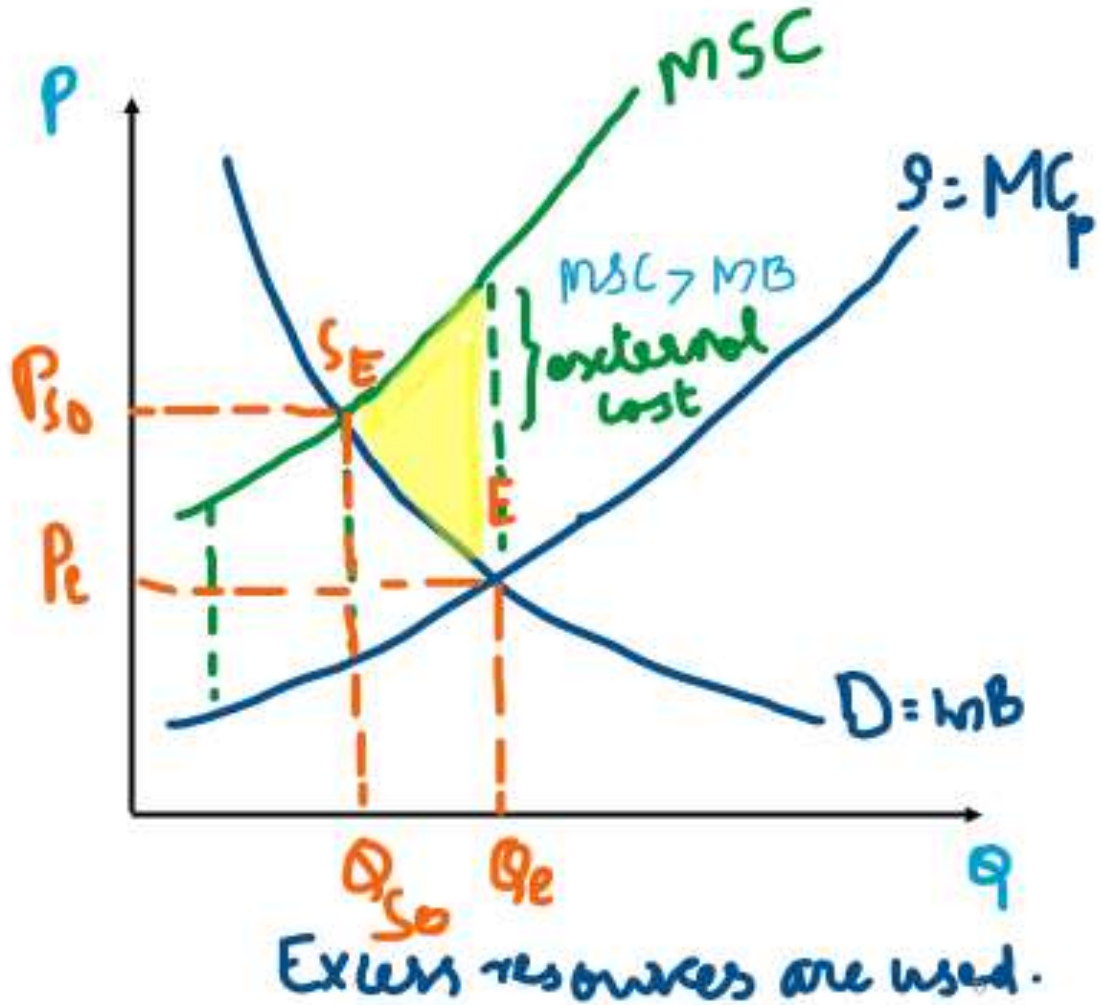

Excludable
Non-Excludable
Rivalrous
Non-Rivalrous
Private Goods
Food, clothes, cars and other consumer goods
Common Goods
Fish, timber, coal
Club Goods
Cinemas, private parks, satellite TV
Public Goods
air, national defence

Negative production Externality

When the production of a good creates negative spill over or costs passed on to society like environmental costs, health costs etc

Let's see an example of Natural gas production. The process is called Fracking which has environmental cost.
'E' is the free market equilibrium.

MPC: Marginal Private Cost
Actual monetary costs to firms for producing goods. E.g. Raw material, wage



MSC: Marginal Social Cost: These are the cost incurred by society as a whole(including MPC and all external cost)

Qso: Socially optimal quantity of production when all costs are taken into account
Pso: Price of gas if all costs taken into account

DWL: Dead Weight Loss
The yellow triangle represents in loss of total welfare resulted from over production of natural gas.