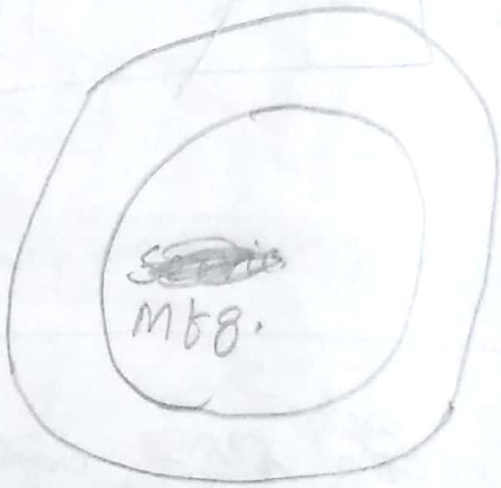
Production

Mfg includes the outcome of goods from raw-materials, ~~But Prod~~ includes the outcome of ~~goods~~ goods and services.

But Prod?

- The process of creation of utility having an exchange value
- Any activity that results in goods and services intended for exchange. → Prof. Meyers.

- ✓ Production excludes all free gifts of nature.
- ✓ Production includes both goods and services.
- ✓ Production results in addition or creation of utilities.
- ✓ Production includes
  - Transformation
  - Transportation
  - Wholesaling
  - Retailing



Production

Examples

1- Mother's services to the child is not production.

2- Mother's efforts in the house is not production, but the services of a maid servant is production.

3- Activities which create utilities but morally undesirable i.e. ~~taking~~ Production of Alcohol or opium is also production as they create utility.

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Direct Production

- Process of acquiring consumer goods directly through the application of labour in Land & other natural resources, is Direct Production.

Indirect Production

- When goods are produced through the help of machines, equipment & other capital goods are Indirect Prod^n.

Factors of Production

Anything that helps in the production of goods and services is called "Factors of Production".

Classical Economics = Land, labour & Capital (Factors of Prod^n)

Marshall added another factor = Org^n

Factors
1. Land
2. Labour
3. Capital
4. Org^n.

Land

Ordinary sense : Surface of the Earth

Eco. sense : Productive resources given by nature and existing in their natural state over the supply of which man has little control.

Land includes
- fertility
- climatic conditions
- topography
- rivers
- mountains
- forests
- mineral deposits etc

Modern Writers
Natural Resources which may be owned by human beings & which can yield an income

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Economics Meaning

Labour :- Any physical or mental effort undertaken with a view to getting a reward in cash or kind.

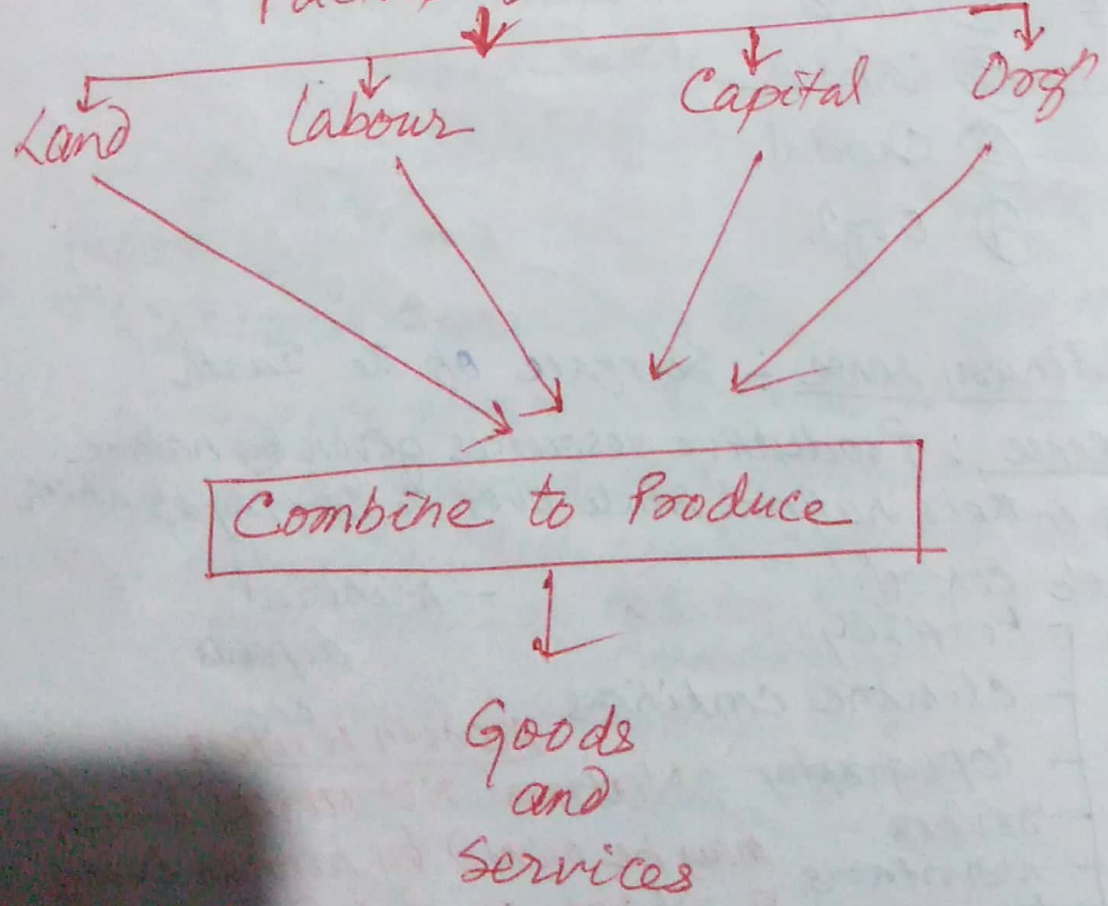
- Any work done for pleasure or leisure is not labour.

Capital :- Means of Production because it helps in further production of wealth. Plants, building machines, highways, ports, raw-materials etc.

Orgn :- A special kind of labour

- Includes the art of organising business, taking responsibility of decisions and risks arising therefrom.
- The man who organises business is called enterpreneur or organiser.

Factors of Prodn



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Production Function

Functional Relation exists between inputs and output is called production function.

$$Q = f(L, K)$$

Where,
Q = Output
L = Labour
K = Capital

Here, inputs are labour and capital.

Both Labour (L) and Capital (K) are independent variables.

Changes in Independent variables (L and K) also changes the dependant variable 'Q' (output).

Production Function

(A) Short-run Prod^n Function → Law of Variable Proportions

(B) Long-run Prod^n Function → Law of Returns to Scale

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Short-Run Prodⁿ Function :-

$$Q_x = f(L, \bar{K})$$

(Here, functional relation exists in between inputs and outputs in the short-run. Fixed factors remain constant.)

Here,

Q_x = Output of good X

L = Labour, a variable factor

$\bar{K}$ = Capital, a fixed factor which is a constant.

For example

$$40_x = f(5L, 4\bar{K})$$

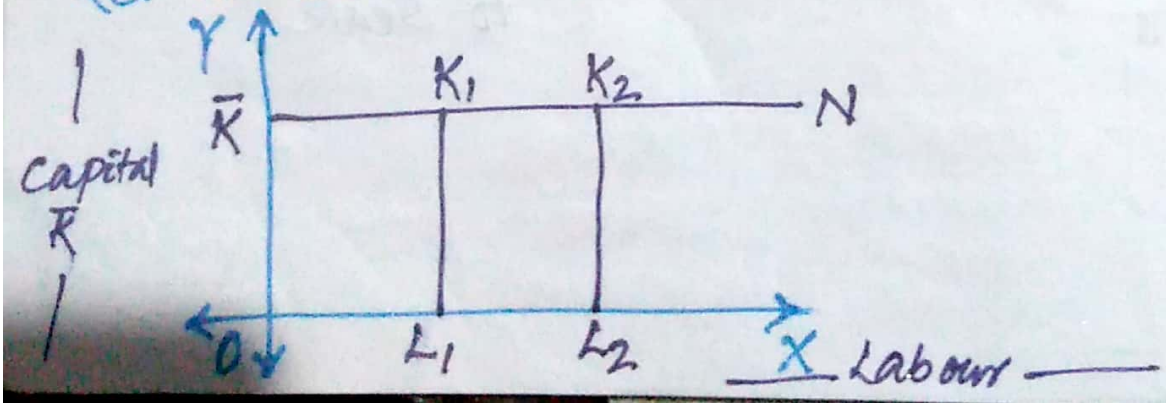
$$45_x = f(6L, 4\bar{K}).$$

Here, $\bar{K}$ (Capital) is constant at 4 units. But, L (Labour) changes from 5 to 6 units resulting in change of output from 40 to 50 units of commodity.

Hence, factor proportion changes from 5:4 to 6:4 as level of output is raised from 40 to 45 units.

This is called Variable factor Proportions.

Let us examine from the following diagram:-



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Here, OK units of capital remain fixed throughout the horizontal line KN

and

higher level of output is achieved only by increasing labour from OL_1 to OL_2.

Thus,

$$\frac{K_1L_1}{OL_1} \neq \frac{K_2L_2}{OL_2}$$

Instead, $\frac{K_1L_1}{OL_1} > \frac{K_2L_2}{OL_2}$

Long-Run Production Function

The functional relation exists between inputs and outputs in the long-run called long run prod^n function.

In the long-run prod^n function all the factors are variables.

Thus, it is the law of Returns to Scale.

$Q_x = f(L, K)$ (Here, both L and K are variables.)

For Example

$$40x = f(5L, 4K)$$
$$80x = f(10L, 8K)$$

Here, output increases by increasing the application of both Labour and capital.

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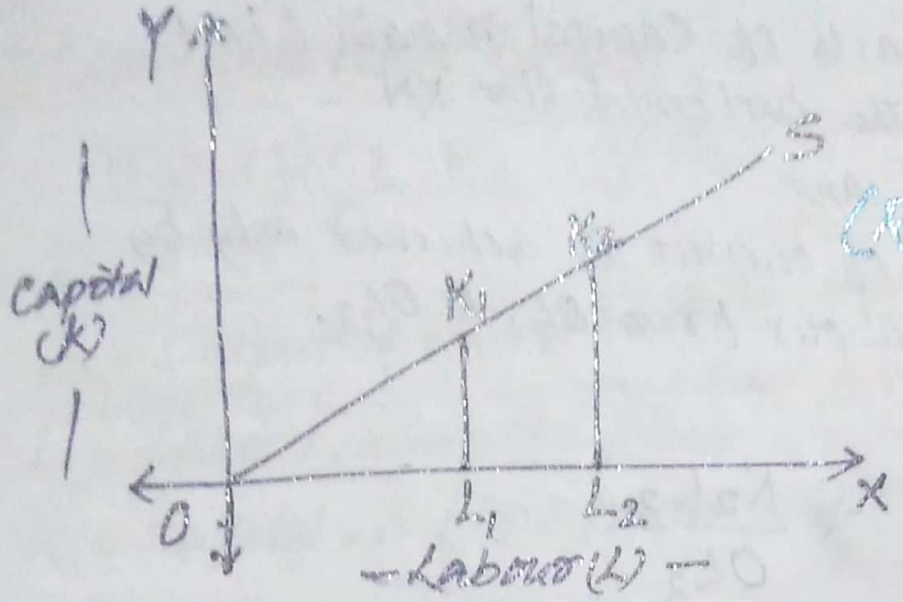

Constant-Factor Ratio (Relevant to Long-run Prod. Function)

Here, $\frac{K_1L_1}{OL_1} = \frac{K_2L_2}{OL_2}$ ($\because \Delta OL_1K_1$ and ΔOL_2K_2 are similar)

Fixed Factors

- Those factors which remain unchanged as output of the firm changes in the short-run.
- A firm increases or decreases its output in the short-run, but the fixed factors remain constant.
- Examples of fixed factors are Machines, factory buildings, plants, permanent employees etc.

Variable factors

- Those factors inputs which change with the change of output in the short-run.
- Example, Raw-materials, labour, fuel, power etc.
- If the firm wants more output, then it can use more material, more labour and more fuel or power.

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Total Product

Amount of aggregate output produced per unit of time by all factor inputs. In the short-run, total product increases with the increase of variable factors like labour and raw-materials. Thus,

$$TP = f(V)$$

Where, TP = Total Product

V = Quantity of a variable factor

F = Functional Relationship

As Variable factor (V) changes, total product (TP) also changes in the short-run other things remaining constant.

Average Product :-

It refers to the output per unit of a given variable factor.

$$AP = \frac{TP}{V}$$

Where, AP = Average Product, V = Quantity of a variable product.

In the short-run, AP changes with a change in variable factor.

Marginal Product :- Addition made to total product by employing one more unit of variable factor.

$$MP_n = TP_n - TP_{n-1}.$$

Where, MP = Marginal Product

n = Any real No.

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Law Of Variable Proportion

Also known as "Law of Proportionality".

Definition

As an equal increments of one input are added, the inputs of other productive services being held constant, beyond a certain point the resulting increments of the product will diminish i.e. marginal product will diminish.

→ A. J. Stigler

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