

Theory of Production ♥♥

Production is any economic activity $\rightarrow$ converts inputs into outputs.

- $\rightarrow$ involves Production of services also.
- $\rightarrow$ does not include work done out of love & affection, voluntarily services & goods for self consumption.
- $\rightarrow$ there should be an intention to exchange in market.
- $\rightarrow$ Production is not creation of matter, Man cannot create matter.

Production Utilities

- 1) Form Utility: changing form of natural resources.
- 2) Place Utility: changing place from they are of little or no use to another place where they are of greater use.
- 3) Time Utility: making material available at time, whenever required.
- 4) Personal Utility: use of personal skills $\rightarrow$ services

Factors of Production

- 1) Land: soil or earth-surface, includes water, air, light, heat
 - $\rightarrow$ free gift of nature $\rightarrow$ Immobile $\rightarrow$ multiple uses
 - $\rightarrow$ supply is fixed $\Rightarrow$ how of economy supply is perfectly inelastic.
 - $\rightarrow$ Permanent & indestructible powers
 - $\rightarrow$ Land is passive factor (not active factor) $\rightarrow$ Heterogeneous (different in fertility) $\rightarrow$ not same

2) Labour: mental or physical force directed to produce goods or service. → done out of love & affection is not labour.

- Connected with Human effort → Active factor → Mobile
- Highly perishable (day labour lost cannot be completely recovered)
- Inseparable from the labourer (physically present)
- Poor Bargaining power (No reserve price)
- All labour may not be productive (power differs)
- Supply of labour inelastic (can't be Inc. or Dec. rapidly)
- Supply curve of labour is Backward bending.
- Supply of labour & wage rate is directly related, for some extent.

3) Capital: man-made goods → used for production of wealth.

- Wealth refers to all those goods & human activities which are useful in production → resource lying idle constitute wealth.
 - not primary or original factor (produced by man)
- Capital is produced factor, while land & labour were not.

Types of capital:

- Fixed Capital → exist in a durable shape
- Circulating capital → only for single use (not available for further use)
- Real capital → physical goods
- Human capital → human skill & ability
- Tangible capital → perceived by senses; Intangible cap. → rights & benefits
- Individual capital → personal property owned by an individual.
- Social capital → belongs to the society as a whole.

Capital formation → known as Investment involves production of more capital goods which are used for further production of goods.

Stages of capital formation

- Savings - ability & willingness to save, Income ↑ Propensity to consume ↓
Propensity to save ↑
- Mobilisation of savings - saved money → enter into circulation → cap. formation.
- Investment - real savings converted into real capital assets
→ invest savings in productive avenues.

4) Entrepreneur :- known as Organiser, manager, risk taker.

Functions:-

- Initiates Business & resource co-ordination
- Risk bearing: Profit is the reward for bearing risk, can't be delegated
- Innovations: New idea or invention to better fulfilment of requirements

Objectives of an enterprise

- Organic objectives: to survive or to stay alive : Growth maximization
- Economic objectives: Profit maximization
- Social objectives: goods of standard quality, avoiding anti-social practices, not cause pollution, gainful employment to society ppl.
- Human objectives: Fair deal to employees, new skills & facilities, working climate, opp. of decision making to employees.
- National objectives: removing inequality & fair opportunity to all.
- self reliant: avoid dependence on other nations. → Economic growth & dev.

Constraints in enterprise's problems

- difficult to determine profit maximizing price.
- hindrance for free mobility of labour & capital.
- shortages & unanticipated emergencies.
- sudden change in govt. policies or natural calamities.
- Unfavourable exchange rate fluctuations → affects budget & plans.

Enterprise's Problems

Problems relating to: objectives, Location, size of plant, finance, organising physical facilities, organisation structure, legal formalities, Industrial relations, Marketing (Product, place, promotion, price)

Production Function

→ Technological relationship b/w inputs and output.

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

output labour capital

Assumptions of Production function

- This rel. is for specific period of time, & is not a measure of output overtime.
- No innovation
- Whatever input combination → output is always at max. level.

Cobb-Douglas Production function (USA)

→ Applied in long run (Returns to scale) (assumed constant returns to scale)

$$Q = AL^a K^{(1-a)}$$

units of labour units of capital

$$\text{Labour} = \frac{3}{4} \text{th or } 75\%$$

$$\text{Capital} = \frac{1}{4} \text{th or } 25\%$$

Short run Production function

- short run period $\Rightarrow$ at least one of the inputs remain unchanged.
- shows max. amount of b & S that can be produced ~~of~~ be given inputs.
- cannot install a new capital equipment.
- Capital is a fixed factor $\rightarrow$ Law of variable proportion is studied.

Long run Production function

- long run period $\Rightarrow$ all factors of production are variable
- can install new machines & capital. $\rightarrow$ free to vary amt. of all inputs.
- Law of returns to scale is studied.

Law of Variable proportions / Law of diminishing returns Law of Returns to Variable Input

Total Product (TP): total output resulting from all factors of production.

Average Product (AP): total product per unit of variable factor.

$$AP = \frac{TP}{\text{No. of units}}$$

Marginal Product (MP): change in TP per unit change in variable factor.

$$MP = TP_n - TP_{n-1}$$

Assumptions:- No change in technology.

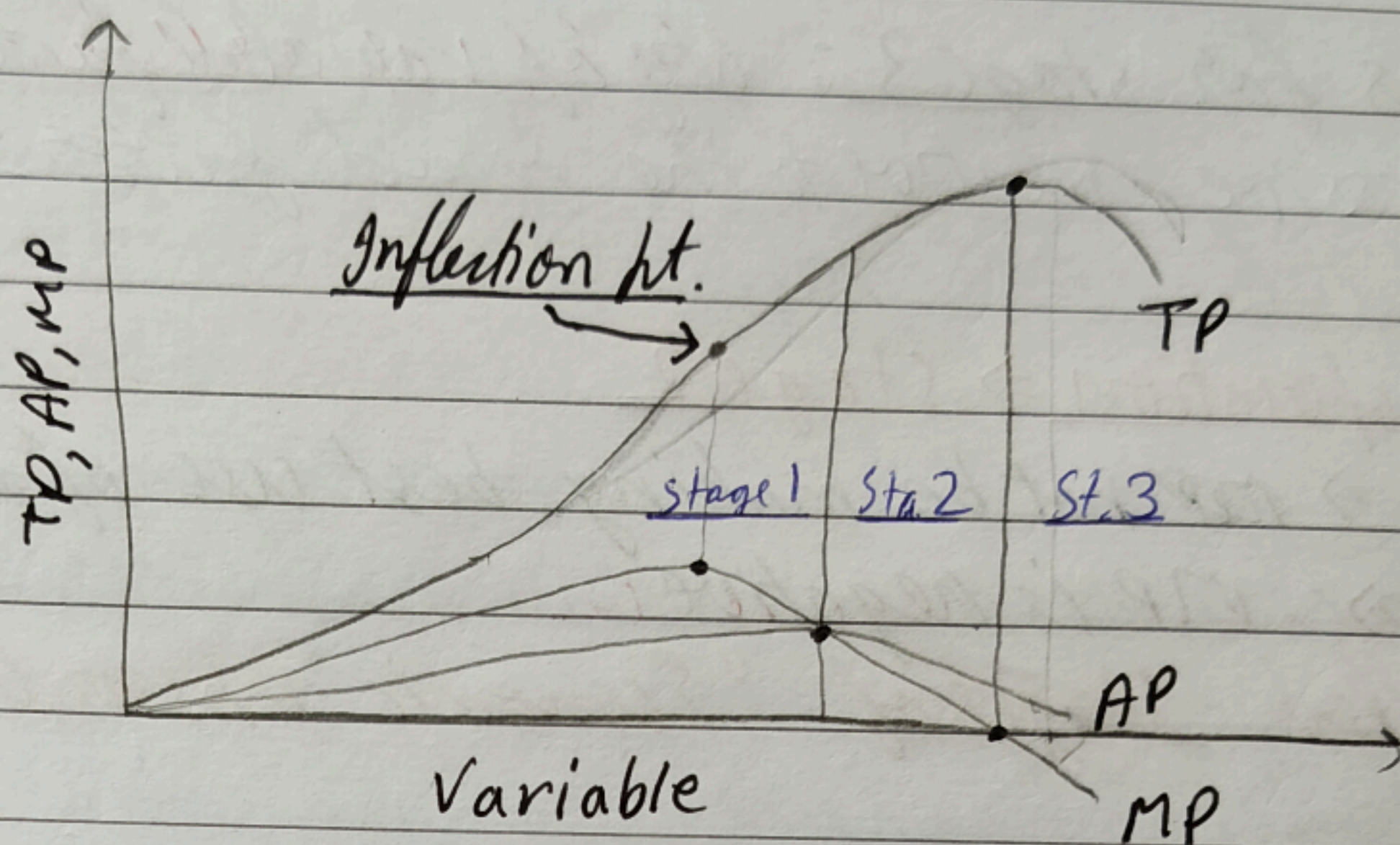
Some inputs quantity to be kept fixed.

Does not apply $\rightarrow$ factors must be used in fixed proportion.

Physical inputs & outputs are considered $\rightarrow$ not economic profitability in monetary terms.

Relationship b/w AP and MP

- 1) $AP \uparrow \Rightarrow AP < MP$
- 2) $AP \text{ max} \Rightarrow AP = MP$, MP curve cuts AP curve at its max.
- 3) $AP \downarrow \Rightarrow AP > MP$



Stages of Law of Variable proportions

- 1) Stage 1: Stage of Increasing returns (decreasing Marginal cost)
 - $TP \uparrow$ at increasing rate till Inflection pt.
 - $MP \uparrow$ & is max at pt. corresponding to Inflection pt.
 - $AP \uparrow$ • $TP \uparrow$ at diminishing rate • $MP \downarrow$ but positive
 - Stage 1 ends: AP reaches at highest & $AP = MP$

Reasons for stage 1: Indivisibility of fixed factors
Division of labour & specialisation

- 2) Stage 2: Stage of Diminishing returns (Inc. Marginal costs)
 - $TP \uparrow$ at diminishing rate until reaches its max pt. where stage 2 ends.
 - $AP \downarrow$ & $MP \downarrow$ but positive, at the end of stage 2 $MP = 0$
 - Reasons for stage 2: fixed factor becomes inadequate relative to the quantity of variable factors.
 $\rightarrow$ Imperfect substitutability

3) Stage 3: Stage of Negative returns

- $TP \downarrow$ • MP is negative • $AP \downarrow$
- Stage is called -ve returns as MP of variable factor is -ve.

Reasons for stage 3: Qty of variable factor becomes too excessive relative to the fixed factor.

Stage of operation $\Rightarrow$ Stage 2

- ✓ Stage 1 $\Rightarrow$ ~~not~~ not be making best use of fixed factors
- ✓ Stage 3 $\Rightarrow$ MP is negative

They are called Stages of "Economic Absurdity" or "Pto. Non-sense".

Due to Law of Variable Proportion, MC and AC and AVC are U-shaped.

Returns to Scale / change in scale of operations

$$Q = K^a L^b C^b$$

Stages of Returns to scale

- 1) Stage 1 - Increasing returns to scale ($a+b > 1$) (Economies of scale)
Increase in output $>$ Inc. in use of factors

Reasons: Indivisibility of factors, Specialisation

- 2) Stage 2 - Constant returns to scale ($a+b = 1$) ~~(Diseconomies of scale)~~
Inc. in output = Inc. in factors (L, K)

$\Rightarrow$ also known as Linear homogeneous production function.

- 3) Stage 3 - Decreasing returns to scale ($a+b < 1$) (Diseconomies of scale)
Inc. in output $<$ Inc. in factors (labour, capital)

Isoquants / equal-product curves / production Indifference curve

Iso product curve :- Similar to Indifference curves
→ represent combination of inputs capable of producing same level of output.

Properties:- Negatively sloped

Concave to origin due to diminishing (MRTS)

Non-intersecting

Never touch x-axis or y-axis

Curve on right → Higher level of output

Indiff. curve → not possible to quantify level of satisfaction.

Isoquants → level of production acquired is easily quantified.

Iso-cost or Equal-cost lines

:- ~~Budget~~ known as Budget line or budget constraint line

→ shows combinations of two factors, which firm can buy with given outlay.

→ All points on Budget line costs the same amt. to firm.

Tangency point of Isoquant with an Iso-cost line
represents Least cost combination of factors.