Chapter - 3

Theory of Production and Cost

Unit - 1 : Theory of Production

* Meaning of production

Production is a process of creating utility in goods

i) Form : RM → FG

ii) Time
↓
Storage
[Warehouses]

iii) Service
↓
Advertise, Insurance, Banking

iv) Place
↓
Transport

* Utility ⇒ Want satisfying power of a commodity.

* Factors of production:

Factors of production are the inputs needed for the creation of a good or service.

i) Capital → Money / Machinery, RM → Interest

ii) Land → Rent

iii) Labour → Wages

iv) Entrepreneur → Organisation → Profit

* Characteristics of Land:

* Free gift of nature
* Limited in supply
* Differ in variety ⟶ Heterogenous
* Immobile
* ~~Heterogenous~~ Passive factor of production
* Alternative uses
* Indestructible

* Characteristics of Labour:

* Human factor
* Active factor
* Cannot be seperated from labourer
* Perishable
* Labour sell his labour not himself
* Difference in efficiency
* Mobile
* Weak bargaining power
* More wages less work.

* Characteristics of Capital:

* Man made factor
* Mobile and transferable
* Depreciates
* Passive factor of production

* Types of Capital: (detail explanation in pdf notes)

i) Human ii) Real iii) Circulating iv) Social

v) Fixed vi) Capital formation.

* Stages of Capital Formation

Stage 1 - Savings (Public)

Stage 2 - Mobilisation (Bank)

Stage 3 - Investment (Loan, Firm)

* Functions of Entrepreneurs: → Key Coordinator

i) Resource co-ordination ii) Risk bearing
iii) Innovation

* Production function

Relationship between inputs and outputs of a firm. In economics, such a relationship is known as production function.

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

* Difference between short run and long run (pdf).

* Explanation of Returns to scale:

Enterprise (firm) objectives

i) Organic ⟶ Survival
ii) Economic ⟶ Profit
iii) Social ⟶ Goods at affordable price
iv) Human ⟶ Employment
v) National ⟶ National development, taxes

* Cobb douglas [Production Function:]
↳ Input & Output

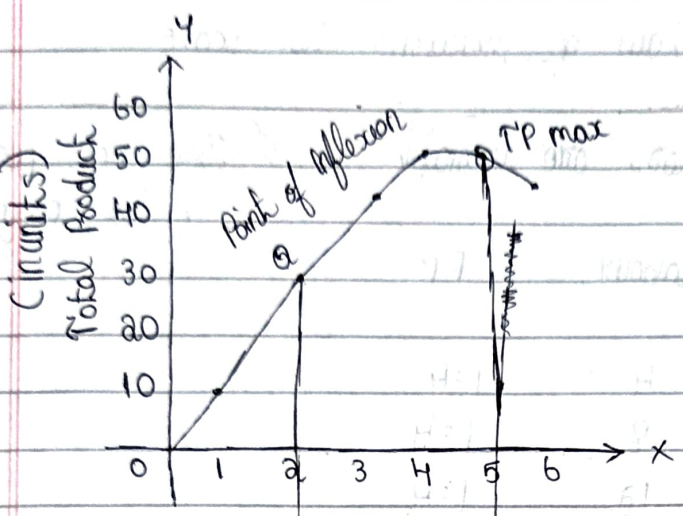
The production function solved by Cobb douglas had 1/4 contribution of capital to the increase in manufacturing industry and 3/4 of labour.

⟶ Capital

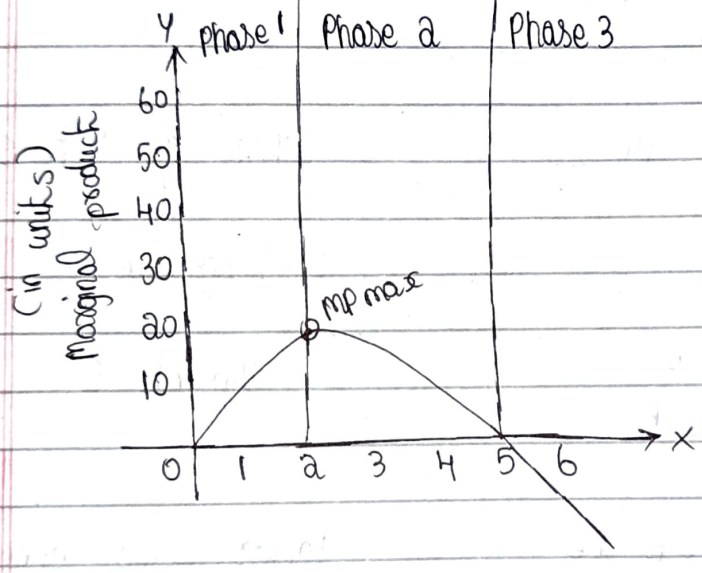
* $Q = \gamma L^{3/4} C^{1/4}$
↓ ↳ ⟶ Labour
Constant

* Short Run: Law of Variable Proportions

(Land) Fixed factor	(Labour) Variable factor	TP (Units)	MP (Units)	Phase
1	1	10	10	Phase 1: Increase return
1	2	30	(20) ⟶	Point of inflexion
1	3	45	15	
1	4	52	7	Phase 2: Diminishing
1	5	52	0	
1	6	48	-4	Phase 3: Negative



a) When TP fall MP is negative
b) When TP max MP is zero



* Short run => Law of VP [Variable Proportion]

Fixed		Variable	FP
1	:	1	1:1
1	:	2	1:2
1	:	3	1:3
1	:	4	1:4
1	:	5	1:5
1	:	6	1:6

Here FP can be changed

* Long run : Law of returns to scale

All factors are variable

Here not possible to change FP

Land	Labour	FP
1	4	1:4
2	8	1:4
3	12	1:4

*

	Law of VP	Law of R to S
i)	Short run	Long run
ii)	Fixed F Variable F	Variable F
iii)	Factor ratio can be changed ; 1:1, 1:2	Factor ratio cannot be changed ; 1:2, 2:4

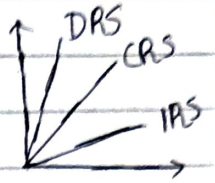
* 3 stages of Law of R to scale

→ Law of Increasing R to scale

→ Law of Constant R to scale

→ Law of Decreasing R to scale

	Land	Labour	Output
i) IRS =	1 → 2	2 → 4	100 → 250
ii) CRS =	1 → 2	2 → 4	100 → 200
iii) DRS =	1 → 2	2 → 4	100 → 190



Change in Output > Change in Input - IRS
Change in Output = Change in Input - CRS
Change in Output < Change in Input - DRS

* Production Optimisation (Equilibrium)

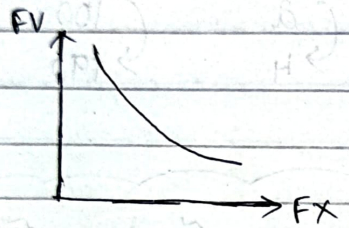
→ Isoquant : Indifference Curve [relatable]

→ Iso cost : Budget line [relatable]

* Isoquants => Producer is indifferent

⟹ Various combination of two inputs that give some output.

Combination	Factor X	Factor Y	MRTS
A	1	12	-
B	2	8	4
C	3	5	3
D	4	3	2
E	5	2	1



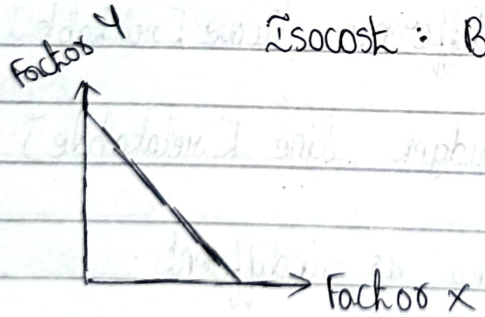
Features

i) Negatively sloped
ii) Convex to origin [Declining MRTS]

[Two IC can never intersect each other]

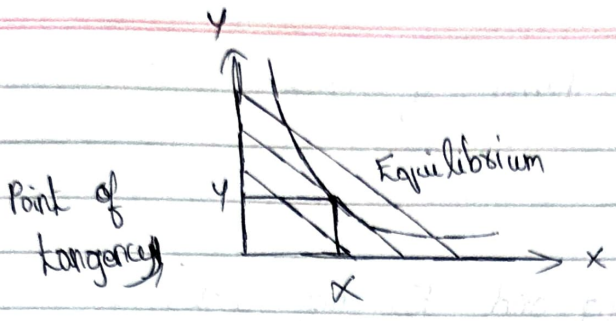
Higher IC ⟶ Higher satisfaction
Higher Isoquant ⟶ Higher output for production

* Isocost : Budget line



Production Optimisation

Least cost, max output



Producer optimised : Isoquant = Isocost [Tangent]

Consumer Equilibrium = IC = Budget line [Tangent]

*

Economies of Scale → Advantages arising because of large scale production

Diseconomies of Scale → Disadvantages arising because of small scale production

* Assumptions - Law of VP

i) Short run

ii) It is possible to change factor proportion, 1:1, 1:2

iii) State of technology is constant

iv) All inputs are homogenous (VF) are same.
[All ~~input~~ units of L are equally efficient]

* Unit - 2 Theory of Cost

* Cost concepts: → Explicit cost → Explicit + Implicit cost

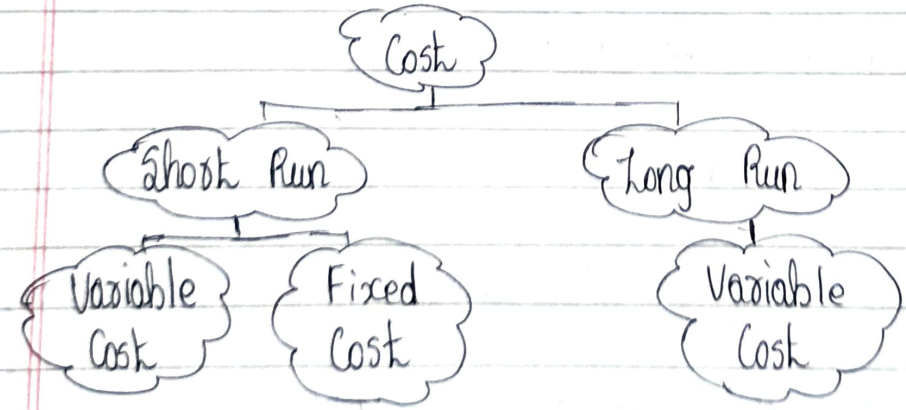
i) Accounting and Economic costs → Next best alternative
ii) Outlay and Opportunity costs
iii) Direct and Indirect costs
iv) Incremental and sunk costs
v) Historical and replacement costs
vi) Private and social costs
vii) Fixed and Variable costs

* Cost function:

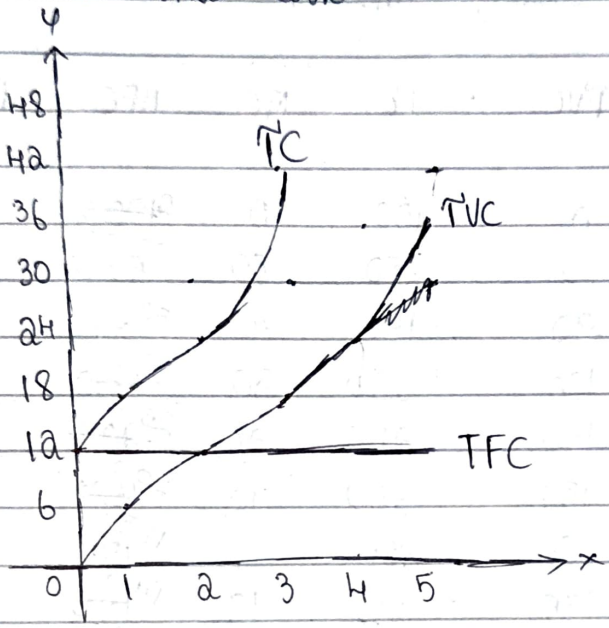
The relation between cost and output is known as 'Cost function'.

$C = f(q)$

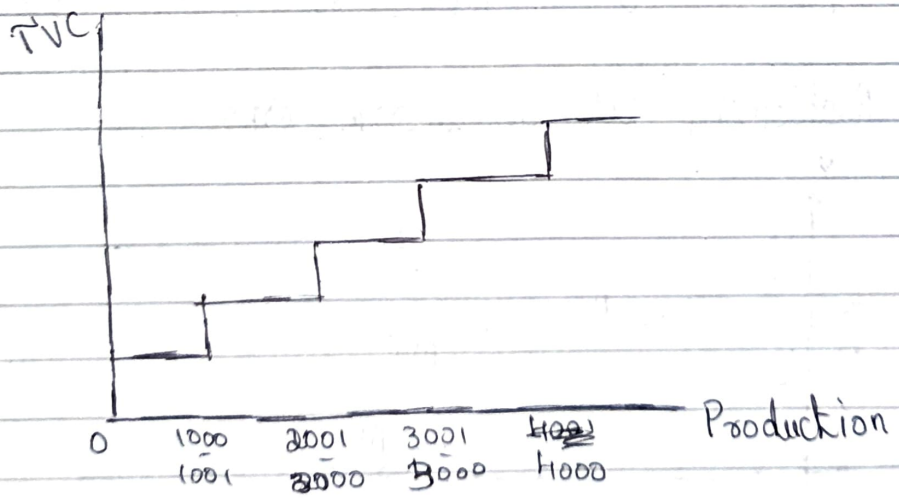
∴ C - Cost of production
q - Quantity of output
f - functional relationship



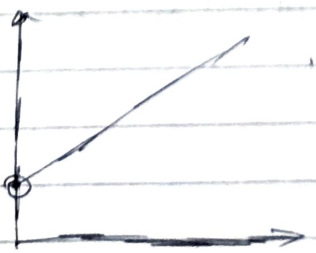
* Short Run Total Cost



* Step Variable Cost : Stair Step



* Semi Variable Cost

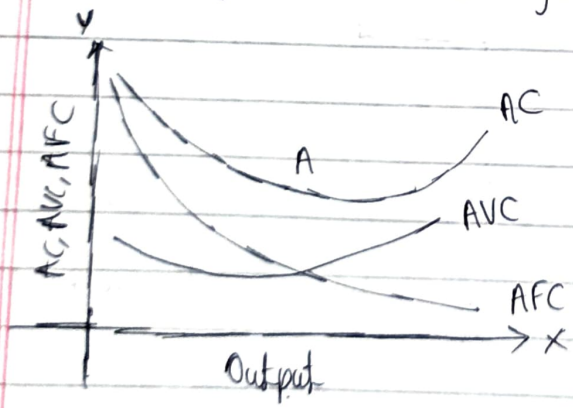


$$AFC = \frac{TFC}{Q}$$

* Schedule showing different short run costs

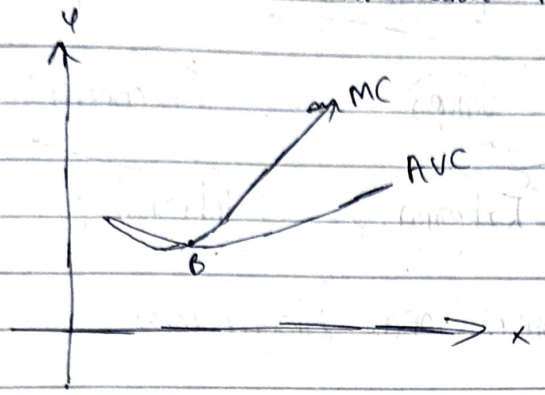
Q	TFC	TVC	= TC	MC	AFC	AVC	ATC
0	100	0	100	0	~~400.0~~		
1	100	50	150	50	100.0 ~~50.0~~	50	150
2	100	90	190	40	50.0 ~~33.3~~	45	95.0
3	100	120	220	30	33.3 ~~25.0~~	40	73.3
4	100	140	240	20	25.0 ~~20.0~~	35	60.0
5	100	150	250	10	20.0 ~~16.7~~	30	50.0
6	100	156	256	6	16.7 ~~14.3~~	26	42.7
7	100	175	275	19	14.3 ~~12.5~~	~~30~~ 25	39.3
8	100	208	308	33	12.5	26	38.5
9	100	270	370	62	11.1	30	41.1
10	100	350	450	80	10	35	45.0

* Relationship between average costs



AFC ≠ x axis because TFC ≠ 0

* Relations between AVC and MC

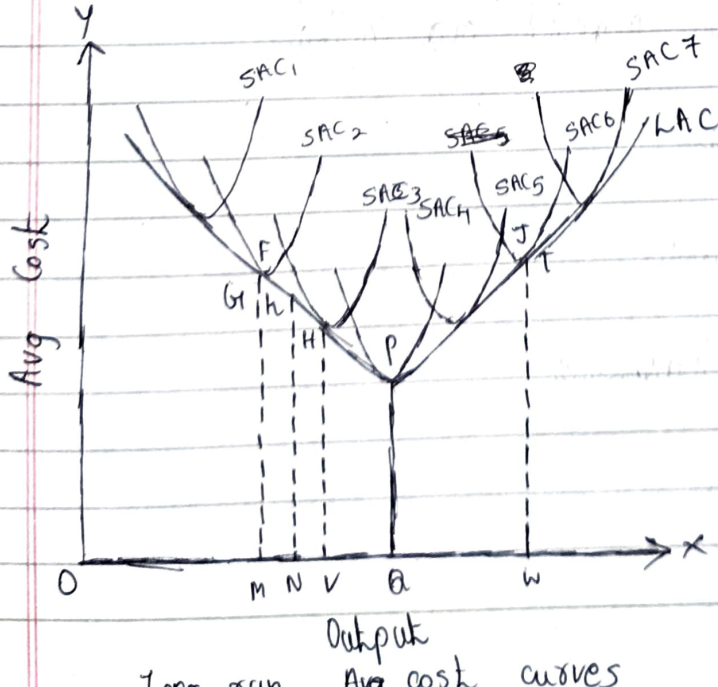


* When MC < AVC, AVC falls
* When MC = AVC, AVC is constant at its min
* When MC > AVC, AVC rises

*

TC / TVC	Inverse S Shaped
TFC	Horizontal line
AC / MC / AVC	U shaped
AFC	Rectangular Hyperbola

* Returns to Scale:



SAC → Plant curve
LAC → Envelope curve or planned curve or blanket curve

Long run Avg cost curves

Advantages when there is larger production

Scale of Production

Disadvantages when there is larger production

Economies of Scale

- Internal
- External

Diseconomies of Scale

- Internal
- External

* Internal Economies and Diseconomies:

↳ It only arrives when goes beyond the limit

i) Technical → costly machine / cheap

ii) Managerial Small / Big

iii) Financial Low / High

iv) Risk bearing Less / More

v) Commercial → Raw material at low price : eg: potato : lays

* External Economies and Diseconomies:

i) Cheaper Raw material and capital → More production makes less price

ii) Technological level of tech will ↑

iii) Skilled labour If there is huge production labour skills ↑

iv) Ancillary Industries Car Industry ↑ Nuts & bolts Industry ↑

v) Information Electronic Vehicles because of prediction of future information