INSIGHTS ON FINANCE & ACCOUNTING

Part 2

Capital Budgeting and Costs Analysis

BY :- ANUJ KUMAR – 16.12.2017

PART - 1

CAPITAL BUDGETING

OBJECTIVES OF CAPITAL BUDGETING

- Estimating cash inflows & outflows of the project
- Evaluating capital investment projects
- Selecting proposals that maximises the return
- Recognize the multiyear focus of capital budgeting.
- Planning decisions making & control tools for Long-run investments in any projects / programs that span multiple years.

Capital Budgeting is used to make the Investment Decision

INTRODUCTION

- **Capital budgeting** is the allocation of funds to long-lived capital projects.
- A **capital project** is a long-term investment in tangible assets.
- Any company's capital budgeting process and competency are important in valuing a company.

BASIC PRINCIPLES OF CAPITAL BUDGETING

Decisions are based on cash flows.

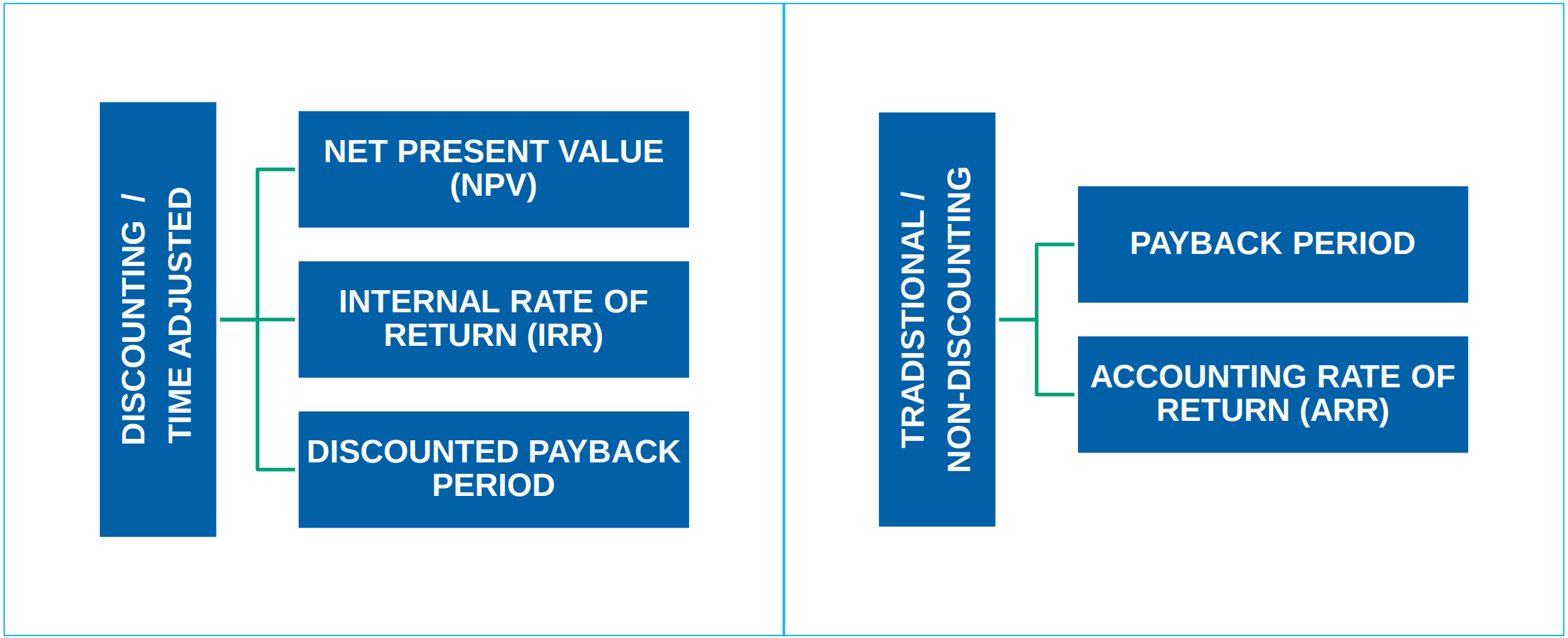
The timing of cash flows is crucial.

Cash flows are incremental.

Cash flows are on an after-tax basis.

CAPITAL BUDGETING TECHNIQUES

TWO TYPES



*** Modern way of Decision making Techniques**

ILLUSTRATION

Activity 1:

ABC manufacturing is planning to invest in a project with capital outflow of Rs. 500,000. Estimates of annual income after depreciation and before taxes given below:

Year	Profit Before Tax (PBT)
1	80,000
2	120,000
3	90,000
4	110,000
5	100,000

- Depreciation Rate: 20%
- Income Tax Rate: 30%
- Interest @ 14%

Calculate following from the above information:

a. NPV
b. Payback Period
c. Discounted Payback Period
d. Accounting Rate of Return

Year	Profit Before Tax (PBT) Rs.
0	(500,000)
1	80,000
2	120,000
3	90,000
4	110,000
5	100,000

Depreciation Rate: 20%

Income Tax Rate: 30%

Depreciation:
500,000 * 20%
= 100,000

Discount Rate: 14%

NET PRESENT VALUE - NPV

Method: $NPV = PV_{inflows} - PV_{outflows}$

NPV = PRESENT VALUE OF CASH INFLOW - PRESENT VALUE OF CASH OUTFLOW

In other words, it is the Difference between the present value of Cash inflow & present value of cash outflow

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Guidance :-

NET PROFIT ≠ CASH

CASH INFLOW = PAT + Depreciation & Amortization

NET PRESENT VALUE – NPV Calculations

Net Present Value (NPV)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Profit Before Tax	80,000	120,000	90,000	110,000	100,000
Less: Income Tax @30%	24,000	36,000	27,000	33,000	30,000
Profit After Tax (PAT) (PBT – Income Tax)	56,000	84,000	63,000	77,000	70,000
Depreciation	**100,000**	**100,000**	**100,000**	**100,000**	**100,000**
Cash Inflow	156,000	184,000	163,000	177,000	170,000
PV @ 14%	136,842	141,582	110,020	104,798	88,293
Cumulative PV	**136,842**	**278,424**	**388,444**	**493,243**	**581,535**

NPV = PV of Cash inflow – PV of Cash Outflow
= 581,535 – 500,000
= **Rs. 81,535**

NPV = **+Ve, Accept**
NPV = **-Ve, Reject**

Thumb Rule :-

If NPV > 0:
Invest: Capital project adds value
If NPV < 0:
Do not invest: Such Capital project destroys value

Only projects with a zero or positive net present value (+ve NPV) are acceptable.

PAYBACK PERIOD

The payback period is the length of time that takes to recover the initial cash expenditure of a project from future incremental cash flows.

PAYBACK PERIOD – Calculations

Payback Period

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Profit Before Tax	80,000	120,000	90,000	110,000	100,000
Less: Income Tax @30%	24,000	36,000	27,000	33,000	30,000
Profit After Tax (PAT)	56,000	84,000	63,000	77,000	70,000
Depreciation	100,000	100,000	100,000	100,000	100,000
Cash Inflow	156,000	184,000	163,000	177,000	170,000
Cumulative Cash inflow	156,000	340,000	**503,000**	680,000	850,000

Payback Period = **3 Years**

Lower Payback Period,
Project Accepted

Time span required to recover the initial investment from expected cash inflows

DISCOUNTED PAYBACK PERIOD

The discounted payback period is the length of time it takes for the cumulative discounted cash flows to equal the initial expenditure.

In other words, it is the length of time for the project to reach NPV = 0.

DISCOUNTED PAYBACK PERIOD – Calculations

Discounted Payback Period

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Profit Before Tax	80,000	120,000	90,000	110,000	100,000
Less: Income Tax @30%	24,000	36,000	27,000	33,000	30,000
Profit After Tax (PAT)	56,000	84,000	63,000	77,000	70,000
Depreciation	100,000	100,000	100,000	100,000	100,000
Cash Inflow	156,000	184,000	163,000	177,000	170,000
PV @ 14%	136,842	141,582	110,020	104,798	88,293
Cumulative PV	136,842	278,424	388,444	**493,243**	581,535

Payback Period = **4 Years (approx.)**

Discounted Payback Period > Non-discounted payback period

Time span required to recover the PV of investment from present Value of expected cash inflows

Note – Discounted Payback Period is always higher than the Payback Period

INTERNAL RATE OF RETURN - IRR

IRR – ALSO KNOWN AS 'BREAKEVEN RATE / CAGR

The Rate at which NPV is "ZERO", is called as IRR

The internal rate of return is the rate of return that results in NPV = 0.
Or
The IRR is the rate that causes the NPV to be equal to zero.

$$IRR = Lr + \frac{NPV_L}{(NPVL - NPVH)} * (Hr - Lr)$$

Lr – Lower Rate of Interests
Hr – Higher Rate of Interests
NPVL – NPV @ Lower Rate of Interests
NPVH – NPV @ Higher Rate of Interests

Internal Rate of Return (IRR)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Profit Before Tax	80,000	120,000	90,000	110,000	100,000
Less: Income Tax @30%	24,000	36,000	27,000	33,000	30,000
Profit After Tax (PAT)	56,000	84,000	63,000	77,000	70,000
Depreciation	100,000	100,000	100,000	100,000	100,000
Cash Inflow	156,000	184,000	163,000	177,000	170,000
PV @ 14%	136,842	141,582	110,020	104,798	88,293
Cumulative PV	136,842	278,424	388,444	493,243	581,535

IRR = **20.5%**

Discount Rate < IRR, Project Accepted
Discount Rate > IRR, Project Rejected

If IRR > r (required rate of return/Discount Rate/ WACC/Hurdle Rate): NPV will be +ve
Invest: Such Capital project adds value

If IRR < r: (required rate of return/Discount Rate/ WACC/Hurdle Rate): NPV will be -ve
Do not invest: Such Capital project destroys value

ACCOUNTING RATE OF RETURN - ARR

The accounting rate of return (ARR) is the ratio of the average net income from the project to the average book value of assets in the project

$$\text{AAR} = \frac{\text{Average net income}}{\text{Average book value}}$$

ACCOUNTING RATE OF RETURN – ARR Calculations

Accounting Rate of Return (ARR)

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
Profit Before Tax	80,000	120,000	90,000	110,000	100,000
Less: Income Tax @30%	24,000	36,000	27,000	33,000	30,000
Profit After Tax (PAT)	56,000	84,000	63,000	77,000	70,000

Total PAT	350,000
Average PAT	70,000
Initial Investment	500,000

Higher ARR is Good

ARR = **14%**

It measures average of profitability on initial investment

DECISION MAKING CRITERIA

SEQUENTIAL ANALYSIS TO BE DONE

1. Higher NPV (in Absolute Value terms - Rs.)
2. Lower Discounted Payback Period – (in Year)
3. Higher IRR (in %)

DECISION RULES
FOR ALL CAPITAL BUDGETING TECHNIQUES

#	Tech.	Accept or Reject Criteria for …	
		Single or Independent Project(s)	Mutually Exclusive Projects
1.	PB	Less than the Target Period	Shortest Payback Period
2.	DPB	Less than the Target Period	Shortest Payback Period
3.	ARR	Above the Target Rate	With the highest ARR
4.	NPV	A positive NPV	With the highest positive NPV
5.	IRR	Higher than the Target Rate (Cost of Capital)	With the highest IRR

The NPV method has the advantage that the end result of the computations is expressed in Absolute Value (Rs.) and not in a percentage.

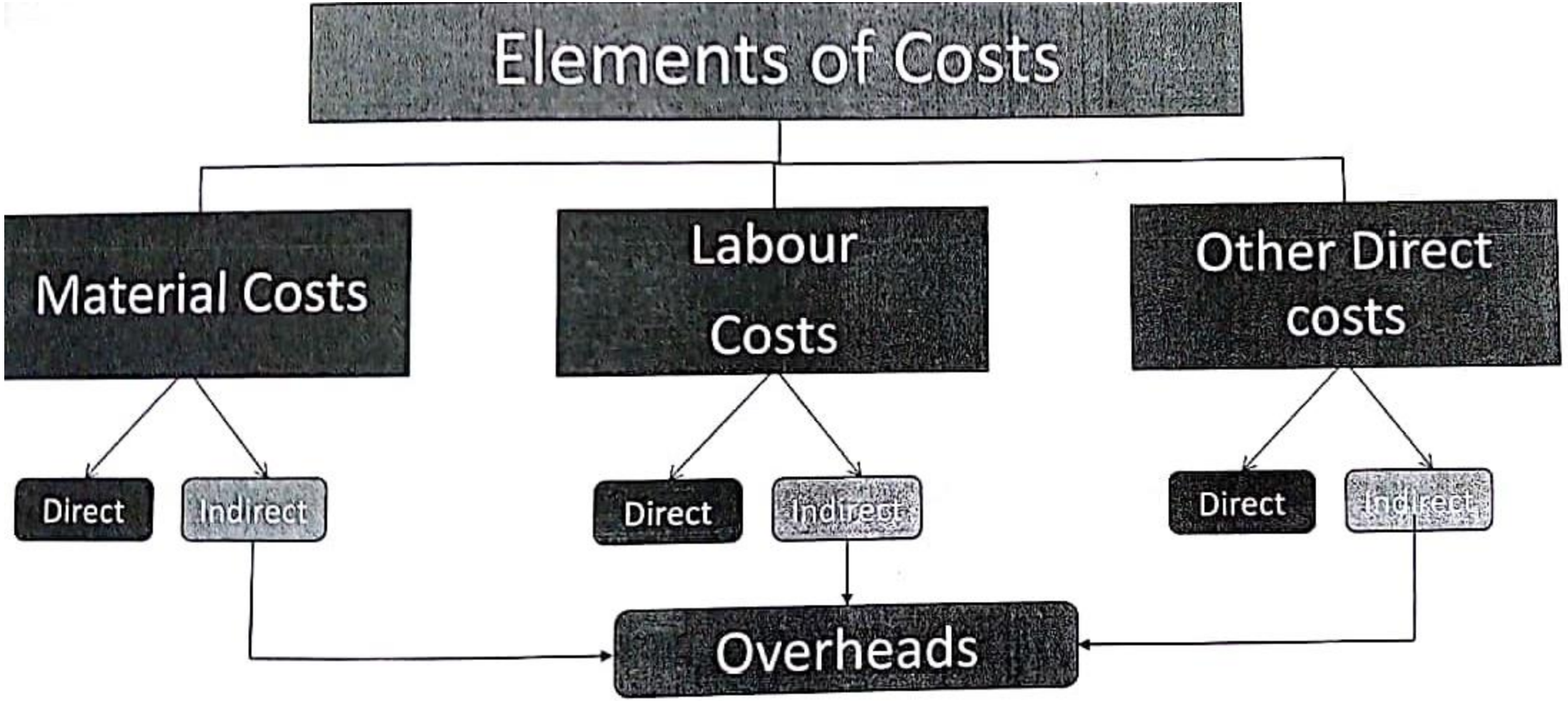
PART - 2

COSTS ANALYSIS

MEANING OF COSTS

An amount of expenditure incurred on a particular product or service

ELEMENTS OF COSTS



Direct Costs

Direct Material	Material which forms part of finished goods Ex: Direct cost in Steel is Iron Ore
Direct Labour	Wages of workers who are directly involved in production of goods Ex: Labour involved in steel plant
Direct Expenses	Expenses directly related to the production of particular product Ex: Cost of lubricant, carriage inward, excise duty, etc.

Indirect Costs

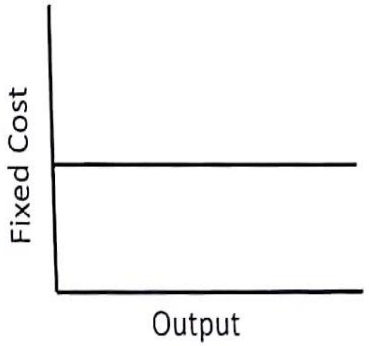
Indirect Material	Material used but it is not part of finished goods
Indirect Labour	Wages which are not part of particular product Ex: Foreman salary, supervisor salary, etc.
Indirect Expenses	Expenses which have indirectly contributed in manufacturing the product Ex: Audit fees, legal fees, Office expense, Depreciation of office Building, etc.

TYPES OF COSTS

Fixed Cost

Cost which remains same with the change in level of output
Ex: Rent, Salary, Insurance, etc.

Ex: Factory Rent is Rs. 50,000 per month	
Production (Units)	Cost (Rs.)
Nil	50,000
1,000	50,000
5,000	50,000
10,000	50,000

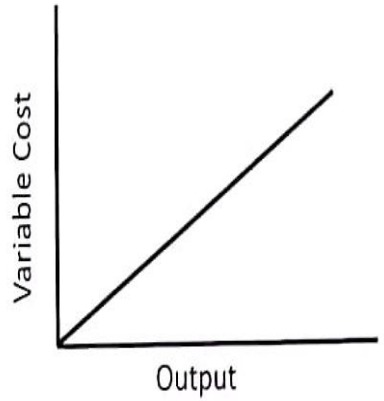


TFC remains fixed in Totality i.e., Total fixed Costs remains constants

Variable Cost

It is the cost that changes in proportion to the goods produced.
The Per Unit cost of variable remains same
Ex: Direct Material, Direct Labour Variable Overheads, etc.

Ex: Variable cost per Unit is Rs. 20	
Production (Units)	Cost (Rs.)
Nil	0
1,000	20,000
5,000	100,000
10,000	200,000



VC remains fixed in per unit basis & Hence varies in Totality

COST SHEET

Particulars	Amount
Direct Material	XXX
+ Direct Labour	XXX
+ Other Direct Cost	XXX
Prime Cost	XXX
+ Manufacturing Overheads	XXX
Manufacturing Cost	XXX
+ Office & Administrative Overheads	XXX
Cost of Production	XXX
+ Selling & Distribution Overheads	XXX
Cost of Sales	XXX
+ Profits	XXX
Sales	XXX

Semi-Variable Cost

Cost which includes both Fixed and Variable component is known as Semi-Variable Cost

H-L Methods (in Miscellaneous Expense)

$$\text{Variable Cost Per Unit} = \frac{\text{Highest Cost} - \text{Lowest Cost}}{\text{Highest Qty} - \text{Lowest Qty}}$$

Total Variable Cost = Variable Cost Per Unit * Lowest Qty

Total Fixed Cost = Total Cost – Total Variable Cost

Activity 3:

Following is the information related of ABC LTD.

Items of Cost	Planned @ 6,000 Units	Planned @ 9,000 Units
Salaries	28,000	28,000
Direct Material	42,000	63,000
Miscellaneous Cost	16,000	20,500

a. Prepare flexible budget for ABC Ltd. @ 7,000, 8,000 & 10,000 Units using High-Low method for semi-variable cost

b. Calculate Cost Per Unit @ 7,000, 8,000 & 10,000 Units

H-L Methods

Variable Cost Per Unit = $\frac{20,500 - 16,000}{9,000 - 6,000}$ = 1.5 / Unit

Total Variable Cost = 1.5 * 6,000 = Rs. 9,000

Total Fixed Cost (TFC) = 16,000 – 9,000 = **Rs. 7,000**

Items of Cost	7,000 (Units)	8,000 (Units)	10,000 (Units)
Salaries	28,000	28,000	28,000
Direct Material (@ Rs. 7)	49,000	56,000	70,000
Misc. Cost			
• Variable (@ Rs. 1.5/ U)	10,500	12,000	15,000
• Fixed	7,000	7,000	7,000
Total Cost	**94,500**	**103,000**	**120,000**
Cost Per Unit (CPU)	**13.5**	**12.88**	**12.00**

Cost-Volume-Profit (C-V-P)

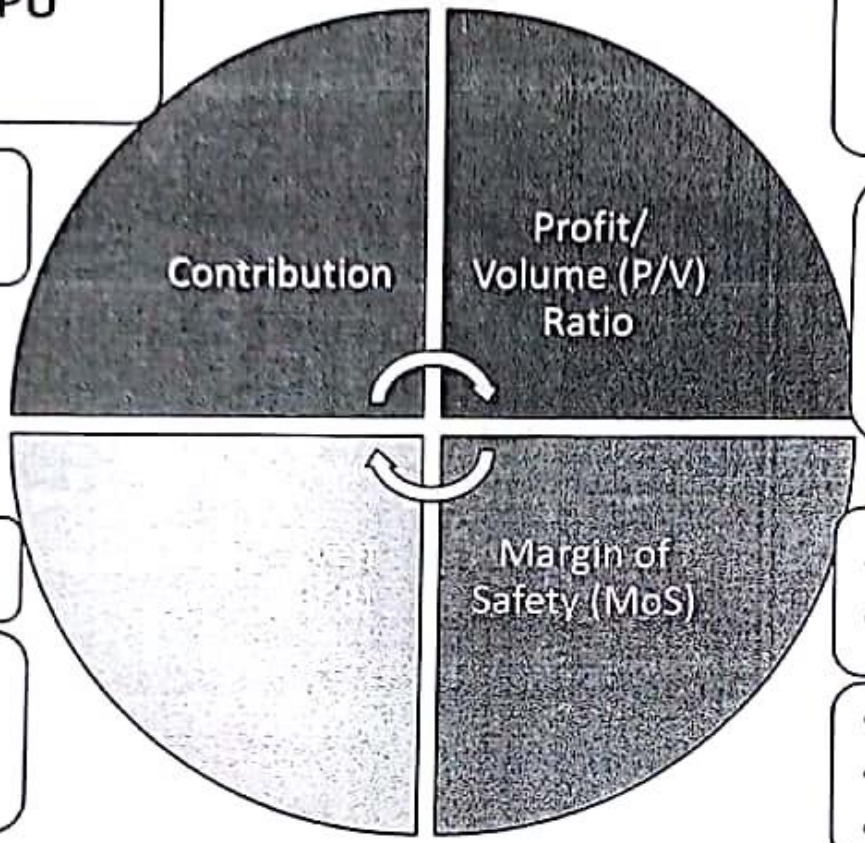
- **Contribution = SPPU – VCPU**
- CPU = SP – VC

- Ex: SP = 200, VC = 120
- Hence, **CPU = 80**

TVC = VC * Nos. of Units
= 120 * 2000 = 2,40,000

BEP = TFC / CPU

- Ex: TFC = 160,000
- Hence, BEP = 160,000 / 80
- **= 2,000 Units**



- P/V or C/S Ratio

Or Variable cost to sales ratio

- = 100% - P/V ratio

- **Ex, 80/200 = 40%**

Or VC to Sales ratio

- = 100% - P/V ratio
- = 100% - 40% = 60%

- Break-Even Sales = BEP * SPPU
- MoS = Budgeted Sales – BES

- Ex, Budgeted Sales = 200,000
- MoS = 500,000 – 400,000
- **= 100,000**

Marginal Costing :

XYZ manufacturing limited has two production facility in Jamshedpur and Kalinganagar. Following is the further information:

Particulars	Jamshedpur	Kalinganagar
Capacity	10,000	15,000
Selling Price	Rs. 150/-	Rs. 150/-
Variable Cost	Rs. 100/-	Rs. 120/-
Fixed Expenses	Rs. 300,000	Rs. 210,000

Find Profit / Loss if 13,000 Units to be manufactured:

(a) From Jamshedpur facility (b) From Kalinganagar facility
(c) 50% from each facility

Find Break-Even Point for both the cities

BEP for JSR = 300000/50 = 6000 Units
&
BEP for KPO = 210000/30 = 7000 Units

Case 1

	JSR Plant	KPO Plant	
Total Sales	15,00,000	----	
Total Variable Costs	10,00,000	-----	
Contribution	5,00,000	-----	
Total Fixed Costs	-3,00,000	-2,10,000	
Profit	**2,00,000**	**-2,10,000**	**-10,000**

Case 2

	JSR Plant	KPO Plant	
Total Sales	------	19,50,000	
Total Variable Costs	-------	15,60,000	
Contribution	------	3,90,000	
Total Fixed Costs	-3,00,000	-2,10,000	
Profit	**-3,00,000**	**-1,80,000**	**-1,20,000**

!!!! THANKS !!!!