# CONCEPT OF NET PRESENT VALUE (NPV)

### Prepared by: Harmanpreet Kaur

## Assistant Professor, Department of Commerce, Shivaji College, DU

EAR		1 2	3	4	5	
FAT	5000	0 75000	100000	50000	70000	
ecide whether the	he company should install the mac	nine. Take cost of capital as 1	LO% use NPV technique.	of Conital	100/	
	TEAR	CFAT		of Capital	10%	
		-20000	4			
		1 50000	-			
		2 <b>75000</b>				
		3 100000				
		4 50000				
		5 <b>70000</b>				
	PRESENT VALUE OF CASH	1	_			
	FLOWS	\$260,184.66				
	NPV	\$60,184.66	Present value of all cash inflow	vs (-) Present value of all cash	outflows	
			NPV (Rate, Value 1, Value 2,	Rate, Value 1, Value 2,) + cash outflow		
	PROFITABILITY INDEX	\$1.30	Present value of all cash inflow	vs (÷) Present value of all cash	outflows	

### **QUESTION 2**

A company is considering two mutually exclusive proposals. Cash flows related to the projects are.						
YEAR 0 1 2 3 4						
PROJECT A	-500000	400000	60000	50000	70000	80000
PROJECT B	-500000	20000	500000	60000	70000	50000

Calculate NPV of the two p	rojects if discount rate is 12	2% which project should be	selected.		
	YEAR	PROJECT A	PROJECT B	Cost of Capital	12%
	0	-500000	-500000		
	1	400000	20000		
	2	60000	500000		
	3	50000	60000		
	4	70000	70000		
	5	80000	50000		
	PRESENT VALUE OF CASH				
	FLOWS	\$530,443.92	\$532,018.50		
	NPV	\$30,443.92	\$32,018.50	Present value of all cash inflo	ws (-) Present value of all cash ou
				NPV (Rate, Value 1,	Value 2,) + cash outflow
	PROFITABILITY INDEX	\$1.0609	\$1.0640	Present value of all cash inflow	ws (÷) Present value of all cash oເ
	Decision	Select B			
		IF(C39>D39,"SELE	CT A","SELECT B")		

# CONCEPT OF INTERNAL RATE OF RETURN (IRR)

### Prepared by: Harmanpreet Kaur

Assistant Professor, Department of Commerce, Shivaji College, DU

#### **QUESTION 1**

PK Ltd. decides to install a new machine costing Rs. 1,00,000. the machine is expected to save costs and its life is estimated to be 6 years. The CFAT from the machine over 6 years are estimated as follows. Calculate IRR of the machine. Should the machine be installed ? Cost of capital is 14%

YEAR	1	2	3	4	5	6
CFAT	15000	20000	25000	35000	40000	45000

YEAR	CFAT	Cost of Capital	14%
0	-100000		
1	15000		
2	20000		
3	25000		
4	35000		
5	40000		
6	45000		
IRR	16.204%	IRR(values, [guess])	

#### **ANNUAL CASH FLOWS**

#### **QUESTION 2**

A company is considering two mutually exclusive proposals. Cash flows related to the projects are.							
YEAR	0	1	2	3	4	5	
PROJECT A	-500000	400000	60000	50000	70000	80000	
PROJECT B	-500000	20000	500000	60000	70000	5000	
Calculate IRR of the two projects if discount rate is 12% which project should be selected.							
	YEAR	PROJECT A	PROJECT B	Cost of Capital	12%		
	0	-500000	-500000				
	1	400000	20000				
	2	60000	500000				
	3	50000	60000	]			

	4	70000	70000
	5	80000	5000
IRR		16%	13%
DECISION	Select Projec	t A	

#### NON-PERIODIC CASH FLOWS

#### **QUESTION 3**

A company has project A under consideration. The inflows and outflows related to the projects are at irregular intervals of time as follows:

Date	Cash flows	
01/04/2017	-100000	
31/12/2017	80000	
30/09/2018	35000	
31/08/2019	30000	
24/10/2020	25000	

Calculate XNPV if discount rate is 12%. Also calculate XIRR.

XNPV	42508.74507
XIRR	44.38%

XNPV(Rate, Values, Dates) XIRR(Values, Dates, [guess])

# CONCEPT OF AVERAGE RATE OF RETURN (ARR)

Prepared by: Harmanpreet Kaur

Assistant Professor, Department of Commerce, Shivaji College, DU

**QUESTION 1** 

A company is conside	ering two projects. The cos	st of both the projects is Rs	. 1,20,000. The Profit after	tax of the projects are as b	elow:		
YEAR	1	2	3	4	5	6	SALVAGE VALUE
PAT PROJECT A	10000	30000	50000	60000	20000	10000	12000
PAT PROJECT B	30000	40000	40000	70000	10000	20000	6000
Calculate ARR.							-
	YEAR	PROJECT A	PROJECT B				
	1	10000	30000	ARR=(AVERAGE PROFIT AF	TER TAX (÷) AVERAGE INV	ESTMENT)× 100	
[	2	30000	40000				
				AVERAGE INVESTMENT	= 1/2[INITIAL INVESTMEN]	Γ- SALVAGE VALUE] + SALA	VAGE VALUE +
	3	50000	40000		ADDITIONAL WORKI	NG CAPITAL	
	4	60000	70000		A	В	
	5	20000	10000	INITIAL INVESTMENT	120000	120000	
	6	10000	20000	SALVAGE VALUE	12000	6000	
-				-			

### AVERAGE PROFIT AFTER

TAX (APAT)	300	00	35000
	AVERAGE(C11:C16)	AVERAGE(D11:D1	6)
AVERAGE INVESTMENT			
(AI)	660	00	63000
	(F15-F16)/2+F16	(G15-G16)/2+G16	
ARR	45.45	5%	55.56%
	A	PAT/AI	

# **CONCEPT OF PAYBACK PERIOD**

### Prepared by: Harmanpreet Kaur

Assistant Professor, Department of Commerce, Shivaji College, DU

The cost of the project	ts is Rs. 60,000. It is expected to g	enerate cash flows as follo	ws:			
YEAR	1	2	3	4	5	6
CFAT	10000	15000	24000	40000	30000	6000
Calculate Payback peri	od. If desired payback period is 4	should the project be accep	ited			
	YEAR	CFAT	<b>Cumulative Cash Flows</b>	Cost of the project	60000	
	1	10000	10000	Desired PB	4	
	2	15000	25000			
	3	24000	49000			
	4	40000	89000			
	5	30000	119000			
	6	6000	125000			
QUESTION 2	DECISION	CONCEPT OF	3+(F9-D12)/C13 SELECT	ACK PERIOD		
The cost of the project	ts is Rs. 1,00,000. It is expected to	generate cash flows as fol	lows:			
YEAR	1	2	3	4	5	
CFAT	60000	50000	40000	30000	20000	
Calculate Discounted P	Payback period assuming a discou	nt rate of 10%				
	YEAR	CFAT	PV of Individual CFAT	Cumulative Cash Flows	Discount Rate	10%
	1	60000	\$54,545.45	\$54,545.45	Initial outlay	100000

\$41,322.31

\$30,052.59

50000

40000

2 3 \$95,867.77

\$125,920.36

**QUESTION 1** 

4	3000	<b>0</b> \$20,490.40	\$146,410.76	
5	2000	<b>0</b> \$12,418.43	\$158,829.19	
Discounted Payback Period	2.1	4 Years		
	2+(030-L31)/D32		=PV(\$Rate	e\$, Year, 0, -CFAT)

#### **QUESTION 1**

A project requires an initial outlay of Rs. 20000 and has a life of 5 years. It generates year ending profits before deprecitaion and taxes of Rs. 12000, Rs. 10000, Rs. 8000, Rs. 6000 and Rs. 5000. It is depreciated on SLM. Tax rate is 35%. Compute (i) Payback period (ii) ARR and (iii) Acceptability of the project if the project if project should satisfy both the criteria of standard payback period of 3 years and standard accounting rate of return on 20%.

20000

Solution Initial investment

Particulars	Year 1	Year 2	Year 3	Year 4	Year 5
PBDT	12000	10000	8000	6000	5000
Less Depreciation	4000	4000	4000	4000	4000
РВТ	=B8-B9	=C8-C9	=D8-D9	=E8-E9	=F8-F9
Less: Tax @35%	=B10*35%	=C10*35%	=D10*35%	=E10*35%	=F10*35%
Profit after tax (PAT)	=B10-B11	=C10-C11	=D10-D11	=E10-E11	=F10-F11
Add: Depreciation	4000	4000	4000	4000	4000
Cash Flows after Tax (CFAT)	=B12+B13	=C12+C13	=D12+D13	=E12+E13	=F12+F13
Cumulative CFAT	=B14	=B15+C14	=C15+D14	=D15+E14	=E15+F14

Payback period	=2+(C5-C15)/D14	years	2.44 years		
ARR	APAT/AI*100	=C20/C21	27.3 percent		
APAT	=AVERAGE(B12:F12)				
AI	=C5/2				

Decision : Since the payback period is less than the standard payback period of 3 years and ARR of the project is higher than the standard ARR of 20%, the project is acceptable.