

International Financial Management

Study Session 12

LOS 1 : International Capital Budgeting

- ✚ Capital Budgeting is the process of Identifying & Evaluating capital projects i.e. projects where the cash flows to the firm will be received over a period longer than a year.
- ✚ Any corporate decisions with an **IMPACT ON FUTURE EARNINGS** can be examined using capital budgeting framework.
- ✚ **Categories of Capital Budgeting Projects:**
 - a) Replacement projects to maintain the business
 - b) Replacement projects for cost reduction
 - c) Expansion projects
 - d) New product or market development
 - e) Mandatory projects

Types of Capital Budgeting Proposals:

- a) **Mutually Exclusive Proposals:** when acceptance of one proposal implies the automatic rejection of the other proposal.
- b) **Complementary Proposals:** when the acceptance of one proposal implies the acceptance of other proposal complementary to it, rejection of one implies rejection of all complementary proposals.
- c) **Independent Proposals:** when the acceptance/rejection of one proposal doesn't affect the acceptance / rejection of other proposal.

LOS 2 : Net Present Value (NPV)

$$\text{NPV} = \text{PV of Cash Inflows} - \text{PV of Cash Outflows}$$

Decision: If NPV is

- +ve Accept the project- increase shareholder's wealth
- ve Reject the project-decrease shareholder's wealth
- Zero Indifferent-No effect on shareholder's wealth

$$\text{NPV} = -\text{CF}_0 + \frac{\text{CF}_1}{(1+k_0)^1} + \frac{\text{CF}_2}{(1+k_0)^2} + \dots + \frac{\text{CF}_n}{(1+k_0)^n}$$

Where,

- CF_0 = the initial investment outlay.
- CF_t = after- tax cash flow at time t
- K_0 = required rate of return for project.

LOS 3 : Profitability Index (PI)/ Benefit cost Ratio/ Desirability Factor/Present Value Index

$$\text{PI} = \frac{\text{PV of Cash InFlows}}{\text{CF}_0 \text{ or Present value of Outflows}}$$

CF_0 = Initial Cash Out Flows

**Note:**

- NPV = - CF₀ + PV of future Cash In Flows
- CF₀ + NPV = PV of Future Cash In Flows
- If NPV is given, then Add Initial outlay in NPV to get, PV of Cash inflows.

Decision:

- If NPV is Positive, the PI will be greater than one.
- If NPV is Negative, the PI will be Less than one.

Rule:

- If PI > 1, Accept the project
- PI < 1, Reject the project
- PI = 1, Indifferent

LOS 4 : Pay-Back Period Method (PBP)

The pay- back period (PBP) is the number of years it takes to recover the initial cost of an investment.

Case I: When Cash inflows are Constant/ equal

$$\text{Pay-back Period} = \frac{\text{Initial Investment/ outflow}}{\text{Annual Cash Inflow}}$$

Case II: When Cash inflows are unequal

$$\text{Pay-back Period} = \text{Full years until recovery} + \frac{\text{Unrecovered Cost}}{\text{Cash Flow during next Year}}$$

Decision:

- Shorter the PBP, better the project.

Drawback:

- PBP does not take into account the time value of money and cash flows beyond the payback period.

Benefit:

- The main benefit of the pay-back period is that it is a good measure of project liquidity.

LOS 5 : Discount pay-back period

- The discounted payback period uses the present value (PV) of project's estimated Cash flows.
- It is the number of years it takes a project to recover its initial investment in present value terms.
- Discounted pay-back period must be greater than simple pay-back period.

LOS 6 : IRR Techniques (Internal Rate of Return)

- IRR is the discount rate that makes the PV of a project's estimated cash inflows equal to the PV of the project's estimated cash outflows.
- i.e. IRR is the discount rate that makes the following relationship:

$$\text{PV (Inflows)} = \text{PV (Outflows)}$$

- IRR is also the discount rate for which the NPV of a project is equal to ZERO.

$$\text{IRR} = \text{Lower Rate} + \frac{\text{Lower Rate NPV}}{\text{Lower Rate NPV} - \text{Higher Rate NPV}} \times \text{Difference in Rate (HR-LR)}$$

How to find the starting rate for calculation of IRR:

Step 1: Calculate Fake Pay-back period:

$$\text{Fake Pay-back Period} = \frac{\text{Initial Investment}}{\text{Average Annual Cash Flow}}$$

Step 2: Locate the above figure in Present Value Annuity Factor Table and take this discount rate to start the calculation of IRR.

Accept/Reject Criteria:

IRR > Cost of Capital	Accept the Proposal
IRR = Cost of Capital	Indifferent
IRR < Cost of Capital	Reject the Proposal

LOS 7 : Net Profitability Index or Net PI

$$\text{Net PI} = \frac{\text{NPV}}{\text{Initial Investment} / \text{Present Value of Outflows}}$$

Decision: Higher the Better.

LOS 8 : Calculation of NPV

	Total Fund Approach / Overall Project Approach
Discount Rate	K_0
Initial Outflow	Equity – Share Capital (Fund) + Debenture + Long-term Loan + Preference Share Capital Or Total Cost of Project
Operating Cash Inflows	Cash Inflow available for overall project
Terminal Cash flows	SV adjusted for Tax Release of Working Capital
NPV	NPV that a project earns for the company as a whole.

Calculation of Project Cash Flows

Sale Price Per Unit	xxx
Less: Variable Cost Per Unit	xxx
Contribution Per Unit	xxx
× No. of Unit	xxx
Total Contribution	xxx
Less: Fixed Cost	xxx
EBDIT	xxx
Less: Depreciation	xxx
EBIT	xxx
Less: Tax	xxx
NOPAT	xxx
Add: Depreciation	xxx
CFAT	xxx

Note 1 : Treatment of Depreciation

[EBDIT – Depreciation] [1 – Tax Rate] + Depreciation

Or

EBDIT (1 – Tax Rate) + Tax saving on Depreciation

Note 2 : Treatment of Interest Cost / Finance Cost

Finance Cost are already reflected in the Projects required rate of return / WACC / K_0

This shows that Interest on Long Term Loans as well as its Tax Saving is already considered by K_0

Note 3 : Net Investment in Working Capital

NWC investment = Change in non-cash current assets

(-)

Change in non-cash current liabilities

(Other than cash and cash equivalents, notes payable, short-term liabilities and current portion of long-term loans.)

		Time
Introduction of Working Capital	Outflow	Year 0
Release of Working Capital	Inflow	End of project Life

- Working Capital should never be adjusted for tax as it is a balance sheet item. Working capital is also not subject to depreciation.

Note 4 : Treatment of Tax

If we have loss in a particular year, there are two adjustments :-

- Set-off** : assumed the firm as other profitable business, Loss in a year generate tax savings in that year.
- Carry Forward** : The company has an individual business or a new business having no other operations, loss in a year will be carried forward to future years for the purpose of Set-off.

Note 5 : Key Points to Remember

- Decisions are based on cash flows, not accounting income:
- Consider INCREMENTAL CASH FLOWS, the change in cash flows that will occur if the project is undertaken.
- Sunk costs should not be included in the analysis** : These costs are not effected by the accept/reject decisions. e.g. Consulting fees paid to a marketing research firm to estimate demand for a new product prior to a decision on the project.
- Externities / Cannibalization** : When considering the full implication of a new project, loss in sales of existing products should be taken into account & also consider positive effects on sale of a firm's other product line.
- Cash flows are based on Opportunity Costs** : Opportunity costs should be included in projects costs.
- The timing of cash flows is important** : Cash flows received earlier are worth more than cash flows to be received later.
- Cash flows are analyzed on an after-tax basis.

LOS 9 : Modified NPV/ IRR

When Cost of Capital & Re-investment rate are separately given, then we calculate Modified NPV.

Modified IRR: It is the discount rate at which Modified NPV is Zero.

$$\text{i.e. Modified NPV} = \frac{\text{Terminal Value}}{(1 + K_0)^n} - \text{PV of Cash Outflow}$$

'or'

$$\text{PV of cash outflow} = \frac{\text{Terminal Value}}{(1 + K_0)^n}$$

LOS 10 : Inflation under Capital Budgeting



Cash Flow:



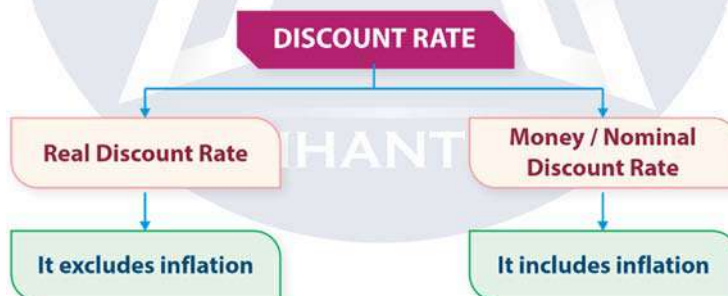
Conversion of Real Cash Flow into Money Cash Flow & Vice-versa

$$\text{Money Cash Flow} = \text{Real Cash Flow} (1 + \text{Inflation Rate})^n$$

Or

$$\text{Real Cash Flow} = \frac{\text{Money Cash Flow}}{(1 + \text{Inflation Rate})^n}$$

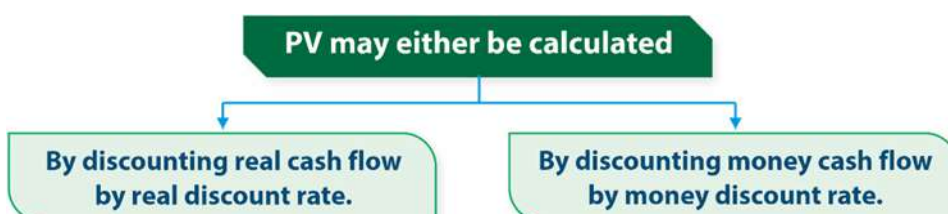
Discount Rate:



Conversion of Real Discount Rate into Money Discount Rate & Vice-versa

$$(1 + \text{Money Discount Rate}) = (1 + \text{Real Discount Rate}) (1 + \text{Inflation Rate})$$

NPV:



**Note:**

- ✚ Answer in both the case will be same.
- ✚ Depreciation is not affected by inflation rate as depreciation is changed on the book value of the asset & not market value.

QUESTION NO. 1A

A multinational company is planning to set up a subsidiary company in India (where hitherto it was exporting) in view of growing demand for its product and competition from other MNCs. The initial project cost (consisting of Plant and Machinery including installation) is estimated to be US\$ 500 million. The net working capital requirements are estimated at US\$ 50 million. The company follows straight line method of depreciation.

Presently, the company is exporting two million units every year at a unit price of US\$ 80, its variable cost per unit being US\$ 40.

The Chief Financial Officer has estimated the following operating cost and other data in respect of proposed project:

- (i) Variable operating cost will be US \$ 20 per unit of production;
- (ii) Additional cash fixed cost will be US \$ 30 million p.a. and project's share of allocated fixed cost will be US \$ 3 million p.a. based on principle of ability to share;
- (iii) Production capacity of the proposed project in India will be 5 million units;
- (iv) Expected useful life of the proposed plant is five years with no salvage value;
- (v) Existing working capital investment for production & sale of two million units through exports was US \$ 15 million;
- (vi) Export of the product in the coming year will decrease to 1.5 million units in case the company does not open subsidiary company in India, in view of the presence of competing MNCs that are in the process of setting up their subsidiaries in India;
- (vii) Applicable Corporate Income Tax rate is 35%, and
- (viii) Required rate of return for such project is 12%.

Assuming that there will be no variation in the exchange rate of two currencies and all profits will be repatriated, as there will be no withholding tax, estimate Net Present Value (NPV) of the proposed project in India.

Present Value Interest Factors (PVIF) @ 12% for five years are as below:

Year	1	2	3	4	5
PVIF	0.8929	0.7972	0.7118	0.6355	0.5674

QUESTION NO. 1B

XY Limited is engaged in large retail business in India. It is contemplating for expansion into a country of Africa by acquiring a group of stores having the same line of operation as that of India. The exchange rate for the currency of the proposed African country is extremely volatile. Rate of inflation is presently 40% a year. Inflation in India is currently 10% a year. Management of XY Limited expects these rates likely to continue for the foreseeable future.

Estimated projected cash flows, in real terms, in India as well as African country for the first three years of the project are as follows:

	Year-0	Year-1	Year-2	Year-3
Cash flows in Indian ₹ (000)	-50,000	-1,500	-2,000	-2,500
Cash flows in African Rands (000)	- 2,00,000	50,000	70,000	90,000

XY Ltd. assumes the year 3 nominal cash flows will continue to be earned each year indefinitely. It evaluates all investments using nominal cash flows and a nominal discounting rate. The present exchange rate is African Rand 6 to ₹ 1.

You are required to calculate the net present value of the proposed investment considering the following:

- (i) African Rand cash flows are converted into rupees and discounted at a risk adjusted rate.
 - (ii) All cash flows for these projects will be discounted at a rate of 20% to reflect it's high risk.
- Ignore taxation.

	Year - 1	Year - 2	Year - 3
PVIF @ 20%	0.833	0.694	0.579

QUESTION NO. 1C

XYZ Ltd. a company based in India, manufactures very high quality modern furniture and sells to a small number of retail outlets in India and Nepal. It is facing tough competition. Recent studies on marketability of products have clearly indicated that the customer is now more interested in variety and choice rather than exclusivity and exceptional quality. Since the cost of quality wood in India is very high, the company is reviewing the proposal for import of woods in bulk from Nepalese supplier.

The estimate of net Indian (₹) and Nepalese Currency (NC) cash flows for this proposal is shown below:

Net Cash Flows (in millions)

NC	25.000	2.600	3.800	4.100
Indian (₹)	0	2.869	4.200	4.600

The following information is relevant :

- XYZ Ltd. evaluates all investments by using a discount rate of 9% p.a. All Nepalese customers are invoiced in NC. NC cash flows are converted to Indian (₹) at the forward rate and discounted at the Indian rate.
- Inflation rates in Nepal and India are expected to be 9% and 8% p.a. respectively. The current exchange rate is ₹ 1 = NC 1.6

Assuming that you are the finance manager of XYZ Ltd., calculate the net present value (NPV) and modified internal rate of return (MIRR) of the proposal.

You may use following values with respect to discount factor for ₹ 1 @ 9%.

Year 1	0.917	1.188
Year 2	0.842	1.090
Year 3	0.772	1

You are required to calculate Net Present value of the proposal.

QUESTION NO. 1I

A US company wants to setup a manufacturing plant in India which requires an initial outlay of ₹ 8 Million. It is expected to have a useful life of 5 years with a salvage of ₹ 2 Million. The company follows straight line method of depreciation. To support additional level of activity, investment would require one time additional working capital of ₹ 1 Million.

Since the cost of production lower in India, the variable cost of production would be ₹ 30 per unit. Additional fixed cost per annum is estimated at ₹ 0.5 Million. The company is projecting its annual sales to 80000 units at the price of ₹ 100 per unit. Applicable tax rate to the company is 34% and its cost of capital is 8%.

Inflation rates in US and India are expected to be 8% and 9% respectively. The current exchange rate is ₹ 72 per US Dollar.

Assuming that all profit will be repatriated every year and there will be no withholding taxes, estimate the net present value of the proposed project in India and evaluate its feasibility.

PVF @ 8% for the five years are as under:

Rate	1 Year	2 Year	3 Year	4 Year	5 Year
8%	0.926	0.857	0.794	0.735	0.681

QUESTION NO. 1J

A proposed foreign investment involves creation of a plant with an annual output of 1 million units. The entire production will be exported at a selling price of USD 10 per unit.

At the current rate of exchange dollar cost of local production equals to USD 6 per unit. Dollar is expected to decline by 10% or 15%. The change in local cost of production and probability from the expected current level will be as follows:



Decline in value of USD (%)	Reduction in local cost of production (USD/unit)	Probability
0	-	0.4
10	0.30	0.4
15	0.15 Additional reduction	0.2

The plant at the current rate of exchange will have a depreciation of USD 1 million annually. Assume local Tax rate as 30%.

You are required to find out:

- Annual Cash Flow After Tax (CFAT) under all the different scenarios of exchange rate.
- Expected value of CFAT assuming no repatriation of profits.
- Viability of the investment proposal assuming an initial investment of USD 25 million on plant and working capital with a required rate of return of 11% on investment and on the basis of CFAT arrived under option (ii). The CFAT will grow @ 3% per annum in perpetuity.

LOS 11 : Overall Beta/ Asset Beta/ Project Beta/ Firm Beta

Situation 1 :

100 % Equity Firm → Unlevered Firm

$$\beta_{\text{Equity}} = \beta_{\text{Assets}} = \beta_{\text{Overall}}$$

Situation 2 :

Debt + Equity Firm → Levered Firm

$$\beta_{\text{Levered}} = \beta_{\text{Unlevered}} = \beta_{\text{Overall}} = \beta_{\text{Assets}}$$

- Overall Beta of the companies belonging to the same industry/sector, always remain same.
- Equity Beta and debt Beta may change with the change in Capital structure.
- Overall Beta of a project can't be changed with the change in capital structure of a particular company.
- According to MM, the change in capital structure doesn't change the overall beta.
- Debt is always assume to be risk free, so. Debt Beta = 0.

$$\text{Overall Beta} = \text{equity Beta} \times \frac{\text{Equity}}{\text{Equity} + \text{Debt} (1 - \text{tax})} + \text{Debt Beta} \times \frac{\text{Debt} (1 - \text{tax})}{\text{Equity} + \text{Debt} (1 - \text{tax})}$$

Overall Cost of Capital/ Discount Rate

$$\begin{aligned} \text{Cost of Capital (K}_o\text{)} &= K_e W_e + K_d W_d \\ K_e &= R_f + \beta_{\text{equity}} (R_m - R_f) \\ K_d &= \text{Interest} (1 - \text{tax rate}) \end{aligned}$$

OR

$$K_o = R_f + \beta_{\text{Overall}} (R_m - R_f)$$

(Only applicable when tax rate is missing)

Note:

- If interest rate is not given, it is assumed to be equal to risk-free rate.
- If Beta Debt is not given, it is assumed to be equal to Zero
- If debt = 0 Overall Beta = Equity Beta
i.e. for 100% equity firm overall beta & equity beta is same

Estimating the project Discount Rate

CAPM can be used to arrive at the project discount rate by taking the following steps:



1. Estimate the project beta.
2. Putting the value of Beta computed above into the Capital Asset Pricing Model (CAPM) to arrive at the cost of equity.
3. Estimate the cost of debt.
4. Calculate the WACC for the project.

QUESTION NO. 2B

XYZ, a large business house is planning to acquire ABC another business entity in similar line of business. XYZ has expressed its interest in making a bid for ABC. XYZ expects that after acquisition the annual earning of ABC will increase by 10%.

Following information, ignoring any potential synergistic benefits arising out of possible acquisitions, are available:

	XYZ	ABC	Proxy entity for XYZ & ABC in the same line of business
Paid up Capital (₹ Crore)	1025	106	--
Face Value of Share is ₹10			
Current share price	₹ 129.60	₹ 55	--
Debt : Equity (at market values)	1 : 2	1 : 3	1 : 4
Equity Beta	--	--	1.1

Assume Beta of debt to be zero and corporate tax rate as 30%, determine the Beta of combined entity.

QUESTION NO. 2F

Equity of KGF Ltd. (KGFL) is ₹ 410 Crores, its debt, is worth ₹ 170 Crores. Printer Division segments value is attributable to 74%, which has an Asset Beta (β_p) of 1.45, balance value is applied on Spares and Consumables Division, which has an Asset Beta (β_{sc}) of 1.20 KGFL Debt beta (β_D) is 0.24.

You are required to calculate:

- Equity Beta (β_E),
- Ascertain Equity Beta (β_E), if KGF Ltd. decides to change its Debt Equity position by raising further debt and buying back of equity to have its Debt Equity Ratio at 1.90. Assume that the present Debt Beta (β_{D1}) is 0.35 and any further funds raised by way of Debt will have a Beta (β_{D2}) of 0.40.
- Whether the new Equity Beta (β_E) justifies increase in the value of equity on account of leverage?

LOS 12 : Proxy Beta (If more than one comparable co. data is given)

- Sometimes overall beta of similar companies belonging to same sector may be slightly different.
- In such case we use proxy beta concept by taking average of all the given companies.

QUESTION NO. 3A

The XYZ Ltd. in the manufacturing business is planning to set up a software development company. The project will have a D/E ratio of 0.27. The company has identified following four pure play firms in the line of software business.

Pure play firm	β_L / β_{equity}	D / E
ABC	1.1	0.3
DEF	0.9	0.25
GHI	0.95	0.35
JKL	1.0	0.3

Assuming tax rate applicable to XYZ Ltd. as 35 per cent, R_f as 12%, K_d as 14% and R_M as 18%, you are required to compute the WACC to be used to compute NPV of the project.

**LOS 13 : ADR & GDR****QUESTION NO. 4A**

Odessa Limited has proposed to expand its operations for which it requires funds of \$ 15 million, net of issue expenses which amount to 2% of the issue size. It proposed to raise the funds through a GDR issue. It considers the following factors in pricing the issue:

- (i) The expected domestic market price of the share is ₹ 300 (Face Value ₹100)
- (ii) 3 shares underlying each GDR
- (iii) Underlying shares are priced at 10% discount to the market price
- (iv) Expected exchange rate is ₹ 60/\$

You are required to compute the number of GDR's to be issued and cost of GDR to Odessa Limited, if 20% dividend is expected to be paid with a growth rate of 20%.

