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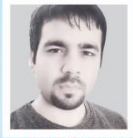
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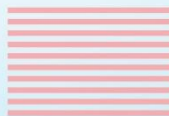
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International Financial Management

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

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

CF_0 = Initial Cash Out Flows

Note:

- ❖ $NPV = -CF_0 + PV$ of future Cash In Flows
- ❖ $CF_0 + NPV = PV$ 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:

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

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

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

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

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

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
x 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

The Future of Finance starts with you

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

1. Decisions are based on cash flows, not accounting income:
2. Consider INCREMENTAL CASH FLOWS, the change in cash flows that will occur if the project is undertaken.
3. **Sunk costs should not be included in the analysis** : These costs are not effected by the accept/reject decisions. Eg. Consulting fees paid to a marketing research firm to estimate demand for a new product prior to a decision on the project.
4. **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.
5. **Cash flows are based on Opportunity Costs** : Opportunity costs should be included in projects costs.
6. **The timing of cash flows is important** : Cash flows received earlier are worth more than cash flows to be received later.
7. 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.

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

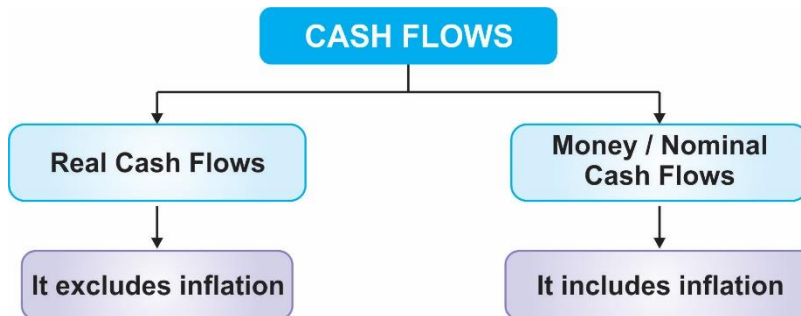
‘or’

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

LOS 10 : Inflation under Capital Budgeting



Cash Flow:

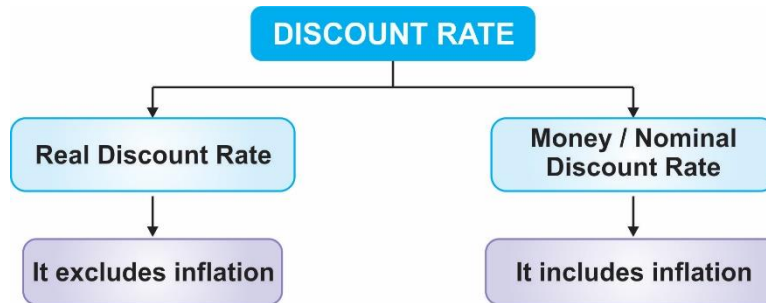


Conversion of Real Cash Flow into Money Cash Flow & Vice-versa

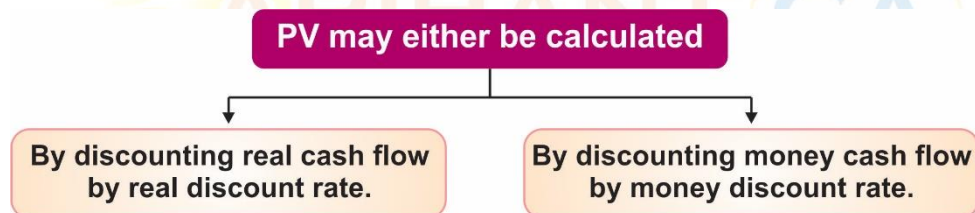
$$\text{Money Cash Flow} = \text{Real Cash Flow} (1 + \text{Inflation Rate})^n$$

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.

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

$\text{Cost of Capital } (K_o) = K_e W_e + K_d W_d$ $K_e = R_f + \beta_{\text{equity}} (R_m - R_f)$ $K_d = \text{Interest} (1 - \text{tax rate})$	OR	$K_o = R_f + \beta_{\text{Overall}} (R_m - R_f)$ <p>(Only applicable when tax rate is missing)</p>
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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.

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.