

**Project Selection Methods** 

Comparative Approach (Benefit Measurement Internal Rate of Return

Payback Period

Present Value

Net Present Value

Cost-Benefit Analysis

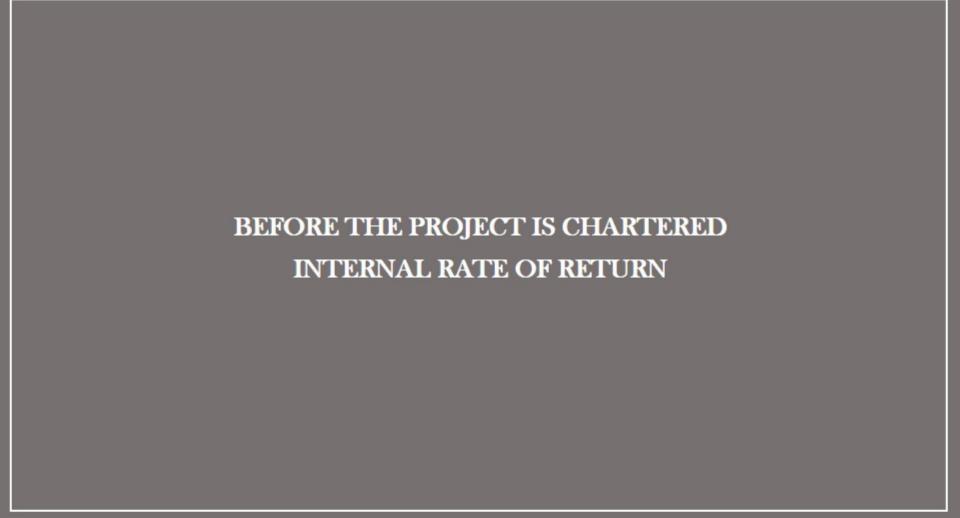
Methods)

Economic Models

- Scoring Models
- Peer Review
- Murder Board

Mathematical Approach (Constrained Optimization Methods)

- Dynamic Programming
- Multi-objective Programming
- Integer Programming
- Linear Programming



**Project Selection Methods** 

Internal Rate of Return

- → IRR
- → Internal Rate of Return calculation is very complicated.
- → Think bank interest rate
- → Higher IRR → Better project
- → Choose the project with higher IRR

**Example:** Your company will start a new project. There are 3 alternative projects. Which project should the company choose?

IRR for Project A is 10 %

IRR for Project B is 12 %

IRR for Project C is 16 %

**Project Selection Methods** 

Internal Rate of Return

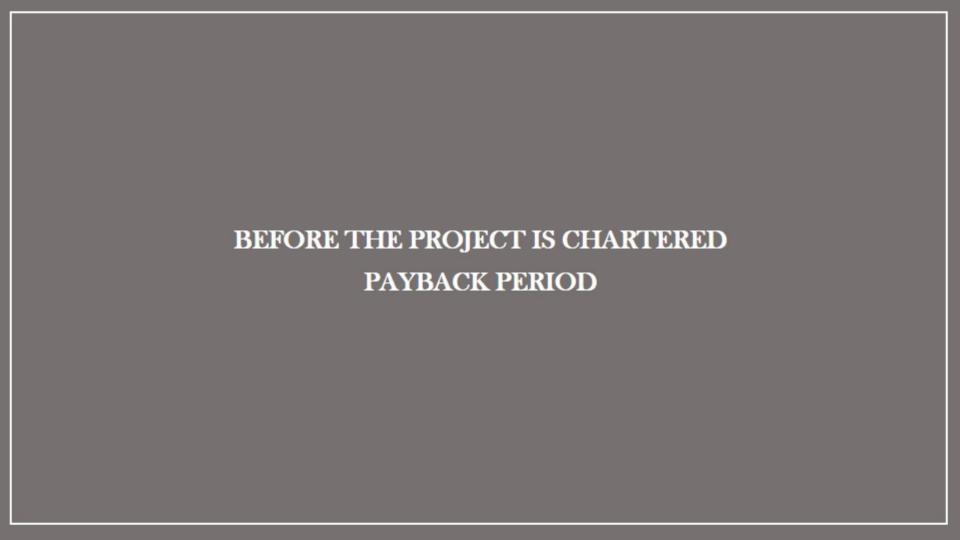
- → IRR
- → Internal Rate of Return calculation is very complicated.
- → Think bank interest rate
- → Higher IRR → Better project
- → Choose the project with higher IRR

**Example:** Your company will start a new project. There are 3 alternative projects. Which project should the company choose?

IRR for Project A is 10 %

IRR for Project B is 12 %

IRR for Project C is 16 % Highest IRR



Project Selection Methods

# Payback Period

- CIOC

→ Time required for the invested money to be repaid.

Example: Your company invests \$ 3,000,000 for project A. If expected yearly revenue is \$ 1,500,000 then the Payback Period for project A will be 2 years.

(3 / 1.5 = 2 years)

The Project having the shortest Payback Period is the best project.

Note: The Payback Period may not be the sole criteria to select a Project. Read the questions carefully!

**Project Selection Methods** 

Payback Period

**Example:** Your company will start a new project. There are 3 alternative projects. Which project should you choose?

Payback Period for Project A is 20 months

Payback Period for Project B is 25 months

Payback Period for Project C is 32 months

**Project Selection Methods** 

Payback Period

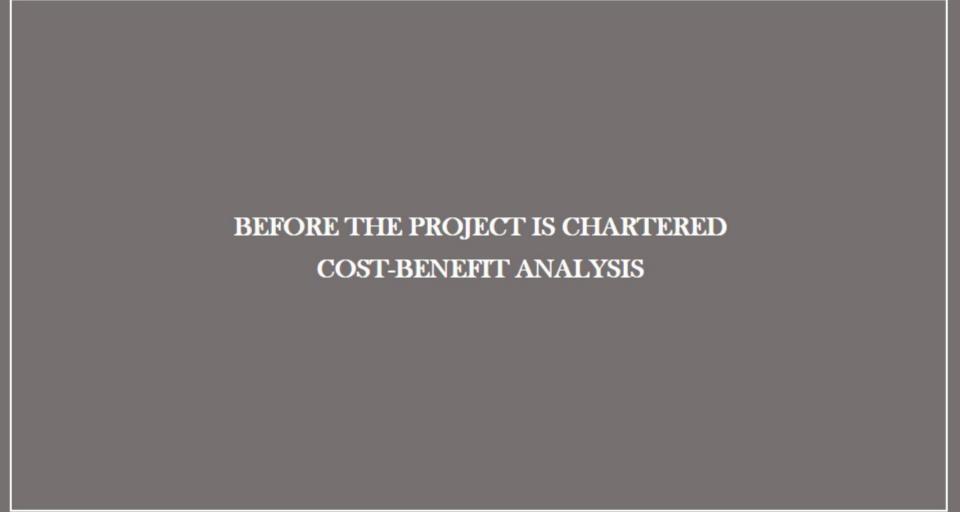
**Example:** Your company will start a new project. There are 3 alternative projects. Which project should you choose?

Payback Period for Project A is 20 months

Payback Period for Project B is 25 months

Payback Period for Project C is 32 months

Answer: Select project A since it has the shortest payback period.



**Project Selection Methods** 

#### **Cost-benefit Analysis**

- → Cost vs Benefits
- → Benefit cost ratio = Total Benefits / Total Costs

**Example:** If the total benefit for a project is \$23,000,000, and the total cost is \$18,000,000 then the benefit-cost ratio is ...

**Project Selection Methods** 

#### Cost-benefit Analysis

- → Cost vs Benefits
- → Benefit cost ratio = Total Benefits / Total Costs

**Example:** If the total benefit for a project is \$23,000,000, and the total cost is \$18,000,000 then the benefit-cost ratio is **1.28.** 

(23,000,000 / 18,000,000 = 1.28)

**Project Selection Methods** 

Cost-benefit Analysis

- → Cost vs Benefits
- → Benefit cost ratio = Total Benefits / Total Costs

**Project Selection Methods** 

Cost-benefit Analysis

- → Cost vs Benefits
- → Benefit cost ratio = Total Benefits / Total Costs

**Example:** The benefit-cost ratio of a project is 1.28. What comment can we make on this project?

The benefits are greater than the costs

**Project Selection Methods** 

Cost-benefit Analysis

- → Cost vs Benefits
- → Benefit cost ratio = Total Benefits / Total Costs

- The benefits are greater than the costs
- The profit is 1.28 times the costs

**Project Selection Methods** 

Cost-benefit Analysis

- → Cost vs Benefits
- → Benefit cost ratio = Total Benefits / Total Costs

- The benefits are greater than the costs
- The profit is 1.28 times the costs

**Project Selection Methods** 

Cost-benefit Analysis

- → Cost vs Benefits
- → Benefit cost ratio = Total Benefits / Total Costs

- The benefits are greater than the costs
- The revenue is 1.28 times the costs



**Project Selection Methods** 

Present Value

→ What is Present Value?

**Example:** You have \$10 in your pocket. Today, you can buy ten pencils for \$10. After five years, is it possible to buy the same ten pencils at \$10?

**Project Selection Methods** 

Present Value



**Example:** You have \$10 in your pocket. Today, you can buy ten pencils for \$10. After five years, is it possible to buy the same ten pencils at \$10?

NO! Money loses its value.

**Project Selection Methods** 

Present Value

→ What is Present Value?

Present Value (PV) = The value of money today

Future Value (FV) = The future value of the money

#### Formula to remember!

$$PV = \frac{FV}{(1+r)^n}$$

r = interest rate

n = number of time periods

**Project Selection Methods** 

**Present Value** 

**Example:** If the interest rate is 8%, what is the Present Value of \$10,000 received 3 years from now?

**Project Selection Methods** 

#### Present Value

**Example:** If the interest rate is 8%, what is the Present Value of \$10,000 received 3 years from now?

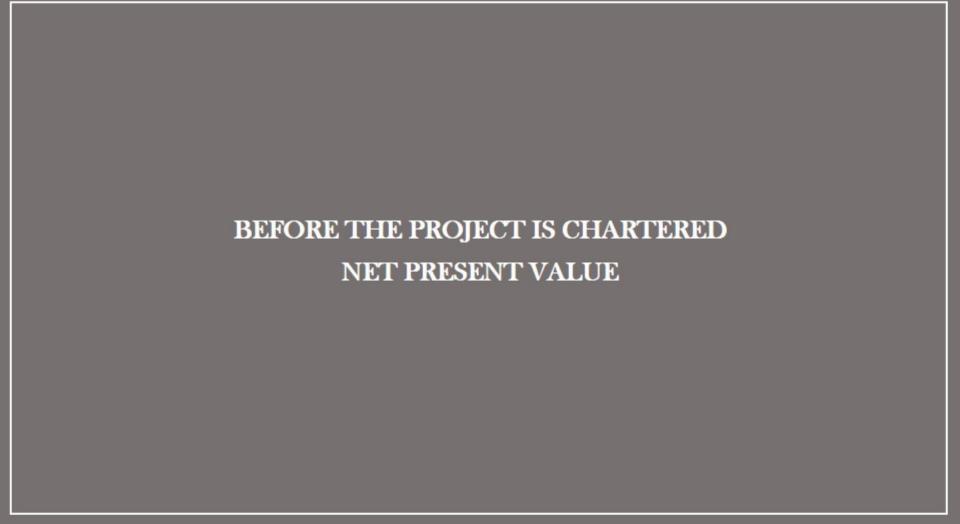
$$PV = 10,000.00 / (1 + 0.08)^3$$
  
 $PV = $7,938.32$ 

**Project Selection Methods** 

#### Present Value

Example: If the interest rate is 8%, what is the Present Value of \$10,000 received 3 years from now?

 $PV \le FV$ 



**Project Selection Methods** 

#### **Net Present Value**

→ (Total Present Value of the revenue) - (Total Present Value of the costs)

**Example:** If the Total Present Value of the revenue for Project A is \$20,000,000 and the Total Present Value of the costs for the same project is \$15,000,000, what is the net present value?

**Project Selection Methods** 

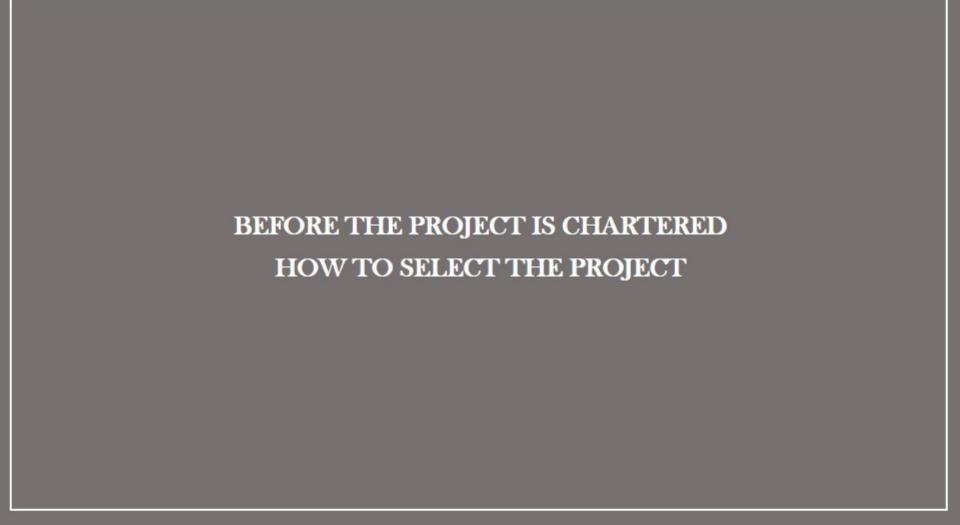
#### Net Present Value

→ (Total Present Value of the revenue) - (Total Present Value of the costs)

**Example:** If the Total Present Value of the revenue for Project A is \$20,000,000 and the Total Present Value of the costs for the same project is \$15,000,000, what is the net present value?

Net Present Value:

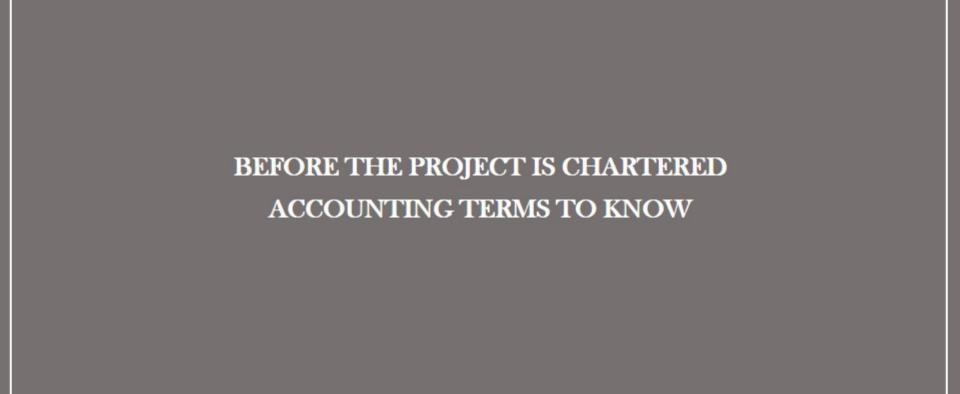
- = \$20,000,000 \$15,000,000
- = \$5,000,000



**Project Selection Methods** 

#### How To Select The Project

- → The Project having the highest IRR is the best Project.
- → The Project having the shortest Payback Period is the best Project.
- → The Project having the highest Benefit-cost Ratio is the best Project.
- → The Project having the highest Present Value is the best Project
- → The Project having the highest Net Present Value is the best Project



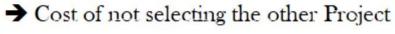
Accounting Terms to Know

#### **Opportunity Cost**

→ Cost of not selecting the other Project

Accounting Terms to Know

#### Opportunity Cost



Example: Consider there are two projects, Project A and Project B. Project A has NPV of \$80,000 and Project B has NPV of \$50,000. If you choose Project A, what will the opportunity cost be?

Accounting Terms to Know

#### **Opportunity Cost**

→ Cost of not selecting the other Project

**Example:** Consider there are two projects, Project A and Project B. Project A has NPV of \$80,000 and Project B has NPV of \$50,000. If you choose Project A, what will the opportunity cost be?

**Answer:** \$50,000

Accounting Terms to Know

#### Sunk Cost

- → Money that cannot be recovered
  - GICI-COSEPINI

Accounting Terms to Know

#### Sunk Cost

→ Money that cannot be recovered

**Example:** You will decide whether or not to continue the Project A. Up to now the Actual Cost, that is the money we have spent, is \$100,000. Therefore, the Sunk Cost is \$100,000.

Accounting Terms to Know

#### Sunk Cost

- → Money that cannot be recovered
- Sunk Cost is gone and cannot be recovered.
- Sunk Cost is the actual cost spent up to now.
- When you make calculations, do not consider the sunk cost to decide whether or not to continue the project. (You should never look back ①)

Accounting Terms to Know

#### Economic Value Added (EVA)

→ The profit provided by the Project to the company

SICI casePM

Accounting Terms to Know

# Law of Diminishing Returns.

# Example:

- 1 painter → 4 days
- 2 painters → 2 days
- 4 painters → 1 day???

Accounting Terms to Know

# Law of Diminishing Returns.

### Example:

- 1 painter → 4 days
- 2 painters → 2 days
- 4 painters → 1 day??? More than 1 day

Accounting Terms to Know

#### **Working Capital**

→ The amount of money that the company can spend for investments

Accounting Terms to Know

Depreciation

**Example:** This year you bought a new computer. If you try to sell it after two years, it may go from half the price you pay today.

Accounting Terms to Know

#### Depreciation

Straight Line Depreciation

**Example:** Assume, you paid \$600 for your computer one year ago. You try to sell it now, and the sale price is \$450. But you decide not to sell it now and to wait for the 2nd year. At the end of the 2nd year, the price you can sell is decreased to \$300. Therefore the computer lost the same value (\$150) each year.

Accounting Terms to Know

#### Depreciation

Straight Line Depreciation

**Example:** Assume, you paid \$600 for your computer one year ago. You try to sell it now, and the sale price is \$450. But you decide not to sell it now and to wait for the 2nd year. At the end of the 2nd year, the price you can sell is decreased to \$300. Therefore the computer lost the same value (\$150) each year.

Accelerated Depreciation

**Example:** Assume, you paid \$600 for your computer one year ago. You try to sell it now, and the sale price is \$450. But you decide not to sell it now and to wait for the 2nd year. At the end of the 2nd year, the price you can sell is decreased to \$100. Therefore, the computer lost its value more than the previous year.