FINANCIAL MANAGEMENT

- NAME OF THE CHAPTER : CAPITAL BUDGETING(THEORY)
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Capital Budgeting
"Should we pursue the building of this plant?"
Project Cost
$10m
Peter

What is Capital Budgeting?

- **The process of identifying, analyzing and selecting investment projects whose returns (cash flows) are expected to extend beyond one year.**(-*James C. Van Horne*)
- **Capital Budgeting may be defined as the decision making process by which firms evaluate the purchase of major fixed assets including premises, machinery and equipment.**
- **Capital budgeting** is the process of identifying, evaluating, and implementing a firm's investment opportunities.

Features of Capital Budgeting

- Huge Funds
- High Degree of Risk
- Affects Future Competitive Strengths
- Difficult Decision
- Estimation of Large Profits
- Long Term Effect
- Affects Cost Structure
- Irreversible Decision

NATURE

- CB Decisions have long-term impact on the business stability, growth & success
- CB Decisions involve huge investment of funds
- CB Decisions are more complicated from concerns of future cash flow estimates and their evaluation at the time of making investment
- CB Decisions are not easily reversible mainly because of loss of investment

Significance of capital budgeting

- The success and failure of business mainly depends on how the available resources are being utilised.
- Main tool of financial management
- All types of capital budgeting decisions are exposed to risk and uncertainty.
- They are irreversible in nature.
- Capital rationing gives sufficient scope for the financial manager to evaluate different proposals and only viable project must be taken up for investments.
- Capital budgeting offers effective control on cost of capital expenditure projects.
- It helps the management to avoid over investment and under investments.

10 Importance of Capital Budgeting

1. Long Term Effect on Profitability
2. Huge Investments
3. Decision cannot be Undone
4. Expenditure Control
5. Information Flow
6. Helps in Investment Decision
7. Wealth Maximization
8. Risk and Uncertainty
9. Complicacies of Investment Decisions
10. National Importance

ADVANTAGES OF CAPITAL BUDGETING

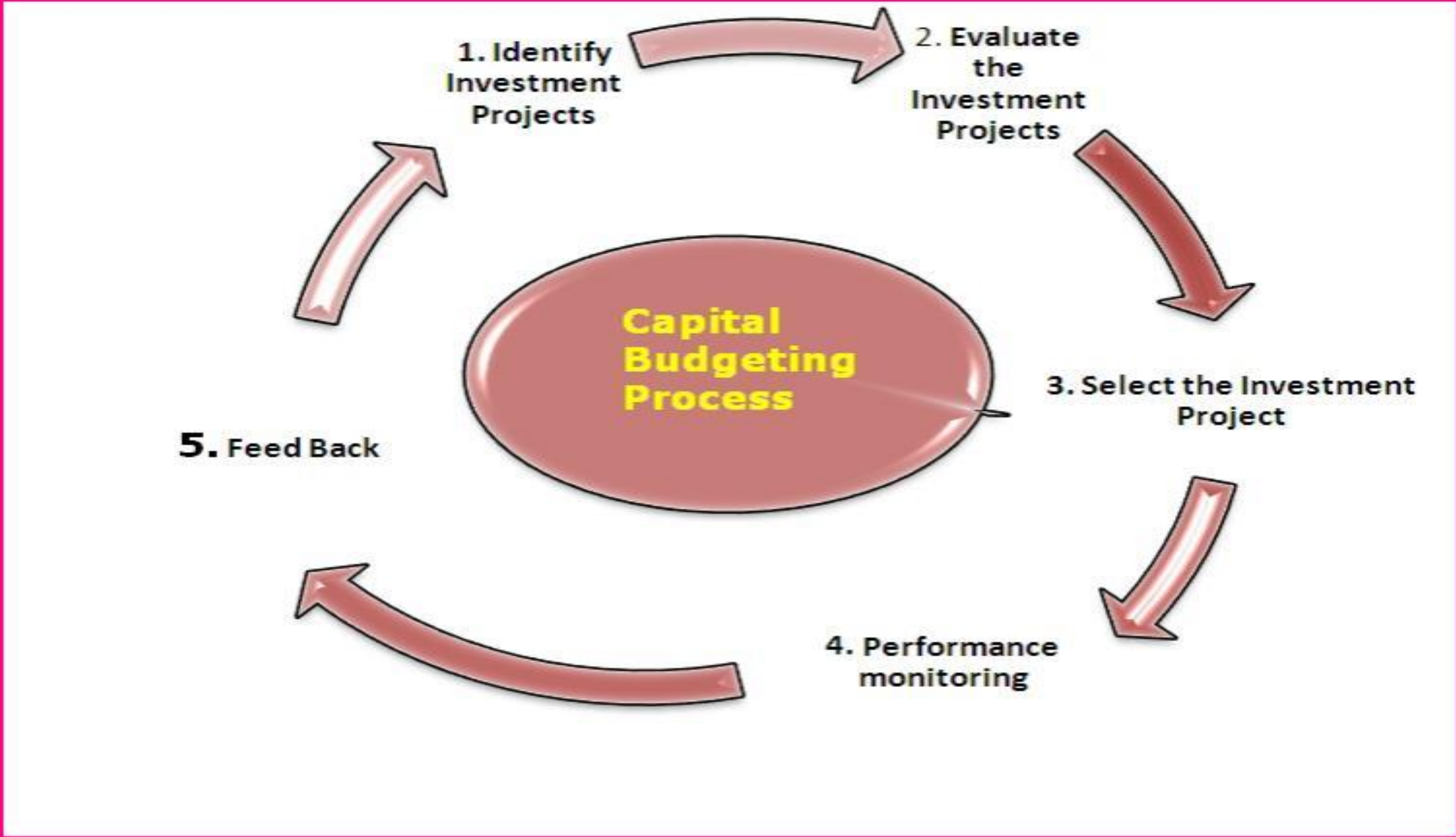
- Optimum utilization of funds
- Helps management to decide on implementing proposals
- Helps in making important business decisions
- Different sources of funds can be considered and it will reduce the overall cost of capital
- During deficit, capital rationing can be followed not to waste scarce fund available.

LIMITATIONS OF CAPITAL BUDGETING

1. The result of decision taken is uncertain. This is so because it is difficult to say that present circumstances will exist in future also .
2. Some factors affecting investment proposals are not measurable (ie cannot be expressed in money value).
3. It is difficult to estimate the period for which investment is to be made and income will generate.
4. It is difficult to estimate the rate of return because future is uncertain .
5. It is difficult to estimate the cost of capital.

Factors influencing capital budgeting

- *Availability of funds*
- *Structure of capital*
- *Government policy*
- *Lending policies of financial institutions*
- *Immediate need of the project*
- *Earnings*
- *Capital return*
- *Economical value of the project*
- *Working capital*
- *Trend of earnings*


1. Identify Investment Projects
2. Evaluate the Investment Projects
3. Select the Investment Project
4. Performance monitoring
5. Feed Back
Capital Budgeting Process

Capital Rationing

- Definition: "A situation where a constraint or budget ceiling is placed on the total size of capital expenditure during a particular period."
- "A situation in which a firm limits its capital expenditure to less than the amount required to fund the optimal capital budget."
- It is the situation that exists if a firm has positive NPV projects but cannot find the necessary funding.
- Occurs when the firm cannot or will not fund profitable (all positive NPV) projects

Meaning and Definition

- Rationing is the process of allocating scarce resources on the basis of priority based on certain criterion
- It is a situation when the company cannot undertake all investment projects with positive NPVs.
- As “a situation where insufficient funds can be made available to finance all the prima facie profitable projects”.
- “a situation where a constraint or a budget ceiling is placed on the size of capital expenditure during a particular period”

Advantages and shortcomings

Advantages of Capital Rationing

- 1 Budget
- 2 No Wastage
- 3 Fewer Projects
- 4 Higher Returns
- 5 More Stability

Disadvantages of Capital Rationing

- 1 Efficient Capital Markets
- 2 The cost of Capital
- 3 Un-Maximising Value
- 4 Small Projects
- 5 Intermediate Cash Flows

TYPES OF CAPITAL RATIONING

HARD CAPITAL RATIONING

HARD CAPITAL RATIONING or “external” rationing occurs when the company faces problems in raising funds in the external equity markets. This can lead to the shortage of capital to finance the new projects in the company.

REASONS

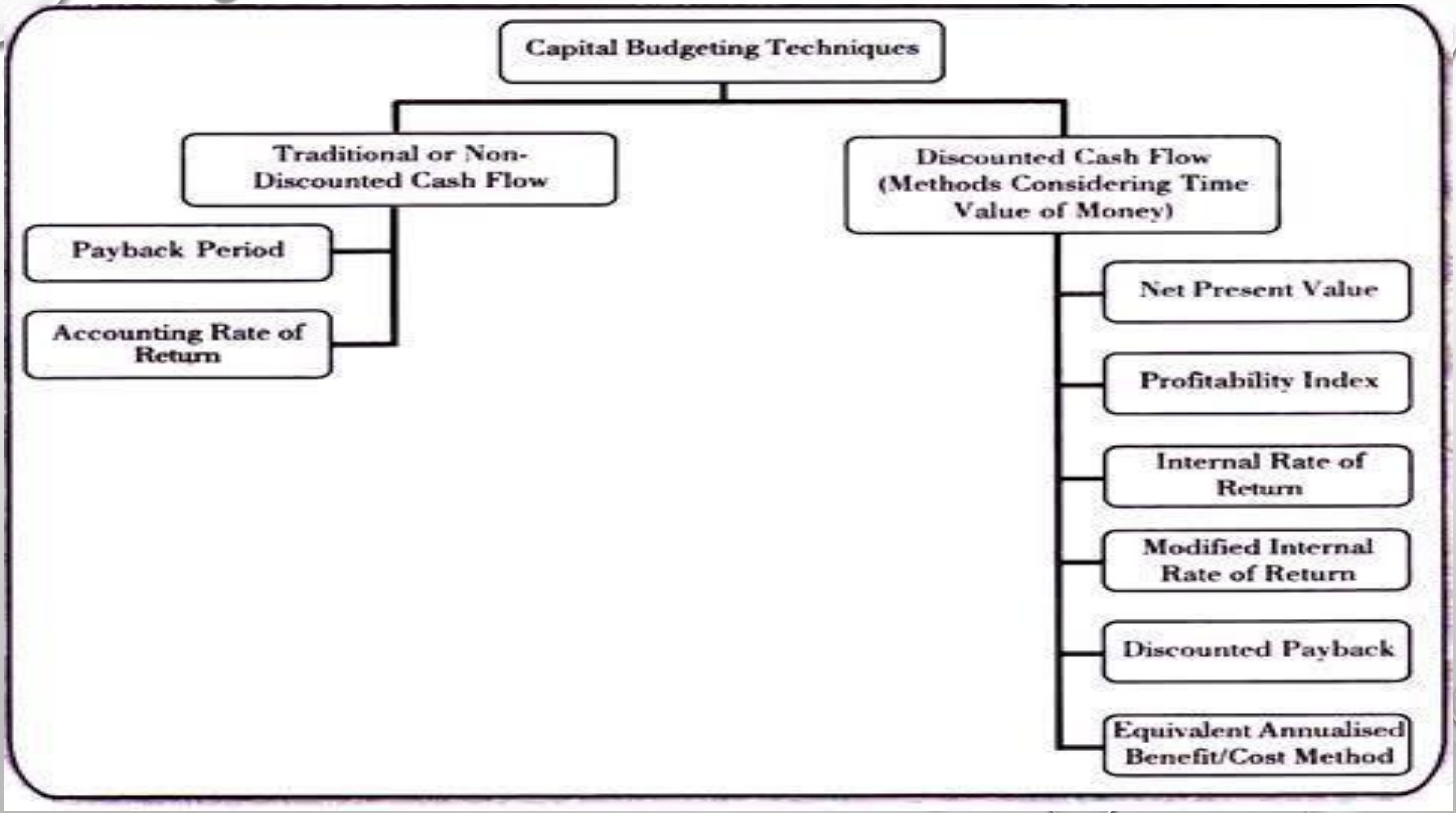
- Start-up Firms
- Poor Management/ Track Record
- Lender’s Restrictions
- Industry Specific Factors

SOFT CAPITAL RATIONING

SOFT CAPITAL RATIONING or “internal” rationing is caused due to internal policies of co. The company may voluntarily have certain restrictions that limit the amount of funds available for investments in projects.

REASONS

- Promoter’s Decision
- An increase in Opportunity Cost of Capital
- Future Scenarios


Capital Budgeting Techniques
Traditional or Non-Discounted Cash Flow
Payback Period
Accounting Rate of Return
Discounted Cash Flow (Methods Considering Time Value of Money)
Net Present Value
Profitability Index
Internal Rate of Return
Modified Internal Rate of Return
Discounted Payback
Equivalent Annualised Benefit/Cost Method

Payback Period

- **Definition:** How long does it take to get the initial cost back in a nominal sense?

- **Computation:**
  1. Estimate the cash flows
  2. Subtract the future cash flows from the initial cost until the initial investment has been recovered

- A "break-even" type measure
- Decision Rule – *Accept if the payback period is less than some preset limit*

Payback Period Advantages & Disadvantages

Advantages

- The formula is straightforward to know and calculate.
- Helps in project evaluation quickly.
- It helps in reducing the risk of losses.

Disadvantages

- It doesn't take time value of money into consideration.
- Doesn't take into consideration the inflow of cash after the payback period.

Discounted Payback Period

- What is the 'Discounted Payback Period'
- A capital budgeting procedure used to determine the profitability of a project. In contrast to an NPV analysis, which provides the overall value of an project, a discounted payback period gives the number of years it takes to break even from undertaking the initial expenditure. Futurecash flows are considered are discounted to time "zero." This procedure is similar to a payback period; however, the payback period only measure how long it take for the initial cash outflow to be paid back, ignoring the time value of money.

Advantages and Disadvantages of Discounted Payback

- Advantages
  - Includes time value of money
  - Easy to understand
  - Does not accept negative estimated NPV investments
  - Biased towards liquidity
- Disadvantages
  - May reject positive NPV investments
  - Requires an arbitrary cutoff point
  - Ignores cash flows beyond the cutoff date
  - Biased against long-term projects, such as R&D, and new projects

PROFITABILITY INDEX

- Profitability Index (PI) is a capital budgeting technique to evaluate the investment projects for their viability or profitability.
- Profitability Index is a ratio of discounted cash inflow to the discounted cash outflow.

STEPS TO CALCULATE PI

Find the expected Cash Inflow → Find the cash outflow → Decide upon the Discount Rate → Discount the expected cash inflows using the discount rate → Discount the future cash outflows and add to initial investment →Divide step (d) by step (e)

PROS AND CONS

ADVANTAGES : It considers time value of money concept. It also allows two investment comparison.

DISADVANTAGES : Two projects having the vast difference in investment and dollar return can have the same PI. In such situation, the NPV method works.

3. IRR

- IRR stands for 'Internal Rate of Return'.
- **Concept:**
  - IRR quite simply tells you what is the return on a project.
  - IRR is the discount rate at which NPV of a project is equal to 'zero'.
  - When we say NPV of a project is equal to 'zero' we mean PV of cash inflows = PV of cash outflows.
- **Definition:**
- IRR is the discount rate at which PV of cost is equal to PV of future cash inflows.
- It is the rate of return that the firm will earn if it invests in the project and receives the given cash inflows.

INTERNAL RATE OF RETURN

ADVANTAGES

1. **Time Value of Money** is being considered while calculating IRR.
2. **Simple to interpret** after the IRR is calculated. Easy to visualize by manager
3. **No requirement of finding Hurdle Rate** / Required Rate of Return
4. Managers **make rough estimate of Required Rate of Return**

DISADVANTAGES

1. **Economies of Scale is ignored**
2. **Impractical implicit assumption** of reinvestment rate at the IRR itself for remaining period of the project.
3. **Dependent or contingent project** are being **ignored** while calculating IRR.
4. **Mutually exclusive** project **are ignored.**
5. **Different terms of project is not considered** by IRR method
6. A mix of positive and negative future cash flows
7. **If later cash inflows are not sufficient** to cover initial investment calculation of **IRR is not possible**
8. **What will increase in wealth is not possible to be measured by IRR.**

Net Present Value

- NPV – THE BASIC CONCEPT
  - The net present value of a project is the difference between the present values of its expected cash inflows and expected cash outflows
  - Positive NPV projects increase shareholder wealth and negative NPV projects decrease shareholder wealth
  - In theory, managers should be indifferent about accepting or rejecting zero NPV projects

Advantages and Disadvantages of NPV

Advantages

- Time Value of Money
- Decision-Making

Disadvantages

- No Set guidelines to Calculate Required Rate of Return
- Cannot be used to Compare Projects of Different Sizes
- Hidden Costs

NPV Decision Rule

- Invest in positive NPV projects
- Reject negative NPV projects
- Use the appropriate discount rate
- If two projects are mutually exclusive, accept the one with higher NPV
- Cost of capital is the minimum acceptable rate of return on projects with similar risk.

How to Interpret & Assess NPV

If the NPV is zero

The investment will earn a return equal to the required rate of return. **Accept** the investment because it earns exactly the minimum return stipulated by management.

If the NPV is positive

The investment will earn a return greater than the required rate of return. **Accept** the investment because it earns more than the minimum return stipulated by management.

If the NPV is negative

The investment will earn a return less than the required rate of return. **Reject** the investment because it earns less than the minimum return stipulated by management.

DEFINITION

- Accounting rate of return (also known as simple rate of return) is the ratio of estimated accounting profit of a project to the average investment made in the project. ARR is used in investment appraisal.

Advantages and Disadvantages of AAR

- Advantages
  - Easy to calculate
  - Needed information will usually be available

- Disadvantages
  - Not a true rate of return; time value of money is ignored
  - Uses an arbitrary benchmark cutoff rate
  - Based on accounting net income and book values, not cash flows and market values

NPV vs IRR vs PB vs PI vs ARR

NPV

NPV stands for Net Present Value. It is used to determine the present value of all future cash flows which will be generated by the investment.

IRR

IRR stands for Internal Rate of Return. It is the rate of return at which the Net Present Value of an investment becomes zero.

PBP

PBP stands for Payback Period. It is the number of years it requires to recover the original cash which is invested in a project.

PI

PI stands for Profitability Index. is the ratio between the present value of all future cash flows and the initial cash outflow of the investment.

ARR

ARR stands for Accounting Rate of Return. It is calculated by dividing the expected income from investment and cost of that investment.

NPV	vs	IRR
Present value of net cash flow	**Meaning**	Discount rate (%) that makes NPV of net cash flow to zero
Absolute sum	**Measure**	Relative measure
Can be used where there are cash flow changes	**Cash flow Changes**	Cannot be used for changing cash flow
NPV is understood by public	**Receptivity**	Business managers are more receptive
Positive NPV - accept the project	**Decision**	Accept project where IRR is greater than WACC

Relationships Between the Internal Rate of Return, Net Present Value and the Cost of Capital

If	Then	Capital Budgeting Decision
NPV < 0	IRR < Cost of Capital	Reject the investment from the cash flow perspective. Other factors could be important.
NPV = 0	IRR = Cost of Capital	Provides the minimum return. Probably reject from the cash flow perspective. Others factors could be important.
NPV > 0	IRR > Cost of Capital	Screen in for further analysis. Other investments may provide better returns and capital should be rationed, i.e., go to the most profitable projects. Others factors could be important.

WHY NPV IS BEST MEASURE ?

NPV calculates the present value of the cash flows based on the opportunity cost of capital and derives the value which will be added to the wealth of the shareholders if that project is undertaken.

NPV vs. PBP

Drawbacks of PBP method:

1. Ignores Time value of money
2. Does not consider cash flow after the PBP

NPV considers time value of money and also the cash flow till the end of the project life

NPV vs. IRR

Drawbacks of IRR method:

1. Does not consider the economies of scale.
2. Assumes discounting and reinvestment at same rate.
3. Enters the problem of multiple IRR when more than one negative cash flows.

NPV vs. PI

A project can have the same profitability index with different investments and the vast difference in absolute dollar return.

NPV has an upper hand in this case.


Thank
You