

ECONOMICS

MODULE - 5

* Time Value of money

↳ refers to the money value w.r.t. different time period.

↳ amount of money is inversely related to the value of money.

↳ with increase in time period, the value of money decreases

Reasons

- 1) Risk and Uncertainty about future
- 2) Inflation; money received today has more purchasing power than the money to be received in future
- 3) Consumption; most believe present consumption more than future consumption



4) Investment: profitable use of received money today to get higher return tomorrow.

• Present value ^(P): Value of a sum of money expected to be received in the future.

• Future value (F): If P is the amount of money that an investment made today will grow by some future.

• Cash-flow diagram

↳ It is a diagrammatic representation of cash-inflow and cash outflow relating to an event, organization or investment with respect to an



$$PW = -\text{Investment} + \frac{\text{Annual (Salvage) Value}}{\text{Return}}$$

particular time on a horizontal scale where vertical line shows cash in-flow and cash-outflow.

- Salvage Value: Amount remaining with an organization after the end of economic life of project

Given	Find	Symbol	Form
P	F	$(F/P, i\%, n)$	$(1+i)^n$
F	P	$(P/F, i\%, n)$	$\frac{1}{(1+i)^n}$
F	A	$(A/F, i\%, n)$	$\frac{1}{(1+i)^n} - 1$
A	F	$(F/A, i\%, n)$	$(1+i)^n - 1$



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P	A	$(A/P, P\%, n)$	$\frac{P(1+P)^n}{(1+P)^n - 1}$
A	P	$(P/A, P\%, n)$	$\frac{(1+P)^n - 1}{P(1+P)^n}$

* Internal Rate of Return ($\uparrow P$)

↳ IRR of a cash-flow ~~pattern~~ pattern is the interest rate at which the present worth of that cash flow pattern reduces to zero.

$$\text{PW of cash inflow} - \text{PW of cash outflow} = 0$$

• why?

It helps managers determine which



potential projects add value and are worth undertaking.

• Limitations

↳ Rank projects only by their overall rate of return rather than their net present values.

• Minimum Acceptable Rate of Return (MARR)

↳ MARR is the minimum rate of return on a project a manager or company is willing to accept before starting a project.

$$Q_4 + \left[\frac{PWIDR}{PWIDR - PW(HDR)} \right] \times D$$

where,



LDR $\rightarrow$ Low $\pm$ ve rate of interest

HDR $\rightarrow$ (-)ve rate of return

D $\rightarrow$ absolute difference b/w LDR & HDR

$\rightarrow$ method to evaluate public alternatives

* Cost-Benefit Analysis (CBA)

Public Project: The projects taken by Govt. which focuses on welfare of public rather than profits of government.

Public Good:

Any good consisting of these characteristics

1) Non-excludability

2) Non-rivalness

is termed as public good

no exclusion of any person from accessing the good
 no one can claim someone that consumption of public good

is a use to availability



Cost-Benefit Analysis

↳ refers to a mathematical approach that helps in the comparison of the cost and expected benefits of two or more options or projects

Types of costs

- ↳ Direct cost (directly associated with your planned project or action)
- ↳ Indirect costs (not directly accounted for in project)
- ↳ Tangible costs (associated with an identifiable source or asset)
- ↳ Intangible costs (difficult to identify and fluctuates with consumer demands)
- ↳ Real cost (incurred in actual production process)

2f

$\frac{NPB}{NBC} > 1$; project accepted

$\frac{NPB}{NBC} < 1$; project rejected



$\frac{NBC}{NPC} = 1$; remains indifferent

