

Chapter 9: Capital Project Evaluation Techniques

I. Payback Technique

How many years until we recoup the initial investment, based on the cash flows (OCI and Terminal Value) of this investment?

Simple Case: If OCI's are annuity:

Payback Period = (Initial Investment)/(Annuity OCI)

Let's say the initial investment is \$100;
the OCI's:

1. \$40
2. \$40
3. \$45

Payback Period = ?

<u>Year</u>	<u>Cash Flow</u>	<u>Cumulative CF</u>
1	\$40	\$40
2	\$40	80
3	\$45	125

We need to start with the last year BEFORE payback:

$$\begin{aligned} & 2 + (\text{Amount Yet Needed}/\text{Next Year's CF}) \\ & = 2 + \$20/\$45 \\ & = ? \\ & = 2.44 \text{ years} \end{aligned}$$

Decision Criterion: Accept if $PP \leq$ Company Standard.

Advantages of Payback:

1. Simple to Understand
2. Does Give Crude Measure of Risk, if we measure risk by uncertainty of cash flows.
WHY? because tends to overlook far-off cash flows, which are the ones the forecaster is most unsure of.
3. Does take Liquidity into account.
4. Computational Simplicity.
5. Intuitive Appeal.
6. Considers cash flows rather than accounting profits.
7. Gives implicit consideration to the timing of cash flows and therefore to the time value of money.

Disadvantages of Payback:

1. Ignores Time Value of Money.
2. Ignores Post-Payback Cash Flows.
3. No link to Shareholder Wealth.
4. Poor Risk Measure.
5. Appropriate Payback Period is a Subjectively Determined Number.

II. BETTER MEASURE: Net Present Value

NPV = (P.V. of ALL CASH INFLOWS – P.V. of Initial Investment)

Decision Criteria:

- IF $NPV \geq 0$, ACCEPT: increases shareholder wealth by this amount.
IF $NPV < 0$, REJECT: erodes shareholder wealth by this amount.

Advantages of NPV:

1. Direct linkage to SWM.
2. Incorporates time value of money.
3. Incorporates risk, through adjustment to discount rate.
4. Works with various cash flow streams.
5. Proper reinvestment rate assumption (cost of capital).

Disadvantages of NPV:

1. Hard for executives to understand.

III. ANOTHER GOOD MEASURE: Internal Rate of Return

“the discount rate that equates the PV of Cash Inflows with the Initial Investment;”
(mathematically, makes $NPV = 0$)

Decision Criteria:

- IF $IRR \geq$ cost of capital, accept;
IF $IRR <$ cost of capital, reject.

Advantages of IRR:

1. Percentage format – easily understandable
2. Usually links to SWM, with possible exception of mutually exclusive projects.
3. Incorporates time value of money.
4. Incorporates risk, through adjustment to cost of capital.

Disadvantages of IRR:

1. Breakdown with non-normal projects.
2. Breakdown with mutually exclusive projects' rankings, due to reinvestment rate assumption (at IRR). Disagrees, in these cases, with NPV accept/reject signal.