



CAPITAL BUDGETING

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Capital budgeting

- Process of making investment decisions in capital expenditures.
- Generally, capital expenditure does not indicate high expenditure, however, it is the nature which defines it.
- capital budgeting is concerned with the allocation of the firm's scarce financial resources among the available market opportunities.
- capital budgeting consist in planning, development of available capital for the purpose of maximising the long-term profitability of the concern



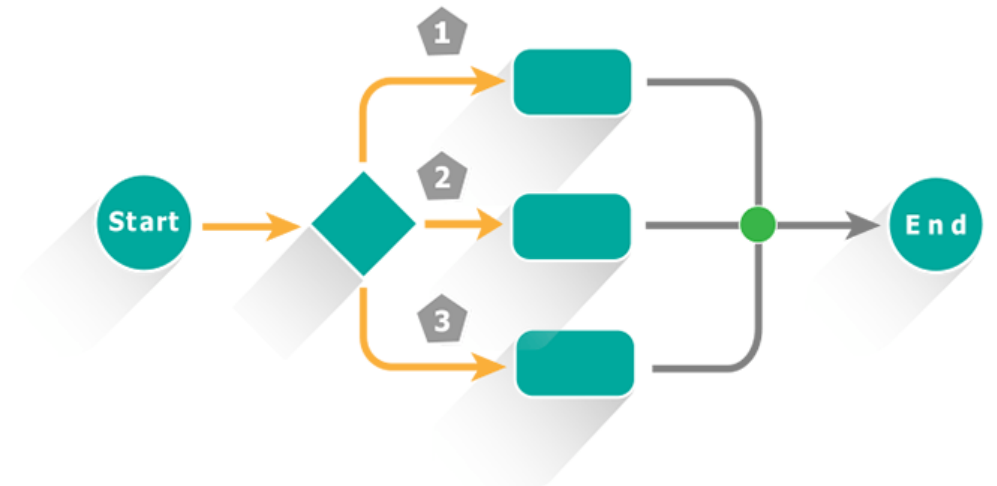
Capital budgeting – Key Features

- Capital budgeting decision involves the exchange of current funds for the benefits to be achieved in future
- the future benefits are expected to be realised over a long-term period
- the funds are invested in non-flexible and long-term activities
- long-term and significant effect on the profitability of the organization
- generally involve larger amount of funds
- irreversible decisions
- Strategic investment decisions.
- Assumptions and external factors



Capital budgeting– Process

- identification of investment proposals
- screening the proposals
- evaluation of various proposals
- fixing priorities
- final approval and preparation of capital expenditure budget
- implementation of proposal
- performance review



Capital budgeting– Decisions

- **Accept reject:** in the case of accept- reject decisions, each of the projects under consideration is evaluated independently. Selection or rejection of one project will not have any impact on the other project under consideration.
- **Mutually exclusive:** in this kind of decisions, all the projects under consideration are evaluated simultaneously. As a result, selection or rejection of one project will have an impact on the other projects under consideration. If anyone project is selected automatically the other projects are rejected.
- **Capital rationing:** It is said to be a special financial situation where the projects under consideration collectively require higher amount, but the availability of funds are limited. As a result, return for every rupee invested is calculated for all the projects and are ranked accordingly. Once the ranking process is done projects will be selected based on the availability of funds.

Capital budgeting– Traditional techniques

- Payback period
- Post payback profitability technique
- Accounting rate of return



Capital budgeting – Discounted Cash flow techniques

- Discounted payback period
- Net present value
- Profitability index
- Internal rate of return



Payback period

- It is the time taken by the project to return the amount of investment.
- Generally, lesser the payback period, higher is the efficiency of the project.
- In the case of mutually exclusive decisions, the project that has lowest payback period will be selected and others will be rejected.
- **Calculation of payback period:** the methodology of payback period depends on nature of CFAT streams. Some projects will generate equal amount of CFAT at the end of every year throughout the life of the project. On the other hand, CFAT values of some projects will change every year.

$$PP = \frac{I}{CFAT}$$

Where,

- PP= payback period
- I= investment
- CFAT= Cash Flows After Tax per annum

Payback period

Merits

- it is very easy to calculate
- this method is best suited to such a business organization that has a tight liquidity position and limited availability of cash

Demerits

- it doesn't consider time value of money
- it doesn't consider overall earnings of the project

Post Payback Profitability period

One of the important demerit of payback period is it doesn't consider earnings during the entire life of the project. As a result, the earnings made after the payback period are not considered which at times may select wrong project.

Merits

- it is easy to calculate
- it considers CFAT values for the entire duration of the project

Demerits

- it doesn't consider time value of money
- at times it is inconsistent with payback period

Average Rate of Return

This method tells us the rate of return earned by the project on its investment. It can be calculated as follows:

$$\text{ARR} = \text{Average Return} / \text{Average Investment}$$

$$\text{Average return} = \text{Total Return} / \text{Number of Years}$$

$$\text{Average Investment} = \text{Investment} / 2$$

Merits:

- it is easy to calculate
- it considers revenue of entire project

Demerits:

- it doesn't consider time value of money
- it selects projects only based on returns but not on duration

Discounted Payback period

- One of the important drawbacks of payback period is, it doesn't consider time value of money. As a result, a Rupee that comes today as well as a Rupee that comes after three years are treated as same, which is not correct. To eliminate this drawback, one can use discounted payback period method.

Procedure to calculate discounted payback period:

- Step 1: multiply cash flows with their respective present value factor of each year to get discounted cash flows of each year
- Step 2 : calculate cumulative discounted cash flows of each year to find out discounted payback period.

- $PVF_{RN} = \frac{1}{(1+R)^N}$

- *Where,*

- $PVF_{R,N}$ = present value factor for a given cost of capital and a particular year

- R = cost of capital

Discounted Payback period...

Merits:

- it considers time value of money
- it is easy to calculate

Demerits:

- it doesn't consider post payback period earnings
- identifying exact cost of capital is difficult

Net Present Value

- In simple terms, net present value tells us the profit that the project earns back after considering present value of cash flows.

- $NPV = PV \text{ of Inflows} - PV \text{ of Outflows}$

Present value of inflows (or) outflows can be calculated with the help of the following formula

- $$PVCF_{RN} = \frac{CF_N}{(1+R)^N}$$

- Where,
- $PVCF_{R,N}$ = present value of cash flows
- CF_N = cash flows of a particular year N
- R = Cost of Capital

Net Present Value...

Merits:

- It considers time value of money
- It considers earnings of entire duration of the project

Demerits:

- Compared with traditional techniques. It is relatively difficult to calculate
- It is not easy to calculate cost of capital
- It may not give correct result in the case of unequal investments of different projects.

Profitability Index

- Profitability index can be calculated by dividing present value of inflows with present value of outflows.
- It says that net present value may not give correct answer in the case of projects with different investments.

Merits:

- it considers time value of money
- it considers earnings for entire duration of the project
- it is helpful, especially when projects require different amounts of investment

Demerits:

- at times it is inconsistent with net present value
- identifying an exact cost of capital is difficult

Internal rate of return

- Cost of capital tells the minimum rate of return that the project has to earn on its investment.
- On the other hand, internal rate of return tells us the most likely rate of return that the project is going to earn. Therefore, in order to accept the project its internal rate of return shall be greater than or at least equal to its cost of capital.
- In the case of mutually exclusive decisions select that project whose IRR is higher or highest.
- At IRR, Net Present Value of a project is approximately 0 (Zero).



Internal rate of return (IRR)...

- Step I : calculate average CFAT of the project
- Step II: Divide the investment with average CFAT to get present value annuity factor.
- Step III : look for the above value in the present value annuity factor table in that year (Row value), which is the total duration of the project and look at the corresponding rate of return (Column) as the cost of capital.
- Step IV : calculate net present value of the project at the above cost of capital
- Step V : if the net present value in the above step is positive, then take a high year cost of capital to get negative net present value. (If the net present value in step four is negative, then take a lesser cost of capital to get positive net present value)
- Step VI : use the following interpolation formula to calculate IRR:
- $$IRR = \text{Lesser Cost of Capital} + \left[\frac{\text{Positive NPV} \times \text{Difference in Discount Rates}}{PV \text{ of Inflows at Lesser Discount rate} - PV \text{ of Inflows at Higher Discount Rate}} \right]$$

Internal rate of return (IRR)...

Merits

- it considers time value of money
- it considers cash flows of entire duration of the project
- it is a better technique when the project is predominantly funded by borrowed funds

Demerits

- among all the techniques it is most cumbersome to calculate
- at times, a project may have more than one internal rate of returns , which makes the decision process difficult

Modified IRR...

- The modified internal rate of return (MIRR) assumes that positive cash flows are reinvested at the firm's cost of capital and that the initial outlays are financed at the firm's financing cost.
- By contrast, the traditional internal rate of return (IRR) assumes the cash flows from a project are reinvested at the IRR itself.
- The MIRR, therefore, more accurately reflects the cost and profitability of a project.
- Meanwhile, the internal rate of return (IRR) is a discount rate that makes the net present value (NPV) of all cash flows from a particular project equal to zero. Both MIRR and IRR calculations rely on the formula for NPV.

THANK YOU