Course Code: CMRC4202

Course Name: MANAGERIAL FINANCE

M.Com – IInd Semester

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Capital Budgeting

Capital budgeting consists in planning for development of available capital for the purpose of maximising the long term profitability (return on investment) of the firm – R M Lynch

Features of Capital Budgeting

- ✓ Capital budgeting decisions involves the proposed investment of funds in the future.
- ✓ Under the capital budgeting long term investment is fixed.
- ✓ Each project involves large amount of capital investment.
- ✓ Under capital budgeting decisions are irreversible nature .
- ✓ Capital budgeting or investment appraisal is the planning for long term investments

Capital Budgeting decisions includes

- Analysis of proposal of the project
- Evaluation of its impact on financial position of the firm
- Selection of best alternative for long term investment .

Reasons for Capital budgeting decisions

- ✓Starting of new project,
- ✓Replacement of Fixed Asset,
- ✓Expansion of Capacity of existing project,
- ✓Diversification of Business.

Importance of Capital Budgeting

- ✓Capital Budgeting decisions have long term implications on the operations of the business,
- ✓ Capital Budgeting Decisions involves higher degree of risk ,
- ✓ Capital Budgeting Decisions are of irreversible in nature due to heavy losses,
- ✓ Capital Budgeting Decisions are difficult to make as it involves future predictions

Capital Budgeting Techniques

- Capital Budgeting Techniques under non discounting criteria
- Capital Budgeting Techniques under discounting criteria

Capital Budgeting Techniques under Non- Discounting Criteria or without considering Time Value of Money

- Pay Back Period
- ARR

Pay Back Period

It measure the length of time required for the project to recover its Investment.

Decision Rule for Accepting and Rejecting the project:

For one project

A project is to be accepted if Pay Back Period is less than or equal to the cut off period .

For more than one project

A project with least Pay Back Period is to be selected.

Pay Back Period = Total Investment(cash outflow)/Annual cash inflow

- *For one project*
- If a project with life of 5 years involves an investment of Rs. 40 lakh and is expected to generate a fixed annual return of Rs. 16 lakh, the pay back =40/16=2.5 year.
- *For more than one project*

consider the cash flows of two projects, x and y:

The payback criterion prefers X, which has a payback period of 3 years, in comparison to Y,

Year	Investment of project X (Rs. 50,000)	Investment of project Y (Rs. 50,000)
	Cash flow of Project X	**Cash flow of Project Y**
1	25,000	15,000
2	15000	150000
3	15,000	15,000
4	10,000	20,000
5	10,000	20,000

Accounting Rate of Return

ARR= Average Profit after Tax (Income)/ Average book value of the investment (Project)

Decision Rule for Accepting and Rejecting the project

A Project with *HIGHEST ARR* is to be selected.

OR

Accept the project if ARR = or > Required Rate of Return

Accounting Rate of Return

The computation of ARR with the following data:

Year	0	1	2	3
Initial Investment	**1,80,000**			
Sales Revenue		2,40,000	2,00,000	1,60,000
Operating expenses excluding Depreciation		1,20,000	1,00,000	80,000
Depreciation		60,000	60,000	60,000
Annual income		*60,000*	*40,000*	*20,000*

Accounting Rate of Return

ARR= Average Profit after Tax (Income)/ Average book value of the investment

Average Annual Income= (60,000+40,000+20,000)/3=40,000

Average book value of the investment = (1,80,000+ 0)/2 =90,000

ARR=(40,000/90,000)*100= 44%.

Decision Rule for Accepting and Rejecting the project:

Accept the project if ARR = or > Required Rate of Return

(firm accept the project if its RRR < 44%.)

Capital Budgeting Techniques under Discounting Criteria or with considering Time Value of Money

- Net Present Value
- Benefit –Cost Method,
- Internal Rate of Return Method

Net Present Value (NPV)

NPV is the difference between the present value of cash inflows and the initial investment over a period of time.

NPV = Present value of cash inflows – Initial investment

Decision Rule for Accepting and Rejecting the project:

A project with positive NPV is to be selected.

A project with negative NPV is not to be selected

Net Present Value (NPV)

A projects involves an initial investment of Rs. 20 lakh and generate net inflow as follows: (assume cost of capital is 12% per annum)

Year	Cash inflow
1	Rs. 4 lakh
2	Rs. 8 lakh
3	Rs. 12 lakh

NPV = Present value of cash inflows – Initial investment

NPV= (3.572+6.376+8.544)-(20.00)

NPV= -1.508

Decision Rule for Accepting and Rejecting the project

A project with negative NPV is not to be selected

Year	Cash in flow (Rs. In lakh)	Present value (Rs. In Lakh)
1	Rs. 4 lakh	4 *PVIF (12,1) = 4* 0.893 =3.572
2	Rs. 8 lakh	8 *PVIF (12,2) = 8* 0.797 =6.376
3	Rs. 12 lakh	12 *PVIF (12,3) = 12* 0.712 =8.544

Internal Rate of Return (IRR)

The IRR is the rate of interest at which the NPV of a project is equal to zero.

Decision criteria

If the IRR is greater than the cost of capital, accept the project.

If the IRR is less than the cost of capital, reject the project.

Internal Rate of Return (IRR)

A project has the following pattern of cash flow, calculate IRR of the project :

Year	Cash flow (Rs. In lakh)
0	20 lakh invested
1	10
2	10
3	6.16
4	2.40

Internal Rate of Return (IRR)

Step1 (calculate of Average annual cash flow)

Average annual cash flow = (10+10+6.16+2.4)/4=7.14

Step2 (Divide the initial outlay by average annual cash flow)

20/7.14 = 2.801

Step3 (from the PVIFA table 2.801 in 4 years , rate of interest = 15%)

Use this rate as a initial value for starting trial and error process and keep trying until you get an interest rate at which the NPV is marginally above zero or zero. The interest rate at this point can be deemed as the IRR for the project.

Internal Rate of Return (IRR)

NPV at r = 15% will be equal to= 1.68

= -20 + (10*0.870)+(10*0.756)+(6.16*0.658)+(2.4*0.572)= 1.68

NPV at r = 16% will be equal to= 1.31

= -20 + (10*0.862)+(10*0.743)+(6.16*0.641)+(2.4*0.552) = 1.31

NPV at r = 18% will be equal to= 0.63

= -20 + (10*0.848)+(10*0.719)+(6.16*0.609)+(2.4*0.516) = 0.63

NPV at r = 20% will be equal to= 0.00

= -20 + (10*0.833)+(10*0.694)+(6.16*0.579)+(2.4*0.482) = 0.00

r=20

NPV=0

IRR= 20%

Benefit cost method or Benefit cost ratio

BCR =PV/I

Where,

BCR= Benefit cost ratio

PV= Present value of future cash flow

I = Initial investment

Decision criteria

BCR>1 = Accept the Project

BCR>1 = Reject the Project

Benefit cost method or Benefit cost ratio

Alpha limited is considering 4 projects A1,A2,A3 and A4 with the following information (cost of capital = 14%)

Project	Initial investment	Annual cash flow (year 1 to 5)
A1	40	15
A2	9	3.0
A3	14	5.0
A4	16	7.0

Benefit cost method or Benefit cost ratio

Project	NPV	Rank
A1	15*PVIFA(14,5) -40 =(15*3.433) – 40 = 11.495	I
A2	3*PVIFA(14,5) -9.0 =(3.0*3.433) – 9.0 = 1.299	IV
A3	5*PVIFA(14,5) -14.0 =(5.0*3.433) – 14.0= 3.16	III
A4	7*PVIFA(14,5) -16.0 =(7.0*3.433) – 16.0 = 8.031	II

Benefit cost method or Benefit cost ratio

Project	BCR	Rank
A1	51.495/40= 1.287	II
A2	10.299/9= 1.14	IV
A3	17.165/14= 1.23	III
A4	24.031/16= 1.50	I