

Accounting for Managers

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MGM341

Lecture (10) **Planning for capital investments**



Planning for Capital Investments

Learning Objectives

- LO 1** Describe capital budgeting inputs and apply the cash payback technique.
- LO 2** Use the net present value method.
- LO 3** Identify capital budgeting challenges.

Capital Budgeting and Cash Payback

Company capital budget authorization process:

1. Proposals for projects are requested from each department.
2. Proposals are screened by a capital budget committee.
3. Officers determine which projects are worthy of funding.
4. Board of directors approves capital budget.

Authorization Process

Many companies follow a carefully prescribed process in capital budgeting.



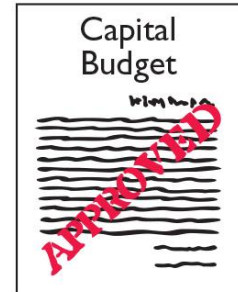
1. Project proposals are requested from departments, plants, and authorized personnel.



2. Proposals are screened by a capital budget committee.



3. Officers determine which projects are worthy of funding.



4. Board of directors approves capital budget.

Cost Flow Information

For purposes of capital budgeting, estimated **cash inflows and outflows** are the preferred inputs.

Why?

Ultimately, the value of all financial investments is determined by the value of cash flows received and paid.

Cost Flow Information

Typical cash flows relating to capital budgeting decisions.

Cash Outflows

- Initial investment
- Repairs and maintenance
- Increased operating costs
- Overhaul of equipment

Cash Inflows

- Sale of old equipment
- Increased cash received from customers
- Reduced cash outflows related to operating costs
- Residual value of equipment

Cost Flow Information

Capital budgeting decisions depend on:

1. Availability of funds.
2. Relationships among proposed projects.
3. Company's basic decision-making approach.
4. Risk associated with a particular project.

Illustrative Data

Sikkim Shipping is considering an investment of €130,000 in new equipment.

Initial investment	€130,000
Estimated useful life	10 years
Estimated residual value	–0–
Estimated annual cash flows	
Cash inflows from customers	€200,000
Cash outflows for operating costs	<u>176,000</u>
Net annual cash flow	<u><u>€ 24,000</u></u>

Cash Payback period

1) Cash flow is constant

$$P.P = \frac{\text{Cash outflow}}{\text{Cash inflow}}$$

2) Cash flow is constant

Year	Cash out flow (I)	Cash inflow (C)	Balance
Year (0)	(X)	-	(X)
Year (1)		(X)	(X)
Year (2)		(X)	(X)
Year (3)			

Cash Payback

Cash payback technique identifies the time period required to recover the cost of the capital investment from the net annual cash inflow produced by the investment.

Cost of Capital
Investment

÷

Net Annual Cash
Flow

=

Cash Payback
Period

Cash payback period for Sikkim is ...

$$\boxed{} \div \boxed{} = \boxed{}$$

Cash Payback

Shorter payback period = More attractive the investment

In the case of uneven net annual cash flows, the company determines the cash payback period when the:

**Cumulative net cash
flows from the
investment**

=

Cost of the investment

Two investment proposals X and Y require a cash outlay of LE 150.000 each, and achieve the following cash inflows:

Proposal	Year one	Year two	Year three	Year four
X	50.000	50.000	50.000	50.000
Y	50.000	80.000	80.000	31.000

Compute the P.P for each investment proposal if the company

Proposal (X)

$$P.P = \frac{\text{Net cash outflow (C.O)}}{\text{Net cash inflow}} = \frac{\text{صافي الإنفاق النقدي}}{\text{التدفق النقدي السنوي الداخل}} = \frac{150.000}{50.000} = 3 \text{ year}$$

Proposal (Y)

Year	Cash outflow	Cash inflow	Balance
	150,000		150,000
1		50,000	100,000
2		80,000	20,000
3		80,000	

$$PP = 2 + (20000/80000) = 2.25 \text{ years}$$

Decision: We advice this company to accept project (Y) because it has lower P.P

DO IT! 1 | Cash Payback Period

Ghim Paper is considering adding another machine for the manufacture of corrugated cardboard. The machine would cost ~~¥~~900,000,000. It would have an estimated life of 6 years and no residual value. The company estimates that annual cash inflows would increase by ~~¥~~400,000,000 and that annual cash outflows would increase by ~~¥~~190,000,000. Compute the cash payback period.

Cash payback period =

=

Disadvantages of P.P

- a) Ignore the time value of money
- b) It ignore cash inflow after P.P

Advantages of P.P

- a) Easy to calculate
- b) Easy to understand
- c) Most popular

Net Present Value Method

Discounted cash flow technique:

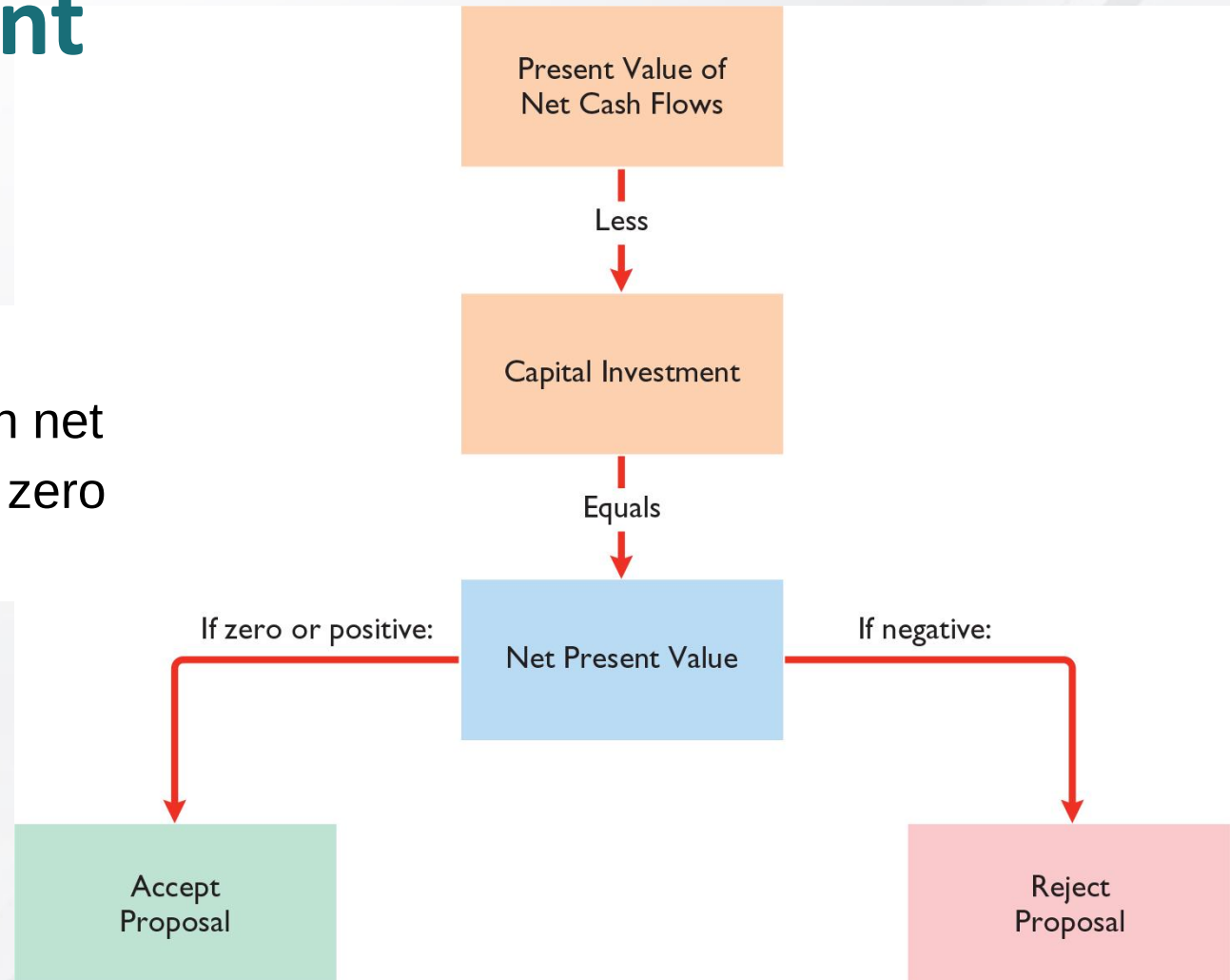
- Generally recognized as best approach.
- Considers both estimated total cash inflows and time value of money.
- Two methods:
 - **Net present value (NPV).**
 - **Internal rate of return (IRR).**

Net Present Value (NPV) method

- Cash inflows are discounted to their present value and then compared with the capital outlay required by the investment (see Decision Tools).
- The interest rate used in discounting is the required minimum rate of return.
- Proposal is acceptable when NPV is zero or positive.
- The higher the positive NPV, the more attractive the investment.

Net Present Value Method

Proposal is acceptable when net present value is zero or positive.



Computing Net Present Value

Present value of cash inflow

-

Investment cost (CO)

Cash flow is constant



$$= \text{Cash flow} \times \frac{1 - \frac{1}{(1+k)^n}}{k}$$

Where:

K → The discount rate

N → Number of year

Cash flow is not constant



Year	Cash flow	P.V factor	P.V
1	x	$\frac{1}{(1+k)^1}$	.
2	x	$\frac{1}{(1+k)^2}$	.
3	x	$\frac{1}{(1+k)^3}$	.

Equal Annual Cash Flows

Illustration: Sikkim Shipping company's annual cash flows are €24,000. If we assume this amount is uniform over the asset's useful life- Capital investments € 130.000, we can compute the present value of the net annual cash flows.

	Present Value at 12%
Discount factor for 10 periods	<u>5.65022</u>
Present value of net cash flows: €24,000 × 5.65022	<u>€135,605</u>

Equal Annual Cash Flows

Illustration: Calculate the present value.

	<u>12%</u>
Present value of net cash flows	
Less: Capital investment	<u>130,000</u>
Net present value	<u><u> </u></u>

The proposed capital expenditure ☐ acceptable at a required rate of return of 12% because the value is positive.

Unequal Annual Cash Flows

<u>Year</u>	<u>Assumed Net Annual Cash Flows</u>	<u>Discount Factor</u> <u>12%</u>	<u>Present Value</u> <u>12%</u>
	(1)	(2)	(1) × (2)
1	€ 34,000	.89286	€ 30,357
2	30,000	.79719	23,916
3	27,000	.71178	19,218
4	25,000	.63552	15,888
5	24,000	.56743	13,618
6	22,000	.50663	11,146
7	21,000	.45235	9,499
8	20,000	.40388	8,078
9	19,000	.36061	6,852
10	18,000	.32197	5,795
	<u>€240,000</u>		<u>€144,367</u>

Unequal Annual Cash Flows

Illustration: Calculate the net present value.

	<u>12%</u>
Present value of net cash flows	€144,367
Less: Capital investment	<u>130,000</u>
Net present value	€ 14,367

Proposed capital expenditure is acceptable at a required rate of return of 12% because the net present value is positive.

Choosing a Discount Rate

In most instances a company uses a required rate of return equal to its **cost of capital** — that is, the rate that it must pay to obtain funds from creditors and shareholders (see Helpful Hint).

Discount rate has two elements:

- ◆ Cost of capital
- ◆ Risk

Rate also know as

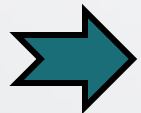
- ✓ required rate of return.
- ✓ hurdle rate.
- ✓ cutoff rate.

Net Present Value (NPV) Method

Question

Compute the net present value of a \$260,000 investment with a 10-year life, annual cash inflows of \$50,000 and a discount rate of 12% - Present value factor 5.65022.

a. \$(9,062).



b. \$22,511.

c. \$9,062.

d. \$(22,511).

Comprehensive Example (1 of 3)

Best Taste Foods is considering investing in new equipment to produce fat-free snack foods.

Initial investment	€1,000,000
Cost of equipment overhaul in 5 years	€200,000
Residual value of equipment in 10 years	€20,000
Cost of capital (discount rate)	15%
Estimated annual cash flows	
Cash inflows received from sales	€500,000
Cash outflows for cost of goods sold	€200,000
Maintenance costs	€30,000
Other direct operating costs	€40,000

Compute the net annual cash flow.

Comprehensive Example (2 of 3)

Compute the net annual cash flow.

Comprehensive Example (3 of 3)

Compute the net annual cash flow.

Event	Time Period	Cash Flow	×	15% Discount Factor	=	Present Value
Net annual cash flow			×		=	
Residual value						
Less: Equipment purchase						
Less: Equipment overhaul						
Net present value						

DO IT! 2 | Net Present Value

The machine would cost ~~₩~~900,000,000. It would have an estimated life of 6 years and no residual value. The company estimates that annual cash inflows would increase by ~~₩~~400,000,000 and that annual cash outflows would increase by ~~₩~~190,000,000. Management has a required rate of return of 9%- PV Factor 4.48592. **Calculate the net present value on this project and discuss whether it should be accepted.**

DO IT! 2 | Net Present Value

Calculate the net present value on this project and discuss whether it should be accepted.

Estimated annual cash inflows ~~₩~~400,000,000

Net annual cash flow

Cash Flow

9% Discount
Factor

Present
Value

Net present value

^aTable 4, Appendix A, 9%, 6 years

Since the net present value is Ghim should the project.

A manufacturing company is offered machine which costs LE 1500.000 and achieve an annual cash inflows of LE 500000 for six years, Do you advice the company to buy this machine given that the Present value factor 3.49

$$N.P.V = P.V \text{ cash inflow} - \text{investment cost (C.O)}$$

$$\begin{array}{c} \downarrow \\ C.I \times P.V \text{ factor} \end{array}$$

$$N. P. V = (500000 \times 3.49) - 15.0000 = 245000$$

Decision: We accept to buy this machine because it has positive (N.P.V)

DO IT

1. For purposes of capital budgeting, estimated cash inflows and outflows are preferred for inputs into the capital budgeting decision tools.

Answer: True

2. The cash payback method is frequently used as a screening tool but it does *not* take into consideration the profitability of a project.

Answer: True

3. The net present value method can only be used in capital budgeting if the expected cash flows from a project are an equal amount each year.

Answer: False

4. In computing the net present value , the discount rate is referred to required rate of return.

Answer: True

5. The primary capital budgeting method that uses discounted cash flow techniques is the cash payback technique

Answer: False

6. If project A has a lower payback period than project B, this may indicate that project A may have a

- a. lower NPV and be less profitable.
- b. higher NPV and be less profitable.
- c. higher NPV and be more profitable.
- d. lower NPV and be more profitable.

Answer (C)

7. Net annual cash flow can be estimated by

- a. deducting credit sales from net income.
- b. adding depreciation expense to net income.
- c. deducting credit purchases from net income.
- d. adding advertising expense to net income.

Answer (B)

Thank You

