

Time Value of Money

The concept of time value of money asserts that money received today will have a greater value than money received in future. It holds that it's better to receive the money today than at a later date. This concept is based on the English proverb that "a bird in a hand is better than two in a bush". A person will always prefer to get money right now rather than at a future date. Such a preference may arise due to following reason:

1. **Future Uncertainty:** Future is uncertain and is full of risk. Because of this risk, individual prefers to have a current sum of money.
2. **Present consumption:** An individual may have some need right now. So, he would not want to delay the acquisition of money for future. He may prefer a sum of money now, so that he could consume it as per present need. Also, purchasing power of money decreases with the time.
3. **Reinvestment opportunity available today:** A consumer always has an opportunity to re-invest money somewhere else and earn some interest on it.

The concept of time value of money is based on two principle

Principle of Compounding

Compounding technique helps in finding the future value of a present sum of money.

$$FV = PV (1 + r)^n$$

Principle of Discounting

Discounting technique helps in finding the present value of a future sum of money.

$$PV = \frac{FV}{(1+r)^n}$$

Note: all questions we have solved under NPV and IRR method is based on principle of discounting and two questions we have solved under Terminal value method is based on principle of compounding.

Cash Flow Estimation

Estimation of cash flow is very important in capital budgeting decision. Any decision related to capital expenditure involves a comparison between cash outflow and cash inflow.

1. Estimation of Annual Operating Saving or Cash inflow

| | |
|--------------------------------------------------------------------------------------------|------------|
| Revenue | XXX |
| Less: Expenses | XXX |
| Profit before Depreciation and Tax | XXX |
| Less: Depreciation | XXX |
| Profit after depreciation but before tax | XXX |
| Less: Tax | XXX |
| Profit after tax | XXX |
| Add: Depreciation | XXX |
| Profit after tax but before Depreciation Or Operating saving or Net Cash inflow | XXX |

(Refer to example 1)

Important Things to understand:

1. **From revenue all expenses are deducted**, these expenses include all fixed and variable expenses.
2. From revenue, expenses are deducted and then depreciation and tax are deducted.
3. **Why do we Deduct depreciation and then add back:** Depreciation is a non-cash expenditure; it should not be included in cash flow estimation. but it is deducted to get the tax benefit as it is an allowed expenditure for the income-tax purpose. It provides tax-shield by reducing the amount of taxable earnings. After charging tax, the amount of depreciation is added back.
4. Whether you call it **Profit after tax but before Depreciation or Operating saving or Net Cash inflow**, all are same.
5. In some books instead of profit, earning word is used.
6. **Profit after tax is taken for calculation of ARR and ROI. The Operating saving or Net Cash inflow is taken for calculation of Payback Period, Discounted Payback Period, Net Present Value, Profitability Index and Internal Rate of Return.**

2. Estimation of Initial investment or cash outflow

| | |
|----------------------------------------------------------|------------|
| Cost of New Project | XXX |
| Add: Installation Charges | XXX |
| Increased Working Capital ¹ | <u>XXX</u> |
| | XXX |
| Less: Working capital freed ² | XXX |
| Sale proceeds from old assets (if any, adjusted for tax) | XXX |
| Net Cash Outflow | XXX |

Important Things to understand:

A. Adjustment for Working Capital:

1. When any new project is undertaken, it may require additional working capital. It is a cash outflow and should be added to the cost of the project as cash outflow.
2. due to such investment, if working capital is freed in the beginning, it should be deducted from cost of new project.
3. At the end of the economic life of the machine, working capital employed in the beginning is released and is a cash inflow. So, this working capital released should be added to the inflow of last year. (refer to the example of Rama Ltd. (NPV) Question 26).
4. If there are any overhauling charges or maintenance charges, it must be added as cash outflow.

B. Adjustment of Salvage Value

When the productive capacity of a machine is over, it is disposed-off at the end of its economic life. The amount thus generated is scrap value of the machine. It should be added back to the cash inflow of last year. (refer to the question of Jyoti Ltd.(ARR) Question 6).

C. In case of discounting techniques, all such values of salvage value, working capital and maintenance charges must be discounted at a given rate for the given year.

D. Sale proceeds from old assets

The book value of the machine is arrived at by deducting the amount of depreciation from the purchase price of old machine. The book value of old machine is compared with the salvage value of the machine. When the salvage value is more than the book value, it will result in capital gain. The appropriate tax rate is used for the tax on capital gain. This tax is then deducted from the salvage value amount to compute the net cash inflow due to sale of old machine. (Refer example 2)

Note: In all methods of capital budgeting, we have made adjustments regarding Depreciation, tax, salvage value, working capital etc. Based on the available information in the question, you should make such adjustment. You have to make sure that which kind of profit should be taken for the asked method.

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