

Depreciation

Depreciation is the permanent and continuous decrease in the book value of a fixed asset due to use, passage of time, obsolescence, expiration of legal rights or any other cause.

Fixed assets are used in the business to derive benefit for more than one accounting period. Periodic profit (i.e. profit for an accounting period which is typically 1 year) is measured by charging the cost against the periodic revenue. Since fixed assets enable generation of periodic revenue, an appropriate proportion of the cost of the fixed assets which is believed to be used or expired for generation of periodic revenue, needs to be charged as cost of the fixed assets is termed as depreciation.

Depreciation accounting is a system of accounting which aims to distribute cost of the fixed asset (less salvage value, if any) over the estimated useful life of the asset in a systematic and rational manner.

Causes of Depreciation:

1. Physical wear and tear: The decrease in the value of the fixed asset due to use.
2. Passage of time: when the assets are exposed to forces of nature like wind, rain, sun, etc. their value may decrease even if they are not put to use.
3. Technological obsolescence: with improvement in technology an earlier fixed asset may become obsolete before its expected useful life.
4. Expiration of legal rights: When the use of an asset, say patents, is governed by time bound arrangement, the value of the asset decreases with time.

Need for charging depreciation:

1. To ascertain the true results of operations of an organization it is necessary to charge the depreciation (cost) against the income (revenue) in each accounting period.
2. To present true and fair financial position because if depreciation is not charged, the unexpired cost of the asset would be overstated.
3. To ascertain true cost of production by including depreciation as an item of cost.
4. For company form of organization, it is compulsory to charge depreciation.
5. The amount of depreciation provision can be invested annually to provide funds for replacement of the asset at the end of its useful life.

Methods of calculating depreciation:

1. **Straight Line Method (SLM):** Under SLM, a fixed and equal amount in the form of depreciation, according to a fixed percentage on the original cost, is written off during each accounting period over the expected useful life of the asset.

How to calculate depreciation under SLM?

$$\text{i. Amount of depreciation} = \frac{\text{Original cost} - \text{Residual value}}{\text{Expected useful life of the asset}}$$

$$\text{ii. Rate of depreciation} = \frac{\text{Amount of depreciation}}{\text{Original cost of the asset}} \times 100$$

Illustration:

Original cost of the asset Rs. 1,00,000; residual value (or salvage value) Rs. 20,000; expected life of the asset 5 years.

$$\text{Amount of depreciation} = \frac{\text{Rs. 1,00,000} - \text{Rs. 20,000}}{5 \text{ years}} = \text{Rs. 16,000}$$

$$\text{Rate of depreciation} = \frac{\text{Rs. 16,000}}{\text{Rs. 1,00,000}} \times 100 = 16\% \text{ per year}$$

Calculation of depreciation and book value over the life of the asset under SLM

Original cost	Rs. 1,00,000
Less: Depreciation at the end of Year 1	Rs. 16,000
Book Value at the beginning of Year 2	Rs. 84,000
Less: Depreciation at the end of Year 2	Rs. 16,000
Book Value at the beginning of Year 3	Rs. 68,000
Less: Depreciation at the end of Year 3	Rs. 16,000
Book Value at the beginning of Year 4	Rs. 52,000
Less: Depreciation at the end of Year 4	Rs. 16,000
Book Value at the beginning of Year 5	Rs. 36,000
Less: Depreciation at the end of Year 5	Rs. 16,000
Book Value at the end of Year 5	Rs. 20,000

2. **Written Down Value Method (WDV):** This method involves the application of a pre-determined percentage of the book value of the asset at the beginning of every accounting period so as to calculate the amount of depreciation. The amount of depreciation reduces every year.

Illustration

Original cost Rs. 2,00,000; rate of depreciation 15%. Show depreciation calculation for 4 years.

Calculation of depreciation and book value over the life of the asset under WDV method

Original cost	Rs. 2,00,000
Less: Depreciation (15% of Rs. 2,00,000)	Rs. 30,000
Book Value at the beginning of Year 2	Rs. 1,70,000
Less: Depreciation (15% of Rs. 1,70,000)	Rs. 25,500
Book Value at the beginning of Year 3	Rs. 1,44,500
Less: Depreciation (15% of Rs. 1,44,500)	Rs. 21,675
Book Value at the beginning of Year 4	Rs. 1,22,825
Less: Depreciation (15% of Rs. 1,22,825)	Rs. 18,424
Book Value at the end of Year 4	Rs. 1,04,401

Difference between SLM and WDV method of Depreciation

No.	Basis	SLM	WDV
1.	Meaning	SLM is a method of depreciation in which the cost of the asset is spread uniformly over the life of the asset by writing off a fixed amount every year.	WDV is a method of depreciation in which a fixed rate of depreciation is charged on the book value of the asset over its useful life.
2.	Calculation	Depreciation is calculated on the original cost of the asset.	Depreciation is calculated on the basis of the written down value of the asset.
3.	Amount of depreciation	The annual depreciation charge under SLM remains fixed during the life of the asset.	Amount of depreciation under WDV method reduces every year
4.	Book value written off	Book value of the asset is completely written off i.e. the asset value is reduced to zero or its salvage value.	The asset's book value is never written off completely.
5.	Initial year's depreciation	Amount of depreciation under SLM is initially lower compared to that under WDV.	Under WDV method the amount of depreciation at the beginning years are higher.
6.	Suitability	Best with assets with negligible repairs.	Appropriate for assets whose repairs increase as the get older.

Replacement Analysis

Replacement decision attempts to formulate a policy as to when to replace the existing machines

irrespective of whether they still have some utility left or not. If the existing machine has become obsolete, the firm is forced to replace it. In this case it is not a replacement decision but a selection of one from many possible replacement alternatives.

If a firm continues to persist with the policy not to replace till the life of the existing machine is over it may be supporting an uneconomical situation. The replacement of existing machine raises the question of time of replacement that is most economical to the firm.

The existing machine is termed as the “defender” and the machine that might be bought to replace the existing one is called the “challenger”. Replacement analysis deals with the evaluation of defender and challenger. Various replacement analysis techniques are applied depending upon different circumstances for existing installed asset (i.e. defender) against the best current available asset (i.e. challenger). If the defender proves to be economical it will be retained else it will be replaced with the challenger.

Sensitivity Analysis

The risk for the capital budgeting projects emanates from the variability of its cash flow. Cash flows are projected on the basis of few critical assumptions. Normally, such assumptions relate to key variables such as the level of output, selling price of the product, cost structure, administrative and other overheads etc. Any change in these key determinants will cause a change in the cash flows and therefore the net present value (NPV) of the project.

Sensitivity analysis measures the change in the NPV of the project with respect to change in one of the independent variables impacting the NPV. For example, one may like to know whether a decline in the selling price by 10% which managers may see as a distinct possibility, can be sustained by the project.

Sensitivity analysis helps managers identify which of the assumptions is the most critical for the project. It not only helps them in making an initial decision of acceptance / rejection of project but also lets them focus their attention on key variables, in order of their criticality to the project's viability in an ever-changing environment.