

Depreciation Costs

The cost and expense of purchasing and installing assets is *capital* cost and expenditure.

With a few exceptions assets lose their original value as they get older and more used (quite independently of the costs incurred in repairing and maintaining them). Anyone who has purchased a new car and then tried to sell it or trade it in a few years later will understand exactly what this means! The older an asset gets and the more it gets used, the less it is worth in general.

Eventually, assets have to be replaced because they are worn out, obsolete or no longer economic to maintain and at that point an organization has to find funds to finance the replacement. It is therefore common (and prudent) business practice to set aside out of profits (usually at the end of each financial year) the estimated decreases in asset values due to increasing age and usage to provide a cash flow for the purpose of financing asset replacement when this becomes necessary.

This practice is called *depreciation*. The amounts set aside are called *depreciation costs* or *charges*. They are revenue costs and are additional to the revenue costs incurred in repairing and maintaining the assets concerned.

The principal methods by which depreciation is calculated are:

- the straight line method
- the constant percentage on reducing balance method
- the annuity method
- the current replacement value (CRV) method.

These methods are now described briefly.

The straight line method of depreciation

This is the most commonly used method. The formula is:

Original cost of asset (A) minus residual value of asset (R) divided by the estimated useful life (L) of the asset (in years)

$$\text{Depreciation} = \frac{A-R}{L}$$

In other words simply divide the expected diminution in asset value (A – R) by the number of years over which that diminution will take place (L); this gives the depreciation cost per year. The original cost of the asset will include installation charges that have been capitalized as well as the purchase price of the asset itself. The residual value is what you think the asset will be worth at the end of its estimated useful life (net of any dismantling charges).

The constant percentage on reducing balance method

This method is also in very common use and is the method applied by the UK's Inland Revenue tax authorities when they assess the profits of an organization for corporation tax purposes. The annual depreciation cost is quite simple: the latest net book value (NBV) of the asset is multiplied by a constant (fixed) percentage depreciation factor.

If we apply this method to plant of, say, £200 000 (assuming a depreciation factor of 20% per year), the calculation is as follows:

| | Depreciation cost | NBV after depreciation |
|--------|--------------------------|------------------------|
| Year 1 | £200 000 ∞ 20% = £40 000 | £160 000 |
| Year 2 | £160 000 ∞ 20% = £32 000 | £128 000 |
| Year 3 | £128 000 ∞ 20% = £25 600 | £102 400 |
| Year 4 | £102 400 ∞ 20% = £20 480 | £81 920 |

and so on.

With this method the asset never gets written down to a zero residual value and the depreciation charge becomes less each year during the life of the asset (though this is usually offset by rising repair and maintenance costs in later years).

The percentage factor used in this method will depend upon the nature of the asset, an estimate of its expected useful life and what residual value you think it might have at the end of that life. It simplifies things considerably to adopt the percentage rates used by the tax authorities for corporation tax calculation purposes.

The annuity method

This method is based on an assumption that as depreciation costs are written off each year, funds of the same value will be invested at compound interest to build up to the replacement cost of the asset (less any residual value it may have) at the end of the asset's life. It therefore involves estimating the life of the asset, the replacement value required and the expected rate of interest on funds invested. Compound interest tables are then consulted to ascertain the annual investment needed and this is then the annual depreciation cost.

Current replacement value (CRV) method

In times of continual inflation it is a realistic assumption that when the life of an asset has expired the replacement asset will cost more to purchase and install than the original one did. The CRV method recognizes this problem and aims to write off sufficient depreciation each year out of profits to build up to the eventual higher replacement value of the asset when the time comes.

There are a number of different formulae used. The most common method is:

- 1 Calculate (from price index tables or latest price lists) the CRV of the asset.
- 2 From the calculated CRV, deduct the latest estimate of the asset's residual value (R) and also deduct the total cumulative depreciation (D) written off to date.
- 3 Divide the result of calculation (2), i.e. the remainder of asset value still to be written off, by the *remaining* number of years of estimated useful life (L) to give a new annual depreciation charge:

$$\frac{\text{K} - R - D}{L}$$