

## Depreciation Methods

### Straight-line Method (S/L)

### Accelerated Methods

#### Sum of the years digits (SYD)

#### Double declining balance (DDB)

#### Units of production

**Used when an asset gives equal benefits to the company throughout its useful life (for example, building).**

**Used when an asset gives greater benefits in earlier years than in later years (for example, office equipment).**

Depreciation expense is the same amount each year.

An accelerated depreciation method that is considered less aggressive than the double-declining method.

A depreciation rate that is twice the straight-line rate is applied against the book value of the asset. For example,  $1/5=20\%$  (S/L rate)  $\times 2 = 40\%$  (DDB rate).

Better matching since asset is more productive in earlier years.

Depreciation rate =  $1/\text{useful life}$  (for example,  $1/5 \text{ years}=20\%$ ).

Numerator = the number of years left in the asset useful life. For example, if it were a 3-year asset, in the first year the numerator would be 3, then 2, then 1.

Salvage value is ignored.

Minimize loss due to obsolescence. Since the asset was depreciated more quickly, the carrying value is lower therefore the loss is smaller.

$(\text{Cost}-\text{salvage value})/\text{useful life} = \text{yearly depreciation expense}$ .

Denominator = the sum of the years in the asset's useful life. The formula is  $N \times (N+1)/2$ . For example  $3(3+1)/2=6$ . In year 1 the basis is multiplied by  $3/6$ , then  $2/6$ , then  $1/6$ .

Depreciation expense should not be reduced below the salvage value.

Helps to even out expenses. Since repair and maintenance in the earlier years is lower, if we take more depreciation earlier on, the total expenses would be more constant over time.

In the final year either:  
 1. Calculate depreciation expense in the last year as the amount to reduce the carrying value to the salvage value.  
 2. Switch from DDB to either SYD or S/L toward the end of the asset useful life, depreciating the asset to its salvage value.

#### Depreciation Expense

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#### Depreciation Expense per unit/hr

$$\frac{(\text{Cost} - \text{Salvage Value})}{\text{Useful Life}}$$

$$\frac{(\text{Cost}-\text{Salvage Value}) \times \# \text{ of Yrs Left in Asset's Life}}{\text{Basis} \quad \text{Sum of Yrs in Asset's Life}}$$

$$\begin{aligned} \text{Year 1: } & \text{Cost} \times (1/3 \text{ of Years}) \times 2 \\ \text{Year 2: } & (\text{Cost} - \text{Depreciation Expense Yr 1}) \times (\%) \end{aligned}$$

$$\frac{(\text{Cost} - \text{Salvage Value})}{\text{Estimated \# of Recoverable Units}}$$

#### Example:

The Asset was purchased on 1/1/2009  
 Cost: \$1,000

Estimated useful life: 5 years  
 Estimated salvage value: \$100

Estimated total outputs: 1,000 units  
 2009 output: 250 units  
 2010 output: 300 units

2009:  $(1,000-100)/5 \text{ years} = 180$   
 2010:  $(1,000-100)/5 \text{ years} = 180$

2009:  $(1,000-100) \times 5 / (1+2+3+4+5) = 900 \times 5/15 = 300$   
 2010:  $(1,000-100) \times 4 / (1+2+3+4+5) = 900 \times 4/15 = 240$

2009:  $1,000 \times 2/5 = 400$   
 2010:  $(1,000-400) \times 2/5 = 240$

2009:  $(1,000-100) \times 250 / 1,000 = 225$   
 2010:  $(1,000-100) \times 300 / 1,000 = 270$

#### Income Statement (1st year)

Revenues	2,000
COGS	1,050
<b>Gross Profit</b>	<b>950</b>
Operating Expenses	650
<b>EBTDA*</b>	<b>300</b>
Depreciation Expense	180
<b>Income Before Income Tax</b>	<b>120</b>

#### Income Statement (1st year)

Revenues	2,000
COGS	1,050
<b>Gross Profit</b>	<b>950</b>
Operating Expenses	650
<b>EBTDA</b>	<b>300</b>
Depreciation Expense	300
<b>Income Before Income Tax</b>	<b>0</b>

#### Income Statement (1st year)

Revenues	2,000
COGS	1,050
<b>Gross Profit</b>	<b>950</b>
Operating Expenses	650
<b>EBTDA</b>	<b>300</b>
Depreciation Expense	400
<b>Income (Loss) Before Income Tax</b>	<b>(100)</b>

#### Income Statement (1st year)

Revenues	2,000
COGS	1,050
<b>Gross Profit</b>	<b>950</b>
Operating Expenses	650
<b>EBTDA</b>	<b>300</b>
Depreciation Expense	225
<b>Income Before Income Tax</b>	<b>75</b>

\*Earnings Before Taxes, Depreciation and Amortization