Comparative Analysis of Depreciation Methods: Straight-Line vs. Diminishing Balance

By

Name: Sachin Gunjal
Batch: CX-132-Mor-May

Information about the terminologies:

Scope

The scope of this comparative analysis includes understanding the key differences between the Straight-Line and Diminishing Balance methods of depreciation. This analysis will help determine which method is more suitable under different circumstances, considering factors like asset cost, additional costs, asset lifespan, and salvage value.

Objectives

To Understand Depreciation Methods:

Provide a detailed explanation of the Straight-Line and Diminishing Balance methods.

To Compare Depreciation Methods:

Analyze and compare the financial implications of each method.

To Provide Practical Examples:

Illustrate both methods with practical examples and calculations.

To Create a Depreciation Schedule:

Generate a year-by-year depreciation schedule for each method.

Introduction

Title

"Comparative Analysis of Depreciation Methods: Straight-Line vs. Diminishing Balance"

Definition of Depreciation:

Depreciation is the systematic allocation of the cost of a tangible asset over its useful life. It reflects the reduction in value of an asset as it is used over time.

Importance of Depreciation in Accounting:

Depreciation helps in matching the cost of the asset with the revenue it generates. It provides a method to allocate the cost of the asset over its useful life, impacting both the income statement and the balance sheet. Depreciation also helps in tax deduction, as it is considered an expense.

Methodologies

- ## Straight-Line Method

The **Straight-Line Method** of depreciation spreads the cost of an asset evenly over its useful life. Every year, the same amount is deducted from the asset's value until it reaches its **residual (salvage) value**.

Depreciation is spread equally over asset life.

Calculation Formula:

Depreciation per year = (Asset Price - Scrap Value) / Estimated Life Span.

Example Calculation:

Suppose an asset costs $10,000 with a scrap value of $2,000 and an estimated life span of 5 years. The annual depreciation would be ($10,000 - $2,000) / 5 = $1,600.

Depreciation Schedule:

A table showing the year-wise depreciation and remaining book value.

- ## Diminishing Balance Method

> The **Diminishing Balance Method** (or Declining Balance) applies a fixed depreciation rate to the **remaining book value** each year. This results in higher depreciation in the early years and lower amounts in later years.

Depreciation is calculated on the **book value** each year using a fixed rate.

Calculation Formula: Depreciation per year = Book Value at Beginning of Year * Depreciation Rate.

Example Calculation:

Suppose an asset costs $10,000 with a depreciation rate of 20%. The first year's depreciation would be $10,000 * 0.20 = $2,000, and the book value at the end of the first year would be $10,000 - $2,000 = $8,000. The second year's depreciation would be $8,000 * 0.20 = $1,600, and so on.

Terminologies

Term	Description
Asset Cost	Base cost of asset ($450,000)
Additional Asset Cost	Setup and delivery costs ($50,000)
Asset Price	Total asset value ($500,000)
Scrap Value	Residual value after life ($50,000)
Estimated Life Span	10 years
Book Value	Value of asset at any point during lifespan
Depreciation Rate	Rate at which asset loses value yearly

Approaches

In this section we will check how 2 different approaches can be use as per requirement.

Straight Line Method

Straight Line Method		
Year	**Year on Year Depreciation Amount**	**Book Value**
1	$45,000.00	$5,00,000.00
2	$45,000.00	$4,55,000.00
3	$45,000.00	$4,10,000.00
4	$45,000.00	$3,65,000.00
5	$45,000.00	$3,20,000.00
6	$45,000.00	$2,75,000.00
7	$45,000.00	$2,30,000.00
8	$45,000.00	$1,85,000.00
9	$45,000.00	$1,40,000.00
10	$45,000.00	$95,000.00
11	Scrap Value	$50,000.00

Diminishing Balance Method

Diminishing Balance Method		
Year	**Year on Year Depreciation Amount**	**Book Value**
1	$1,02,835.88	$5,00,000.00
2	$81,685.45	$3,97,164.12
3	$64,885.06	$3,15,478.67
4	$51,540.03	$2,50,593.62
5	$40,939.70	$1,99,053.59
6	$32,519.56	$1,58,113.88
7	$25,831.21	$1,25,594.32
8	$20,518.46	$99,763.12
9	$16,298.39	$79,244.66
10	$12,946.27	$62,946.27
11	Scrap Value	$50,000.00

Key Findings

A. Yearly Depreciation

- In the Straight Line method, the depreciation amount is fixed at $45,000 per year throughout the asset's useful life. This is calculated by subtracting the scrap value from the asset price and dividing it equally over the years.
- In the Diminishing Balance method, depreciation starts high at around $102,850 in the first year and decreases each year thereafter. This is because depreciation is calculated on the remaining book value each year, not the original cost.

B. Total Depreciation

- Over the entire useful life, both methods lead to approximately $450,000 in total depreciation, which is the difference between the purchase price and the scrap value.

C. Depreciation Pattern

- Straight Line follows a constant pattern where the same amount is deducted every year.
- Diminishing Balance follows a decreasing pattern, where the amount of depreciation gets smaller each year.

D. Simplicity

- The Straight Line method is simple and easy to understand and implement, making it ideal for straightforward accounting.
- The Diminishing Balance method is of medium complexity, requiring more calculations each year as it's based on the reducing balance**.**

E. Typical Use Cases

- Straight Line is best suited for assets used uniformly over time, such as buildings, office furniture, or fixtures.
- Diminishing Balance is commonly used for technology related assets, machinery, or equipment that lose more value in the early years due to rapid obsolescence or heavy use.

Insights

Straight-Line Method

1. Depreciation amount stays the same each year, making it easier to plan budgets and forecast profits.
2. Shows steady profits year over year, useful for stakeholders and investors who prefer consistent results.
3. Ideal for assets used consistently, like office furniture, buildings, leasehold improvements, etc.
4. Doesn't reflect the real-world rapid loss in value of some tech or machinery assets.
5. Since deductions are uniform, it doesn’t offer accelerated tax savings in early years.

Diminishing Balance Method

1. Reflects how most assets (like electronics) lose value faster in the beginning.
2. Higher depreciation means reduced taxable income in early years.
3. Provides a more accurate picture of the asset’s book value as it rapidly decreases in early usage.
4. Great for IT equipment, vehicles, or any asset whose performance declines quickly.
5. Since book value drops fast, it may signal replacement needs earlier.

Conclusions

There’s no one best way to depreciate an asset—it depends on the asset and your goals. Straight-Line is simple and spreads cost evenly.

Diminishing Balance reduces value faster at first, which fits tech items and helps with early tax savings.

Both end at the same scrap value but take different paths to get there.

Basic Problem Statements

Straight Line Method

1. Calculate the Asset Price

Asset Prize = Asset cost + Additional asset class = **$5,00,000**

2. What is the depreciation as per straight line method

Depreciation as per straight line = (Asset Price – Scrap Value)/Estimated Life Span = **$45,000**

3. What is the depreciation percentage for the straight-line method?

Depreciation percentage = (Depreciation as per straight line / Asset Price) *100 = **9%**

4. What is the total depreciation for its life span

Total depreciation for its life span = Depreciation as per straight line* Estimated Life Span = **$4,50,000**

5. Find the depreciated book value after its life span

Depreciated book value after its life span = Asset Price -Total depreciation for its life span = **$50,000**

6. What is the Balance amount

In straight Line depreciation, total balance amount is reduced to zero.

Balance amount = Scrap Value - Depreciated book value after its life span = **$ 0**

Diminishing Balance Method

1.Calculate the Asset Price

Asset Prize = Asset cost + Additional asset class = **$5,00,000**

2. Find the rate of depreciation as per diminishing balance method

rate of depreciation as per diminishing balance method =

$$\mathbf{1-}\ (\frac{Scrap\ value}{Asset\ price})\text{^}1/(Life\ Span)\ =\ \mathbf{20.57\%}$$

Intermediate Problem Statements

1. Find the Book Value for Year 1 and the after that Calculate the Year on Year Depreciation amount (Hint :- For Year on Year Depreciation amount for Year1 you can use formula of (Book Value on Year1 * Rate of Depreciation as per Diminshing Balance Method))

Ans = Year 1 value = $1,02,836

2. Find the Book Value for Year2 and its Year on Year Depreciation amount for Year2 (Hint : For Calculating the Book Value for Year2 use formula (Book Value of Year1 - Year on Year Depreciation amount) and for For Year on Year Depreciation amount for year2 you can use formula of (Book Value on Year2 * Rate of Depreciation as per Diminshing Balance Method))

Ans = Year 2 value = $81,685

3. Find the Book Value for Year3 and its Year on Year Depreciation amount for Year3 (Hint : For Calculating the Book Value for Year3 use formula (Book Value of Year2 - Year on Year Depreciation amount) for Year2 and for For Year on Year Depreciation amount for year3 you can use formula of (Book Value on Year3 * Rate of Depreciation as per Diminshing Balance Method))

Ans = Year 3 value = $64,885

4. So by using above approach calculate for 10 years data

Diminishing Balance Method		
Year	**Year on Year Depreciation Amount**	**Book Value**
1	$1,02,835.88	$5,00,000.00
2	$81,685.45	$3,97,164.12
3	$64,885.06	$3,15,478.67
4	$51,540.03	$2,50,593.62
5	$40,939.70	$1,99,053.59
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9	$16,298.39	$79,244.66
10	$12,946.27	$62,946.27
11	**Scrap Value**	$50,000.00

Advanced Problem Statements

1) Calculate the annual depreciation amount using the straight line method for the given asset.

2) Calculate the total depreciation for the asset's entire life span using the straight-line method.

3) What is the depreciated book value of the asset after its life span using the straight-line method?

4) Calculate the rate of depreciation per year as per the diminishing balance method.

5) What is the depreciation amount for the asset in the second year according to the diminishing balance method?

6) What is the book value of the asset in the fourth year using the diminishing balance method?

7) Calculate the total depreciation for the asset's entire life span using the diminishing balance method.

8) What is the book value of the asset after its life span using the diminishing balance method?

Q.	Problem Statement	Formula	Answer
1	Calculate the annual depreciation amount using the straight line method for the given asset.	Asset Price * Depreciation Percentage	45000
2	Calculate the total depreciation for the asset's entire life span using the straight-line method.	Depreciation / Year as per Straight Line Method * Estimated Life Span	450000
3	What is the depreciated book value of the asset after its life span using the straight-line method?	Asset Price - Total Depreciation For Its Life Span	50000
4	Calculate the rate of depreciation per year as per the diminishing balance method.	1-((Scrap value)/(Asset price))^1/(Life Span)	20.57%
5	What is the depreciation amount for the asset in the second year according to the diminishing balance method?	(Book Value - 1sr year Depreciation amount)*Rate of Depreciation as per Diminishing Balance Method	81685.45
6	What is the book value of the asset in the fourth year using the diminishing balance method?	3rd Year Book Value - 3rd Year Depreciation amount	250593.6
7	Calculate the total depreciation for the asset's entire life span using the diminishing balance method.	sum of all year depreciation value	450000
8	What is the book value of the asset after its life span using the diminishing balance method?		50000

9) Compare the total depreciation amounts obtained from the straight-line method and the diminishing balance method. Which method results in higher total depreciation?

ANS:

Straight-Line Method

- Total Depreciation = $4,50,000.00
  Calculated as Asset Price - Scrap Value = $5,00,000 - $50,000

Diminishing Balance Method

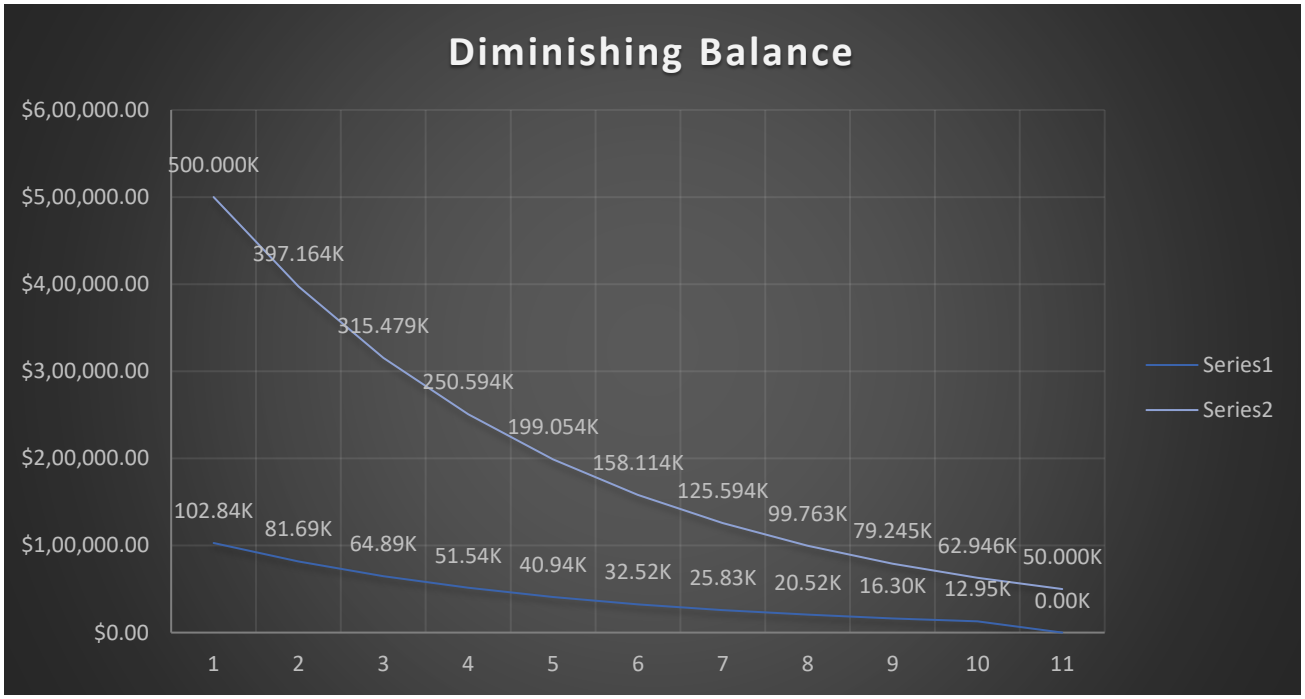
- The total depreciation is not explicitly shown, but by design, this method never fully depreciates the asset down to scrap value. Instead, it reduces the book value by a percentage every year.

  total depreciation < $4,50,000.00

The Straight-Line Method results in higher total depreciation over the full asset life span compared to the Diminishing Balance Method.

10) Prepare an Presentation for above Analysis you made so far along with Visual Graphs representation

For Diminishing value



For Straight Line Method