Depreciation Methods - I: SL & DB

Methods to Calculate Asset Value…

Methods are largely determined by the IRS…

Straight Line (SL) Method

Depreciation is uniform over the recovery period.*

Declining Balance (DB) Method

Depreciation is a fixed % of the book value over the recovery period.

Pre-1981 Tax Code

MACRS Method⁺

Depreciation is a combination of both DB and SL over the recovery period.

Post-1986 Tax Code

⁺ Modified Accelerated Cost Recovery System (MACRS)

** used for intangible assets even today*

Straight-Line (SL) Depreciation

Straight-line (SL) method of depreciation reduces the asset's book value uniformly over the recovery period.

The Depreciation Expense is the same each year.

Depreciation Expense = (Cost Basis – Salvage Value) / Recovery Period)

The Asset Value (Book Value) decreases by the Depreciation Expense each year.

Book Value (End of Year) = Book Value (End of Previous Year) – Depreciation Expense

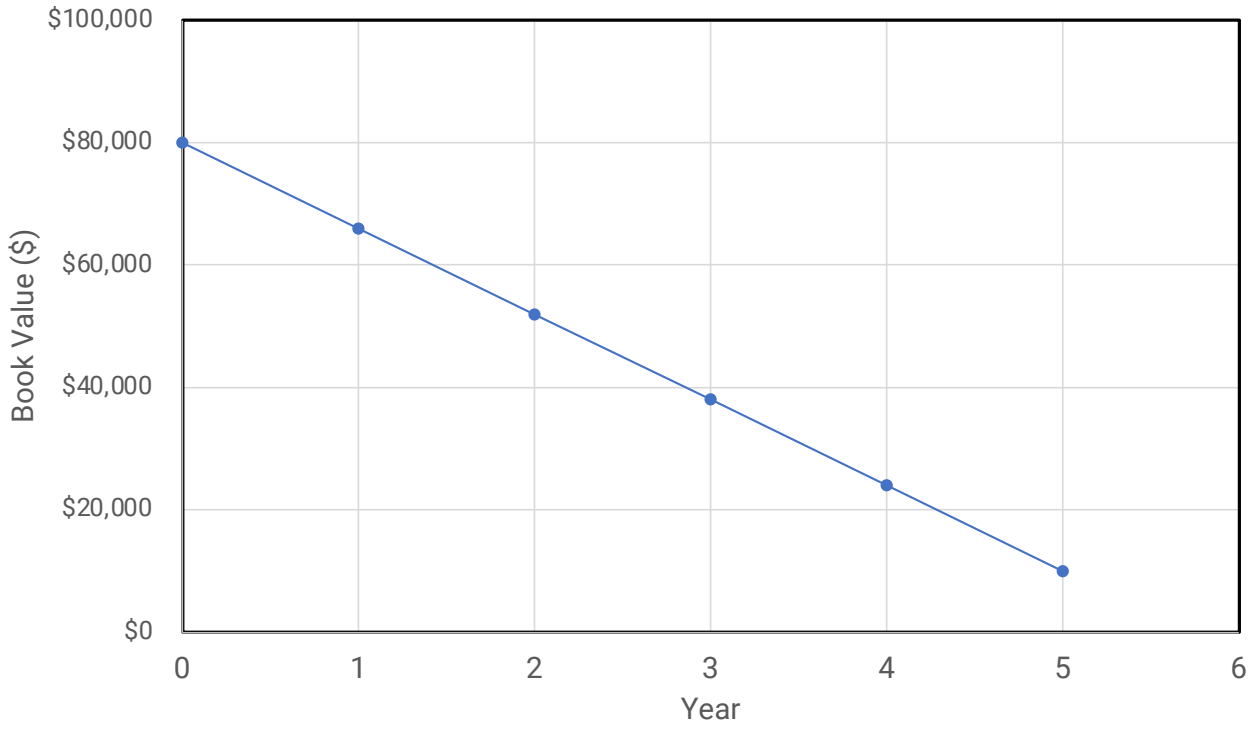
The initial Book Value is the Cost Basis.

The ending Book Value is the Salvage Value, or $0 if there is no Salvage Value.

Straight-Line (SL) Depreciation

A new asset costs $80,000, has a 5-year recovery period, and is estimated to have a salvage value of $10,000. What is the Depreciation Expense and Book Value over time?

	A	B	C
1	**Straight-Line Depreciation**		
2			
3	**Cost Basis:**	**$80,000**	
4	**Recovery Period:**	**5**	
5	**Salvage Value:**	**$10,000**	
6			
7	**Year**	**Depreciation Expense ($)**	**Book Value ($)**
9	0		$80,000
10	1	$14,000	$66,000
11	2	$14,000	$52,000
12	3	$14,000	$38,000
13	4	$14,000	$24,000
14	5	$14,000	$10,000



Depreciation Expense = (Cost Basis – Salvage Value) / Recovery Period

Declining Balance (DB) Depreciation

Declining Balance (DB) method of depreciation reduces the asset's book value by a constant rate (%) over the recovery period.

The depreciation rate is determined by one of two ways:

- Declining Balance (DB) Method: Rate = 150% / (Recovery Period)
- Double Declining Balance (DDB) Method: Rate = 200% / (Recovery Period)

The Depreciation Expense is a fixed % of the previous year's book value.

Depreciation Expense = (Rate) x (Previous Year's Book Value)

Double Declining Balance (DDB) Method

Example: DDB = 200%

- Equipment Cost = $80,000
- Salvage Value = $10,000
- Recovery Period, N = 5
- Rate = (200% / 5) = 40% = 0.4

End of Year	Annual Depreciation	Book Value	
0	-	$80,000	*x 0.4 = $32,000*
1	$32,000	$48,000	*x 0.4 = $19,200*
2	$19,200	$28,800	*x 0.4 = $11,520*
3	$11,520	$17,280	*x 0.4 = $6,912*
4	$6,912	$10,368	*x 0.4 = $4,147*
5	368*	$10,000	*?*

*

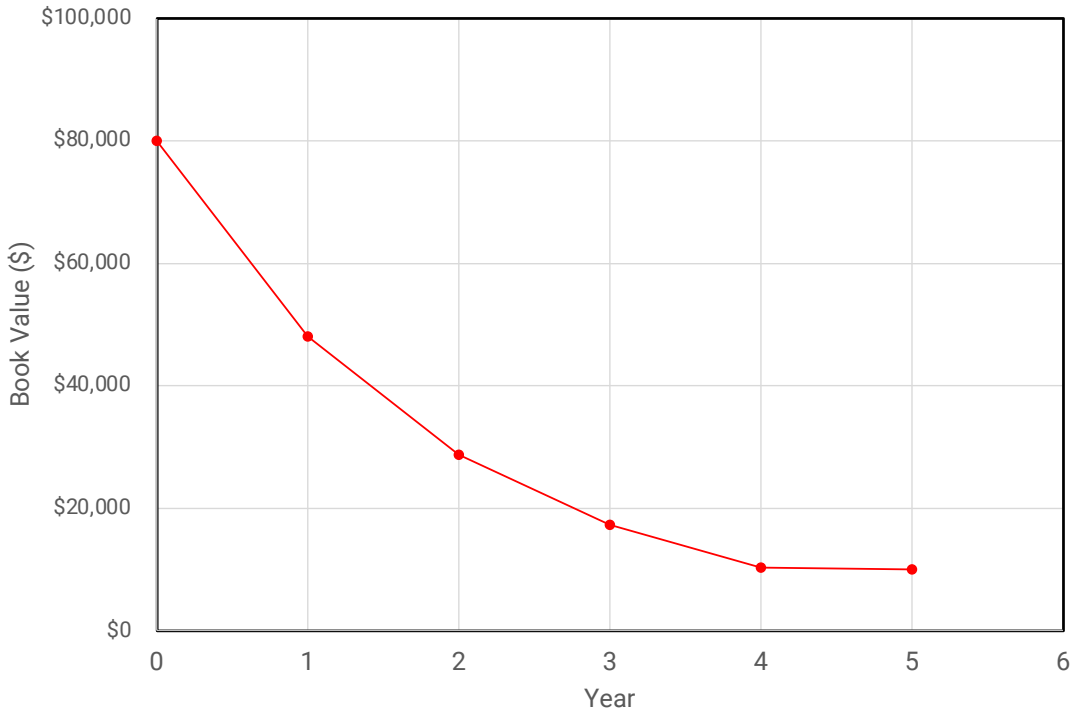
- The calculated depreciation in Year 5: 0.4 x $10,368 = $4,147
- This would make the book value ($10,368 - $4,147) less than salvage value ($10,000) and the IRS does not allow the book value to go below the salvage value.
- The final year's depreciation amount is just what is required to match the Salvage Value

Double Declining Balance (DDB) Depreciation

A new asset costs $80,000, has a 5-year recovery period, and is estimated to have a salvage value of $10,000. What is the Depreciation Expense and Book Value over time?

	A	B	C
1	**Double Declining Balance Depreciation**		
2			
3	**Cost Basis:**	**$80,000**	
4	**Recovery Period:**	**5**	
5	**Salvage Value:**	**$10,000**	
6			
7	**DB Rate:**	**200%**	
8	**Depreciation Rate:**	0.40	*=B7/B4*
9			

Year	Depreciation Expense ($)	Book Value ($)
0		$80,000
1	$32,000	$48,000
2	$19,200	$28,800
3	$11,520	$17,280
4	$6,912	$10,368
5	$368	$10,000



Depreciation Expense = (Depreciation Rate) x (Previous Year's Book Value)

Declining Balance (DB) Method

The annual depreciation is higher in the early years. This aligns with reality that assets lose value more quickly early in the recovery period.

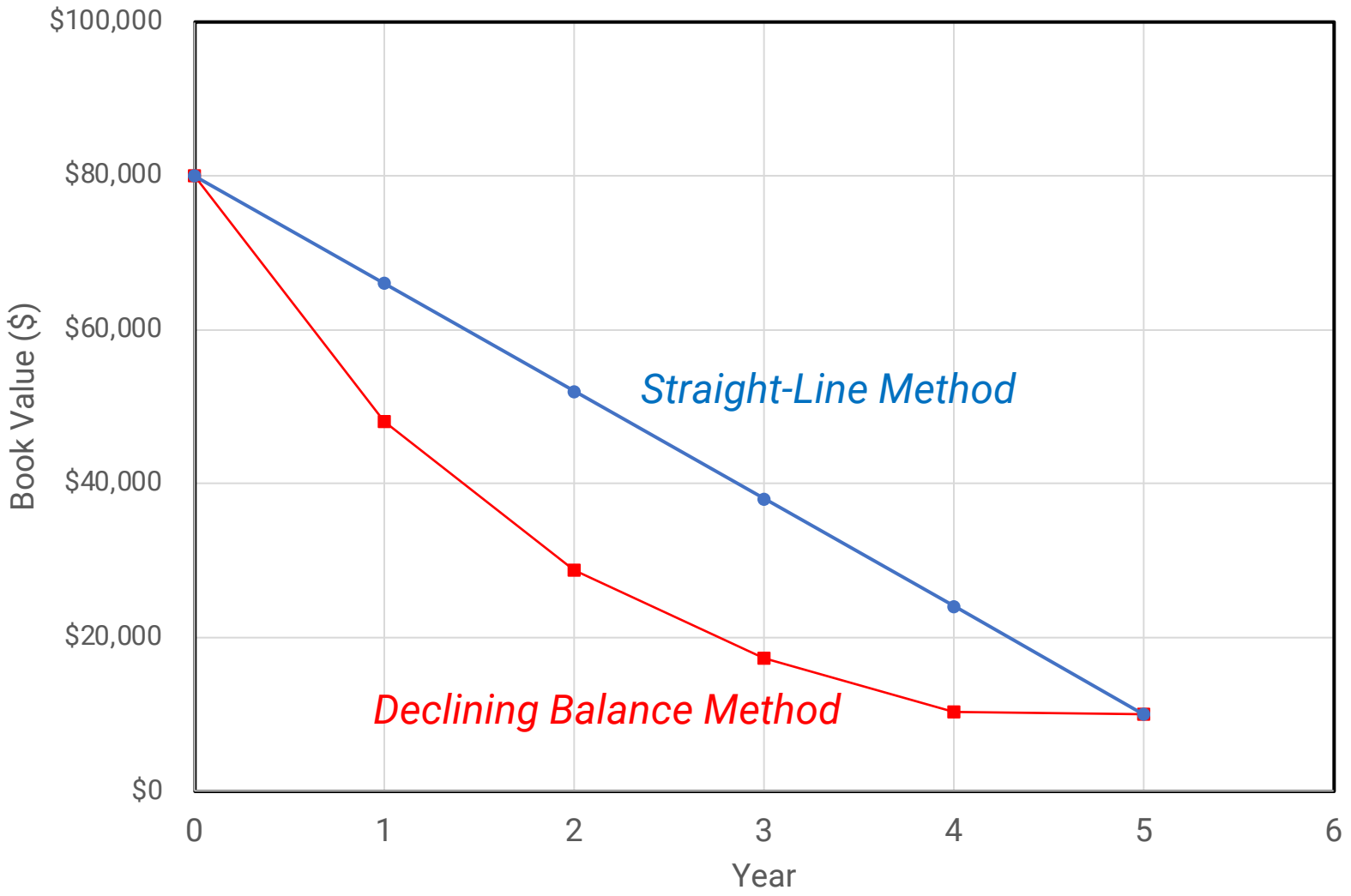
Therefore, the tax deduction is higher in the early years compared to the SL method.

The depreciation is “accelerated” relative to the SL method

However, two things to note:

- The Book Value can go below the Salvage Value – which the IRS doesn’t allow (fortunately Accountants keep track…)
- The DB method never gets to a zero. If there is no Salvage Value ($0), this is a problem…but accountants have a way of dealing with that.

The SL vs. DB Method of Depreciation



Switching from DB to SL to Fix the Book Value = $0 Problem!

The Declining Balance approach can never get to a Book Value = $0.

If there is no Salvage Value, the ending Book Value remains greater than $0, and we do not get the full tax benefit of depreciation.

Accountants can “switch” from the DB method to the SL method to force the Book Value to be $0 at the end of the recovery period.

The DB-to-SL Switch occurs whenever the depreciation expense from the SL method is larger than the depreciation expense from the DB method!

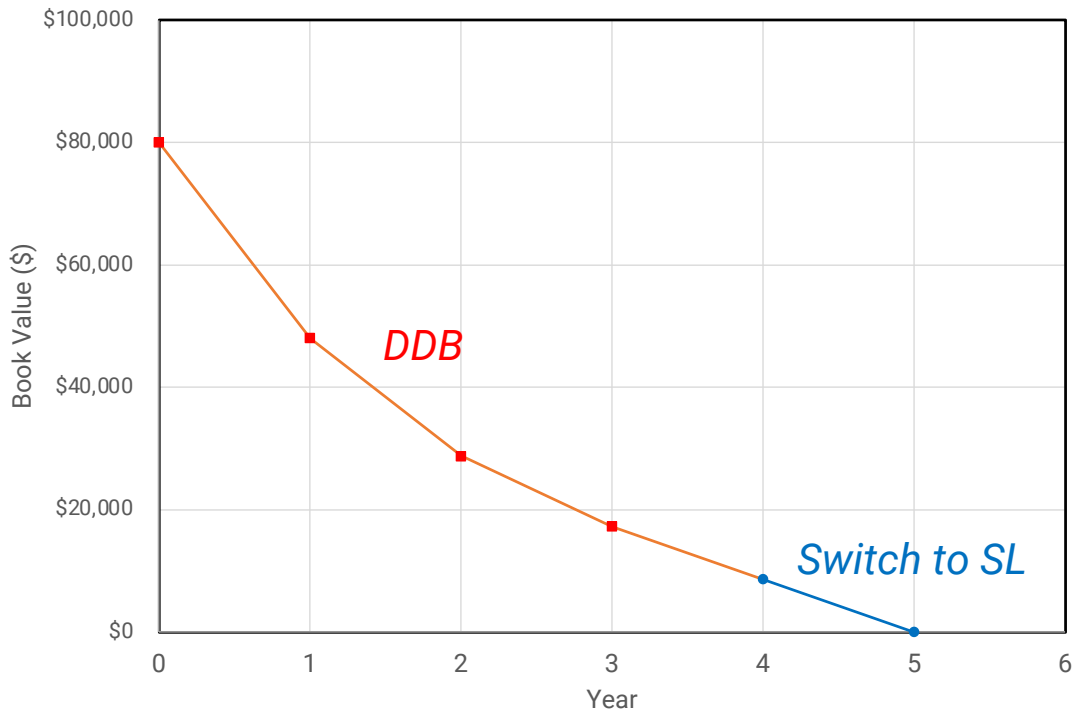
But…the SL Depreciation Expense is now determined by:

SL Depreciation Expense = (Book Value at End of Previous Year) / (Years Remaining)

Double Declining Balance (DDB) Depreciation

A new asset costs $80,000, has a 5-year recovery period, and has no salvage value. What is the Depreciation Expense and Book Value over time?

	A	B	C	D	E
1	**DDB-to-SL Swithing Example**				
2					
3	**Cost Basis:**	**$80,000**			
4	**Recovery Period:**	**5**			
5	**Salvage Value:**	**$0**			
6					
7	**DB Rate:**	**200%**			
8	**Depreciation Rate:**	0.40			
9					
10	**Year**	**Depreciation Expense, DB ($)**	**Depreciation Expense, SL ($)**	**Book Value, SL ($)**	**Method Used**
11					
12	0			$80,000	
13	1	$32,000	$16,000	$48,000	DB
14	2	$19,200	$12,000	$28,800	DB
15	3	$11,520	$9,600	$17,280	DB
16	4	$6,912	$8,640	$8,640	SL
17	5	$3,456	$8,640	$0	SL



SL Depreciation Expense = (Book Value at End of Previous Year) / (Years Remaining in Recovery Period)

One More Thing…

"Bonus Depreciation"

Another method of depreciation was included in the recent 2018 change in the tax laws…

Bonus Depreciation: Expense the entire cost of the asset in the year it was purchased.

Since expenses are tax deductible, the ability to expense the entire cost of the asset was like giving companies a huge tax deduction.

Why would the US government do this? To encourage more spending on large capital items, thus boosting the economy.

But the 100% Bonus Depreciation only lasts until 2022, then it changes again!

Next Time…

Depreciation Methods-II: MACRS!

Credits & References

Slide 1: Stacked US quarter coins on wooden table, by DoubletreeStudio, Adobe Stock (228508883.jpeg).

Slide 14: Financial analyst analysis business financial report on digital tablet during discussion at meeting of corporate showing the results of their successful teamwork by crizzystudio, Adobe Stock (502970152.jpeg).