



# **EM600 - Engineering Economics and Cost Analysis**

## ***Lecture 06: Depreciation and Financial Statements***

- References:
  - Park, Chan S. Contemporary Engineering Economics. New Jersey: Pearson Prentice Hall, 2006 (Chapter 9: 9.1 – 9.6; Chapter 2: 2.2.2 & 2.2.3; Chapter 10: 10.2)
  - Ganguly, A. Engineering Economics Using Excel. New Jersey: SSE, 2008

After completing this module you should understand the following:

- Overview of Depreciation
- Depreciable versus Non-Depreciable Assets
- Types of Depreciation
- Introduction to Income Statements
- Introduction to Cash Flow Statements

- Overview of Depreciation:
  - Definition:<sup>1</sup>
    - *Depreciation is a word used in accounting, economics and finance to spread the cost of an asset over the span of several years.*
    - *Depreciation is the reduction in value of an asset due to usage, passage of time, wear and tear, technological outdateding or obsolescence, depletion or other such factors.*

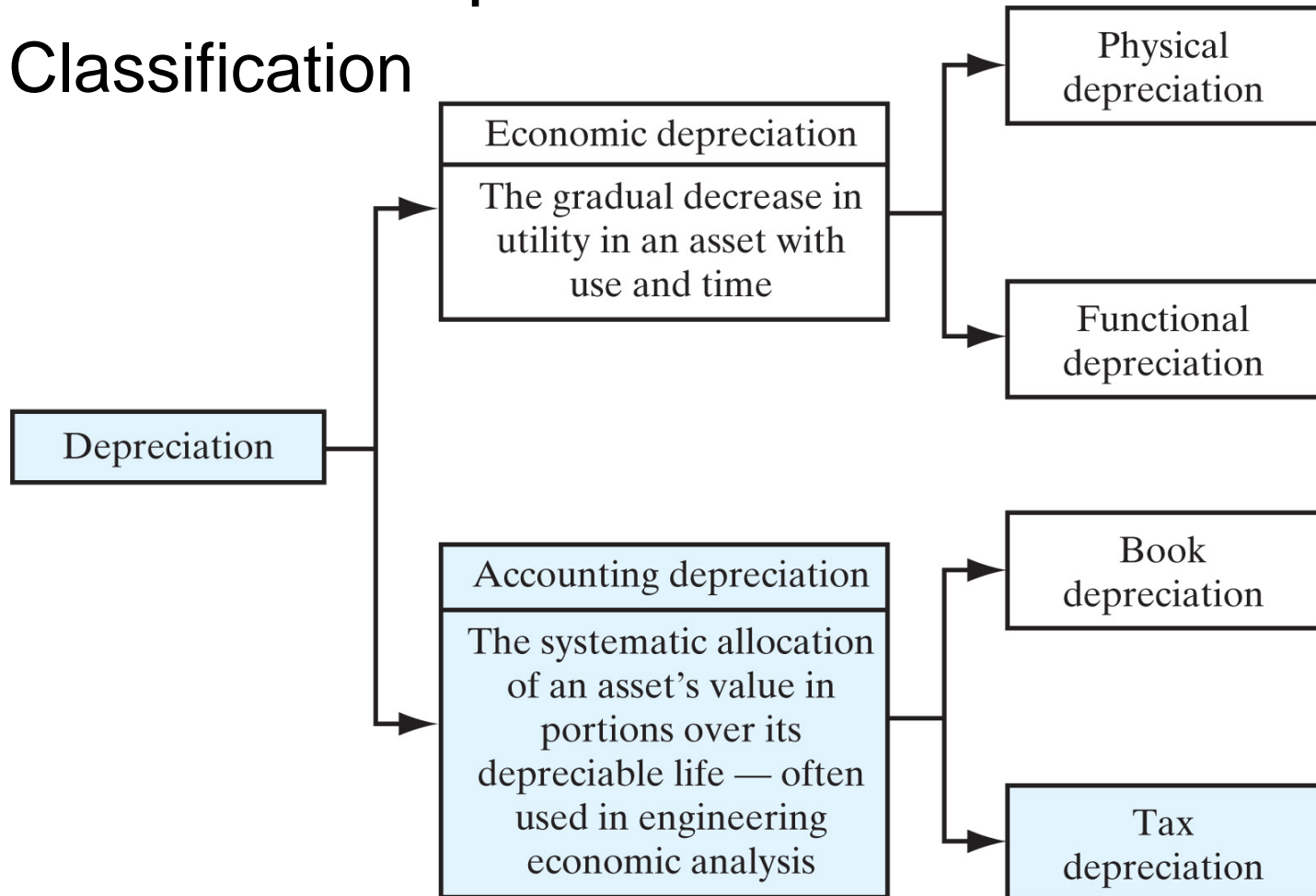
1. “depreciation” en.wikipedia.org. July 1, 2008 < <http://en.wikipedia.org/wiki/Depreciation> >.

- Overview of Depreciation:
  - Key Concepts:
    - The entire cost of replacing a machine cannot be properly charged to any one year's production; rather, the cost should be spread (or **capitalized**) over the years in which the machine is in service.
    - The cost charged to operations during a particular year is called **depreciation**.
    - From an engineering economics point of view, our primary concern is with **accounting depreciation**; The systematic allocation of an asset's value over its depreciable life.

- Overview of Depreciation:
  - Key Concepts:
    - Accounting depreciation can be broken into two categories:
      - **Book depreciation:** method of depreciation used for financial reports and pricing products:
      - **Tax depreciation:** method of depreciation used for calculating taxable income and income taxes; it is governed by tax legislation.
  - Accounting depreciation defined:
    - *The systematic allocation of an asset's value in portions over its depreciable life – often used in engineering economic analysis. (Chan S. Park)*

- Overview of Depreciation:
  - Key Concepts:
    - Economic depreciation can be broken into two categories:
      - Physical Depreciation
      - Functional Depreciation
  - Economic depreciation defined:
    - *The gradual decrease in utility in an asset with use and time.* (Chan S. Park)

- Overview of Depreciation:
  - Classification



*Classification of types of depreciation (Chan S. Park, Figure 9.1)*

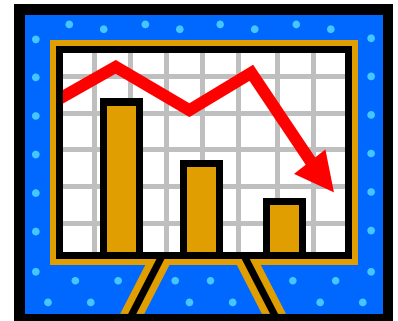
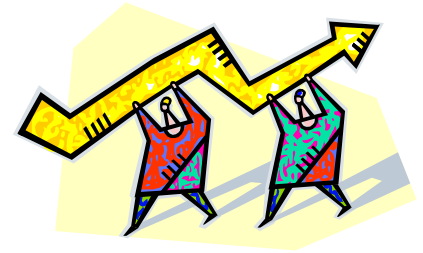


- Overview of Depreciation:
  - What can be depreciated?
    - Depreciation . . . a gradual decrease in the utility of fixed assets with use and time.
      - Assets used in business or held for production of income ✓
      - Assets having a definite useful life and a life longer than one year ✓
      - Assets that will wear out, become obsolete or lose value ✓
  - A qualifying asset for depreciation must satisfy all of the three conditions above

- Overview of Depreciation:
  - The four components of information required to calculate depreciation are:
    - Cost basis
    - Salvage value
    - Depreciable life
    - Depreciation method

- Depreciation: COST BASIS
  - Cost basis of an asset:
    - The total cost that is claimed as an expense over the asset's life.
    - The sum of the annual depreciation expenses.
    - Includes:
      - Actual cost of asset
      - Incidental expenses (freight, installation, site preparation . . . etc)
      - **Trade-in allowance** where applicable
  - Used to determine the depreciation base.

- Depreciation: COST BASIS
  - Trade-in Allowance:
    - Unrecognized Gain
      - Trade-in allowance  $>$  Book Value
      - Subtract from cost basis of new asset
    - Unrecognized Loss
      - Trade-in allowance  $<$  Book Value
      - Added to cost basis of new asset



- Depreciation: USEFUL LIFE & SALVAGE VALUE
  - Useful life of an asset:
    - IRS published guidelines, Asset depreciation ranges, ADRs
    - *The length of time that a depreciable asset is expected to be useable.<sup>1</sup>*
  - Salvage value of an asset:
    - *The estimated value of an asset at the end of its useful life.<sup>2</sup>*

1. “useful life” InvestorWords.com. WebFinance, Inc. July 15, 2008 <  
[http://www.investorwords.com/5193/useful\\_life.html](http://www.investorwords.com/5193/useful_life.html)>

2. “salvage value” InvestorWords.com. WebFinance, Inc. July 15, 2008 <  
[http://www.investorwords.com/4372/salvage\\_value.html](http://www.investorwords.com/4372/salvage_value.html)>

<b>EXAMPLES: Asset Depreciation Range</b>			
<b>Assets Used</b>	<b>Lower Limit</b>	<b>Midpoint Life</b>	<b>Upper Limit</b>
<i>Office Furniture, fixtures and equipment</i>	8	10	12
<i>Information Systems (Computers)</i>	5	6	7
<i>Automobiles, taxis</i>	2.5	3	3.5
<i>Light Trucks</i>	3	4	5
<i>Heavy Trucks (concrete ready-mixer)</i>	5	6	7
<i>Industrial steam and electrical generation and/or distribution system</i>	17.5	22	26.5

- Depreciation Methods:

- Book Depreciation:

- Used for financial reporting
    - 3 methods

- Straight-line method (SL)
      - Accelerated method (Declining balance, DB)

Applicable for purpose  
of this class

- Units-of-production method

- Tax Depreciation:

- Used for tax purposes
    - Primary method
      - **MACRS: Modified Accelerated Cost Recovery System**

Not applicable for  
purpose of this class

- Book Depreciation:
  - Straight-line method
    - Assumes the asset provides an equal amount of service in each year of its useful life.
    - Applies an equal dollar amount of depreciation in each accounting period.

- $D_n = \frac{(I - S)}{N}$

where,

$D_n$  = depreciation charge for year  $n$

$I$  = total cost of asset (cost basis)

$S$  = salvage value

$N$  = useful life



- Book Depreciation:
  - Straight-line method
    - $D_n$  = depreciation charge for year  $n$
    - $D_n$  can be calculated using an Excel Formula:
      - $D_n = \text{SLN}(\text{cost}, \text{salvage}, \text{life})$   
where,  
cost = initial investment cost,  $I$   
salvage = salvage value,  $S$   
life = useful life for the project,  $N$
      - For straight line depreciation,
        - »  $D_1 = D_2 = \dots = D_n$
        - » Therefore, the value is calculated once, a referenced for each book value calculation,  $BV_n$ .
      - Refer to Ganguly, Engineering Economics Using Excel (Chapter 3) for further details

- Book Depreciation:
  - Straight-line method
    - Book Value, BV:
      - The value of an asset as it appears on a balance sheet.
      - $BV_n$ , the book value for a given year is defined by,  
$$BV_n = \text{Total Cost} - \text{Accumulated Depreciation}$$
$$BV_n = I - (D_1 + D_2 + \dots + D_n)$$



- Book Depreciation:
  - Example 1: Straight-line method
    - Joe Bloggs is buying a new car for his IT consulting business. The car has a total cost of \$19,950. The useful life of the car is expected to be 3 years and the expected salvage value at the end of the car's useful life is \$12,750.
    - Using straight-line depreciation calculate:
      - Annual depreciation allowances, and
      - Resulting book values



- Book Depreciation:
  - Example 1: Straight-line method

- Calculate  $D_n$

$$D_n = \frac{(I - S)}{N} = \frac{(\$19,950 - \$12,750)}{3} = \$2,400$$

$$\begin{aligned} I &= \$19,950 \\ S &= \$12,750 \\ N &= 3 \end{aligned}$$

- Calculate and tabulate  $BV_n$

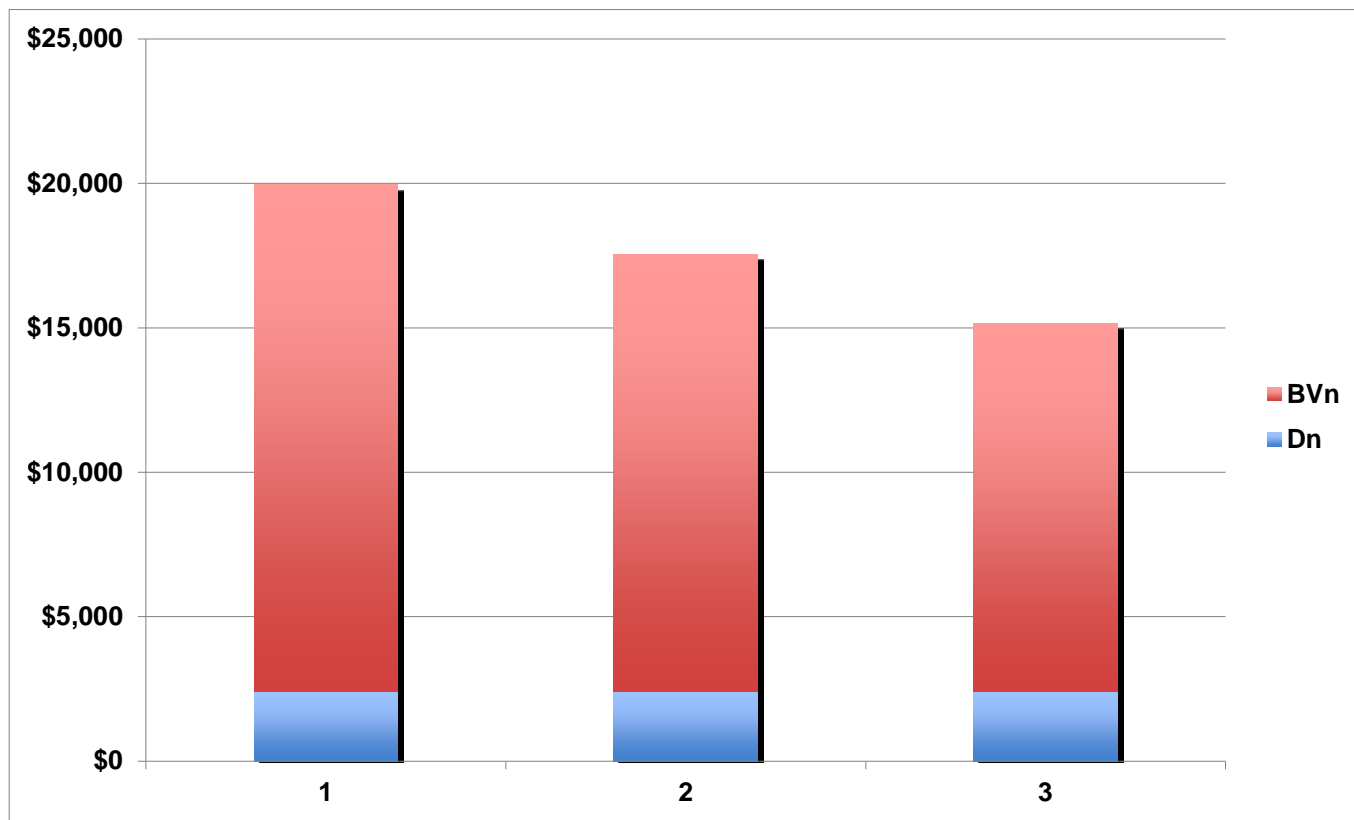
n	$BV_{n-1}$	$D_n$	$BV_n$
1	\$19,950	\$2,400	\$17,550
2	\$17,550	\$2,400	\$15,150
3	\$15,150	\$2,400	\$12,750

*Starting book value  
for each year*

*Depreciation amount  
for each year*

*Ending book value  
for each year*

- Book Depreciation:
  - Example 1: Straight-line method



- Book Depreciation:
  - Accelerated methods
    - Assumes the asset does NOT provide an equal amount of service in each year of its useful life.
    - Applies an unequal dollar (deductions begin large and decrease over time) amount of depreciation in each accounting period.
    - Declining-balance (DB) method adopted with common multipliers of 1.5 or 2.0
      - 1.5 → 150% DB
      - 2.0 → 200% DB, also known as double-declining-balance method, DDB

- Book Depreciation:
  - Declining-balance method (DB)
    - Allocates a fixed fraction,  $\alpha$ , of the beginning book balance each year.

$$\alpha = \left( \frac{1}{N} \right) (\text{multiplier})$$

Where,             $N$  = useful life  
                         multiplier = 1.5 or 2.0

- Definition:
  - *A depreciation method in which a fixed fraction,  $\alpha$ , is applied to the book balance in the first year and that same fraction is applied to the undepreciated amount (beginning book balance) in each subsequent year.*

- Book Depreciation:
  - Declining-balance method (DB)
    - Depreciation charge,  $D_n$ , for any year  $n$

$$D_n = \alpha I (1 - \alpha)^{n-1}$$

- Total DB (TDB) depreciation at the end of  $n$  years

$$TBD = I \left[ 1 - (1 - \alpha)^n \right]$$

- Book Value,  $BV_n$ , at the end of  $n$  years

$$BV_n = I (1 - \alpha)^n$$



- Book Depreciation:
  - Declining-balance method (DB)
    - $D_n$  = depreciation charge for year  $n$
    - $D_n$  can be calculated using an Excel Formula:
      - $D_n = \text{DDB}(\text{cost}, \text{salvage}, \text{life}, \text{period}, [\text{factor}])$   
where,  
cost = initial investment cost,  $I$   
salvage = salvage value,  $S$   
life = useful life for the project,  $N$   
period = 1, 2, . . . ,  $n$   
[factor] = the desired multiplier. If omitted “2” (DDB) is assumed.

- Book Depreciation:
  - Declining-balance method (DB)
    - $D_n$  = depreciation charge for year  $n$
    - $D_n$  can be calculated using an Excel Formula:
      - For declining balance depreciation,
        - »  $D_1 \neq D_2 \neq \dots \neq D_n$
        - » Therefore, the depreciation value is calculated for each period.
      - Refer to Ganguly, Engineering Economics Using Excel (Chapter 3) for further details

- Book Depreciation:
  - Example 2: Declining-balance method
    - John Smith Construction Inc. is buying a new articulated truck for its business. The truck has a total cost of \$289,500. The useful life of the truck is expected to be 5 years and the expected salvage value at the end of the truck's useful life is \$22,512.
  - Using double-declining-balance depreciation calculate:
    - Annual depreciation allowances, and
    - Resulting book values



- Book Depreciation:
  - Example 2: Double-declining-balance method
    - Calculate and tabulate  $\alpha$ ,  $D_n$ , and  $BV_n$

**$I = \$289,500$**   
 **$S = \$22,512$**   
 **$N = 5$**   
 **$Multiplier = 2$**

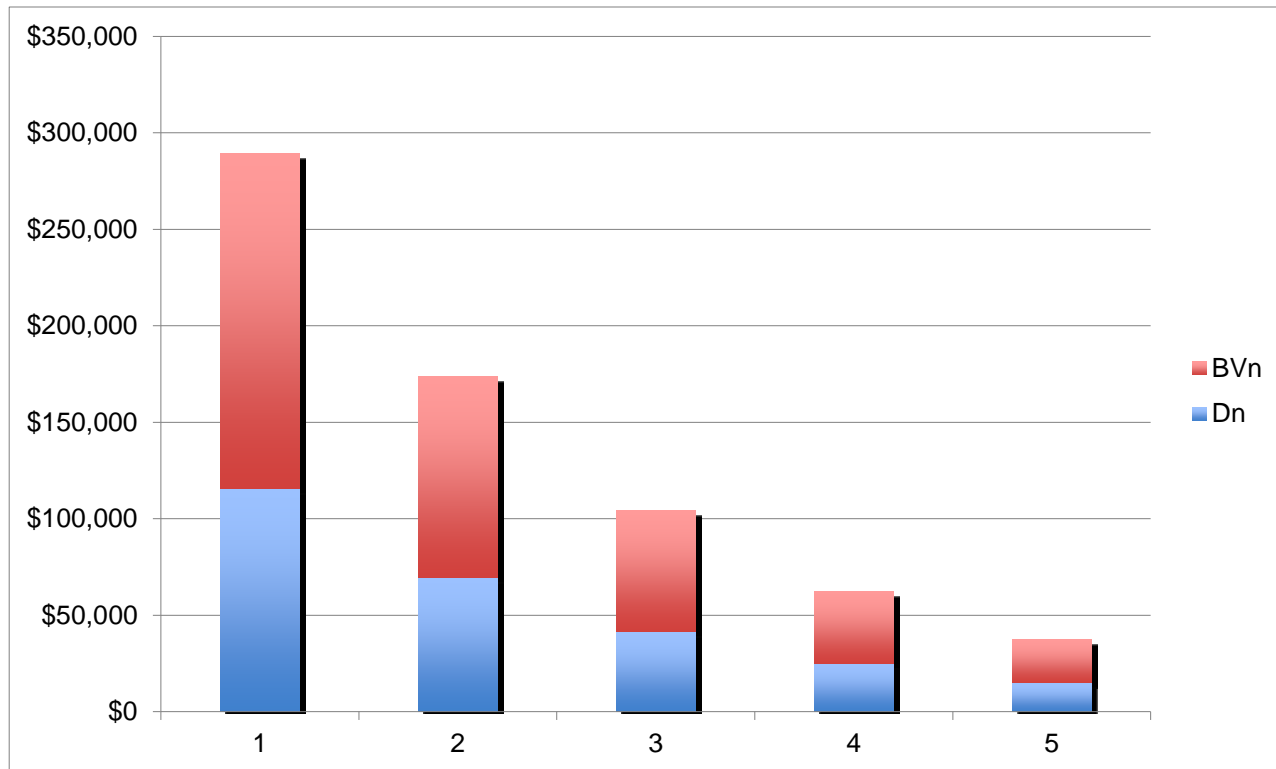
n	$BV_{n-1}$	$\alpha$	$D_n$	$BV_n$
1	\$289,500	0.4	\$115,800	\$173,700
2	\$173,700	0.4	\$69,480	\$104,220
3	\$104,220	0.4	\$41,688	\$62,532
4	\$62,532	0.4	\$25,013	\$37,519
5	\$37,519	0.4	\$15,008	\$22,512

$$\alpha = \left( \frac{1}{N} \right) (\text{multiplier})$$

$$D_n = \alpha I (1 - \alpha)^{n-1}$$

$$BV_n = I (1 - \alpha)^n$$

- Book Depreciation:
  - Example 2: Double-declining-balance method



- Book Depreciation:

- **Note on Salvage Value (S):**

*S for the asset must be estimated at the outset of the depreciation analysis.*

- When  $BV_N \neq S$ , adjustments are required
    - If  $BV_N > S$ ,
      - Entire cost of asset has not been depreciated
      - Will not benefit fully from the tax deferring benefits
      - Switch to SL depreciation method in any year  $n$  when,  $D_n$  by the DB method  $<$   $D_n$  by the SL method
    - If  $BV_N < S$ ,
      - Asset depreciated below salvage value resulting in a tax law violation
      - For any year  $n$ , if  $BV_n < S$ , the depreciation amounts are adjusted so that  $BV_n = S$

- Book Depreciation:
  - Summary:
    - Book value is never zero.
    - For straight line depreciation, at the end of the project life, the book value should equal the salvage value.
    - In other methods, the calculated book value cannot depreciate under the salvage value.

- Tax Depreciation:
  - MACRS method
    - **M**odified **A**ccelerated **C**ost **R**ecovery **S**ystem.
    - Method facilitates taxpayers to deduct larger depreciation expenses during the first few years of an assets life.
    - Key Tables:
      - MACRS property classifications as per GDS (general depreciation system)
      - MACRS depreciation schedules for personal property classes



**Table 1: MACRS property classifications as per GDS**

Recovery Period	ADR Midpoint Class	Applicable Property
3-year	$ADR \leq 4$	Special tools for the manufacture of plastic products, fabricated metal products, and motor vehicles
5-year	$4 < ADR \leq 10$	Automobiles, light trucks, high-tech equipment, equipment used for R&D, computerized telephone switching systems
7-year	$10 < ADR \leq 16$	Manufacturing equipment, office furniture, fixtures
10-year	$16 < ADR \leq 20$	Vessels, barges, tugs, railroad cars
15-year	$20 < ADR \leq 25$	Waste-water plants, telephone- distribution plants, or similar utility property.
20-year	$25 < ADR$	Municipal sewers, electrical power plant.
27.5-year		Residential rental property
39-year		Nonresidential real property including elevators and escalators

*Information source - IRS (Chan S. Park)*

## Table 2: MACRS depreciation schedules for personal property classes

Recovery Year	3-Year Property	5-Year Property	7-Year Property	10-Year Property	15-Year Property	20-Year Property
1	33.33	20.00	14.29	10.00	5.00	3.750
2	44.45	32.00	24.49	18.00	9.50	7.219
3	14.81 *	19.20	17.49	14.40	8.55	6.677
4	7.41	11.52 *	12.49	11.52	7.70	6.177
5		11.52	8.93 *	9.22	6.93	5.713
6		5.76	8.92	7.37	6.23	5.285
7			8.93	6.55 *	5.90 *	4.888
8			4.46	6.55	5.90	4.522
9				6.56	5.91	4.462 *
10				6.55	5.90	4.461
11				3.28	5.91	4.462
12					5.90	4.461
13					5.91	4.462
14					5.90	4.461
15					5.91	4.462
16					2.95	4.461
17						4.462
18						4.461
19						4.462
20						4.461
21						2.231

**Years 3, 5, 7, 10 @ 200% DB**

**Years 15, 20 @ 150% DB**

**\* Denotes year to switch from declining-balance depreciation method to straight-line depreciation method**

**The percentage for each year  $n$  is multiplied by the initial total cost, or, the beginning book balance.**

**e.g.  $I = \$10,000$ ; for 5 year MACRS the depreciation value  $D_n$  for each year is  $D_1 = \$2,000$ ;  $D_2 = \$3,200$ ;  $D_3 = \$1,920$ ;  $D_4 = \$1,152$ ;  $D_5 = \$1,152$ ,  $D_6 = \$576$**

**Information source - IRS Publication 534. Depreciation.  
Washington DC: US Government Printing Office Dec 2005**

- **Table 2: *MACRS depreciation schedules for personal property classes***
  - Half-year convention
    - Assumes salvage value,  $S = 0$
    - Assumes all assets placed in service midyear
    - Remaining half year's depreciation is taken in the year following the recovery period
      - ➔  $N = 3$ ; MACRS has 4 years
      - $N = 7$ ; MACRS has 8 years
      - . . . etc

- **Table 2: *MACRS depreciation schedules for personal property classes***
  - Depreciation method “switch”
    - As described earlier for the declining balance method in Book Depreciation, MACRS requires a switch to the SL depreciation method in any year  $n$  when,  $D_n$  by the DB method  $<$   $D_n$  by the SL method.

- Tax Depreciation:
  - Example 3: MACRS method
    - John Smith Construction Inc. is buying a new hauling truck for its business. The truck has a total cost of \$54,000. The useful life of the truck is expected to be 8 years and the expected salvage value at the end of the truck's useful life is \$11,150.
    - For tax purposes, the truck should be depreciated with the MACRS method over its 5-year class life.
    - Calculate:
      - Annual depreciation allowances, and
      - Resulting book values



- Tax Depreciation:
  - Example 3: MACRS method
    - Calculate and tabulate  $D_n$ , and  $BV_n$

**$I = \$54,000$**   
 **$S = \$11,150$**   
 **$N = 8$**   
**MACRS = 5-year**

n	$BV_0$	MACRS	$D_n$	$BV_n$
0	\$54,000	-	-	\$54,000
1	-	20.00%	\$10,800	\$43,200
2	-	32.00%	\$17,280	\$25,920
3	-	19.20%	\$10,368	\$15,552
4	-	11.52%	\$6,221	\$9,331
5	-	11.52%	\$6,221	\$3,110
6	-	5.76%	\$3,110	\$0

$$D_n = BV_0 \times \text{MACRS}$$

$$D_1 = \$54,000 \times 20.00\% = \$10,800$$

$$D_2 = \$54,000 \times 32.00\% = \$17,280$$

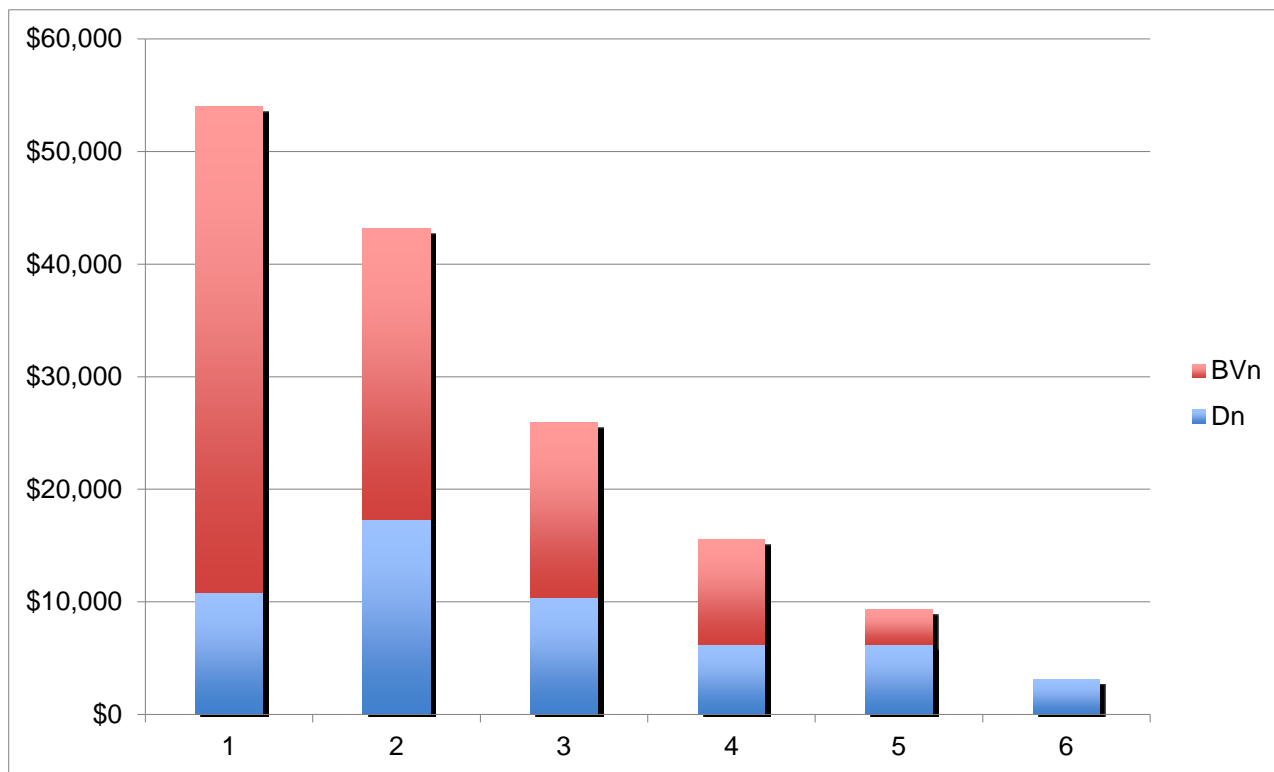
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$$D_6 = \$54,000 \times 5.76\% = \$3,110$$

**NOTE:** Even though an estimated  $S$  of \$11,150 is given, the MACRS method assumes  $S$  to be zero (\$0).

**QUESTION:** If at  $N = 8$ , the truck is sold for \$10,000, are there any tax implications? Why?

- Tax Depreciation:
  - Example 3: MACRS method



- Tax Depreciation:
  - Example 4: MACRS method
    - J.S. Pharma Inc. has purchased a new extraction machine for its generic drug business. The machine has a total cost of \$225,000. The useful life of the machine is expected to be 8 years and the expected salvage value at the end of the machine's useful life is \$32,500.
    - For tax purposes, the machine should be depreciated with the MACRS method over its 7-year class life
    - Calculate:
      - Annual depreciation allowances, and
      - Resulting book values
      - Book value for tax purposes at the end of 4 years





- Tax Depreciation:
  - Example 4: MACRS method
    - Calculate and tabulate  $D_n$ , and  $BV_n$

$I = \$225,000$   
 $S = \$32,500$   
 $N = 8$   
 $MACRS = 7\text{-year}$

$$D_n = BV_0 \times MACRS$$

$$D_1 = \$225,000 \times 14.29\% = \$32,153$$

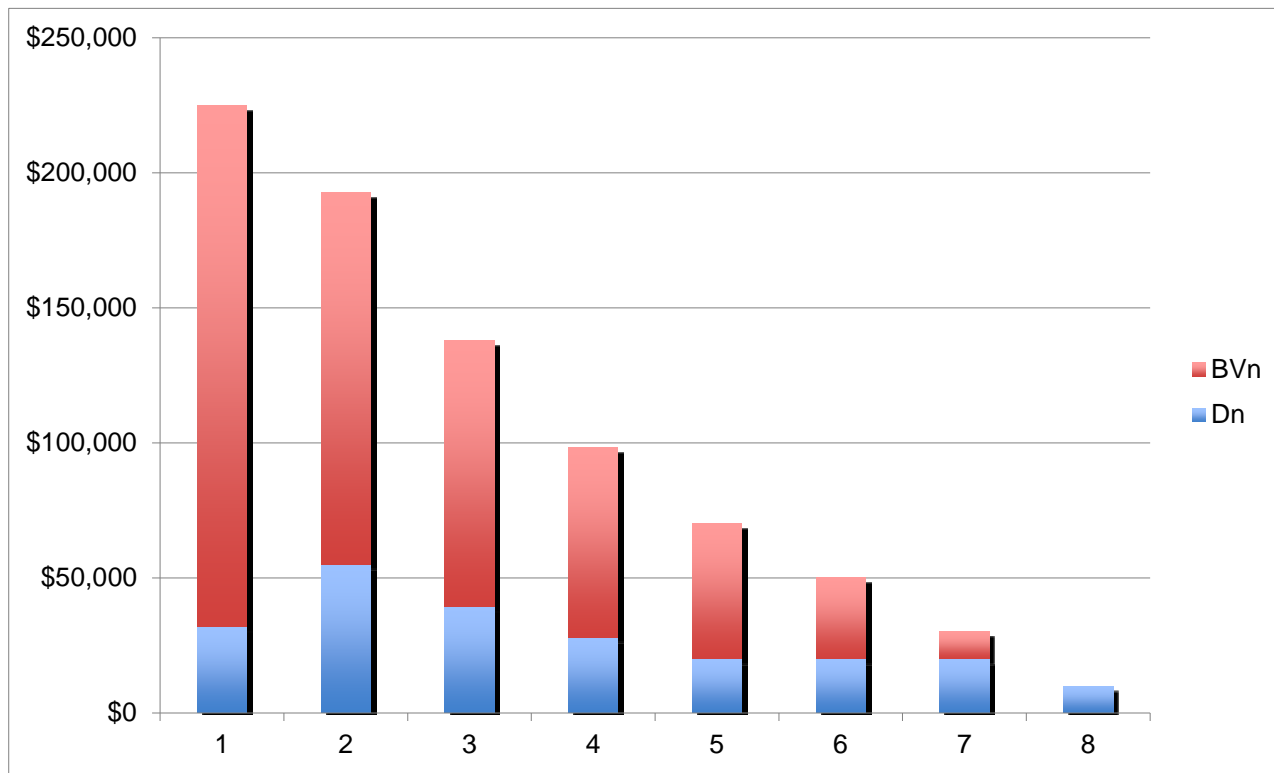
$$D_2 = \$225,000 \times 24.49\% = \$55,103$$

...

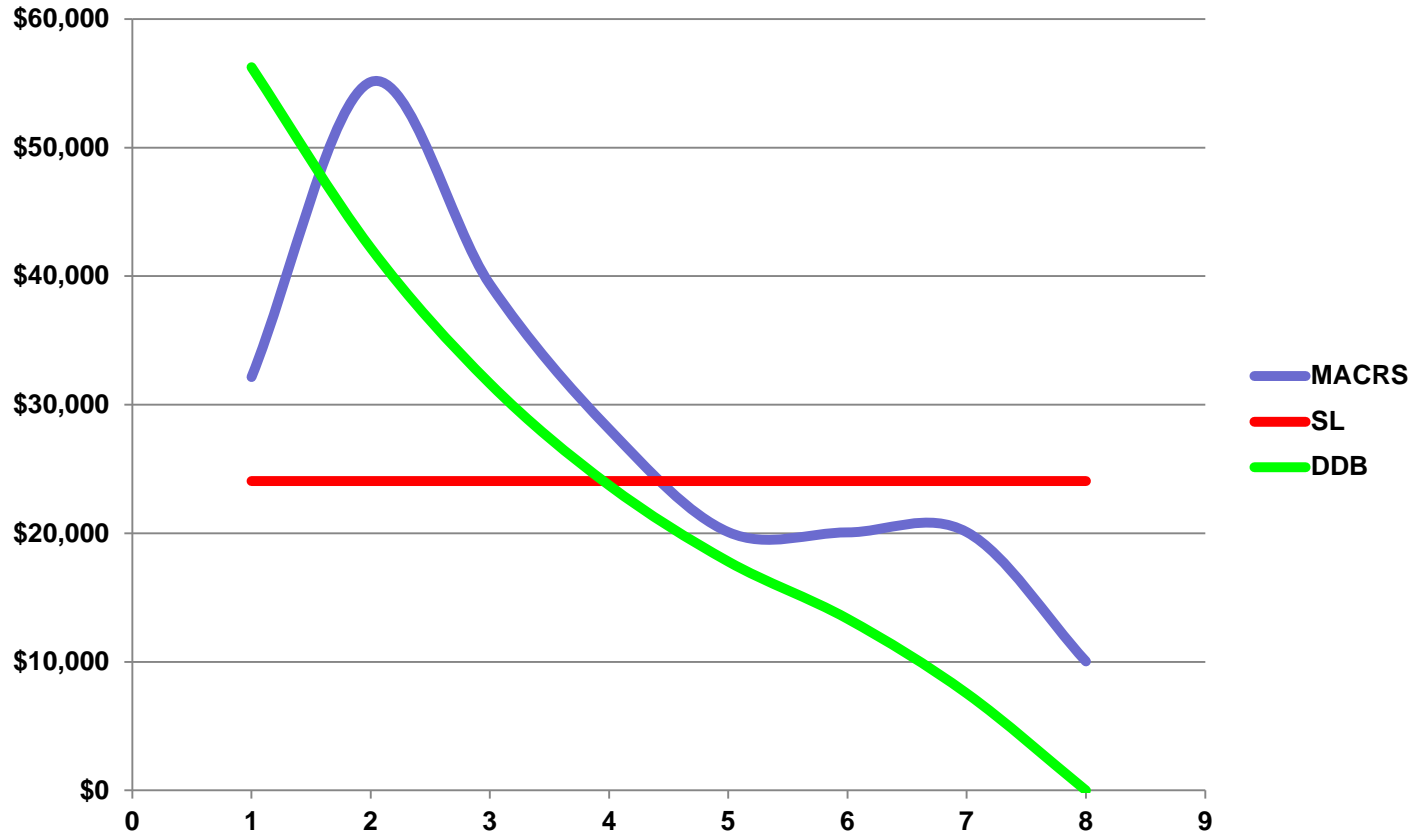
$$D_8 = \$225,000 \times 4.46\% = \$10,035$$

n	$BV_0$	MACRS	$D_n$	$BV_n$
0	\$225,000	-	-	\$225,000
1		14.29%	\$32,153	\$192,848
2		24.49%	\$55,103	\$137,745
3		17.49%	\$39,353	\$98,393
4		12.49%	\$28,103	<b>\$70,290</b> = $BV_4$
5		8.93%	\$20,093	\$50,198
6		8.92%	\$20,070	\$30,128
7		8.93%	\$20,093	\$10,035
8		4.46%	\$10,035	\$0

- Tax Depreciation:
  - Example 4: MACRS method



- Comparison: MACRS, DDB, SL
  - Data used from example 4 with calculations for the SL and DDB methods also included.



- Repairs or Improvements made to depreciable assets:
  - Impact assessment:
    - Will the life of the asset be extended?
    - Will the originally estimated salvage value,  $S$ , increase?
    - If either situation arises,
      - Revise the estimated useful life of the asset,  $N$
      - Update the periodic depreciation expense,  $D_n$
  - Book Depreciation Revision:
    - Revise the current book value
    - Allocate this cost over the remaining years of the asset's useful life
  - Tax Depreciation Revision:
    - Repair or improvement is treated as a separate property item

- Depletion:
  - Definition: (Chan S. Park)
    - *Depletion is the actual physical reduction of natural resources (oil, gas, . . . etc) by companies.*
    - *A deduction may be claimed as the resource is depleted (capital investment recovery).*
  - Methodology:
    - 2 methods:
      - Cost depletion
      - Percentage depletion
    - Both methods can be used for calculating, with the larger value taken as depletion allowance for the year.
    - Cost depletion must be used for certain resources e.g. oil, gas, standing timber.

- Amortization:
  - Definition: (Chan S. Park)
    - *The amortization expense is a special form of depreciation for an intangible asset, such as patents, goodwill and franchises.*
    - *The amortization expense is the systematic write-off to expenses of the cost of an intangible asset over the periods of its economic usefulness.*
  - Methodology:
    - Normally a straight-line (SL) method is used to calculate the amortization expense.

- Income Statement
  - Also known as *profit and loss statement*
  - Definition:
    - *Summarizes the financial performance (revenues and expenses) of a company over a specific accounting period (year, quarter, month).*
  - Equation:
    - $\text{Revenues} - \text{Expenses} = \text{Net Profit (Loss)}$

- Income Statement

- Key Definitions:

- Revenue (Chan S. Park)
      - Income from goods sold and services rendered during the specific accounting period.
    - Gross Profit Margin
      - Net Revenue less the cost of producing the goods and providing the services.
    - Operating Income
      - Is a measure of a company's earning power from ongoing operations and includes operating revenues and expenses such as sales and marketing expenses, general and admin expenses, income from goods sold, . . . etc.
    - Non-operating Income
      - Includes non-operating revenues and expenses such as rents, interest receipts, interest payments . . . etc.



- Income Statement Sample:

	Fiscal Year Ended		
	January 28, 2005	January 30, 2004	January 31, 2003
Net revenue	\$ 49,205	\$ 41,444	\$ 35,404
Cost of revenue	40,190	33,892	29,055
Gross margin	<u>9,015</u>	<u>7,552</u>	<u>6,349</u>
Operating expenses:			
Selling, general, and administrative	4,298	3,544	3,050
Research, development, and engineering	463	464	455
Total operating expenses	<u>4,761</u>	<u>4,008</u>	<u>3,505</u>
Operating income	4,254	3,544	2,844
Investment and other income, net	191	180	183
Income before income taxes	4,445	3,724	3,027
Income tax provision	1,402	1,079	905
Net income	<u>\$ 3,043</u>	<u>\$ 2,645</u>	<u>\$ 2,122</u>
Earnings per common share:			
Basic	<u>\$ 1.21</u>	<u>\$ 1.03</u>	<u>\$ 0.82</u>
Diluted	<u>\$ 1.18</u>	<u>\$ 1.01</u>	<u>\$ 0.80</u>
Weighted average shares outstanding:			
Basic	2,509	2,565	2,584
Diluted	2,568	2,619	2,644

*Annual Report, Dell Corporation, 2005 (Chan S. Park)*

- Cash Flow Elements
  - Elements of Cash Outflows:
    - Purchase of new equipment
    - Investments in working capital
    - Manufacturing, operating and maintenance costs
    - Leasing expenses
    - Interest and repayment of borrowed funds
    - Income taxes and tax credits

- Cash Flow Elements
  - Elements of Cash Inflows:
    - Borrowed funds
    - Operating revenues
    - Cost savings or cost reduction
    - Salvage value
    - Working-capital release

- Cash Flow Statement
  - Also known as *statement of cash flows*
  - Includes 3 types of cash flows (inflows and outflows):
    - *Cash flow from operating activities.*
      - Cash inflows and outflows related to the production and sales of goods and services.
      - Cash flow from operation = Net Income + Depreciation (or Amortization)
    - *Cash flow from investing activities.*
      - Cash inflows related to the purchasing of new fixed assets or financial assets . . . etc, and cash outflows relating to selling old equipment or financial assets . . . etc.
    - *Cash flow from financing activities.*
      - Cash inflows related to borrowing funds or selling stock . . . etc, and cash outflows from paying off existing debt . . etc.

## Income statement

Revenues
Expenses
Cost of goods sold
Depreciation
Debt interest
Operating expenses
<hr/>
Taxable income
Income taxes
<hr/>
Net income

## Cash flow statement

+ Net income	← Operating activities
+ Depreciation	
+	
– Capital investment	
+ Proceeds from sales of depreciable assets	← Investing activities
– Gains tax	
– Investments in working capital	
+ Working capital recovery	+
+	
+ Borrowed funds	← Financing activities
– Repayment of principal	

Net cash flow

*A popular format used for presenting a cash flow statement  
(Figure 10.2, Chan S. Park)*

- Cash Flow Statement Sample:

	Fiscal Year Ended		
	January 28, 2005	January 30, 2004	January 31, 2003
Cash flows from operating activities:			
Net income	\$ 3,043	\$ 2,645	\$ 2,122
Adjustments to reconcile net income to net cash provided by operating activities:			
Depreciation and amortization	334	263	211
Tax benefits of employee stock plans	249	181	260
Effects of exchange rate changes on monetary assets and liabilities denominated in foreign currencies	(602)	(677)	(537)
Other	78	113	60
Changes in:			
Operating working capital	1,755	872	1,210
Noncurrent assets and liabilities	453	273	212
Net cash provided by operating activities	<u>5,310</u>	<u>3,670</u>	<u>3,538</u>
Cash flows from investing activities:			
Investments:			
Purchases	(12,261)	(12,099)	(8,736)
Maturities and sales	10,469	10,078	7,660
Capital expenditures	(525)	(329)	(305)
Purchase of assets held in master lease facilities	—	(636)	—
Cash assumed in consolidation of Dell Financial Services, L.P.	—	172	—
Net cash used in investing activities	<u>(2,317)</u>	<u>(2,814)</u>	<u>(1,381)</u>
Cash flows from financing activities:			
Repurchase of common stock	(4,219)	(2,000)	(2,290)
Issuance of common stock under employee plans and other	1,091	617	265
Net cash used in financing activities	<u>(3,128)</u>	<u>(1,383)</u>	<u>(2,025)</u>
Effect of exchange rate changes on cash and cash equivalents	565	612	459
Net increase in cash and cash equivalents	430	85	591
Cash and cash equivalents at beginning of period	4,317	4,232	3,641
Cash and cash equivalents at end of period	<u>\$ 4,747</u>	<u>\$ 4,317</u>	<u>\$ 4,232</u>

*Annual Report, Dell Corporation, 2005 (Chan S. Park)*



