

Problem 7-17 modified

Goal: Determine/compare annual depreciation & book value via different methods

Given: Fixed Capital \$35,000 $V_o = \text{initial cost}$
 Salvage Value \$5,000 $V_s = \text{salvage value}$
 Life 5 **years**
 MACRS Recovery 6 **years** federal tax write-off period

Approach:

- 1) Straight-Line with salvage = capital recovery
- 2) MARCS = tax law depreciation
- 3) Double Declining Balance, no salvage = market value estimate
- 4) Declining Balance to match a salvage value

Calculations:

(1) Straight Line with salvage $f = 1/n$ 0.2
 Basis $= V_o - V_s$ \$30,000

(2) MACRS 5-yr tax law Basis $= V_o$ \$35,000
 Table 7-9 Recovery factors

| | |
|-------|--------|
| f_1 | 0.2000 |
| f_2 | 0.3200 |
| f_3 | 0.1920 |
| f_4 | 0.1152 |
| f_5 | 0.1152 |
| f_6 | 0.0576 |

(3_{book}) Sum-Of-Years-Digits

| | | |
|------------|--------|-----------------|
| sum | 15 | $= n/2 * (n+1)$ |
| f_1 | 0.3333 | $= 5 / 15$ |
| f_2 | 0.2667 | $= 4 / 15$ |
| f_3 | 0.2000 | $= 3 / 15$ |
| f_4 | 0.1333 | $= 2 / 15$ |
| f_5 | 0.0667 | $= 1 / 15$ |

(3) Double Declining Balance $f = 2/n$ 0.4
 Basis $= V_o$ \$35,000

(4) Declining Balance $f = 1 - (V_s/V_o)^{1/n}$ 0.32239
 Basis $= V_o - V_s$ \$30,000

Answer

| Year | Annual d_{sl} | Book Value Straight Line | Annual d_{MACRS} | Book Value MACRS | Annual d_{DDB} | Book Value Double Decline | Annual d_{DB} | Book Value Declining Balance | Annual d_{SOYD} | Book Value SOYD |
|------|-----------------|--------------------------|--------------------|------------------|------------------|---------------------------|-----------------|------------------------------|-------------------|-----------------|
| 0 | | \$35,000 | | \$35,000 | | \$35,000 | | \$35,000 | | \$35,000 |
| 1 | \$6,000 | \$29,000 | \$7,000 | \$28,000 | \$14,000 | \$21,000 | \$11,283.62 | \$23,716.38 | \$11,667 | \$23,333.33 |
| 2 | \$6,000 | \$23,000 | \$11,200 | \$16,800 | \$8,400 | \$12,600 | \$7,645.90 | \$16,070.48 | \$9,333 | \$14,000.00 |
| 3 | \$6,000 | \$17,000 | \$6,720 | \$10,080 | \$5,040 | \$7,560 | \$5,180.95 | \$10,889.53 | \$7,000 | \$7,000.00 |
| 4 | \$6,000 | \$11,000 | \$4,032 | \$6,048 | \$3,024 | \$4,536 | \$3,510.67 | \$7,378.87 | \$4,667 | \$2,333.33 |
| 5 | \$6,000 | \$5,000 | \$4,032 | \$2,016 | \$1,814 | \$2,722 | \$2,378.87 | \$5,000.00 | \$2,333 | \$0.00 |
| 6 | | (\$1,000) | \$2,016 | \$0 | \$1,089 | \$1,633 | \$1,611.95 | \$3,388.05 | \$0 | \$0 |

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Problem 7-17 Book Value Depreciation Comparison

