CHAPTER

5

Depreciation

In this chapter you will learn the differences among the methods available for depreciating construction assets, including the methods used for tax purposes. Understanding the difference in depreciation methods is necessary for a manager to interpret the financial statement and financial ratios, which is covered in the next chapter. Simply put, changing the method of depreciation can have significant impact on the company's financial statements. Understanding depreciation is also necessary when preparing income tax projections, which is discussed in Chapter 13.

Suppose a year ago your business purchased a new $30,000 truck to haul materials to various construction sites. If your company were to sell that truck today, could the company sell it for $30,000? The answer is no. The truck is worth less today than it was a year ago due to wear and tear, the age of the equipment, and obsolescence. This loss in equipment value over time is known as depreciation.

For the owners of depreciable assets, such as equipment and buildings, it is important to estimate the depreciation of the assets for three reasons:

1. For a company to prepare its financial statements the company managers must accurately determine the value of the company's assets. The value of the company's depreciable assets equals the price paid for the assets less the depreciation of the assets. In the case of the truck, when it was purchased it would have been listed as an asset with a value of $30,000 on the company's balance sheet. As the truck gets older, the value of the asset is offset by its depreciation.

2. For a company to allocate the cost of owning the assets used to complete construction projects and support company operations, the annual cost of owning these assets must be determined. The asset's depreciation is a significant cost of owning an asset.

3. In most cases the Internal Revenue Service (IRS) requires that cost of a depreciable asset be spread over the useful life of the asset. Depreciation for tax purposes must follow the rules set forth in the Internal Revenue Code.

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Many of these rules can be found in *Instructions for Form 4562*, published by the IRS. Because of the complexity of the tax code, it is recommended that the service of a Certified Public Accountant (CPA) be employed in the calculation of depreciation for tax purposes.

Because the depreciation method required by the Internal Revenue Code may not accurately reflect the actual depreciation of an asset, a different method of depreciation or a different useful life may be used to determine the value of the asset for financial statements or cost allocations than was used for tax purposes.

The useful life of an asset is the number of years it is useful to a company and is most often a function of economics rather than the number of years an asset can be used. Although an asset may continue to function, it may no longer be economical to use the asset and the asset may be replaced by a more economical asset. In this case, economics govern the useful life of the asset rather than whether the asset continues to function.

The three commonly used methods to calculate depreciation are the straight-line method, the sum-of-the-years method, and the declining-balance method. Each of these depreciation methods uses the following variables:

P = the purchase price of the asset.

F = the salvage value of the asset which is the estimated resale value of the asset at some time in the future when it is sold. For tax purposes, the salvage value is assumed to be zero.

N = the recovery period which is the number of years over which the asset is to be depreciated. For tax purposes, the Internal Revenue Code identifies the recovery period for different classes of assets. For other purposes, the recovery period is often equal to the useful life of the asset.

R_m = the depreciation rate or percentage of depreciation taken in year m.

D_m = the depreciation for year m.

BV_m = the book value or the value of the asset as it is listed on the accounting books at the end of year m. The book value equals the purchase price less the depreciation recorded to date.

The book value and depreciation may be calculated for each year of an asset's useful life. A tabular listing of the annual book value and annual depreciation is known as the depreciation schedule.

STRAIGHT-LINE METHOD

The straight-line method of depreciation assumes that an asset loses value at a constant rate. The annual depreciation rate is calculated by dividing 1 by the recovery period as follows:

$$R_m = 1/N \tag{5-1}$$

The annual depreciation rate for the straight-line method is constant for all years of the recovery period. The annual depreciation is calculated by taking the purchase price less the salvage value of the equipment and multiplying the result by the annual depreciation rate as follows:

$$D_m = (P - F)R_m \tag{5-2}$$

By substituting Eq. (5-1) into Eq. (5-2) the annual depreciation is calculated as follows:

$$D_m = (P - F)/N \tag{5-3}$$

The book value of the asset decreases at a uniform rate each year and is calculated for the end of year m as follows:

$$BV_m = P - m(D_m) \tag{5-4}$$

The book value for an asset at the end of year m is calculated from the previous year's book value, as follows:

$$BV_m = BV_{m-1} - D_m \tag{5-5}$$

If we were to plot the book values for an asset these values would fall on a straight line; hence, the name of the method.

Example 5-1: A dump truck is purchased for $110,000 and has an estimated salvage value of $10,000 at the end of the recovery period. Prepare a depreciation schedule for the dump truck using the straight-line method with a recovery period of five years.

Solution: Using Eq. (5-1), the annual depreciation rate is calculated as follows:

$$R_m = 1/5$$

Using Eq. (5-3), the annual depreciation is calculated as follows:

$$D_m = (\$110{,}000 - \$10{,}000)/5 = \$20{,}000$$

Using Eq. (5-4), the book values at the end of years 1 through 5 is calculated as follows:

$$BV_1 = \$110{,}000 - 1(\$20{,}000) = \$90{,}000$$
$$BV_2 = \$110{,}000 - 2(\$20{,}000) = \$70{,}000$$
$$BV_3 = \$110{,}000 - 3(\$20{,}000) = \$50{,}000$$
$$BV_4 = \$110{,}000 - 4(\$20{,}000) = \$30{,}000$$
$$BV_5 = \$110{,}000 - 5(\$20{,}000) = \$10{,}000$$

m	R_m	D_m ($)	BV_m ($)
0			110,000
1	1/5	20,000	90,000
2	1/5	20,000	70,000
3	1/5	20,000	50,000
4	1/5	20,000	30,000
5	1/5	20,000	10,000

TABLE 5-1 Depreciation Schedule for Example 5-1

Alternately, they may be calculated from the previous year book value using Eq. (5-5) as follows:

$$BV_1 = \$110,000 - \$20,000 = \$90,000$$
$$BV_2 = \$90,000 - \$20,000 = \$70,000$$
$$BV_3 = \$70,000 - 20,000 = \$50,000$$
$$BV_4 = \$50,000 - 20,000 = \$30,000$$
$$BV_5 = \$30,000 - 20,000 = \$10,000$$

Organizing the annual depreciation rates, annual depreciation, and annual book values in table form is known as the depreciation schedule. The depreciation schedule for Example 5-1 is shown in Table 5-1.

SUM-OF-THE-YEARS METHOD

The sum-of-the-years (SOY) method is used to accelerate the depreciation of an asset. The annual depreciation rate is calculated by dividing the number of years left in the recovery period by the sum of the years in the recovery period as follows:

$$R_m = (N - m + 1)/SOY \tag{5-6}$$

where

$$SOY = N(N + 1)/2 \tag{5-7}$$

With the sum-of-the-years method the annual depreciation is calculated by taking the purchase price less the salvage value of the equipment and multiplying the resultant by the annual depreciation rate as follows:

$$D_m = (P - F)R_m \tag{5-8}$$

CALCULATING STRAIGHT-LINE DEPRECIATION USING EXCEL

Example 5-1 may be set up in a spreadsheet as shown in the following figure:

	A	B	C
1	Purchase Price ($)		110,000
2	Salvage Value ($)		10,000
3	Recovery Period (yrs)		5
4			
5	m	Dm ($)	BVm ($)
6	0		110,000
7	1	20,000	90,000
8	2	20,000	70,000
9	3	20,000	50,000
10	4	20,000	30,000
11	5	20,000	10,000

The following formulas, text, and values will need to be entered into the spreadsheet:

	A	B	C
1		Purchase Price ($)	110,000
2		Salvage Value ($)	10,000
3		Recovery Period (yrs)	5
4			
5	m	Dm ($)	BVm ($)
6	0		=C1
7	1	=SLN($C$1,$C$2,$C$3)	=C6-B7
8	2	=SLN($C$1,$C$2,$C$3)	=C7-B8
9	3	=SLN($C$1,$C$2,$C$3)	=C8-B9
10	4	=SLN($C$1,$C$2,$C$3)	=C9-B10
11	5	=SLN($C$1,$C$2,$C$3)	=C10-B11

This spreadsheet is designed for a five-year recovery period using the SLN function to calculate the straight-line depreciation of an asset. The SLN function is written as

=SLN(cost,salvage,life)

where

cost = purchase price of the asset

salvage = salvage value of the asset at the end of the recovery period

life = recovery period in years

Whenever the cells containing the purchase price, salvage value, and recovery period are used in an equation, they are written as an absolute reference by placing the dollar sign ($) in front of both the row and the column reference. This allows cell B7 to be copied to cells B8 through B11 without changing the formula. See Appendix B for more information on absolute references.

By substituting Eq. (5-6) into Eq. (5-8) we get the following:

$$D_m = (P - F)(N - m + 1)/SOY \tag{5-9}$$

The book value for the end of year m is calculated as follows:

$$BV_m = P - (P - F)[m(N - m/2 + 0.5)/SOY] \tag{5-10}$$

When preparing a depreciation table it is often easier to subtract the annual depreciation from the previous year's book value using the following equation:

$$BV_m = BV_{m-1} - D_m \tag{5-11}$$

Example 5-2: A dump truck is purchased for $110,000 and has an estimated salvage value of $10,000 at the end of the recovery period. Prepare a depreciation schedule for the dump truck using the sum-of-the-years method with a recovery period of five years.

Solution: The sum of the years is calculated using Eq. (5-7) as follows:

$$SOY = 5(5 + 1)/2 = 15$$

The annual depreciation rate for the first year is calculated using Eq. (5-6) as follows:

$$R_1 = (5 - 1 + 1)/15 = 5/15$$

The annual depreciation for the first year is calculated using Eq. (5-8) as follows:

$$D_1 = (\$110,000 - \$10,000)5/15 = \$33,333$$

The book value at the end of the first year is calculated using Eq. (5-11) as follows:

$$BV_1 = \$110,000 - \$33,333 = \$76,667$$

The annual depreciation rate for the second year is calculated using Eq. (5-6) as follows:

$$R_2 = (5 - 2 + 1)/15 = 4/15$$

The annual depreciation for the second year is calculated using Eq. (5-8) as follows:

$$D_2 = (\$110,000 - \$10,000)4/15 = \$26,667$$

SIDEBAR 5-2

CALCULATING SUM-OF-THE-YEARS DEPRECIATION USING EXCEL

Example 5-2 may be set up in a spreadsheet as shown in the following figure:

	A	B	C
1	Purchase Price ($)		110,000
2	Salvage Value ($)		10,000
3	Recovery Period (yrs)		5
4			
5	m	Dm ($)	BVm ($)
6	0		110,000
7	1	33,333	76,667
8	2	26,667	50,000
9	3	20,000	30,000
10	4	13,333	16,667
11	5	6,667	10,000

The following formulas, text, and values will need to be entered into the spreadsheet:

	A	B	C
1		Purchase Price ($)	110,000
2		Salvage Value ($)	10,000
3		Recovery Period (yrs)	5
4			
5	m	Dm ($)	BVm ($)
6	0		=C1
7	1	=SYD($C$1,$C$2,$C$3,A7)	=C6-B7
8	2	=SYD($C$1,$C$2,$C$3,A8)	=C7-B8
9	3	=SYD($C$1,$C$2,$C$3,A9)	=C8-B9
10	4	=SYD($C$1,$C$2,$C$3,A10)	=C9-B10
11	5	=SYD($C$1,$C$2,$C$3,A11)	=C10-B11

This spreadsheet is designed for a five-year recovery period using the SYD function to calculate the sum-of-the-years depreciation of an asset. The SYD function is written as

=SYN(cost,salvage,life,per)

where

cost = purchase price of the asset
salvage = salvage value of the asset at the end of the recovery period
life = recovery period in years
per = year for which depreciation is being calculated

Whenever the cells containing the purchase price, salvage value, and recovery period are used in an equation, they are written as an absolute reference by placing the dollar sign ($) in front of both the row and the column reference. This allows cell B7 to be copied to cells B8 through B11 without changing the formula. See Appendix B for more information on absolute references.

TABLE 5-2 Depreciation Schedule for Example 5-2

m	R_m	D_m ($)	BV_m ($)
0		0	110,000
1	5/15	33,333	76,667
2	4/15	26,667	50,000
3	3/15	20,000	30,000
4	2/15	13,333	16,667
5	1/15	6,667	10,000

The book value at the end of the second year is calculated using Eq. (5-11) as follows:

$$BV_2 = \$76,667 - \$26,667 = \$50,000$$

The remaining years are calculated in a similar manner. The annual depreciation rates, annual depreciation, and annual book values for Example 5-2 are shown in Table 5-2.

DECLINING-BALANCE METHOD

The declining-balance method is used to accelerate the depreciation of an asset. The annual depreciation is calculated from the previous year's book value. The annual depreciation rate is based on a declining-balance factor between 1.25 and 2.00, which is divided by the recovery period. The most common annual depreciation rates for the declining-balance method are calculated as follows:

$$R_m = 2.00/N \text{ for } 200\% \text{ declining-balance or}$$
$$\text{double-declining-balance} \tag{5-12}$$
$$R_m = 1.50/N \text{ for } 150\% \text{ declining-balance} \tag{5-13}$$

The annual depreciation equals last year's book value multiplied by the annual depreciation rate and can be calculated as follows:
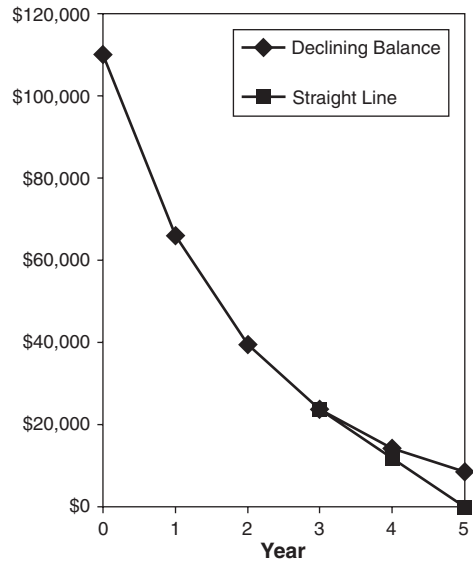
$$D_m = (BV_{m-1})R_m \tag{5-14}$$

The book value at the end of year m is calculated using one of the following formulas:

$$BV_m = P(1 - R_m)^m \quad \text{provided that } BV_m \geq F \text{ and } m \text{ is a whole number} \tag{5-15}$$

$$BV_m = BV_{m-1} - D_m \quad \text{provided that } BV_m \geq F \tag{5-16}$$

FIGURE 5-1 Switching to Straight-Line Depreciation when Straight-Line Depreciation Exceeds Declining-Balance Depreciation


Because this depreciation method does not automatically produce a book value equal to the salvage value at the end of the recovery period, the book value must be forced to intersect the salvage value. The declining-balance method may either fail to depreciate the asset enough to reach the salvage value or it may depreciate the asset below its salvage value.

If the declining-balance method fails to depreciate the asset to its salvage value, the declining-balance method is forced to the salvage value by switching to the straight-line method and depreciating the current book value over the years remaining in the recovery period. The switch to straight-line occurs when the depreciation calculated by the straight-line method exceeds the depreciation calculated by the declining-balance method. For example, when you have a piece of equipment with a salvage value of zero, the declining-balance method will never reach the salvage value, as shown in Figure 5-1. By switching to the straight-line method when the depreciation calculated by the straight-line method for the remaining years exceeds the depreciation calculated by the declining-balance method (year 3 in Figure 5-1) the depreciation is forced to the salvage value of zero.

Alternatively, the declining-balance method may depreciate an asset below its salvage value. For a piece of equipment with a large salvage value, the declining-balance method often produces a book value below the salvage value before the completion of the recovery period. When the declining-balance method produces a book value below the salvage value, the depreciation is stopped at the salvage value. In Figure 5-2, the salvage value of $20,000 is exceeded in year 4 (a year before the end of the recovery period) and the depreciation is stopped at $20,000.

Figure 5-2 Stopping the Declining-Balance Depreciation at the Salvage Value
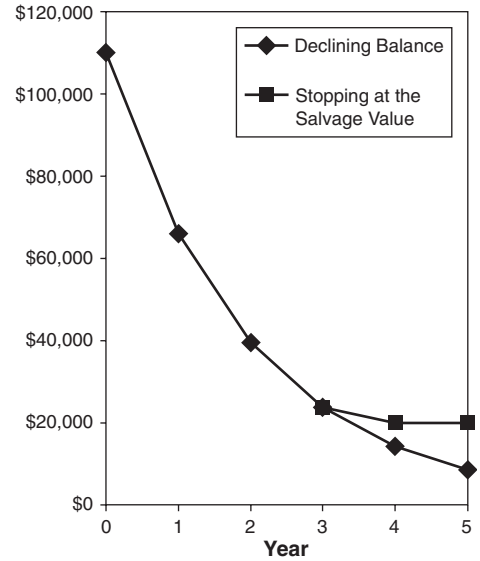
Example 5-3: A dump truck is purchased for $110,000 and has an estimated salvage value of $10,000 at the end of the recovery period. Prepare a depreciation schedule for the dump truck using the 200% declining-balance method with a recovery period of five years.

Solution: Using Eq. (5-12), the annual depreciation rate for each year under the 200% declining-balance method is as follows:

$$R_m = 2.00/5 = 0.40$$

Using Eq. (5-14) and the 200% declining-balance method, the annual depreciation for the first year is as follows:

$$D_1 = (\$110,000)0.40 = \$44,000$$

Using Eq. (5-3), the annual depreciation for the first year using the straight-line method is as follows:

$$D_1 = (\$110,000 - \$10,000)/5 = \$20,000$$

Using Eq. (5-16) and the larger of the two depreciations, the book value at the end of the first year is as follows:

$$BV_1 = \$110,000 - \$44,000 = \$66,000$$

The depreciation using the 200% declining-balance method, the depreciation using the straight-line method, and the book value for years 2 through 4 are calculated in the same manner as follows:

$$D_2 = (\$66,000)0.40 = \$26,400$$
$$D_2 = (\$66,000 - \$10,000)/4 = \$14,000$$
$$BV_2 = \$66,000 - \$26,400 = \$39,600$$
$$D_3 = (\$39,600)0.40 = \$15,840$$
$$D_3 = (\$39,600 - \$10,000)/3 = \$9,867$$
$$BV_3 = \$39,600 - \$15,840 = \$23,760$$
$$D_4 = (\$23,760)0.40 = \$9,504$$
$$D_4 = (\$23,760 - \$10,000)/2 = \$6,880$$
$$BV_4 = (\$23,760 - \$9,504 = \$14,256$$

Using Eq. (5-14) and the 200% declining-balance method, the annual depreciation for the fifth year is as follows:

$$D_5 = (\$14,256)0.40 = \$5,702$$

Because the dump truck has been in service for four years, there is one year left in its recovery period. Using Eq. (5-3), the annual depreciation for the fifth year using the straight-line method is as follows:

$$D_m = (\$14,256 - \$10,000)/1 = \$4,256$$

Using Eq. (5-16) and the larger of the two depreciation amounts, the book value at the end of the fifth year is as follows:

$$BV_5 = \$14,256 - \$5,702 = \$8,554$$

Because the 200% declining-balance method produces a book value less than the salvage value, we must stop the depreciation at the salvage value. To stop at the salvage value, we must depreciate the difference between the current book value and the salvage value, or $4,256(\$14,256 - \$10,000)$. Using Eq. (5-5), the book value for the fifth year is as follows:

$$BV_5 = \$14,256 - \$4,256 = \$10,000$$

The annual depreciation rates, annual depreciation, and annual book values for Example 5-3 are shown in Table 5-3.

TABLE 5-3 Depreciation Schedule for Example 5-3

m	R_m	D_m (\$)	BV_m (\$)
0		0	110,000
1	0.40	44,000	66,000
2	0.40	26,400	39,600
3	0.40	15,840	23,760
4	0.40	9,504	14,256
5	0.40	4,256	10,000

S I D E B A R 5 - 3

CALCULATING DECLINING-BALANCE DEPRECIATION USING EXCEL

Example 5-3 may be set up in a spreadsheet as shown in the following figure:

	A	B	C
1	Purchase Price ($)		110,000
2	Salvage Value ($)		10,000
3	Recovery Period (yrs)		5
4	Rate (%)		200
5			
6	m	Dm ($)	BVm ($)
7	0		110,000
8	1	44,000	66,000
9	2	26,400	39,600
10	3	15,840	23,760
11	4	9,504	14,256
12	5	4,256	10,000

The following formulas, text, and values will need to be entered into the spreadsheet:

	A	B	C
1		Purchase Price ($)	110,000
2		Salvage Value ($)	10,000
3		Recovery Period (yrs)	5
4		Rate (%)	200
5			
6	m	Dm ($)	BVm ($)
7	0		=C1
8	1	=VDB($C$1,$C$2,$C$3,A7,A8,$C$4/100)	=C7-B8
9	2	=VDB($C$1,$C$2,$C$3,A8,A9,$C$4/100)	=C8-B9
10	3	=VDB($C$1,$C$2,$C$3,A9,A10,$C$4/100)	=C9-B10
11	4	=VDB($C$1,$C$2,$C$3,A10,A11,$C$4/100)	=C10-B11
12	5	=VDB($C$1,$C$2,$C$3,A11,A12,$C$4/100)	=C11-B12

This spreadsheet is designed for a five-year recovery period using the VBD function to calculate the declining-balance depreciation of an asset. The VBD function is written as

=VBD(cost,salvage,life,Start_period,End_period,No_switch)

where

cost = purchase price of the asset
salvage = salvage value of the asset at the end of the recovery period
life = recovery period in years

Start_period = starting period for which depreciation is to be calculated
End_period = ending period for which depreciation is to be calculated
Factor = depreciation factor; 2 for double-declining and 1.5 for 150% declining balance (defaults to 2 if left blank)
No_switch = determines if depreciation switches to straight-line when the straight-line depreciation is greater than the declining balance, False switches to straight-line and True does not switch to straight-line (defaults to False is left blank)

To calculate one year's depreciation, the Start_period should be the previous year and the End_period should be the current year. The previous spreadsheet uses a drop-down box to select between a 200% and 150% depreciation factor. Whenever the cells containing the purchase price, salvage value, and recovery period are used in an equation, they are written as an absolute reference by placing the dollar sign ($) in front of both the row and the column reference. This allows cell B8 to be copied to cells B9 through B12 without changing the formula. See Appendix B for more information on absolute references and drop-down boxes.

Figure 5-3 shows the depreciation of an $110,000 dump truck with a salvage value of $10,000 and a recovery period of five years using the straight-line, sum-of-the-years, and 200% declining-balance methods.

FIGURE 5-3 Comparison of Depreciation Methods.
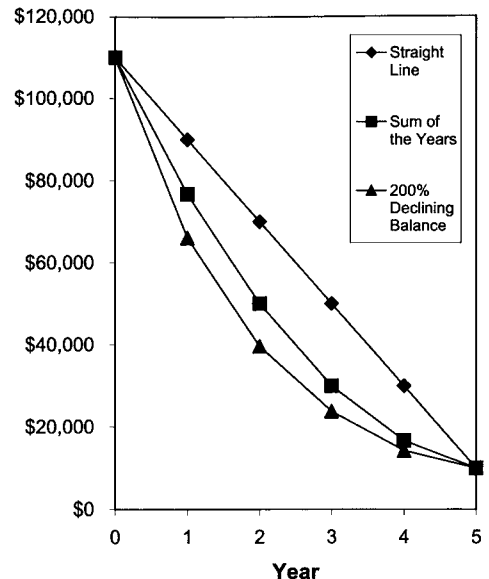
MACRS

The Modified Accelerated Cost Recovery System (MACRS) established the depreciation rules used by the IRS when calculating income taxes. The rules use the straight-line, the double-declining-balance, and the 150% declining-balance depreciation methods and establish the rules regarding when each of these methods may be used. The MACRS also establishes rules about how much depreciation may be taken during the year an asset is purchased, the recovery period for different classes of assets, and when assets may be written off rather than be depreciated. A discussion of the depreciation rules established by the MACRS follows.[14]

PLACING IN SERVICE AND DISPOSING OF AN ASSET

For tax purposes, a full year's depreciation is not allowed by the IRS during the tax year the asset is placed in service or disposed of. In most cases, the IRS assumes that the asset was placed in service or disposed of in the middle of the year and allows taxpayers to take 50% of the annual depreciation for the first and last years of service. This is known as the half-year convention. The half-year convention does not apply to real property.

Should the taxpayer place more than 40% of the year's depreciable assets—excluding real property—in service during the last quarter, the IRS assumes that the individual assets were placed in service or disposed of in the middle of the quarter that the asset was placed in service or disposed of.[15] For equipment placed in service during the year, the taxpayer is allowed to take one-eighth of the annual depreciation in the quarter the asset was placed in service and one-fourth of the annual depreciation during the remaining quarters of their tax year. For disposal of the equipment, the taxpayer is allowed to take one-eighth of the annual depreciation in the quarter the asset was disposed of and one-fourth of the annual depreciation during the proceeding quarters of the tax year. This is known as the midquarter

TABLE 5-4[16]   Depreciation Percentages for the Midquarter Convention

QUARTER	PLACED IN SERVICE	DISPOSED OF
1st	0.875	0.125
2nd	0.625	0.375
3rd	0.375	0.625
4th	0.125	0.875

[14]For a complete discussion of the MACRS, see IRS publication 946, *How to Depreciate Property*, 2006.

[15]IRS, *Instructions for Form 4562,* 2006, p.7.

[16]IRS, *Instructions for Form 4562,* 2006, p. 7.

TABLE 5-5[17] Depreciation Percentages for the
Midmonth Convention

MONTH	PLACED IN SERVICE	DISPOSED OF
1st	0.9583	0.0417
2nd	0.8750	0.1250
3rd	0.7917	0.2083
4th	0.7083	0.2917
5th	0.6250	0.3750
6th	0.5417	0.4583
7th	0.4583	0.5417
8th	0.3750	0.6250
9th	0.2917	0.7083
10th	0.2083	0.7917
11th	0.1250	0.8750
12th	0.0417	0.9583

convention. Under the midquarter convention, the percentages of depreciation allowed are shown in Table 5-4. The midquarter convention does not apply to real property (real estate).

For real estate, the IRS assumes that the real estate was placed in service or disposed of in the middle of the month it was placed in service or disposed of. For real estate placed in service during the year, the taxpayer is allowed to take one-twenty-fourth of the annual depreciation in the month the real estate was placed in service and one-twelfth of the annual depreciation during the following months of the tax year. For the disposal of real estate, the taxpayer is allowed to take one-twenty-fourth of the annual depreciation in the month the real estate was disposed of and one-twelfth of the annual depreciation during the proceeding months of the tax year. This is known as the midmonth convention. The percentages of depreciation allowed under the midmonth convention are shown in Table 5-5.

IRS STANDARD RECOVERY PERIODS AND DEPRECIATION METHODS

For tax purposes, the IRS has set up standard recovery periods. The IRS recognizes the following standard recovery periods or classes of property:

Three-year: Rent-to-own property and tractors.

Five-year: Automobiles, light general propose trucks, calculators, copiers, computer equipment, concrete trucks, heavy general purpose trucks, trailers, and other construction assets.

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[17]IRS, *Instructions for Form 4562*, 2006, p. 7.

Seven-year: Office furniture, office equipment, and railroad tracks.

Ten-year: Vessels, barges, tugs, and other water transportation equipment.

Fifteen-year: Retail motor fuel outlets.

Twenty-year: Farm buildings.

Twenty-five-year: Municipal sewers, water treatment plants, and water distribution lines.

Twenty-seven-and-a-half-year: Residential real estate where more than 80% of the rent is derived from the dwelling units.

Thirty-nine-year: Nonresidential real estate.

Fifty-year: Railroad roadbeds, right-of-ways, and tunnels.

A more detailed list of equipment and their recovery periods can be found in IRS publication 946, *How to Depreciate Property*.

For tax purposes, 200% declining-balance depreciation switching to straight-line depreciation when the annual straight-line depreciation rate exceeds the depreciation from the 200% declining-balance method is used for properties with a standard recovery period of 3, 5, 7, or 10 years. Table 5-6 shows the annual depreciation rates for 3-, 5-, 7-, and 10-year property using the half-year convention and the 200% declining-balance method. The depreciation rates in Table 5-6 are expressed as a percentage of the purchase price rather than the previous year's book value.

Table 5-7 through 5-10 show the annual depreciation rates for 3-, 5-, 7-, and 10-year property using the midquarter convention and the 200% declining-balance

TABLE 5-6[18]   Depreciation Rates for 200% Declining Balance Using the Half-Year Convention

YEAR	3 YEARS (%)	5 YEARS (%)	7 YEARS (%)	10 YEARS (%)
1	33.33	20.00	14.29	10.00
2	44.45	32.00	24.49	18.00
3	14.81	19.20	17.49	14.40
4	7.41	11.52	12.49	11.52
5	NA	11.52	8.93	9.22
6	NA	5.76	8.92	7.37
7	NA	NA	8.93	6.55
8	NA	NA	4.46	6.55
9	NA	NA	NA	6.56
10	NA	NA	NA	6.55
11	NA	NA	NA	3.28

[18]IRS, *Instructions for Form 4562,* 2006, p. 13.

TABLE 5-7[19]   Depreciation Rates for 200% Declining Balance Using the Midquarter
Convention; the Asset Is Placed in Service during the First Quarter

YEAR	3 YEARS (%)	5 YEARS (%)	7 YEARS (%)	10 YEARS (%)
1	58.33	35.00	25.00	17.50
2	27.78	26.00	21.43	16.50
3	12.35	15.60	15.31	13.20
4	1.54	11.01	10.93	10.56
5	NA	11.01	8.75	8.45
6	NA	1.38	8.74	6.76
7	NA	NA	8.75	6.55
8	NA	NA	1.09	6.55
9	NA	NA	NA	6.56
10	NA	NA	NA	6.55
11	NA	NA	NA	0.82

method. Table 5-7 shows assets placed in service during the first quarter, Table 5-8
shows assets placed in service during the second quarter, Table 5-9 shows assets
placed in service during the third quarter, and Table 5-10 shows assets placed in
service during the fourth quarter. The depreciation rates in Tables 5-7 through 5-10
are expressed as a percentage of the purchase price rather than the previous year's
book value.

TABLE 5-8[20]   Depreciation Rates for 200% Declining Balance Using the Midquarter
Convention; the Asset Is Placed in Service during the Second Quarter

YEAR	3 YEARS (%)	5 YEARS (%)	7 YEARS (%)	10 YEARS (%)
1	41.67	25.00	17.85	12.50
2	38.89	30.00	23.47	17.50
3	14.14	18.00	16.76	14.00
4	5.30	11.37	11.97	11.20
5	NA	11.37	8.87	8.96
6	NA	4.26	8.87	7.17
7	NA	NA	8.87	6.55
8	NA	NA	3.34	6.56
9	NA	NA	NA	6.55
10	NA	NA	NA	6.55
11	NA	NA	NA	2.46

[19]IRS publication 946, *How to Depreciate Property,* 2006, p. 72.
[20]IRS publication 946, *How to Depreciate Property,* 2006, p. 73.

TABLE 5-9[21]   Depreciation Rates for 200% Declining Balance Using the Midquarter Convention; the Asset Is Placed in Service during the Third Quarter

YEAR	3 YEARS (%)	5 YEARS (%)	7 YEARS (%)	10 YEARS (%)
1	25.00	15.00	10.71	7.50
2	50.00	34.00	25.51	18.50
3	16.67	20.40	18.22	14.80
4	8.33	12.24	13.02	11.84
5	NA	11.30	9.30	9.47
6	NA	7.06	8.85	7.58
7	NA	NA	8.86	6.55
8	NA	NA	5.53	6.55
9	NA	NA	NA	6.56
10	NA	NA	NA	6.55
11	NA	NA	NA	4.10

For property with a standard recovery period of 3, 5, 7, or 10 years, the property owner may make an irrevocable election to use 150% declining-balance depreciation switching to straight-line depreciation when the annual straight-line depreciation rate exceeds the depreciation calculated by the 150% declining-balance method. This election must apply to all property within its class that is placed in service during the year.[22]

TABLE 5-10[23]   Depreciation Rates for 200% Declining Balance Using the Midquarter Convention; the Asset Is Placed in Service during the Fourth Quarter

YEAR	3 YEARS (%)	5 YEARS (%)	7 YEARS (%)	10 YEARS (%)
1	8.33	5.00	3.57	2.50
2	61.11	38.00	27.55	19.50
3	20.37	22.80	19.68	15.60
4	10.19	13.68	14.06	12.48
5	NA	10.94	10.04	9.98
6	NA	9.58	8.73	7.99
7	NA	NA	8.73	6.55
8	NA	NA	7.64	6.56
9	NA	NA	NA	6.55
10	NA	NA	NA	6.56
11	NA	NA	NA	5.73

[21]IRS publication 946, *How to Depreciate Property,* 2006, p. 73.

[22]IRS, *Instructions for Form 4562,* 2006, p. 7.

[23]IRS publication 946, *How to Depreciate Property,* 2006, p. 74.

TABLE 5-11[24] Depreciation Rates for 150% Declining Balance Using the Half-Year Convention

YEAR	5 YEARS (%)	7 YEARS (%)	10 YEARS (%)	15 YEARS (%)
1	15.00	10.71	7.50	5.00
2	25.50	19.13	13.88	9.50
3	17.85	15.03	11.79	8.55
4	16.66	12.25	10.02	7.70
5	16.66	12.25	8.74	6.93
6	8.33	12.25	8.74	6.23
7	NA	12.25	8.74	5.90
8	NA	6.13	8.74	5.90
9	NA	NA	8.74	5.91
10	NA	NA	8.74	5.90
11	NA	NA	4.37	5.91
12	NA	NA	NA	5.90
13	NA	NA	NA	5.91
14	NA	NA	NA	5.90
15	NA	NA	NA	5.91
16	NA	NA	NA	2.95

For property with a 15-year or 20-year recovery period, 150% declining-balance depreciation switching to straight-line depreciation when the annual straight-line depreciation rate exceeds the 150% declining-balance depreciation rate is used as the depreciation method. Table 5-11 shows the annual depreciation rates for 5-, 7-, 10-, 15-, and 20-year property using the half-year convention and 150% declining-balance method. The depreciation rates are expressed as a percentage of the purchase price rather than the previous year's book value.

Straight-line depreciation must be used for property with a recovery period of 25 years or more and for all real estate. It is important to note that when depreciating real estate, only the building and improvements may be depreciated. The cost of the land is not depreciated.

Example 5-4: Prepare a depreciation schedule to be used for tax purposes for a $30,000 truck using the 200% declining-balance method and the half-year convention.

Solution: For tax purposes, the recovery period for the truck is five years and the salvage value is zero. From Table 5-6 the depreciation rate for the first year is 20%. The first year's depreciation is calculated as follows:

$$D_1 = (\$30,000)0.2000 = \$6,000$$

[24]IRS, *Instructions for Form 4562,* 2006, p. 13.

Using Eq. (5-16), the book value at the end of the first year is as follows:

$$BV_1 = \$30{,}000 - \$6{,}000 = \$24{,}000$$

The depreciation rate and book value for the second through the sixth years are calculated in the same manner and are as follows:

$$D_2 = (\$30{,}000)0.3200 = \$9{,}600$$
$$BV_2 = \$24{,}000 - \$9{,}600 = \$14{,}400$$
$$D_3 = (\$30{,}000)0.1920 = \$5{,}760$$
$$BV_3 = \$14{,}400 - \$5{,}760 = \$8{,}640$$
$$D_4 = (\$30{,}000)0.1152 = \$3{,}456$$
$$BV_4 = \$8{,}640 - \$3{,}456 = \$5{,}184$$
$$D_5 = (\$30{,}000)0.1152 = \$3{,}456$$
$$BV_5 = \$5{,}184 - \$3{,}456 = \$1{,}728$$
$$D_6 = (\$30{,}000)0.0576 = \$1{,}728$$
$$BV_6 = \$1{,}728 - \$1{,}728 = \$0$$

The annual depreciation and annual book values are shown in Table 5-12.

Example 5-5: Prepare a depreciation schedule to be used for tax purposes for a $30,000 truck using the 200% declining-balance method and the midquarter convention. The truck is placed in service during the fourth quarter of the company's tax year.

Solution: For tax purposes, the recovery period for the truck is five years and the salvage value is zero. From Table 5-4 we see that we can only take 0.125 (12.5%) of the depreciation in the first year because we are using the midquarter convention. From Table 5-10, the depreciation rate for the first year is 5%. The first year's depreciation may be calculated as follows:

$$D_1 = (\$30{,}000)0.0500 = \$1{,}500$$

Using Eq. (5-16), the book value at the end of the first year is as follows:

$$BV_1 = \$30{,}000 - \$1{,}500 = \$28{,}500$$

TABLE 5-12 Depreciation Schedule for Example 5-4

m	D_m ($)	BV_m ($)
0	0	30,000
1	6,000	24,000
2	9,600	14,400
3	5,760	8,640
4	3,456	5,184
5	3,456	1,728
6	1,728	0

CALCULATING MACRS DEPRECIATION USING EXCEL

Example 5-4 may be set up in a spreadsheet as shown in the following figure:

	A	B	C	D	E	F	G
1	Purchase Price ($)		30,000				
2	Recovery Period (yrs)		5				
3						MACRS Depreciation Rates	
4	m	Dm ($)	BVm ($)			Years	
5	0		30,000		m	3	5
6	1	6,000	24,000		1	33.33	20.00
7	2	9,600	14,400		2	44.45	32.00
8	3	5,760	8,640		3	14.81	19.20
9	4	3,456	5,184		4	7.41	11.52
10	5	3,456	1,728		5	-	11.52
11	6	1,728	-		6	-	5.76

The following formulas, text, and values need to be entered into the spreadsheet:

	A	B	C	D	E	F	G
1		Purchase Price ($)	30,000				
2		Recovery Period (yrs)	5				
3						MACRS Depreciation Rates	
4	m		Dm ($)	BVm ($)			Years
5	0			=C1		m	3	5
6	1	=$C$1*IF($C$2=3,F6,G6)/100	=C5-B6		1	33.33	20
7	2	=$C$1*IF($C$2=3,F7,G7)/100	=C6-B7		2	44.45	32
8	3	=$C$1*IF($C$2=3,F8,G8)/100	=C7-B8		3	14.81	19.2
9	4	=$C$1*IF($C$2=3,F9,G9)/100	=C8-B9		4	7.41	11.52
10	5	=$C$1*IF($C$2=3,F10,G10)/100	=C9-B10		5	0	11.52
11	6	=$C$1*IF($C$2=3,F11,G11)/100	=C10-B11		6	0	5.76

In this spreadsheet, the depreciation rates for 3 and 5 years from Table 5-6 are used to calculate the depreciation for each year. A drop-down box is used to select the recovery period in cell C2 and an IF function is used to select between the rates found in columns F and G based on the selected recovery period. Whenever the cell containing the purchase price is used in an equation, it is written as an absolute reference by placing the dollar sign ($) in front of both the row and the column reference. This allows cell B6 to be copied to cells B7 through B11 without changing the formula. See Appendix B for more information on absolute references, drop-down boxes, and the IF function.

TABLE 5-13 Depreciation Schedule for Example 5-5

m	D_m ($)	BV_m ($)
0	0	30,000
1	1,500	28,500
2	11,400	17,100
3	6,840	10,260
4	4,104	6,156
5	3,282	2,874
6	2,874	0

The depreciation rate and book value for the second through the sixth years are calculated in the same manner and are as follows:

$$D_2 = (\$30,000)0.3800 = \$11,400$$
$$BV_2 = \$28,500 - \$11,400 = \$17,100$$
$$D_3 = (\$30,000)0.2280 = \$6,840$$
$$BV_3 = \$17,100 - \$6,840 = \$10,260$$
$$D_4 = (\$30,000)0.1368 = \$4,104$$
$$BV_4 = \$10,260 - \$4,104 = \$6,156$$
$$D_5 = (\$30,000)0.1094 = \$3,282$$
$$BV_5 = \$6,156 - \$3,282 = \$2,874$$
$$D_6 = (\$30,000)0.0958 = \$2,874$$
$$BV_6 = \$2,874 - \$2,874 = \$0$$

The annual depreciation and annual book values are shown in Table 5-13.

Example 5-6: Prepare a depreciation schedule to be used for tax purposes for a $1,170,000 office building, excluding the cost of the land. The office building is placed in service during the third month of the company's tax year.

Solution: For tax purposes, the recovery period for the office building is 39 years with a salvage value of zero at the end of the 39 years. By tax code, straight-line depreciation must be used. Using Eq. (5-3), the annual depreciation using the straight-line method is as follows:

$$D_m = (\$1,170,000 - \$0)/39 = \$30,000$$

From Table 5-5 we see that only 0.7917 (79.17%) of the annual depreciation may be taken the first year because we are required to use the mid-month convention; therefore, the depreciation is as follows:

$$D_1 = \$30,000(0.7917) = \$23,751$$

Using Eq. (5-5), the book value at the end of the first year is as follows:

$$BV_1 = \$1,170,000 - \$23,751 = \$1,146,249$$

Using Eq. (5-5), the book value at the end of the second year is as follows:

$$BV_2 = \$1,146,249 - \$30,000 = \$1,116,249$$

The book values at the end of the third through thirty-ninth years are calculated in a similar manner. At the end of the thirty-ninth year the book value is $6,249 and the asset has been depreciated for 38.7917 years, leaving 0.2083 years in its useful life. The depreciation for the fortieth year is calculated as follows:

$$D_{40} = \$30,000(0.2083) = \$6,249$$

Using Eq. (5-5), the book value at the end of the fortieth year is as follows:

$$BV_{40} = \$6,249 - 6,249 = \$0$$

The annual depreciation and annual book values are shown in Table 5-14.

TABLE 5-14   Depreciation Schedule for Example 5-6

m	D_m ($)	BV_m ($)	m	D_m ($)	BV_m ($)
0	0	1,170,000	21	30,000	546,249
1	23,751	1,146,249	22	30,000	516,249
2	30,000	1,116,249	23	30,000	486,249
3	30,000	1,086,249	24	30,000	456,249
4	30,000	1,056,249	25	30,000	426,249
5	30,000	1,026,249	26	30,000	396,249
6	30,000	996,249	27	30,000	366,249
7	30,000	966,249	28	30,000	336,249
8	30,000	936,249	29	30,000	306,249
9	30,000	906,249	30	30,000	276,249
10	30,000	876,249	31	30,000	246,249
11	30,000	846,249	32	30,000	216,249
12	30,000	816,249	33	30,000	186,249
13	30,000	786,249	34	30,000	156,249
14	30,000	756,249	35	30,000	126,249
15	30,000	726,249	36	30,000	96,249
16	30,000	696,249	37	30,000	66,249
17	30,000	666,249	38	30,000	36,249
18	30,000	636,249	39	30,000	6,249
19	30,000	606,249	40	6,249	0
20	30,000	576,249			

When an asset is sold for more or less than its book value that was used for tax purposes, an adjustment must be made during the tax year the asset is disposed of. If the asset is sold for more than its book value, the difference between the sales price and the book value is recorded as a gain on the sale of an asset. If an asset is sold for less than its book value, the difference between the sales price and the book value is recorded as a loss on the sale of an asset.

Example 5-7: The truck in Example 5-4 was sold for $8,000 at the end of the fourth year. What is the gain or loss on the sale of this truck?

Solution: From Example 5-4, the book value at the end of year four was $5,184. Because the asset was sold for more than the book value there is a gain on the sale of the asset. The gain on the sale of the truck is $2,816 ($8,000 − $5,184).

SECTION 179 DEDUCTION

For the 2006 tax year, under Section 179 of the Internal Revenue Code, some taxpayers may deduct up to $108,000 in equipment costs without having to depreciate the equipment. If the amount of Section 179 property placed in service exceeds $430,000; the allowed write-off is generally reduced by the difference between the amount of Section 179 property placed in service and $430,000. For example, if you placed $490,000 of Section 179 property in service during one tax year, your allowable Section 179 deduction would be $108,000 minus the difference between $490,000 and $430,000 ($60,000), or $48,000 ($108,000 − $60,000).[25] Other limits, such as limits on vehicles, may further reduce the availability of a Section 179 deduction. If only part of an asset's value is written off using Section 179, the remaining value of the asset is depreciated using the standard depreciation rules. For example, if you purchase a $158,000 piece of excavating equipment and wrote off $108,000 under Section 179, the remaining $50,000 would be depreciated using a 5-year recovery period. When an owner has equipment that can be writen off using Section 179, the owner would want to use a different depreciation schedule for the equipment when preparing the company's financial statements, in order to state the equipment's value accurately.

DEPRECIATION FOR NONTAX PURPOSES

As indicated earlier in the chapter, depreciation is calculated differently for financial statements and for use in the billing of equipment than the depreciation calculated for tax purposes. The calculations may differ for any of the following reasons:

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[25]IRS, publication 946, *How to Depreciate Property,* 2006, p. 19.

1. A different depreciation method is being used.
2. A different recovery period is being used.
3. The salvage value has been included in the calculations.
4. The asset is exempt from depreciation under Section 179 but is depreciated for other purposes.
5. Special depreciation allowances are available for tax purposes, which allow even faster depreciation of an asset than is used for financial purposes. This type of provision is often used to stimulate the national economy. This special depreciation allowance will be ignored in the examples and problems at the end of the chapter.

Because of these differences, the depreciation schedule for an asset may be very different for each of these purposes.

Example 5-8: Prepare a depreciation schedule to be used for the financial statements for the truck in Example 5-4 using the 200% declining-balance method. The truck was placed in service during the first month of the company's tax year and a full year's depreciation may be taken during the first year. The company estimates that the truck's useful life is six years. At the end of six years the estimated salvage value of the truck is $5,000. Compare the depreciation calculated for the financial statements to the depreciation calculated for tax purposes in Example 5-4.

Solution: Using Eq. (5-12), the annual depreciation rate for each year under the 200% declining-balance method is as follows:

$$R_m = 2.00/6 = 0.33333$$

Using Eq. (5-14) and the 200% declining-balance method, the annual depreciation for the first year is as follows:

$$D_1 = (\$30,000)0.33333 = \$10,000$$

Using Eq. (5-3), the annual depreciation for the first year using the straight-line method is as follows:

$$D_1 = (\$30,000 - \$5,000)/6 = \$4,167$$

Using Eq. (5-16) and the larger of the two depreciation amounts, the book value at the end of the first year is as follows:

$$BV_1 = \$30,000 - \$10,000 = \$20,000$$

The depreciation using the 200% declining-balance method, the depreciation using the straight-line method, and the book value for years 2 through 4 are calculated in the same manner as follows:

$$D_2 = (\$20,000)0.33333 = \$6,667$$

$$D_2 = (\$20,000 - \$5,000)/5 = \$3,000$$
$$BV_2 = \$20,000 - \$6,667 = \$13,333$$
$$D_3 = (\$13,333)0.33333 = \$4,444$$
$$D_3 = (\$13,333 - \$5,000)/4 = \$2,083$$
$$BV_3 = \$13,333 - \$4,444 = \$8,889$$
$$D_4 = (\$8,889)0.33333 = \$2,963$$
$$D_4 = (\$8,889 - \$5,000)/3 = \$1,296$$
$$BV_4 = \$8,889 - \$2,963 = \$5,926$$

Using Eq. (5-14) and the 200% declining-balance method, the annual depreciation for the fifth year is as follows:

$$D_5 = (\$5,926)0.33333 = \$1,975$$

Because the truck has been in service for four years, there are two years left in its recovery period. Using Eq. (5-3), the annual depreciation for the fifth year using the straight-line method is as follows:

$$D_5 = (\$5,926 - \$5,000)/2 = \$463$$

Using Eq. (5-16) and the larger of the two depreciation amounts, the book value at the end of the fifth year is as follows:

$$BV_5 = \$5,926 - \$1,975 = \$3,951$$

Because the 200% declining-balance depreciation method produces a book value less than the salvage value, we must stop the depreciation at the salvage value. To stop at the salvage value, we must depreciate the difference between the current book value and the salvage value, or $926 ($5,926 − $5,000). The book value for the fifth year is as follows:

$$BV_5 = \$5,926 - \$926 = \$5,000$$

No depreciation is taken in the sixth year because we are at the salvage value and the book value remains at $5,000. The annual depreciation and annual book values are shown in Table 5-15.

TABLE 5-15   Depreciation Schedule for Example 5-8

m	D_m (\$)	BV_m (\$)
0	0	30,000
1	10,000	20,000
2	6,667	13,333
3	4,444	8,889
4	2,963	5,926
5	926	5,000
6	0	5,000

FIGURE 5-4 Book Values Comparison for Examples 5-4 and 5-8
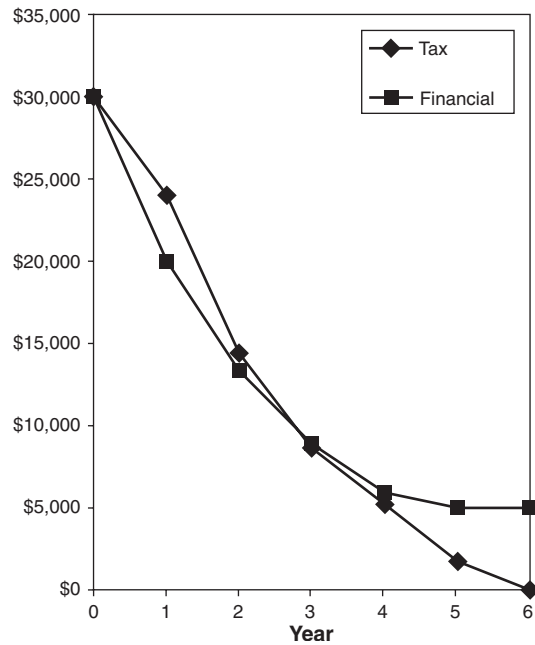
The greatest difference occurs in the sixth and seventh years because the depreciation for financial purposes includes a salvage value, whereas the depreciation for tax purposes ignores the salvage value. A comparison of the two depreciation schedules is shown in Figure 5-4.

CONCLUSION

Depreciation is the loss in value of a piece of equipment or real property. Different depreciation schedules may be used for the preparation of financial statements, the billing of equipment, and the preparation of income taxes, which may result in very different depreciation rates. For the preparation of financial statements and the billing of equipment there are three commonly used methods. They are the straight-line method, the sum-of-the-years method, and the declining-balance method. For tax purposes the IRS has set up standard recovery periods for assets and has identified the depreciation methods that may be used for each of the recovery periods. The depreciation methods allowed by the IRS include the straight-line, 200% declining-balance, and 150% declining-balance methods. The IRS has also established three standard conventions that are used to determine the percentage of the annual depreciation allowed when equipment or property is placed in service or disposed of. They are the half-year convention, the midquarter convention, and the

midmonth convention. A business owner may expense some equipment under Section 179 of the Internal Revenue Code without having to depreciate the equipment.

PROBLEMS

1. A piece of equipment is purchased for $110,000 and has an estimated salvage value of $10,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the straight-line method with a recovery period of seven years.

2. A piece of equipment is purchased for $40,000 and has an estimated salvage value of $1,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the straight-line method with a recovery period of five years.

3. A piece of equipment is purchased for $110,000 and has an estimated salvage value of $10,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the sum-of-the-years method with a recovery period of seven years.

4. A piece of equipment is purchased for $40,000 and has an estimated salvage value of $1,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the sum-of-the-years method with a recovery period of five years.

5. A piece of equipment is purchased for $110,000 and has an estimated salvage value of $10,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the 200% declining-balance method with a recovery period of seven years.

6. A piece of equipment is purchased for $40,000 and has an estimated salvage value of $1,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the 200% declining-balance method with a recovery period of five years.

7. A piece of equipment is purchased for $110,000 and has an estimated salvage value of $10,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the 150% declining-balance method with a recovery period of seven years.

8. A piece of equipment is purchased for $40,000 and has an estimated salvage value of $1,000 at the end of the recovery period. Prepare a depreciation schedule for the piece of equipment using the 150% declining-balance method with a recovery period of five years.

9. Prepare a depreciation schedule to be used for tax purposes for a $110,000 railroad spur (track) using the 200% declining-balance method and a half-year convention. Ignore any special depreciation allowances.

10. Prepare a depreciation schedule to be used for tax purposes for $40,000 of computer equipment using the 150% declining-balance method and a half-year convention. Ignore any special depreciation allowances.

11. Prepare a depreciation schedule to be used for tax purposes for a $110,000 railroad spur (track) using the 200% declining-balance method and the midquarter convention. The equipment was placed in service during the second quarter of the company's tax year. Ignore any special depreciation allowances.

12. Prepare a depreciation schedule to be used for tax purposes for $40,000 of computer equipment using the 200% declining-balance method and a midquarter convention. The equipment was placed in service during the third quarter of the company's tax year. Ignore any special depreciation allowances.

13. Prepare a depreciation schedule to be used for tax purposes for a $1,170,000 office building. The office building is placed in service in the fifth month of the company's tax year. The cost of the land is not included in the $1,170,000. Ignore any special depreciation allowances.

14. Prepare a depreciation schedule to be used for tax purposes for a $495,000 apartment building. The apartment building is placed in service in the ninth month of the company's tax year. The cost of the land is not included in the $495,000. Ignore any special depreciation allowances.

15. The truck in Example 5-4 was sold for $4,000 at the end of the fifth year. What is the capital gain or loss on the sale of the truck?

16. The truck in Example 5-4 was sold for $12,000 at the end of the second year. What is the capital gain or loss on the sale of the truck?

17. In 2006, your company purchased a front-end loader for $150,000, a dump truck for $85,000, and a dumping trailer (pup) for the dump truck for $38,000. In 2007, your company purchased two side-dump trailers for $65,000 each and two tractors to pull the side-dump trailers for $68,000 each. In December of 2008, your company purchased a dump truck for $87,000. Determine the depreciation allowed for tax purposes for the 2008 tax year. The tax year runs from January to December. Ignore all Section 179 deductions. Hint: The tractors have a different recovery period than the rest of the equipment.

18. How would the depreciation change if you include the Section 179 deductions? Use the limits for the 2006 tax year for all three tax years.

19. Modify the spreadsheet in Sidebar 5-1 to handle recovery periods up to 10 years. Test your spreadsheet by entering the data from Example 5-1 and Problems 1 and 2. Compare your spreadsheet's solution to the answer to these problems. Hint: Use the IF function to discontinue the depreciation and book value at the end of the recovery period.

20. Modify the spreadsheet in Sidebar 5-2 to handle recovery periods up to 10 years. Test your spreadsheet by entering the data from Example 5-2 and

Problems 3 and 4. Compare your spreadsheet's solution to the answer to these problems. Hint: Use the IF function to discontinue the depreciation and book value at the end of the recovery period.

21. Modify the spreadsheet in Sidebar 5-3 to handle recovery periods up to 10 years. Test your spreadsheet by entering the data from Example 5-3 and Problems 5 through 8. Compare your spreadsheet's solution to the answer to these problems. Hint: Use the IF function to discontinue the depreciation and book value at the end of the recovery period.

22. Modify the spreadsheet in Sidebar 5-4 to handle 3-, 5-, 7-, and 10-year recovery periods using the depreciation rates for the 200% declining-balance method and the half-year convention (see Table 5-6). Test your spreadsheet by entering the data from Example 5-4 and Problem 9. Compare your spreadsheet's solution to the answer to these problems. Hint: Use the IF function to select the depreciation rate and discontinue the book value at the end of the recovery period.

23. Prepare a spreadsheet to calculate the depreciation for residential (27.5-year recovery period) and commercial (39-year recovery period) real estate using the straight-line depreciation method. The spreadsheet should allow the user to select the month that the real estate is placed in service, with January being the first month. Use the percentages in Table 5-5 to determine the first year's depreciation. Test your spreadsheet by entering the data from Example 5-6 and Problems 13 and 14. Compare your spreadsheet's solution to the answer to these problems. Hint: Use the IF function to discontinue the depreciation and book value at the end of the recovery period and the VLOOKUP function to select the data from Table 5-5. (See Appendix B for more information on the VLOOKUP function.)

REFERENCES

IRS, *Instructions for Form 4562*, 2006.

IRS publication 946, *How to Depreciate Property*, 2006.