CHAPTER 11
Depreciation and Depletion
LECTURE OUTLINE

Chapter 11 can be covered in two class sessions. Most students are already familiar with the three primary chapter topics: depreciation accounting, income tax depreciation and depletion accounting.

A. Depreciation, Depletion, and Amortization: Procedures to indicate that the service potential of an asset has declined. Depreciation and depletion are discussed in this chapter. Amortization is discussed in Chapter 12.

1. Depreciation is a decline in service potential due to physical and economic factors.

2. Depreciation accounting is the process of allocating the cost of tangible assets to expense in a rational and systematic manner over the periods of use. It is not a process of valuation.

3. Factors to be considered in the depreciation process:
   a. Depreciation base. This is equal to the original cost minus the expected salvage value.
   b. Estimated service life. Describe the difference between the physical life of an asset and its service life.

   (1) An asset’s physical life is limited by physical factors such as wear and tear. These factors set the outside limit for an asset’s useful life.

   (2) An asset’s service life is limited by economic factors such as inadequacy, supersession, and obsolescence.

B. Methods of Depreciation. Describe the characteristics of these methods and the factors that influence the choice of method, as described below.
1. **Activity Methods:** Assumes that depreciation is a function of use. The life of the asset is considered in terms of either the output it provides or the number of units of activity it works. An estimate of units of output or service units is often difficult to measure. This method is not appropriate in situations where depreciation is a function of time instead of activity.

2. **Straight-line Method:** This method is widely used because of its simplicity in charging a constant amount each period. This method assumes that the asset’s economic usefulness is the same each year and that repair and maintenance expenses are essentially the same each year.

3. **Decreasing Charge (Accelerated Depreciation) Methods:** Justified on the grounds that since the asset is more efficient in the earlier years more depreciation should be charged in those years.

   a. **Sum-of-the-Years’-Digits Method.** This method requires multiplication of the asset’s depreciable cost by a fraction that decreases each year of the asset’s service life. Each fraction uses the sum of the years’ digits as a denominator and number of years estimated life at the beginning of the year as a numerator.

   b. **Declining Balance Methods.** The declining balance rate remains constant and is applied to the remaining book value, which declines each year. Salvage value is ignored in computing periodic depreciation. However, the asset is not depreciated below salvage value.

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**TEACHING TIP**

**Illustration 11-1** displays a graphical example of the effects of different depreciation methods on book value.

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C. Special Depreciation Methods.

1. **Inventory method:** Used to value small assets such as hand tools. Depreciation expense is equal to the decline in appraisal value of the items after taking purchases into account.
2. **Retirement and Replacement methods:** Used to depreciate numerous interchangeable items that have small unit value, such as utility poles and railroad ties.

   a. The retirement method charges the cost of the retired asset (less salvage value) to depreciation expense.

   b. The replacement method charges the cost of replacement units purchased (less salvage value) to depreciation expense.

   c. Point out that the retirement method is equivalent to a FIFO cost flow assumption; the replacement method is equivalent to a LIFO cost flow assumption.

3. **Group and Composite methods:** Group methods are used for similar assets. Composite methods are used for dissimilar assets. When an asset is retired, any resulting loss or gain is charged or credited to the accumulated depreciation account.

   a. The composite rate is equal to the group’s annual depreciation divided by its total cost.

   b. No gain or loss is recognized on disposition of any unit. The difference between the sales price and the unit’s cost is recorded to Accumulated Depreciation.

4. **Compound Interest methods:** These are not illustrated in the textbook because they have limited acceptance.

5. **Hybrid or Combination methods:** Companies may develop their own tailor-made depreciation methods as long as it allocates an asset’s cost over the asset’s life in a systematic and rational manner.

D. Selection of a depreciation method.
1. Point out that different methods may be used for accounting purposes and for tax purposes. The tax method is usually chosen to minimize taxes in the earlier years.

2. Conceptually, the proper method for accounting purposes is the one that best meets the objectives of financial reporting as indicated in FASB Concepts Statement No. 1.

3. Practically, the method chosen for accounting purposes may be selected because it reduces bookkeeping costs, is simple to apply, or maximizes reported income.

E. Special Depreciation Issues.

1. Depreciation for partial periods. Many methods are applied and are acceptable as long as they are used consistently.

   a. Conceptually it is necessary to determine the depreciation expense for the full year and then prorate it between the two periods involved.

   b. As a practical matter many companies use arbitrary fractional-year depreciation policies (such as a full year’s depreciation in the year of acquisition and none in the year of disposal). These policies are acceptable as long as they are applied consistently.

2. Depreciation as a source of asset replacement funds. Point out that depreciation does not provide funds; revenues provide funds. Depreciation retains funds by reducing taxable income and retained earnings available for dividends.

3. Revision of estimates. Changes in estimates of salvage value or service life are shown in current and prospective (future) periods as required by APB Opinion No. 20.

   a. Point out the difference between a change of accounting principle, a correction of an error, and a change of accounting estimate.

   b. In a change of accounting estimate, no retroactive adjustment of opening balances is made and no journal entry is required.
c. When the straight-line method is used, the subsequent depreciation expense is equal to

\[
\text{Remaining Net Book Value} - \text{Salvage} \over \text{Remaining Years of Life}
\]

**Illustration 11-2** provides a graphical example of a revision in estimated salvage value under the straight-line method.

**F. Impairment in Value.**

**Illustration 11-3** provides a flowchart of the accounting process for impairments. Discuss with students the various events which may result in an impairment and also the differences in accounting for assets held for sale and those held for disposal.

1. Impairment occurs when the expected future net cash flows (undiscounted) of an asset is less than the asset’s carrying value.
   
   a. Review events for possible impairment.
   
   b. Apply **recovered test** to determine if impairment has occurred.

2. If impairment has occurred, recognize impairment loss for the amount by which the carrying value of the asset exceeds the fair value of the asset.

3. **If the impaired asset is held for use**, the new cost basis of the asset is the reduced carrying amount. The cost basis is **not written up**, even if the fair value of the asset increases in future years.
   
   a. Depreciation is taken on the new cost basis over the asset's remaining useful life.
4. **If the impaired asset is intended to be disposed of**, it is reported at the lower of cost or fair value less cost to sell (net realizable value). There is no depreciation expense for the impaired assets being held for disposal because their costs will be recovered during the sale.

   a. Restoration of the impairment loss is possible, as long as the write-up does not exceed the carrying amount of the asset before impairment.

G. Depletion: Used to account for natural resources which are physically consumed over the period of use, such as petroleum, minerals, and timber.

1. Establishment of depletion base. The costs of natural resources may be classified as either:

   a. **Acquisition cost**, which is the price paid to obtain the property.

   b. **Exploration costs**: a successful efforts or full-cost approach may be followed. Discuss the conceptual merits of these approaches.

   c. **Development costs** which include both tangible equipment not included in the depletion base and intangible development costs which are included in the depletion base.

   d. **Restoration costs** are necessary to restore the property to its natural state after the resources have been extracted. These costs are included in the depletion base.

2. Write-off of resource cost: Normally the unit of production method is used. The depletion rate is established by dividing the total estimated units available into the depletion base.

   **Illustration 11-4** reflects the flow of asset costs to the income statement. Emphasize that depletion costs is recognized in the period that units are withdrawn. If units are not sold, depletion costs become a product cost and are inventoried.
3. Controversy concerning oil and gas accounting. Mention *FASB Statement No. 19* which would have required a form of successful efforts costing and *FASB Statement No. 25* which suspended most of those requirements. Discuss intervention by the SEC and its unsuccessful attempt to develop Reserve Recognition Accounting.


   a. Difficulty of estimating recoverable reserves.

   b. Discovery value accounting which is an approach very similar to reserve recognition accounting. In general discovery value is not recognized in the accounts.

   c. Tax aspects: Use of the percentage depletion method.

   d. Liquidating dividends. The major accounting problem is to distinguish between those dividends that are a return of capital and those that are not.

H. Presentation and Analysis of Property, Plant, Equipment, and Natural Resources.

   1. Disclosures for Property, Plant, and Equipment:

      a. The basis of valuation (usually historical cost).

      b. Pledges, liens, and other commitments or liabilities related to the property.

      c. Depreciation expense for the period.

      d. The balances of major classes of depreciable assets.

      e. Accumulated depreciation, either by major classes of depreciable assets, or in total.
f. A general description of the depreciation methods used.

2. Disclosures for Natural Resources:
   a. The basis of valuation (usually historical costs).
   b. Pledges, liens, and other commitments or liabilities related to the property.
   c. The accounting method used—full cost or successful efforts.
   d. The manner of disposing of costs relating to oil and gas producing activities (e.g., expensing immediately versus depreciation and depletion.)
   e. Public companies must also supply supplemental information regarding reserve quantities, capitalized costs, acquisition, exploration and development activities, and measures of discounted net cash flows related to proved oil and gas reserve quantities.

3. Analysis ratios:
   a. Asset turnover = \( \frac{\text{Net Sales}}{\text{Average total assets}} \)
      (1) Indicates how efficiently a company uses its assets to generate sales
   
   b. Rate of return on assets = \( \frac{\text{Net income}}{\text{Net sales}} \times \frac{\text{Net sales}}{\text{Average total assets}} \)
      (1) Measures how profitably assets were used during a period.
      (2) May also be calculated as: \( \frac{\text{Net income}}{\text{Average total assets}} \)

   **TEACHING TIP**

   Illustration 11-5 displays the rate of return ratio, and its components.

1. The objectives of tax laws and financial reporting are different, therefore, the process of allocating asset cost to the periods benefited are different for accounting reporting and income tax purposes.

a. For assets acquired between 1981 and 1986, the Economic Recovery Act of 1981 created the **Accelerated Cost Recovery System (ACRS)**. The IRS preestablished cost recovery periods for various classes of assets and eliminated salvage value as a factor in calculating the amount of cost recovery deducted each year.

b. The Tax Reform Act of 1986 created a **Modified Accelerated Cost Recovery System (MACRS)** applicable to assets placed in service in 1987 and later.

2. The computation of depreciation under MACRS differs from the computation under GAAP in three ways:

a. A mandated tax life (recovery period), which is generally shorter than the economic life of the asset.

   (1) Each item of depreciable property is assigned to one of eight different property classes.

   (2) The recovery period of an asset depends on the property class. The MACRS property classes include a class for 3-, 5-, 7-, 10-, 15-, 20-, 27.5-, and 39-year property.

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<td><strong>Illustration 11-6</strong> lists the eight MACRS property classes and provides examples of the type of assets that would be assigned to each class.</td>
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b. Cost recovery is computed on an accelerated basis for six of the eight property classes.

   (1) The 3-, 5-, 7-, and 10-year property classes require the use of the double-declining balance method.

   (2) The 15- and 20-year property classes employ the 150% declining balance method.
(3) The 27.5- and 39-year property classes require the use of the straight-line method.

c. An asset is depreciated to zero value so that there is no salvage value at the end of its MACRS life.

3. The application of the accelerated methods under MACRS is simplified by using IRS published tables reflecting the percentage of depreciable cost that can be recovered each year.

Illustration 11-7 displays a table of MACRS depreciation rates by class of property. The table automatically incorporates the switch to the straight-line method and the half-year convention.

a. Cost recovery computations for income tax purposes must reflect a **half-year convention**; that is, a half year of depreciation is allowed in the year of acquisition and in the year of disposition.

b. When one of the accelerated methods is used, a change is made to the straight-line method in the first year that straight-line depreciation exceeds the accelerated depreciation.

4. As an alternative to MACRS, the straight-line method of depreciation may be used based on IRS established recovery periods (life in years).

5. GAAP requires that the cost of depreciable assets be allocated to expense over the expected useful life of the asset in a systematic and rational manner. Methods of depreciation adopted for financial reporting should reflect this requirement. However, from a cost-benefit perspective, some firms adopt tax depreciation methods for book purposes.