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Special Phases of Lumber Accounting

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By Richard S. Wyler

The lumber industry is engaged in the exploitation of natural resources and embraces some accounting features not generally found in other lines of manufacture nor in commercial accounting. A discussion of the accounting problems peculiar to this industry may therefore be of interest and is presented under the following captions:

Depletion
Depreciation
Inventories

Depletion

Lumber manufacturers are engaged in converting a raw material known as timber into a finished product known as lumber. As the raw material or timber was acquired for a consideration and has a value, provision must be made for the return to the owners of the capital so invested upon the exhaustion of the holdings. This is accomplished by means of a depreciation or depletion charge to operations for the timber cut and manufactured and an offsetting credit to the timber account to denote the reduction in the available supply on hand. It is essential, therefore, that a proper basis be fixed for the depletion of the holdings for the purpose of

(a) The amortization of the timber investment during the life of the holdings;

(b) The equitable absorption of the amortization charge in the production accounts, in order correctly to ascertain the cost of the product manufactured.

The first prerequisite for a proper depletion charge is the determination of the cost of the timber. The latter is generally acquired in large tracts, including in most cases the land on which it grows. In order to determine the initial cost of the stumpage, it is necessary to segregate the cost of the land from the cost of the timber. As the area of the land is usually known and as a value can be placed thereon, no difficulty is encountered in allocating the purchase price to the two elements.

As a timber supply sufficient to permit its operation for a number of years must be acquired in order to justify the con-

struction of a manufacturing plant, it is evident that interest, taxes and other carrying charges will accrue before the timber is exhausted. The question arises, therefore, as to the treatment of these charges as capital outlays or current operating expenses. In cases where the holdings are large and will not be exhausted for ten or more years, an undue burden would be placed upon current operating costs if all of the carrying charges were absorbed. In these cases, the manufacturer is justified in capitalizing them. Due to the fact that there is a constantly diminishing supply of timber, its value has uniformly increased over periods of years, despite temporary declines in times of depression. If carrying charges are capitalized, the depletion charge will more clearly reflect the actual value of the timber when it is cut. Consideration should be given to the fact that if the operator should defer the acquisition of this excess supply until it was required for manufacturing purposes, a higher price would have to be paid under normal conditions than that expended for the initial supply. The operations of future years may therefore properly be charged for the carrying of the timber and the risks thereby involved. The practice of absorbing the carrying charges direct in the operating accounts is of course more conservative, and operators holding a limited supply of timber only gain nothing by capitalizing them. This refers only to plants which are in operation. Corporations which are not operative and have no income but hold timber for future use should capitalize these charges. The federal income-tax regulations provide that after properties are on a normal production basis, such expenditures shall be treated as current operating expenses. During the high tax period from 1917 to 1921, inclusive, lumber manufacturers generally absorbed the carrying charges in their operating costs.

After finding the cost of the timber as above explained, a basis is furnished for the determination of the depletion charge to operations for the timber cut. In the past many lumber manufacturers have used an arbitrary rate for depletion, which was not based directly upon the cost of the timber. In well managed and prosperous mills, the depletion unit used was high and was generally based on the market value of the finished product, so that the investment account, at the completion of the particular operation, would show a considerable profit. In mills less pros-

perous, the reverse was true and the depletion rate was frequently below the actual unit cost of the stumpage, so that the timber account would show a loss when the supply was exhausted. Neither basis is correct, as the depletion unit should be based upon the cost of the timber, irrespective of market fluctuations in the finished product. The cost furnishes a stable basis, while depletion charges based on the market value of the lumber fluctuate constantly and do not permit a useful comparison of operating costs over a period of years. While lumber prices are governed by the law of demand and supply and by special conditions prevailing in the industry, timber values are not subject to such frequent and radical variations. The latter are governed by the quality of the timber, the density of the stand, its accessibility and its location in respect to the consuming markets. Stumpage of good quality will produce a larger percentage of the higher grades of lumber, and the realization from the manufactured product will therefore be greater than in the case of low-grade timber. If the stand is heavy and if the timber is easily accessible. less development work is necessary and logging costs are lower. If it is well situated, close to railroad facilities and the consuming markets, the transportation cost of the finished product is lower and, conversely, the net realization to the manufacturer is greater. While constant rises of lumber prices over a period of years will affect the value of the raw material, it is also true that seasonable market fluctuations do not react upon the value of the timber and should not be taken into consideration in establishing depletion charges to operations.

The cost of the timber being established, the unit depletion rate is determined by dividing the cost by the estimated cut. Estimates of the available supply are generally prepared by professional timber cruisers and are more or less trustworthy. Before accepting these estimates, however, tests should be made with the actual cut from specific tracts, or the average stand per acre as shown by the estimates should be compared with the actual cutting experience. Overestimates thus disclosed should be adjusted. The average depletion unit will change from year to year, as new purchases should be taken into consideration in determining the unit.

The depletion unit as above determined is applied against the timber cut during the year and furnishes the depletion charge to

operations and conversely the credit to the timber or the depletion reserve account. When log inventories fluctuate in quantity, it is desirable to base the depletion charge on the timber actually cut in the woods. In this case an inventory of the logs on hand must be taken and reflected in the operating accounts. In case the cut is a hand-to-mouth matter and the quantity of logs on hand is small and constant, the depletion charge may be based upon the quantity of logs manufactured at the mill. The following example discloses the operation of the timber and land accounts:

Timber and land purchased:

Land	Acres	30,000
Timber—estimate	M feet	150,000
Purchase price		$660,000.00
Average value of land—per acre		2.00
Average value of timber—per M feet		4.00

TIMBER AND LAND ACCOUNT

		Timber			Land		
	Total	M feet	Average per M feet	Amount	Acres	Average per acre	Amount
Initial purchase	$660,000.00	150,000	$4.00	$600,000.00	30,000	$2.00	$60,000.00
Timber cut during year		20,000	4.00	80,000.00			
Land sold	80,400.00		4.00		200	2.00	400.00
Balance at end of yr.	579,600.00	130,000	4.00	520,000.00	29,800	2.00	59,600.00
New purchases	107,500.00	20,000	5.125	102,500.00	2,500	2.00	5,000.00
	687,100.00	150,000	4.15	622,500.00	32,300	2.00	64,600.00
Timber cut	103,750.00	25,000	4.15	103,750.00	.....	.....	.....
Balance at end of yr.	583,350.00	125,000	4.15	518,750.00	32,300	2.00	64,600.00

When the timber stand comprises several species, these may be segregated into separate accounts at varying unit values, and the depletion charge may be separately calculated on the basis of the quantities of the several species cut. If desirable, the timber area may be divided into several blocks according to its location, or new purchases may be carried as separate units and several timber accounts may be operated with varying depletion rates. When new purchases are intermingled with the old tracts, it is desirable to use the above average cost basis at the end of each year for the purpose of determining the unit depletion rate.

The several federal income-tax acts provide for the revaluation of timber acquired prior to March 1, 1913, on the basis of

the fair market value at that date, which has complicated the treatment of timber accounts. Many manufacturers who revalued their timber have credited the resulting appreciation to the regular surplus account. This, of course, was incorrect, as the credit represented simply a book appreciation. The proper procedure requires that this surplus be credited to a special account, and that the amount realized each year only be transferred to the earned surplus account as non-taxable income. As new purchases made after March 1, 1913, and cut in subsequent years are generally intermingled with timber bought prior to that date, it is as a rule impossible to allocate the timber cut to the specific tracts. The amount of appreciation realized each year applies only to the timber cut from purchases prior to March 1, 1913. The yearly cut must therefore be allocated to the two classes on the basis of the ratio of the purchases prior to March 1, 1913, to the total holdings at the end of each year, as shown in the following table:

	Total		Purchases before March 1, 1913				Purchases after March 1, 1913	
	M feet	Amount	M feet	Total Cost	Appreciation		M feet	Amount
Balance at beginning of year	100,000	$540,000	60,000	$300,000	$180,000	$120,000	40,000	$240,000
Average per M feet	$	5.40		5	3	2		6
Ratio of purchases prior to and after March 1, 1913, to total holdings	% 100		60				40	
Timber cut during year	20,000		12,000				8,000	
Depletion charge		108,000		60,000	36,000			48,000
Appreciation realized						24,000		
Balance at end of year	80,000	$432,000	48,000	$240,000	$144,000	$ 96,000	32,000	$192,000

The land account may be operated on approximately the same basis as the timber account. As the date of acquisition of each tract is usually known, sales of land can be allocated to tracts acquired prior or subsequent to March 1, 1913, and realization of appreciation will only be claimed for acreage sold from purchases prior to that date.

Depreciation

Depreciation of lumber plants is governed principally by the factor of obsolescence through the exhaustion of the available timber supply, rather than by the decline in value resulting from wear and tear. In view of the fact that mills are generally adjacent to or in the timber holdings, their value depends upon their usefulness to the present owners. They are reduced to a salvage value whenever the timber is cut out, irrespective of the physical condition of the machinery at that time. Regular depre-

ciation rates applied on mill machinery, buildings, etc., may result in a depreciated value reflecting the actual physical condition of the property as a manufacturing operation, which, from the standpoint of future usefulness, may be entirely out of proportion. By using for depreciation purposes a rate based upon the current exhaustion of stumpage, assurance is given that the plant investment will be reduced to the salvage value whenever operations are discontinued. The charge to operations, being governed by the yearly production, places a uniform burden upon the units of lumber produced. As the timber stand is known, no difficulty is encountered in the use of this method.

In determining the estimated timber stand for depreciation purposes, it is frequently desirable to include, in addition to the timber owned, a conservative estimate of adjacent timber, which the operator expects to secure. If practically all the available supply is held, this procedure is of course not necessary. If, however, the plant owns only a small initial supply of timber, but expects to acquire considerable additional stumpage, the depreciation charges during the early years of operation will be too high if only its own holdings are taken into consideration. The estimates are applied on the cost of the plant, after allowing for the estimated salvage value. The rate thus obtained represents the depreciation chargeable to each unit of production, which is usually based on a measure of one thousand feet. The rate is readjusted each year to absorb additions to plant and to reflect additional timber acquired.

As sawmill plants are generally complete at the commencement of operations, minor additions in subsequent years should be charged to current operating expenses, unless they materially increase the manufacturing facilities or the efficiency of the plant. In plants where the buildings and heavy machinery can be used until the timber stand is exhausted but more delicate machinery will have to be replaced during the course of operations, a special reserve for replacement should be provided in order to preclude an undue increase in depreciation charges in later years. The expected replacement cost may be reflected in the regular depreciation charges, an allowance being made therefor in determining the depreciable value of the plant.

Logging equipment, including log cars, loaders, etc., tractors and trucks, has a relatively short life. It is frequently replaced

during the life of the operation and should be depreciated on the basis of established depreciation rates governed by decline in value through wear and tear. Livestock, wagons, etc., are subject to hard usage and frequent losses in the course of operations. Stock is continually added or sold. The application of fixed depreciation rates is therefore unsatisfactory if one would state these assets at a representative value in the balance-sheet. While an allowance based on the estimated depreciation should be included in the monthly operating accounts, it is desirable to revalue these assets by means of conservative inventories at the end of each year and to adjust the annual depreciation charge on that basis.

Inventories

The valuation of inventories in the lumber industry offers some difficulties not generally encountered in other manufacture.

The operating accounts reflect the average cost of the product without regard to grades. During the war period the market values of the products were generally higher than the cost, and inventories on the basis of average cost of production resulted, in fact, in a valuation based on cost or market, whichever was lower. The heavy declines in market prices during the past two years reduced the sales value of the product of many grades below cost and the average cost of production does not offer a satisfactory inventory basis. The selling price of lumber is quoted by grades and it is necessary either to reduce the several market quotations to an average market price, which can be compared with the average cost of production, or to determine on the basis of the average cost of production the cost applicable to the several grades. This is accomplished by determining the quantities of the various grades produced during the year and applying these quantities on the market price less an allowance for selling, shipping and administration expenses, including therein a reasonable marketing profit. If the average thus obtained is lower than the average cost of production, it should be applied against the entire inventory, and, conversely, the average cost of production should be used if the average market value is higher. The inventory valuation is thus based on cost or market, whichever is lower.

This method should only be used, however, when the grades of lumber on hand are in the same proportion as the average grades of production. If the closing inventory includes an abnormal

percentage of low-grade lumber it will be overstated if valued on the above basis, and it will be understated if the percentage of low-grade lumber on hand is subnormal. Under such conditions the average market value of the product manufactured during the period should be determined by applying the production of the several grades on a normal or average market price. The ratios of the market prices of the various grades to the average market price should be calculated and these percentages should be applied against the average cost of production in order to find the cost of the lumber by grades. A comparison can then be made between the market prices of the various grades and their cost, the lower being used for inventory purposes. The market price is based on the finished product and, if applied on the inventory quantities of the lumber in the yard, no consideration is given to shrinkage and reduction in grade, which occurs when the lumber is dressed for shipment. In valuing the inventories, an allowance should therefore be made for cut-offs and reductions in grade.