Journal of Accountancy

Volume 33 | Issue 1 Article 2

1-1922

# Should Obsolescence Be Capitalized?

Earl A. Saliers

# Should Obsolescence Be Capitalized?*

By Earl A. Saliers

Income-tax legislation has necessitated the more careful formulation of those accounting principles which should govern records which are concerned with the acquisition, use, abandonment or replacement of wasting assets. This subject is still in its developmental stage; nevertheless, more has been done to establish a theoretically sound procedure in case of loss or expense resulting from wear and tear and depletion than in case of obsolescence. Moreover, obsolescence is usually regarded merely as one type of depreciation and as being governed by quite the same principles as apply to depreciation arising from ordinary physical wear and tear.

Admitting that for purposes of classification it may be admissible or even desirable to regard obsolescence as one kind of depreciation when the word "depreciation" is employed in a comprehensive sense, it is nevertheless necessary, in treating obsolescence in detail, to begin by recognizing the fact that it differs in some very important ways from physical depreciation.

The writer thinks it advisable to classify "depreciation" as thus comprehensively employed into three classes, as follows:

1. Wear and tear.
2. Obsolescence.
3. Inadequacy.

With wear and tear we are sufficiently familiar to make it unnecessary to consider it here. We are also familiar in a general way with obsolescence and inadequacy, but usually these have not been carefully distinguished, and accountants have not gone far enough in the study of their financial significance. Sometimes inadequacy and obsolescence are regarded as synonymous. One authority says that "obsolescence is the loss due to the necessity of discarding property because it has become *inadequate* or incapable of being used in competition with more modern and effective things, or because the market for the article it produces will disappear before the producing property is exhausted."[1] The revenue law of 1918 provided

* A paper read at the New England regional meeting of the American Institute of Accountants, at Hartford, Connecticut, December 10, 1921.

[1] Holmes, G. E. *Columbia Income-tax Lecture*, p. 151.

for a "reasonable allowance for obsolescence," but made no mention of inadequacy; and, so far as the writer knows, inadequacy has not been comprehensively considered by the treasury department in the interpretation of the various income-tax laws.

In reality, however, inadequacy and obsolescence are distinctly different concepts. A plant or a unit of plant may be inadequate but not obsolescent. On the contrary, an asset which is obsolete may be wholly adequate to perform its allotted work. Adequacy has reference to the capacity of a machine or plant to meet the demand made upon it for a given volume of output and therefore is not primarily concerned with the question of the machine's up-to-dateness; for the reason that a strictly up-to-date machine of a capacity of, say, four units per hour may be entirely inadequate to meet the demand made upon it, whereas an entirely obsolete machine of, say, eight units per hour capacity may be entirely adequate to meet such a demand. Inadequacy arises from physical incapacity; obsolescence is purely a question of cost of production and is related in no way to the capability of a given plant or unit of plant to meet the demand made upon it for a given output. It follows that the factors which give rise to inadequacy and obsolescence are not related and that these two forms of depreciation should receive individual consideration.

Let us assume the case of a machine which costs $10,000, has an estimated natural physical life of ten years and an estimated scrap value of $1,000. If the machine lives out its natural physical life, i. e., if neither obsolescence nor inadequacy causes it to be abandoned before it is worn out, it will be cared for by the usual method of setting up a depreciation reserve against which its cost less salvage is charged when abandoned. But there are two possible alternatives. First, the machine may, before the expiration of the tenth year, become incapable of performing the amount of work demanded of it because of an increase in that amount. Secondly, it may become unprofitable to continue using the machine because another could be purchased which would do the work equally well at a smaller cost per unit of output. Under the first assumption the machine is inadequate; under the second assumption it is obsolete. It is easy to see that the factors

or influences which give rise to the one are not the ones that give rise to the other.

It is the writer's belief that the failure to do more than merely generalize on this subject has led to the scrapping of a great amount of equipment which was neither inadequate nor obsolete when scrapped. This has happened because accountants and managers fail to realize that in a going concern there can be no such thing as a capital loss, that every expense of production must be charged to cost of production and that therefore the entire cost of wasting assets must be included in the *cost* of production, whether or not all plant units live out their natural physical life. This truth is given effect by establishing depreciation reserves which are intended to return the cost of wasting assets out of revenue during their natural physical lives. Sometimes an attempt is also made to forestall obsolescence and inadequacy, either by setting up excessive depreciation reserves or by setting up special reserves which are of the nature of reserves for contingencies. No fault can be found with reserves for contingencies if they are thoroughly understood and if they are regarded as true surplus and not as valuation reserves. But the writer believes that no reserves of any kind are necessary or desirable for the proper handling of obsolescence and inadequacy, because the cost of a unit of plant should be written off by means of a charge to depreciation based on the natural physical life of such unit, and where such rate does not cover cost due to the shortening of useful life from obsolescence or inadequacy the uncovered cost or cost not returned through such normal depreciation rate should be added to the cost of replacement and written off over the natural physical life of the new unit.

There are several reasons why this ought to be the procedure. In the first place it is impossible to make adequate provision in advance for either inadequacy or obsolescence because the time of occurrence of either cannot be forecast. This is true in particular of obsolescence, and it is true in only a less degree of inadequacy. We rightly regard wear and tear as an accruing expense in which the element of time is a determining factor; but we wrongfully assume that time has any relation to obsolescence and inadequacy. Obsolescence and inadequacy do not accrue in the sense that interest and wages and depreciation from wear and tear do. On the other hand

they are similar to losses from fire or storm or to the cost of tearing down a structure, which is added to the cost of the structure which replaces it. Obsolescence should not result in the partial writing down of the unit under consideration; on the contrary it either causes the given unit to become immediately or entirely worthless or it has no financial effect whatever. It is illogical to speak of a unit of plant as being partly obsolete. As long as it is profitable to continue an existing unit in operation it is not obsolescent in any effective sense because obsolescence is purely a matter of relative costs of production, not of physical condition. Obsolescence becomes effective only when production can be carried on more cheaply by replacing a given unit, *the undepreciated or unrecovered cost of which was considered as a part of the cost of replacement.* Obsolescence, therefore, when effective, is measured by the amount by which cost less salvage exceeds the amount of the depreciation already written off at any given time.

Returning to our assumed illustration of the machine which cost $10,000 and possesses an estimated life of ten years and a residual or scrap value of $1,000, let us further assume that five years of useful life have expired and that at the close of each year a depreciation reserve has been credited with one-tenth of ($10,000—$1,000) or $900, so that now there exists a reserve of $4,500. There is, of course, an additional $4,500 to be accounted for, either in the form of future charges to depreciation or as obsolescence or inadequacy. Now suppose that at the end of the fifth year a new machine which costs $9,000 comes on the market and will perform equivalent service at a smaller total cost per unit of output. The problem is to determine whether or not the old machine is obsolete. The two elements which enter into cost of production are (a) the unrecovered investment in the machine and (b) necessary current expenses such as labor and power. We may assume that an investigation shows that these items are for the old and new machines, respectively:

| *Old machine* | | *New machine* | |
|---|---|---|---|
| Unrecovered cost, i. e., cost less depreciation | Current operating expense | Unrecovered cost, i. e., cost less depreciation | Current operating expense |
| $5,500 | $600 | $8,000 | $400 |

If money is worth 6 per cent., the capitalized cost of operating the old machine is \$600 ÷ .06 or \$10,000; that is, it is equivalent to a capital investment of \$10,000, whereas the capitalized cost of operating the new machine is \$400 ÷ .06 or \$6,666.67. Adding these to the original costs of the respective machines we have for the old machine:

| | |
|---|---|
| Original cost less earned depreciation | \$ 5,500.00 |
| Capitalized operating cost | 10,000.00 |
| Total capitalized cost | \$15,500.00 |

and for the new machine:

| | |
|---|---|
| Original cost | \$ 8,000.00 |
| Capitalized operating cost | 6,666.67 |
| Total capitalized cost | \$14,666.67 |

Therefore, as compared with a new machine of equal capacity the old machine is worth \$4,666.67, which is obtained by deducting the excess in total capitalized cost of the old machine over that of the new machine (\$833.33) from the unrecovered investment in the old machine (\$5,500.00). But since its salvage value is only \$1,000, to scrap it would mean a loss of \$4,666.67—\$1,000 or \$3,666.67 and no saving in total capitalized cost of production, because when the old machine is valued at \$4,666.67 it produces as cheaply as does the new machine. The true total capitalized cost of production if the old machine were scrapped would be:

| | |
|---|---|
| Original cost of new machine | \$ 8,000.00 |
| Unrecovered cost of old machine (less salvage) | 4,500.00 |
| Capitalized operating cost | 6,666.67 |
| | \$19,166.67 |

whereas the capitalized cost of operating the old machine is only \$15,500. If, however, the new machine could be bought for \$8,000 — \$3,666.67, or \$4,333.33, then the new and old machines would be on a par and it would be immaterial whether the replacement were made or not. The same would be true if the capitalized operating cost of operating the new machine could be reduced to (\$6,666.67—\$3,666.67) or \$3,000 (which is an operating expense of \$180 capitalized at 6%), for then we should have:

| | |
|---|---|
| Original cost of new machine | \$ 8,000.00 |
| Unrecovered cost of old machine (less salvage) | 4,500.00 |
| Capitalized operating cost | 3,000.00 |
| | \$15,500.00 |

These calculations show that before a machine can be said to be obsolete it must be shown that production can be carried on more cheaply with a new machine to whose cost has been added the unrecovered cost (less salvage) of the old one. They also show that unless a machine is made entirely obsolete by a new invention it is not affected in any way whatever because it continues to be cheaper to operate the old machine than to scrap it and buy the new one.

The fact that the unrecovered cost (less salvage) of the old machine must be added to the cost of a new machine in order to determine whether or not the old machine is obsolete does not of itself make it compulsory that the unrecovered cost (less salvage), which is the measure of effective obsolescence, be capitalized in determining cost of replacement. We must therefore inquire further into what disposition ought to be made of this cost of obsolescence. The following methods of procedure are open to consideration:

(a) Charge it to current operations.
(b) Charge it to surplus.
(c) Capitalize it and then recover it through depreciation charges based upon the expected natural physical life of the unit which replaces the one which has become obsolete.

There is good reason why obsolescence ought not to be charged to current operations except in unusual circumstances, although it is, perhaps, the plan now most frequently pursued. Until the passage of the revenue law of 1918 no deduction was allowable for obsolescence until the obsolete property was sold or otherwise actually disposed of. Section 214 (a) (8) of the 1918 law provided that in computing net income there should be permitted as a deduction:

> A reasonable allowance for exhaustion, wear and tear of property used in the trade or business, including a reasonable allowance for obsolescence.

Article 161 of regulations 45 provides, furthermore, that

> * * * For convenience such an allowance will usually be referred to as depreciation, excluding from the term any idea of a mere reduction in market value not resulting from exhaustion, wear and tear or obsolescence. The proper allowance for such depreciation of any property used in the trade or business is that amount which should be set aside for the taxable year in accordance with a consistent plan by which the aggregate of such amounts for the useful life of the property in the business will suffice, with the salvage value, at the end of such useful life to provide in place of the property its cost, or its value as of March 1, 1913, if acquired by the taxpayer before that date.

Article 166 furthermore provides that

> Inasmuch as under the provisions of the income-tax acts in effect prior to revenue act of 1918 deductions for obsolescence of property were not allowed except as a loss for the year in which the property was sold or permanently abandoned, a taxpayer may for 1918 and subsequent years revise the estimate of the useful life of any property so as to allow for such future obsolescence as may be expected from experience to result from the normal progress of the art.

Various rulings and decisions have been handed down by the bureau of internal revenue but none of them draws a clear line of distinction between depreciation from wear and tear and obsolescence, while some of them use the words "depreciation" and "obsolescence" as if they were synonymous.

It may be inferred, therefore, that the treasury regards obsolescence as a proper charge to current operations; but this stand is made upon the assumption that obsolescence is an accruing expense in the same sense as is physical wear and tear. We have endeavored to show that this is not true; that, on the contrary, from the nature of the case, obsolescence cannot accrue before it actually occurs, any more than a loss due to a fire can accrue before the fire occurs. Moreover, to charge obsolescence to the period preceding the time when the property actually becomes obsolete is in effect to say that since a new invention made in the future will greatly cheapen production we shall burden the present period not only with its due proportion of accruing expenses but we shall also add to such expenses the cost of scrapping good machinery in order to make way for machinery which will give still cheaper costs in the future.

In reality obsolescence cannot usually be foreseen for any considerable period of time because of the fortuitous character of the events which cause it, and it is about as logical to attempt to accrue future fire losses as to attempt to accrue future obsolescence costs. But there is this difference between a fire loss and an obsolete asset. The thing destroyed by fire is entirely destroyed and possesses no further producing capacity, whereas the obsolete asset invariably possesses additional producing capacity which is not utilized because it is not profitable to do so. The reason it is unprofitable to utilize it is that the cost of the old machine not yet recovered through depreciation charges to operations can be added to the cost of a more up-to-date machine and still enable production to be

carried on at a smaller total cost than if the old machine were continued in use. Since every dollar of investment should be charged against output, it is reasonable that the cost of scrapping machinery not yet worn out be charged against the output of the period which gets the benefit of the more economical machinery.

Article 142 of regulations 45 provides that loss due to the voluntary scrapping of old buildings and machinery incident to their replacement is deductible as an expense in an amount representing the difference between their cost less salvage and the amount of depreciation previously written off. This is the correct procedure if the units scrapped are worn out, because all use value has been or should have been charged against past output, and the replacement has in no way been hastened by improved methods and new inventions. But if a physically good plant is scrapped because it ought to be superseded by more improved types of structure, the cost less salvage of such assets which has not been recovered through proper depreciation allowances based on estimated natural life or would not have been recovered had such proper allowances been made is not a current expense but an element in the true cost of replacement. This is true because it is not profitable to make the replacement unless such amount can be added to the direct cost of the unit which replaces the old one and still permit production to be carried on more cheaply than with the old unit. The new unit must justify itself by paying for the unrecovered portion of the one which it replaces in the same way that a new management must justify itself by assuming the unliquidated obligations of the old one. Unless such cost is recognized the burden of depreciation will not be distributed equitably over the proper periods.

Another way of putting the matter is to say that all costs of wasting assets must be recovered through depreciation rates based upon the natural physical life of such assets, and that whenever the cost of any asset is not so returned during the period of its usefulness because of the shortening of life from obsolescence such unrecovered cost should be recovered during the natural physical life of the asset which replaces it. Depreciation rates are presumably based on scientific estimates of the life of the asset in question, and it is possible, where a great amount of data regarding longevity of physical assets

has been collected, to determine the normal expected life with great accuracy so long as no attempt is made to allow for factors which none can foresee with any degree of certainty, such, for instance, as accidents, obsolescence and other contingencies. Much has already been done in the way of establishing mortality tables for important classes of assets based upon extensive data derived from experience. Rates based upon such tables will be meaningless if we are arbitrarily to increase them to meet contingencies which by nature are uncertain and, indeed, may never occur. We have shown, moreover, that the cost of obsolescence is not one which accrues from the time an asset is installed until it becomes obsolete. It is rather in the nature of a deferred charge to be distributed over the period which follows its occurrence, or, in exceptional instances, to be charged directly to surplus.

This latter procedure, namely, considering obsolescence as a capital loss, should be followed only when no replacement takes place because the demand for the output has ceased. It is exemplified by the prohibition legislation which compelled brewers to scrap their plants and write off their goodwill.

Advisory tax board memorandum No. 44, which deals at length with the obsolescence of intangible assets, recognizes the fact that expiring time is not a measure of obsolescence, for it says:

* * * In the great majority of cases depreciation is fairly measured by the effluxion of time. This is the ordinary rule, a departure from which should be allowed only when deduction provided thereunder does not meet the statutory requirement of reasonableness. * * * The situation presented by the distillers and dealers in liquor is highly exceptional. The total amount in respect of which they are entitled to claim a deduction is the cost of their goodwill, trade-marks, trade brands, or the value thereof, on March 1, 1913, if acquired prior thereto, excluding, of course, any tangibles acquired since that date, the expenditures for which were deductible in computing income for tax purposes. But as already indicated, the legislative situation had by January 31, 1918, reached a decisive point which completed the first stage in the obsolescence of these assets. (It was in January, 1918, that prohibition became a foregone conclusion because it was in that month that certain doubtful states adopted the prohibition amendment by decisive votes.) On that date a computable part thereof had become obsolete. The value of such assets rests upon the probable future income that will accrue to the owner thereof. Estimates of the probable amount of this income may vary, but there is no other known method by which the value can be computed. In view of the status of prohibition legislation on January 31, 1918, it is certain that upon that date the value of the goodwill, trade-marks, trade brands, etc., of distillers and dealers in liquor was reduced to the then present value of the income to be derived therefrom between that date and approximately January, 1920. (Prohibition became effective January 16, 1920.)

The memorandum continues:

> Depreciation of intangibles now in question when computed upon the basis of the time rule does not meet the requirements of the statute, and therefore another rule must be found. * * * The rule of apportionment which most closely approximates the actual facts, and is therefore the most reasonable, is that under which the value of the intangibles on January 31, 1918, is spread on the time basis between that date and the date upon which prohibition became effective and the balance of the allowable deduction (measured by the difference between the value on January 31, 1918, and March 1, 1913), taken in accordance with the provisions of section 205 of the act and articles 1621-1625 of regulations 45 against the first taxable year ending on or after January 31, 1918.

As a consequence of this reasoning the advisory tax board concluded that obsolescence fully accrued on January 31, 1918, should be permitted as a deduction for the first taxable year ending on or after January 31, 1918, plus an additional deduction of such a proportion of the remaining value of the intangible assets as the period between January 31, 1918, and the end of the taxable year bore to the total interval between January 31, 1918, and January 16, 1920.

This recognizes that obsolescence does not accrue as do expenses but rather occurs as do losses, and that passage of time is not a proper basis upon which to determine its amount. It is here made to apply only to intangibles, and a careful reading of the memorandum leaves the impression that the full significance of the principles laid down was not realized. If one remembers that obsolescence is purely a question of value he must arrive at the conclusion that the principles which govern obsolescence are the same whether the asset to which the value or lack of value attaches is a tangible or an intangible asset; and it inevitably follows that in most instances where obsolescence really becomes effective it does so as at a given date, not over a period of years, as does depreciation. Consequently it must be regarded as either a loss or a cost of replacement depending on whether or not replacement is necessary.