Journal of Accountancy

Volume 62 | Issue 2 Article 5

8-1936

Valuation of Inventories

American Institute of Accountants. Special Committee on Inventories

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AMERICAN INSTITUTE OF ACCOUNTANTS

SPECIAL COMMITTEE ON INVENTORIES

At the time of the appointment in July, 1933, of the special committee on inventories, the president of the Institute assigned to it the task of collaborating with the sub-committee on inventory valuations of the American Petroleum Institute's committee on uniform methods of oil accounting in the efforts of that body to bring about a desirable degree of uniformity in the valuation of oil companies' inventories. We present herewith our report on the committee's work in the carrying out of that assignment.

While the principle of "cost or market, whichever is lower" may be said to have had a theoretical recognition in the petroleum industry as a broadly guiding theory, in actual practice there have been divergencies of considerable extent in the application of the general principle. To a large degree this situation seems to have been due to very appreciable fluctuations in the market values of crude oil and the products refined therefrom, which engendered problems affecting both the balance-sheet and the income account in an important degree because of the relatively dominant position of the inventories as regards both of these financial statements in the case of oil companies.

The scope of our joint deliberations with the sub-committee mentioned did not include the discussion of the details of cost or of cost computations, either in respect of the production costs of crude oil or the manufacturing costs of products, but was restricted to the consideration of cost and market valuations as constituting the factors of inventory valuations. Accordingly we have not undertaken herein to discuss the practice of valuing crude oil produced at the posted field price at date of lifting, in lieu of its computed cost—a practice which may involve an anticipation of profit (where not covered in the elimination of intercompany or interdepartmental profit); nor have we consid-

ered the varying treatments in the accounts of such cost factors as lease rentals, renewals and abandonments, and dry holes.

In the course of our initial joint deliberations with the American Petroleum Institute's sub-committee on inventory valuations, it became apparent that, while the members of that sub-committee agreed as to the desirability of a common plan (with a majority preference in the sub-committee for the "last in, first out" basis), divergencies of views and viewpoints on the subject under discussion existing among the member companies of the American Petroleum Institute, as reflected by the members of that body's sub-committee, indicated the desirability of their making further efforts within their own group to arrive at a general consensus of opinion, in order that our committee's approach to the subject might be from the standpoint of dealing with a matter that we could view as being in the realm of an industrial practice, either existent or proposed. As a result, the sub-committee mentioned and its parent committee, after further consideration on their part, laid the matter before the board of directors of the American Petroleum Institute, which passed the following resolution on November 12, 1934:

"*Resolved:* That the uniform method of valuing petroleum inventories called the 'last in, first out' system, as presented by the committee on uniform methods of oil accounting is hereby accepted and recommended for adoption for the calendar year 1934 or as soon thereafter as practicable, as a method of valuing petroleum inventories, to be used in conjunction with the general form of balance-sheet and text as approved December 9, 1926, as a system for keeping books and accounts and for making the report for all those engaged in the oil industry, it being understood this uniform method of valuing petroleum inventories, as well as the balance-sheet and text, is subject to such changes and improvements from time to time as the committee may deem necessary after approval by the board of directors."

As a brief explanation of the method of inventory valuation thus recommended in the foregoing resolution, the American Petroleum Institute's committee on uniform methods of oil accounting has promulgated the following:

"1. *Current costs against current sales:* Current costs of crude oil and products should be charged against current sales as long as inventory quantities remain approximately unchanged, or sales are about equivalent to new acquisitions (production and purchases).

"2. *Crude oil:* In the costing of crude oil stock (inventory), current production and current purchases should be the first applied to current cost of sales and current operations. Wherever practicable, the various grades of crude oil handled by the company may be classified or grouped into a minimum number of 'grades.' 'Grades' of crude oil mean a major grouping of crude oils such as used in reporting to the petroleum administrative board (oil code authority). This method should be applied to stocks in the field, storage, transit, at refineries, and all other points, as far as it is practicable for the company to do so.

"3. *Products:* In the costing of product inventories, current purchases and current production should be the first applied to current cost of sales and current operations. This method should be applied to stocks at refineries, bulk terminals, in transit, and at all other points, as far as it is practicable for the company to do so.

"The various kinds or brands of oil products handled by the company may be classified or grouped into a minimum number of 'products.' The term 'products' means a combination of a number of individual brands or kinds of finished or unfinished oils. Examples of 'products' are: kerosene (refined oil), gasoline (naphthas), lubricating oils, motor oils, gas oils, fuel oils, waxes, asphalts, coke, etc. No definite recommendation is made as to the number of products each company should carry as a separate item on the inventory. However, it is suggested that it be the smallest number feasible to obtain full advantage of the equalizing effect of the 'last in, first out' inventory plan.

"4. *Cost or market:* In starting the 'last in, first out' inventory plan, the prices should be set at a conservative or reasonable figure. In the future, inventory prices should not be reduced to market prices, when lower than the regular inventory value. Where the market value of the inventory is less than that carried in the balance-sheet, such condition should be shown in parentheses or as a footnote in such manner that the approximate difference can be ascertained, either in dollars or percentage.

"5. *Transportation:* In ascertaining the inventory value, all transportation should be taken at full tariff or market rates. Obviously, where a company has had a reserve for the elimination of intercompany profits in inventory, such reserve will remain practically constant under this method of valuing inventory, so long as the quantity of inventory on hand remains about the same."

The petroleum industry belongs to that industrial group in which price changes in the raw material commodity exert, practically, a simultaneous and corresponding effect on the product commodities. Where this is the case, the effective profit margin, as conceived by sales and other operating officials, very frequently

is taken to reflect the spread between current sales prices on the one hand and the reproductive or replacement cost of the related raw materials rather than inventory costs, on the other. The disparity between this concept of the profit margin and that resulting from the application of the inventory costs is, of course, accentuated if the raw material commodity prices experience frequent and relatively substantial fluctuations, as has been the case in the petroleum industry. Thus, while over a long period, such as a complete economic cycle, profits would aggregate substantially the same total by whichever method computed, the divergencies in results shown for any one year or shorter fiscal period might be considerable.

This characteristic of quick communication of price changes as between raw material commodities and the derivative products is not, of course, peculiar to the petroleum industry alone; but at least in certain of the other industries similarly affected—the cotton textile and grain milling industries, for example—a means of "price protection" or "profit insurance" is afforded by the futures traded in in those markets. Where such a means exists, management by availing itself thereof, is enabled to correlate its buying and selling prices, so as to effectuate this concept of the profit margin in the stated earnings.

The principle of "cost or market, whichever is lower," which constitutes the present-day generally followed method of inventory valuation, is one of long standing, coming to us from the days of less complex business relations and situations than those of today. In those earlier days, the balance-sheet was accorded much more attention, as compared with the income account, than is the case today, and accounting practices naturally reflected this viewpoint. To value inventories at cost was, of course, the logical thing to do; to take cognizance of a declining market was equally logical and properly conservative. The question of what constituted "cost," however, in the earlier days of simple business relations did not give rise to the involved considerations called for by present-day business complexities; and because of the much greater emphasis laid on the balance-sheet, the effect upon income of the diverse views which are possible in regard to cost computations seem not to have stimulated great interest in those earlier days.

The actual, identifiable cost of the articles inventoried would, of course, be more readily determinable in a simpler business struc-

ture; where, however, such "identifiable" costs were not at hand, resort to an arbitrary allocation was unavoidable. While the solution ordinarily has been to regard the first goods in as the first out (doubtless reflecting the general mercantile maxim of moving the oldest goods out of stock, wherever possible, before touching newer goods), other allocations have also been used. Generally speaking, we may view the means adopted as classifiable into three categories, viz.:

The first in, first out basis.
The last in, first out basis.
The basis of cumulatively averaged costs.

In times of rising prices, the inventories valued on the basis of "first in, first out" would tend to aggregate a larger valuation than if the basis of "last in, first out" were used; conversely, in times of falling prices, the inventories valued on the basis of "first in, first out" would tend to aggregate a lower valuation than if the basis of "last in, first out" were used. Cumulatively averaged costs would occupy the middle ground between the first two named. These observations, of course, have to do with the consideration of cost without the periodic interjection of market value adjustments. From the foregoing generalizations it appears that, in times of price inflationary movements, both the second and third "cost hypotheses" will lead to more conservatively presented operating results than the first named—a fact which may very understandably recommend them to the consideration of prudent management. Their effect upon the income account is a closer correlation of current sales prices and current purchase costs than that produced by the "first in, first out" method.

The matter at issue between the "first in, first out" method on the one hand and the "last in, first out" method (as well as the so-called "basic" or "base stock" method) on the other may be expressed in the form of a query, viz.: Should "cost of sales" be regarded as meaning "previously inventoried costs," or may it mean "current reproduction costs"? To illustrate the divergent results, an example may be adduced, in which a single unit is employed for the sake of clarity. A wagon maker has a wagon in stock which cost him $50.00 the selling price of which is $65.00—to yield him his desired profit of $15.00 per wagon. Before he sells the wagon, he learns from the concern supplying him with his materials of a price increase, the result of which is to make the

reproduction cost of his wagon $60.00. By reason of this knowledge the wagon maker "marks up" his wagon to $75.00, at which figure he sells it for cash and builds a new wagon costing him $60.00. The net change resulting from the whole transaction is that his till shows $15.00 more cash than he had before.

Now, the advocate of "reproduction cost of sales" says to the wagon maker:

"The profit you made is $15.00; and the proper inventory price for the present wagon you have in stock is $50.00. That is the number of dollars of your capital invested in your stock in trade; the only change that you have effectively realized in that investment is the substitution for one wagon of another wagon exactly like it—the same wagon in fact except only as regards physical identity."

On the other hand, the advocate of "first in, first out" says to the wagon maker:

"Your profit is $25.00, although you may have only $15.00 more in cash to show for it. The other $10.00 is contained in the increased cost and value of the new wagon, $60.00 as against the old one at $50.00. You must not fail to recognize and to give effect to the price level change."

Considering the other side of the problem, let us assume that after the above transaction the price level reverted to its original status, thus consummating the economic cycle; accordingly, the wagon at present in stock, which actually had cost $60.00 to build (but was inventoried at either $50.00 or $60.00 according to the procedure followed) is sold for $65.00, and replaced in stock by one which cost $50.00 to build. Now under either procedure, the latest wagon will be inventoried at $50.00. The profit on the second transaction, however, will have been $15.00, according to the "reproduction cost of sales" advocate, or $5.00 according to the "first in, first out" advocate. The aggregate profits on the two transactions, of course, will be the same in either case, but the periodic distribution will differ. If, when prices rose, the wagon builder had clearly foreseen the subsequent price decline as an inevitable part of the economic sequence, his desire to conduct his business and his accounts accordingly by an inventorying method that would correlate his sales prices with those costs which had directly influenced the sales prices is quite understandable.

The foregoing example illustrates the duality of the concepts involved. It is the concept of inventories in the abstract represent-

ing dollars versus the concept of inventories in the concrete representing a wagon. The "first in, first out" advocate says: "He disposed of a wagon—that constitutes the crux of profit determination, which is realization." The "reproduction cost" advocate counters: "True, he disposed of a 'wagon' but he did not dispose of his 'stock-in-trade'; he still has that, he merely changed the physical identity of it."

It has seemed to us that the viewpoint from which the problem presented should be considered is well expressed by our Institute's special committee on coöperation with stock exchanges in its report of September 22, 1932, from which we quote:

"From an accounting standpoint, the distinguishing characteristic of business today is the extent to which expenditures are made in one period with the definite purpose and expectation that they shall be the means of producing profits in the future; and how such expenditures shall be dealt with in accounts is the central problem of financial accounting."

Considering the problem from this sound and practical viewpoint, the conclusion is inescapable that profit determination in the financial accounts should not fail to take cognizance of what we may term the business viewpoint.

The prime purpose of the "last in, first out" principle, which the board of directors of the American Petroleum Institute has recommended to the membership of that institute, is to bring about, in the determination of profits in the financial accounts, a substantial correlation between sales prices and those raw material prices which have been directly causative of such sales prices.

In its practical effect in the accomplishment of this objective, the "last in, first out" principle may be viewed as comparable to the "base stock" or "basic inventory" method of inventory valuation, the purpose of which likewise is that the revenue from high sales prices be burdened with the costs causative of such high sales prices, and not leave high price level inventories to be absorbed later by revenue representing a lower price level, upon the turn of the economic cycle.

In the "base stock" or "basic" method, however, as its designation implies, the approach to the problem is by way of ascertaining a "normal" inventory stock and the "low price level" at which that stock is to be valued—the result of such a valuation being the consequent absorption of current raw material costs by current sales revenue. It may, perhaps, be stated that whereas

the principle of "cost or market, whichever is lower" (with cost determination on the "first in, first out" basis, or possibly on that of averaged costs) accomplishes its objective of a conservative inventory valuation from a "short-term" viewpoint, the "basic" method, in theory, looks to the longer economic cycle, and the eventual return of a low price level after a high price level interim.

The "last in, first out" method, as enunciated by the American Petroleum Institute, however, has not dealt with the valuation of the residual inventory beyond requiring it to be "at a conservative or reasonable figure." Consequently the valuation of the inventory, as it appears on the balance-sheet at any given time, will generally reflect, in the case of each member company adopting the method, the particular valuation price level which each member company may regard as "conservative or reasonable." In the absence of a simultaneous adoption of the method by the various member companies, it is more than likely that viewpoints of what would be regarded as "conservative or reasonable" will vary widely, not only because of the varying viewpoints of different individuals, but because of the psychological influence exerted by the business conditions, attitude and outlook prevailing at the particular time when each company undertakes to determine what that figure shall be.

The recommendation of the committee on uniform methods of oil accounting contained in the paragraph numbered "4" above, captioned "cost or market," that "inventory prices should not be reduced to market prices, where lower than the regular inventory value," it is to be understood, is based on the assumption that the inventory valuation adopted upon the inauguration of the "last in, first out" method is such a "conservative or reasonable figure"; that the price level thus reflected in the inventory is one —comparable to the "normal valuation" of the "basic" method —which will be lower than that which ordinary market fluctuations within the span of the economic cycle may be expected to reach; and that those occasions when market prices do fall below those represented in the inventory are expectantly only temporary phenomena evidencing unusual conditions, from which, expectantly, a prompt recovery is to be looked for. It is because of the expectantly short duration of such market decline, as well as of its presumed rarity of occurrence that the committee on uniform methods of oil accounting has recommended to its member companies that the inventory be not reduced to market in such

instances, but that the difference be disclosed "in parentheses or as a footnote."

This recommendation, of course, places the greatest importance on the price level to be adopted in the inventory. Frequent recurrence of market declines of this nature might be assumed to indicate that a "conservative figure" had not been adopted. It is, of course, understandable that were market write-downs a matter of frequent occurrence in the income account, they would defeat the prime objective of the "last in, first out" method, namely the correlation of sales revenue with the costs causative of the prices reflected in such sales revenue.

The method as thus promulgated by the American Petroleum Institute, in leaving the establishment of the basic price (and the basic quantity, too) to the individual member companies will tend to certain divergencies which will operate against comparable results as between such member companies.

In a general way, the rule of "cost or market, whichever is lower" affords, more or less, a common standard of measure of the inventories shown on the balance-sheets of companies in the same industry, so that one might reasonably infer that the inventory of one amounting to $2,000,000, was, in fact, worth somewhere about double that of another company amounting to $1,000,000. This might, of course, not be strictly true, particularly in so far as the factor of cost is concerned, but the factor of market value would operate as a "leveler" of values. Under the proposed "last in, first out" rule, however, in so far as it is not uniformly applied by two companies in respect of the price level adopted, it might conceivably happen that the $2,000,000 inventory of the one and the $1,000,000 of the other, were, in fact, of identical value if measured by their current market value. It may be suggested that during the period of development of this method within the industry, any misunderstanding of this kind would be obviated by a parenthetical disclosure in the balance-sheet of the current replacement value of the inventory, whether such value were greater or less than the stated inventory value.

In respect of comparative operating results between any two member companies, the method as outlined may also not accomplish strict comparability. In the case of one, for example, the sales of the fiscal period may be burdened in full with a cost of sales representing the current costs of that period. In the case of the other company, let us assume sales to have exceeded the pur-

chases for the period; to the extent of such excess, the aggregate cost of sales will be influenced by the amount thereof representing the amount regarded as taken out of the initial inventory, charged to cost of sales at the prices in such inventory, which might vary considerably from the current costs of the fiscal period. Initial inventories, either small or large, relatively, in point of quantities, and low priced or high priced, relatively, in point of valuation, would thus exert an influence on such comparative operating results.

It is to be observed that, in conceivable instances, the application of the "last in, first out" method may produce results not materially different from those under the ordinary application of the rule of "cost or market, whichever is lower"; where the goods sold have in fact been those of latest acquisition, the "lower of cost or market" rule if applied to identifiable units would not (aside from any market write-down) entail a different treatment. The "last in, first out" method, however, extends its treatment to include the actual delivery out of inventory of goods replaced in such inventory by current purchases; in such case the method assumes, for the purpose of determining the cost of sales, that the goods delivered were those currently purchased.

We have been informed by the inventory sub-committee of the American Petroleum Institute that, of the larger oil companies, a number have accepted the recommendation of that Institute's board of directors, with respect to the "last in, first out" method, having either adopted the plan or resolved to adopt it; several of that number had, in fact, adopted it prior to such recommendation. At the most recent joint session of our committee with the American Petroleum Institute's sub-committee, on December eighteenth last, we found that considerable progress had been made by the representatives of the American Petroleum Institute in arriving at a consensus of views upon the matter; however, unanimity of viewpoint was still lacking.

As the director's resolution above-mentioned stated, the plan has been promulgated by the American Petroleum Institute in the form of a recommendation, the acceptance or rejection of which remains a matter for the determination of each member. The approval of that plan by the American Institute of Accountants is requested by the American Petroleum Institute, in the same view, namely that it be approved as applicable to those companies which elect to adopt it, leaving other methods equally open to

approval, as they may be found worthy of approval, in the case of those companies which do not elect to follow the "last in, first out" method.

Our committee, after careful consideration of the matter, have found themselves in agreement in reaching the following conclusion:

The "last in, first out" method for the valuation of oil company inventories, as recommended by the American Petroleum Institute, constitutes an acceptable accounting principle for those companies, which, finding it adaptable to their needs and views as correctly reflecting their income, apply it consistently from year to year; it is important, however, that full and clear disclosure, in their published financial statements, be made by the companies adopting it, both as to the fact of its adoption and the manner of its application, including information as to the period adopted for the unit of time within which the goods "last in" are deemed to be the "first out," that is, whether the fiscal year or a shorter or longer period.

Since the method as outlined by the committee of the American Petroleum Institute requires that the valuation to be placed upon the inventory be "conservative or reasonable," without, however, providing for a uniform standard or common basis in the determination of such valuations, it must be understood by readers of the financial statements of companies adopting the method that the inventory valuation of one such company is not to be regarded as comparable with that of another, except only in so far as the current replacement valuation, required to be disclosed when less than the valuations arrived at under the method, afford such a comparison.

The foregoing conclusion of our committee, however, does not preclude our viewing other methods as being either equally acceptable or preferable in the case of other companies where different conditions may prevail.

We present the foregoing, including the above-mentioned request of the American Petroleum Institute for approval of its plan, for the consideration of the appropriate governing body of our Institute.

Yours truly,

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