

12-1926

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Recommended Citation

Sanders, T. H. (1926) "Some Variations in Inventory Valuations," *Journal of Accountancy*: Vol. 42 : Iss. 6 , Article 3.

Available at: <https://egrove.olemiss.edu/jofa/vol42/iss6/3>

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Some Variations in Inventory Valuations

BY T. H. SANDERS

Cost or market, whichever is the lower, is still the most widely accepted rule for valuing inventories of raw materials, work in process and unsold finished stock. Under steady price conditions it is undoubtedly the safe and reasonable rule; moreover, there is very great advantage in a uniform and generally recognized practice, since no one is then left in doubt as to the basis on which this item has been determined and profits computed. But it is doubtful whether an item of such importance can be left to the arbitrary action of any single rule, and, as a matter of fact, there is very high business and accounting authority for modifications under certain conditions.

The present article consists in substance of a comparison between the practices of the National Lead Company, the International Harvester Company and the United States Steel Corporation, as shown by a study of their annual reports during the last fifteen years, but with special reference to the war period. Incidentally one gets an interesting contrast in methods of reporting to stockholders, and of certification by outside auditors as authority for published statements. The net result of this investigation is that a broad view of the subject of inventory valuation may well require substantial modification of the common rule, without resorting to measures too drastic for reasonable consideration. At the present moment, moreover, there seems to be some tendency for inventories to increase, and there is a possibility that accountants may again be confronted with a mild form of the problems which faced them in 1920.

NATIONAL LEAD COMPANY

The National Lead Company gives very little accounting information in its annual reports, offering practically no details concerning profit and loss, and very few comments on the balance-sheet. The annual reports from 1917 to 1925 inclusive contain no mention of any public accountant having seen their records or certified their accounts. This comment is not intended as a stricture; the entire series of reports creates an impression of solidity, cautious yet effective management, and a desire on the part of the directors to do their duty to their stockholders, their

employees and the public. Nevertheless, the adequate reporting and authentication of company results is of importance, and the National Lead Company is conservative in this respect.

From 1911 to 1913 no remarks are made on the inventory in the report. The 1914 report contains the statement, "Inventories have been taken on our usual conservative basis." In 1915 an item entitled "Metal reserve" appeared on the liability side of the balance-sheet to the amount of \$200,000. By way of explanation it was stated that this amount was to cover rises in the market prices of tin and antimony—rises which were then expected to be reversed in the near future. In 1916 this metal reserve was increased to \$300,000, and the same figure appeared in the 1917 report.

In 1916, 1917 and 1918, each annual inventory showed an increase of \$1,000,000 over the previous year. In the last-named year the metal reserve was accordingly increased to \$1,000,000, and reference was made in the report to the necessity of keeping a minimum quantity of stock on hand, in order to do business. In 1919 a further million was added to the inventory, and in 1920 the increase was three and a half million dollars. It was at this point that the company printed in its annual report the statement that it had throughout the war valued lead, the main item in its inventory, at 3.4 cents a pound, the lowest price at which purchases were made during 1914. The explanation given was as follows:

Our normal-stock system of taking inventories has been followed in the preparation of this statement, with the exception noted below.

Prior to the war, the National Lead Company divided its inventories into normal stocks and excess above normal. The normal stocks were valued at the lowest price reached by metals in the year 1914. The excess above normal was valued at cost. The normal stocks never change—either in quantity or value placed thereon. The excess above normal varies in quantity and value according to the facts. In case of an encroachment upon the normal stock at any branch creating a deficiency, a reserve is created in the normal-stock inventory sufficient to buy the amount of such deficiency at the replacement value of the metal at that time—the first metal purchased being used to make good the deficiency in the normal stock.

In fixing the amount of normal stocks, we determine the amount of metal (whether lead, tin, copper or antimony) in the following manner:

1. The amount of metal normally in transit to our factories.
2. The amount of raw metal necessary in the factories to prevent possible stoppage of manufacturing, due to transportation or other difficulties.
3. The amount of metal in process of manufacture, which in case of white lead extends over several months.
4. The amount of manufactured products necessary to be carried in stock at factories and warehouses, in order to make prompt deliveries.

The result is that about 80% of our total inventories is in normal stocks. Inasmuch as the purchases of raw materials from month to month approximately equal our sales of metal in the form of manufactured products from month to month we adopt the fiction:—that the metal sold in the form of

Some Variations in Inventory Valuations

manufactured products during any given month was made out of the metal bought during that month, and the normal stock is never touched, and our inventories, therefore, are valued at cost.

For all practical purposes, the normal stock is like a piece of machinery which the company has to have always on hand in order to operate. When the price for pig lead, for instance, went to 11 cents a pound, the National Lead Company could not make an actual profit thereon without selling its normal stocks but, in that event, it would either have to buy back such normal stocks at the then market, or go out of business. In the latter case, it would lose the value of its goodwill and the cost of the marketing, which would be far greater than any possible profit on sale.

This being true we do not deceive ourselves by marking up inventory values and taking book profits, upon which we could not realize, to be followed later by book losses of like amount. Bookkeeping is likely to affect policy. By taking book profits on ascending markets of raw material, a company is likely to be led into extravagance and wastefulness. On the other hand, book losses during a period of declining market are likely to be discouraging and may become embarrassing. Our stockholders are also likely to be deceived by apparent high earnings followed by severe losses, if such book profits and losses are reported in our published statements.

The advantage to the company of this safe and conservative method of taking inventories has been made manifest during the last few years. For instance, the market price of pig lead advanced from the low price of \$3.40 per hundred pounds, at which our normal stock of lead is inventoried, to \$11 (or higher) during the war years, and on December 31, 1920, it had fallen to \$4.75. Inasmuch as we have never taken any book profits, we do not now have to take any book losses. It would have been just as reasonable to mark up the value of our plants and machinery to the replacement value thereof during the war years (with a consequent showing of book profits), and then write them down to present replacement values (with a consequent showing of book losses), as to make similar variations in our normal stock.

Of course, as to our excess above normal stocks—which have always been inventoried at actual cost until written down to the market on December 31, 1920—we have like all others who have inventoried at market or cost (whichever is lower), made profits and losses. But these, while serious, are relatively unimportant.

Because of the unusually rapid and pronounced decline in the market price of metals at the close of the year, it was deemed prudent to create additional normal stocks where needed, and inventory all excess above normal stocks at market instead of at cost. Inasmuch as the normal-stock system of inventory, as above described, automatically creates in itself a metal reserve, the metal reserve of one million dollars—created in 1918—was used for this purpose, as originally intended.

The significance of this policy may be gathered from the two tables given on pages 432 and 433. From the 1922 report one learns that the "normal stock" of lead had been 80,000 tons; the net effect is, therefore, that the inventory has been written down from the usual cost or market basis by the difference between 3.4 cents a pound and current prices, multiplied by 80,000 tons. For purposes of this computation the average annual prices for pig lead have been used,* which are doubtless a fair approximation to what cost or market would be in any one year.

*Bureau of labor statistics, Bulletin No. 367, pp. 144-5.

TABLE I
Showing adjustment of inventories of National Lead Company from normal to "cost or market"

	Lead basic inventory at lowest 1914 price	Average market price for year (cents)	Basic inventory at the year's average price	Excess over basic value	Total inventory as reported	Total inventory adjusted
1913.....	\$5,440,000	4.4	\$7,040,000	\$1,600,000	\$7,300,000	\$8,900,000
1914.....	5,440,000	3.9	6,240,000	800,000	7,200,000	8,000,000
1915.....	5,440,000	4.6	7,360,000	1,920,000	6,300,000	8,200,000
1916.....	5,440,000	6.8	10,880,000	5,440,000	7,300,000	12,700,000
1917.....	5,440,000	9.1	14,560,000	9,120,000	8,200,000	17,300,000
1918.....	5,440,000	7.4	11,840,000	6,400,000	15,000,000	21,400,000
1919.....	5,440,000	5.8	9,280,000	3,840,000	16,000,000	19,800,000
1920.....	5,440,000	8.1	12,960,000	7,520,000	19,600,000	27,100,000
1921.....	5,440,000	4.6	7,360,000	1,920,000	20,600,000	22,500,000
1922.....	5,440,000	5.8	9,280,000	3,840,000	19,600,000	23,400,000

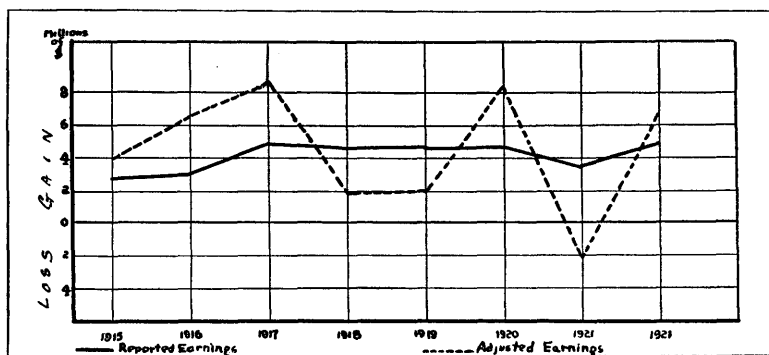
Some Variations in Inventory Valuations

TABLE II
Showing corresponding adjustment of profits

	Reported net earnings	Excess over value	Net profits inventory at average market
1914.....	\$2,500,000	\$800,000	
1915.....	2,700,000	1,920,000	\$3,820,000
1916.....	3,000,000	5,440,000	6,520,000
1917.....	4,900,000	9,120,000	8,580,000
1918.....	4,700,000	6,400,000	1,980,000
1919.....	4,600,000	3,840,000	2,040,000
1920.....	4,700,000	7,520,000	8,380,000
1921.....	3,500,000	1,920,000	2,100,000 *
1922.....	4,900,000	3,800,000	6,780,000

* Loss.

The effect of these comparisons is shown graphically by the following chart:



National Lead Company: Reported net earnings, and net earnings adjusted to cost or market basis

In 1922 the report stated that the bureau of internal revenue had disapproved of the company's normal-stock method of valuing inventory, which necessitated submitting to the government revised returns, with inventories at cost or market, whichever was the lower. The report stated that in the long run this would make no difference in the amount of taxes payable. Most accountants understand, however, that on account of excess-profits taxes at varying rates, and also because of changes from year to year in the rates of taxation, the year in which income is

reported does make a difference in the amount of taxes paid over a series of years.

The 1922 report also stated that the metal reserve covers the excess costs on the inventory over and above the normal quantity; this means that the entire inventory, normal and excess above normal, was practically marked down to a pre-war basis.

Further arguments in favor of the company's normal-inventory method appear in the 1924 report. A table was appended to show the wide fluctuations in profits which would have arisen during the preceding fifteen months on the normal inventory of lead, now 96,000 tons. During the first three months increases in market prices would have given a profit of \$3,840,000; during the next three months precisely this amount would have been lost again. In the next eight months a profit of \$6,720,000 would have been made through increased prices, and over one-third of this would have been lost again during the next month. In the report of the following year the company stated that every one cent a pound change in the market price of lead meant \$2,000,000 to its inventory. The National Lead Company is still carrying its normal inventory of lead at the base price of 3.4 cents a pound, and to this extent eliminates price fluctuations in the computation of its profits.

An interesting comment on this situation was made by a well-known investment service, which stated that, as a result of the normal-inventory method, the company showed "no fancy book-keeping profits during the war period." One would like to know if the writer knew precisely what he meant.

INTERNATIONAL HARVESTER COMPANY

The International Harvester Company's experiment in stabilization through the inventory was not quite so thoroughgoing as that considered above. The Harvester Company began only in 1917; it used 1916 prices to value its "basic" (i.e., normal minimum) inventory, and abandoned this value in 1921 because current prices had gone below their base price. The figures of four years only, therefore, 1917-1920 inclusive, are affected, but the steadying effect on profits was almost as marked as in the case of the National Lead Company. The importance of the problem to the International Harvester Company may be judged by the fact that its inventory averages 60% of its an-

Some Variations in Inventory Valuations

nual sales. The following extracts from its reports will show the procedure:

December 31, 1916

Raw materials, work in process, and finished products were valued at cost, which was lower than market at December 31, 1916. In view of the rapid rise in raw-material prices and the uncertain conditions surrounding their future course, an addition of \$1,000,000 has this year been made to the inventory depreciation reserve, making the total reserve \$2,750,000, which amount has been deducted from the inventories.

December 31, 1917

Raw materials, work in process, and finished products are valued at 1916 inventory prices (being the actual cost of that year), which are adopted as a fair and stable basis for inventory valuations during the period of the war. In addition the company is carrying the general inventory reserve previously accumulated.

December 31, 1918

Note.—The "basic" inventory, representing a normal quantity of raw materials, work in process, and finished products, has been valued at 1916 inventory prices (being the actual cost of that year), which were adopted in 1917 as a fair and stable basis for inventory valuations during the period of the war. The "excess" inventory (that is, the quantity in excess of normal) has been valued at reasonable market prices. In addition, the company is carrying the general inventory reserve previously accumulated.

December 31, 1919

The "basic" inventory, representing a normal quantity of raw materials, work in process, and finished products, is valued at 1916 inventory prices (being the actual cost of that year), which have been adopted as a fair and stable basis for inventory valuations during the period of high prices. The "excess" inventory (that is, the quantity in excess of normal) is valued at 1919 cost or market, whichever is lower. The general inventory reserve of \$5,975,000 existing at December 31, 1918, has been utilized during 1919 in the disposition of war losses.

December 31, 1921

The rapid decline in market values during the year 1921 of the commodities entering into the company's products has resulted in price levels that make unnecessary the continuation of the "basic" inventory method of valuing inventories; therefore, raw materials and supplies, including purchases after the close of the manufacturing season, have been valued at cost or market, whichever was lower, at December 31, 1921. Work in process of manufacture and finished products have been valued at replacement cost, based on market values of raw materials and labor rates at December 31, 1921; such replacement cost being lower than the year's cost of production.

The situation was somewhat complicated by the fact that for part of this period there were two corporations, the International Harvester Company of New Jersey, and the International Harvester Corporation. The former did the domestic business, the latter the foreign business and some "new lines." The corporation sustained heavy losses in Europe through the war, and the two companies were re-combined in 1919, in time for the New Jersey Company's reserves to help to meet the corporation's losses.

Like the National Lead Company, the International Harvester Company met with no sympathy from the bureau of internal

revenue, and was required to file returns and pay taxes upon profits computed on the usual basis. The company's officers nevertheless expressed satisfaction with their experience, and said that they would do the same thing again in like circumstances. The adverse arguments of the bureau are stated in the following paragraph:

Valuation on "base stock" method: The base-stock method of taking inventory is not warranted by the law or regulations. According to this method, a manufacturer or dealer values at the same price year after year the minimum quantity of goods which he must have on hand at all times. It did not appear that this method had had any considerable recognition as the best accounting practice, but on the contrary, it was evident that it had not been widely adopted. A taxpayer who values his inventory at cost and who retains identifiable goods year after year may attain the results with respect to such identifiable goods which would be attained through the use of the base-stock inventory method. Goods which have been so intermingled that they can not be identified with specific invoices must, however, be deemed to be the goods most recently purchased because, in the absence of evidence as to the actual facts, this presumption is more nearly true than any other.—Adv. Bd. rec. 65, 1 C. B. 51.

The reports of the International Harvester Company contain the full certificate of public accountants, including specific explanation of the mode of valuing the inventories.

UNITED STATES STEEL CORPORATION

The United States Steel Corporation arrives at substantially the same results by a somewhat different process. Its reports are remarkable for their clarity and completeness; in the matter under discussion they may be distinguished from the two cases previously mentioned in that, while avoiding the valuation of inventories at inflated prices, the exact effect of the adjustment may be seen, and the balance-sheet and income statement adjusted to a cost or market basis if the reader so desires. In the case of the National Lead Company an approximation to this basis may be made, but not an exact adjustment; while any attempt to re-compute the International Harvester Company's position would be still more of an estimate. Moreover, both the balance-sheet and the income statement of the steel corporation are certified on their face by public accountants, in addition to the complete certification shown on another page, which clearly states the scope of the audit.

In the 1916 report the detailed inventory schedule shows \$13,500,000 deducted as "reserve for amount of actual cost or market value of stocks in excess of normal prices therefor." In the balance-sheet only the net figure, after deducting this reserve, is

Some Variations in Inventory Valuations

shown; in the condensed profit-and-loss statement the reserve is deducted as a special adjustment. The certificate of the auditors states that "an adequate reserve has been made in respect of all abnormal values."

In 1917 this reserve became \$30,000,000, in 1918, \$51,000,000, and in 1919, \$90,000,000. At this point the certificate discontinued the term "abnormal values" and stated that "a substantial reserve has been deducted from the values so determined," that is, at "approximate cost." In 1920 the reserve grew to \$95,000,000, still reported in the same way, and it was stated that this represented the excess of unit prices over similar prices at the close of 1915. In 1921 the reserve was reduced to \$61,000,000, and it was then described as being "set aside from earnings of previous years to absorb deflation in valuation in war period prices which may from time to time develop in respect to inventory items." In 1922 the reserve was reduced to \$50,000,000, and remains at approximately that figure in the last annual statement.

It is clear, therefore, that the balance-sheet might be adjusted by any interested person, by adding the stated amount of the reserve to the balance-sheet inventory figure and to the surplus. The income statement of any year might also be adjusted by adding to the net profits shown the change in the inventory reserve for that year. The only point on which we are not informed by the reports is whether or not the company's published income figures were accepted by the internal-revenue bureau.

CONCLUSIONS

The net effect of these three company studies is the indication that business men of the highest standing felt it necessary, in a period of inflation, to depart from the customary cost or market method of valuing inventory, and to reserve against such part of the increased value as they believed could not be permanent. What is more, accountants of the highest standing have certified these statements. The practice is at variance with the common accounting rule and is disapproved by the internal-revenue department. Accountants may, however, very well consider whether they can not better adapt their rules to the requirements of sound business, while so presenting the facts that the situation is perfectly clear to the reader. The basic method described above was permitted by the income-tax authorities in England, largely

because of their practice of averaging the profits of three years for the purpose of computing the taxable income. It may be that in due time our own internal-revenue bureau will become somewhat more elastic in this respect.

The suggestion that a minimum or normal inventory is a fixed investment of the same character as plant assets is ingenious, but not fully convincing. As the internal-revenue decision points out, there is a fundamental difference, in that the specific goods of the inventory are sold and replaced between annual reports, whereas the identical plant assets are retained. The bureau's suggestion that the identical goods of an inventory might be carried forward from year to year, and a company thus realize the benefits of the "normal inventory" method, is obviously futile. The question is one of broad business policy, and is not to be answered on a basis of simple arithmetic of this sort.

As in so many accounting difficulties, the real question is as to the period which should be covered by an income statement, in order to show truly the earnings of a business. If it be supposed that a period of inflation lasted for five years, at the end of which prices were at the same level as at the beginning, a single income statement covering the entire period would include no profit or loss arising from inventory changes; its income would come solely from selling goods for more than they cost. Interim income statements would, on the contrary, contain extra profits during the period of rising prices, with equal losses during the fall; the total net profits would be the same. But that does not mean that one can simply wait for time to iron things out; at any one point it is not known how soon, or to what extent, rises in prices will be reversed. Apart from tax considerations, the published reports should give the best possible guidance to stockholders who are thinking of selling their holdings during the fluctuations. Any computations as to the true net worth of a corporation, the value of its capital stock and its current ratios are certainly more enlightening when made upon information as given in the reports of the United States Steel Corporation, than they are if "cost or market" inventories alone are available. The net effect of the former presentation is that cost or market values are given for those who desire them, but a more permanent valuation is added, and is preferred. The one essential thing is that any departure from custom should be fully explained, and its effect indicated precisely, in order that no one may be misled in the intermediate stages.