

LIFO INVENTORY ACCOUNTING: EFFECTS ON CORPORATE PROFITS, INVENTORY-SALES RATIOS, AND INVENTORY INVESTMENT

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Changes in the rate of inventory investment have played an important role in the pattern of economic growth in the current recovery that began in early 1975. Though inventory investment accounts for only a small portion of gross national product, changes in the rate of activity in this sector have often dominated the influence exerted by all other components (final sales) of GNP on quarterly economic growth rates. Table I compares growth rates of inflation-adjusted GNP, real final sales, and changes in the rate of inventory investment over the last ten quarters. The dominant role of inventory investment is especially evident in each of the first and fourth quarters shown in the table. Reductions in the rate of change in business inventories in the fourth quarters of 1975, 1976, and 1977, respectively, have overshadowed strong gains in final sales and significantly moderated economic growth in those quarters. Conversely, increases in inventory building in the first quarters of 1976, 1977, and 1978 offset concurrent slowdowns in sales and led to higher GNP growth rates than would be indicated from total sales figures alone. Inventory behavior, therefore,

has been watched carefully as an indicator of prospective changes in aggregate economic output.

According to the generally accepted view, the most important factor affecting business demand for inventory stocks is the expected rate of business sales.¹ When sales are expected to increase, firms generally increase their accumulation of inventories. A slowdown in expected sales, on the other hand, usually leads to a slowdown in inventory investment. The ratio of inventories to sales (I/S), consequently, is frequently used by managers and economic analysts as a rough measure of the adequacy of business inventories relative to the level of sales. Chart 1 shows the historical relationship between book value inventories to sales ratios since 1960 for the manufacturing sector separately and for all manufacturing and trade combined. Each series suggests that fairly lean inventory stocks were maintained in 1977 relative to sales levels (i.e., I/S ratios appeared to be below historical averages). This knowledge would seem to support expectations that inventories may increase relative to sales in the near term.

This article describes a recent significant shift in accounting methods used to value business inventories that has been encouraged by the severe inflation of the 1970's. In an effort to remove inflation-related inventory profits from corporate profit statements, businesses have increasingly taken advantage of an industry accounting option granted 40 years ago. The switch from FIFO (first in-first out) and other related inventory accounting methods to LIFO (last in-first out) eliminates unrealized inventory profits and appears to be a rational response by business to an inflationary environment.

The switch to LIFO accounting, however, has also resulted in a change in the manner in which a portion of ending inventories are reported on corporate balance sheets. Inflation causes LIFO inventories to be biased downward and this problem is exacerbated as LIFO usage increases. Present aggregate inventories may be understated, therefore, upsetting the

Table I
**INVENTORY INVESTMENT, REAL FINAL SALES,
AND REAL GNP**

	Inventory Investment ¹	Change In Inventory Investment ¹	Real Final Sales ²	Real GNP ²
1975 IV	- 4.6	- 7.5	+5.6	+3.0
1976 I	+ 9.7	+14.3	+3.9	+8.8
II	+12.1	+ 2.4	+4.3	+5.1
III	+13.8	+ 1.7	+3.3	+3.9
IV	- 1.8	-15.6	+6.3	+1.2
1977 I	+ 9.7	+11.5	+3.8	+7.5
II	+13.2	+ 3.5	+5.1	+6.2
III	+15.7	+ 2.5	+4.4	+5.1
IV	+ 8.7	- 7.0	+6.1	+3.8
1978 I	+14.7	+ 6.0	-1.7	0.0

¹ Billions of 1972 dollars, annual rate.

² Quarter-to-quarter compounded annual rates of change, 1972 dollars.

Source: Department of Commerce, Bureau of Economic Analysis.

¹ For a discussion of the determinants of inventory investment and its influence on gross national product, with special reference to the present business cycle, see [18] and references cited in that paper.

historical comparability of I/S ratios. The article then examines whether explicit recognition of inventory accounting techniques used by business enriches understanding of recent quarter-to-quarter inventory swings. Before these effects of the LIFO method of inventory accounting are discussed, however, the impacts LIFO and FIFO have on corporate profit statements and balance sheets, respectively, are first described and the economic incentives for a switch to LIFO are explored.

FIFO and LIFO Defined FIFO and LIFO have substantially different ways of allocating inventories purchased over time at different prices to corporate balance sheets and income statements. FIFO accounting charges the cost of the first, or earliest, inventory acquired against current revenue for purposes of measuring corporate profits. Because of this, it is referred to as a historical cost accounting technique. During inflationary times the cost of goods sold, therefore, often reflects the lower inventory prices experienced in earlier periods. The cost of the unsold (most recently acquired) inventory is carried forward to the next accounting period. FIFO

inventories on balance sheets, therefore, are valued at price levels prevailing relatively near the time when accounts are closed.

The LIFO inventory valuation method exactly reverses the FIFO treatment of inventories. The last, or most recent, inventory costs incurred are charged against current revenue in profit reports of firms using LIFO. These costs approximate the replacement cost of inventory sold during the period. Cost of goods sold with LIFO, therefore, is based on the advanced prices of inventory most recently purchased. Ending inventories on balance sheets are carried at the (lower) acquisition costs of earlier periods. Some LIFO inventories could conceivably remain on balance sheets perpetually.

From the above, it is clear that the inventory valuation method a business chooses can affect both its reported profit and stock of inventory during periods when prices are changing. During a severe inflation, as experienced in this decade, FIFO reports lower cost of goods sold and, therefore, higher profits than the LIFO accounting method. The entire difference, however, is attributable solely to inventory price changes and is generally referred to as inventory

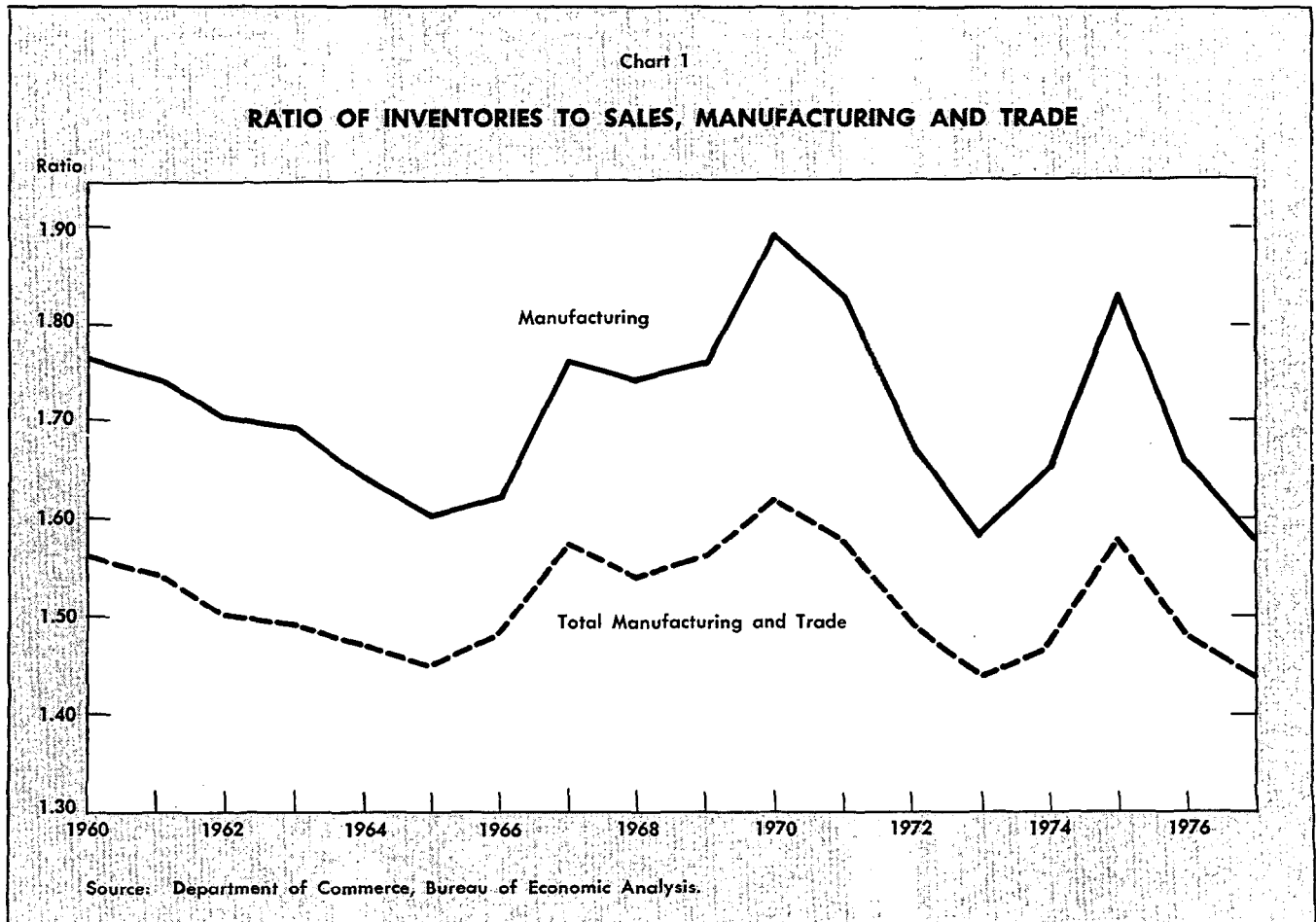


Table II

TOTAL CORPORATE PROFITS, TAXES, DIVIDENDS, AND UNDISTRIBUTED PROFITS

Year	Corporate Profits (Before Tax)				Tax Liability	Corporate Profits (After Tax)			Undistributed Profits	
	Reported	IVA ¹	CCA ²	Adjusted		Reported	Adjusted	Dividends	Reported	Adjusted
1972	96.2	-6.6	2.5	92.1	41.5	54.7	50.6	24.6	30.0	26.0
1973	115.8	-18.6	1.9	99.1	48.7	67.1	50.4	27.8	39.3	22.6
1974	126.9	-40.4	-2.9	83.6	52.4	74.5	31.2	31.0	43.6	0.2
1975	123.5	-12.0	-12.2	99.3	50.2	73.4	49.1	32.4	41.0	16.7
1976	156.9	-14.1	-14.7	128.1	64.7	92.1	63.4	35.8	56.3	27.6
1977	171.6	-14.6	-17.2	139.8	69.1	102.5	70.7	41.2	61.3	29.5
TOTAL	790.9	-106.3	-42.6	642.0		464.3	315.4		271.5	122.6
Percent Change 1972-1977						87.4	39.7		104.3	13.5
Average Percent Change Per Year						17.5	7.9		20.9	2.7

¹ The Inventory Valuation Adjustment reflects the total inventory profits of firms using accounting methods other than a replacement cost basis.

² Capital Consumption Adjustment.

Source: Department of Commerce, Bureau of Economic Analysis.

profits. In an effort to eliminate inventory profits, many businessmen have shifted inventories to the LIFO method. The next section will briefly discuss inflation's impact on corporate profits and will look at the potential adjustment provided by a mass shift to LIFO.

Inflation's Effect on Profits A great deal of attention has been given the subject of inflation accounting in recent years by accountants, financial analysts, and economists. General agreement exists on the desirability of adjusting financial reports and the National Income Accounts for inflation's impact on the valuation of business inventories and fixed capital assets (plant and equipment, etc.) depleted in the production process.² The Inventory Valuation Adjustment (IVA) was adopted by the Department of Commerce for the National Income Accounts in 1947 to adjust aggregate corporate profits for differences between the valuation of inventories reported on a historical cost basis and the cost at which inventories are replaced. In addition, the Internal Revenue Service has allowed individual firms to achieve essentially the same effect for tax purposes since

² This is consistent with Pigou's capital-maintenance definition of income. "From the joint work of the whole mass of reproductive factors there comes an in-flowing stream of output. This is gross real income. When what is required to maintain capital intact is subtracted from this there is left net real income" [12]. Fellner adds that "using up physical capital plus replacing it involves no realization, and hence any gains or losses developing from this practice should not enter into the tax base" [5].

1939 by reporting inventories valued by the optional LIFO method. The Capital Consumption Adjustment (CCA), first applied to the National Income Accounts in 1977, attempts to remove from aggregate corporate profits the difference between original cost depreciation of capital actually reported by business and replacement cost depreciation. Businesses have no such depreciation option for purposes of tax computation, however, and many observers argue that accelerated depreciation methods that are acceptable currently do not adequately reflect replacement costs. General agreement on the need for a more appropriate accounting method for physical assets is accompanied, however, by controversy over the "best" accounting technique to accomplish this purpose.³

The appropriateness of inflation-adjusted values for financial liabilities is even more controversial.⁴ Some analysts argue that an inflation-adjusted tax

³ Alternative techniques are discussed in some of the references listed at the end of this article. See, in particular, [2, 3, 4, 5, 7, 8, 10, 15, 19, 20, and 21].

⁴ A major point of controversy over this subject is whether profits are to be measured (and taxed) on an accrual or on a realization basis. At issue is the point at which income should be registered. Should income be acknowledged at the time the market value of an asset (liability) increases (decreases), or only when these changes in value are actually converted into cash? Present accounting practices embody a combination of these principles. For discussion of the issues involved, see [5, 9, 15, 16, and 21]. This and other issues in the inflation accounting literature are complex and beyond the scope of this article.

Table III

NONFINANCIAL CORPORATE PROFITS, TAXES, DIVIDENDS, AND UNDISTRIBUTED PROFITS

Year	Before Tax					After Tax			Undistributed Profits	
	Reported	IVA	CCA	Adjusted	Tax Liability	Reported	Adjusted	Dividends	Reported	Adjusted
1972	75.9	-6.6	2.5	71.8	33.6	42.3	38.2	21.6	20.7	16.6
1973	92.7	-18.6	1.9	76.0	39.6	53.1	36.4	23.8	29.3	12.6 [*]
1974	102.9	-40.4	-2.9	59.6	42.4	60.5	17.2	30.2	30.3	-13.0
1975	102.3	-12.0	-12.2	78.1	40.7	61.6	37.4	28.9	32.7	8.5
1976	130.5	-14.1	-14.7	101.7	53.4	77.1	48.3	32.4	44.7	15.9
1977	141.8	-14.6	-17.2	110.0	57.3	84.5	52.7	38.2 ¹	46.3	14.5

¹ Preliminary figure.

Source: Department of Commerce, Bureau of Economic Analysis.

system must recognize as taxable income the *accrued* capital gain on the decline in the real value of net corporate debt caused by inflation [e.g., see 1, 16, 21]. Inflation adjustment of financial liabilities has not received as much attention as adjustments for physical assets and no allowance for debt revaluation is presently incorporated or required in the National Income Accounts or corporate income statements.

Table II gives the Commerce Department's estimates of the overstatement of corporate profits due to inflation since 1972.⁵ Total corporate profits before and after taxes are shown along with official estimates of adjustments necessary for inventory profits and underdepreciation of fixed capital. According to these figures, inventory profits and underdepreciation led to an overstatement of corporate profits for tax purposes by \$150 billion over the last six years. The IVA corrects for over two-thirds of this total overstatement although underdepreciation has become the larger factor over the last three years. Subtraction of dividends paid to stockholders from after-tax profits reveals that the burden of the inflation distortion is borne by retained earnings.⁶ This burden is actually understated by the figures in Table II, which are in current dollars and, therefore, do not reflect the erosion of the purchasing power of these funds.

In effect, then, inflation raises the tax burden on business, depriving investors of the ability to recover the real value of used-up physical capital without being taxed on that recovery. Fellner, Clarkson, and

⁵ These figures include no attempt to adjust the value of corporate debt for inflation.

⁶ Inclusion of an estimate of reduction in real indebtedness due to inflation, it has been claimed, reduces the overstatement of internally generated funds in corporate accounts [21].

Moore feel inflation introduces "unlegislated taxation of capital" and "reduces the incentive to invest" [6, p. 3]. The combined effects of inflation, namely, increasing effective tax rates on capital⁷ and the erosion of an important source of funds available for investment, therefore, have adversely affected business investment in recent years.

Table III shows that the experience of nonfinancial companies has been even worse than that evidenced for all corporations. Excluding financial companies, the greatest distortion in business profits occurred in 1974 when inflation hit double-digit levels. For that year alone, after-tax profits and retained earnings of nonfinancial companies were overstated by \$43.3 billion. In 1974, nonfinancial companies actually paid out in taxes and dividends more than their *realized earnings*.

The LIFO accounting method yields adjustments in reported earnings equivalent in size to the IVA when physical inventories are increased or unchanged and something less than the IVA when physical inventories are liquidated.⁸ The size of the IVA and the behavior of aggregate real business inventories suggests the application of LIFO accounting to all inventories could perhaps have reduced reported aggregate corporate profits by as much as \$90-\$100 billion over the 1972-1977 period. Proportionate reductions in taxes and dividends paid could have

⁷ Considerable evidence has been presented that supports the view that the net effect of inflation has been that the annual net return on capital, defined as the sum of inflation-adjusted profits and the actual net interest paid, has been subject to higher effective corporate income tax rates the higher the rate of inflation [e.g., 6, 11, and 20].

⁸ When physical stocks decline during an inflationary period, an IVA is required also for a portion of inventories valued on a LIFO basis, since some inventories sold are not carried at replacement cost but in terms of prices of prior periods [13].

significantly improved actual cash flow. Corporations, it appears, had a powerful incentive, therefore, to utilize the LIFO option during the last several inflation-plagued years.

The Switch to LIFO A significant increase in the use of LIFO inventory accounting has, in fact, taken place in recent years. The Department of Commerce estimates that the proportion of total manufacturing inventories valued on a LIFO basis doubled in 1974 and has stabilized at approximately 33 percent since that time.⁹ Table IV shows the results of an annual survey of inventory valuation methods used by 600 major U. S. companies. Over 50 percent of these companies used LIFO for some portion of their inventories in 1974, more than twice the number reporting LIFO usage in prior years. This proportion has increased slightly since 1974. Nevertheless, many firms do not make use of LIFO at all and most who do only apply it to a portion of their inventories. The interesting question, in light of the apparently large tax-saving and liquidity benefits accruing to LIFO users, though, is why the large majority of firms still value inventories with accounting methods that do not remove the effect of inventory price changes. Apparently, other considerations have limited the switch from FIFO to LIFO.

LIFO's Disadvantages There are several consequences of using LIFO that appear unattractive to management thereby prompting firms to retain usage of historical cost methods of inventory accounting. Perhaps the most important consequence is that earnings per share reported by LIFO firms are usually lower than they would be through alternative accounting methods. Per share earnings or earnings on total assets remain important performance yardsticks for management and stockholders. LIFO accounting may lead to smaller dividends to stockholders and smaller bonuses and salary increases to corporate management since each are usually tied to profit performance. Management, as well as owners, therefore, may be reluctant to switch to LIFO unless the firm has a strong underlying liquidity need.

Secondly, LIFO's potential benefits to individual firms may be reduced or even eliminated during periods when inventory prices are falling. Certainly, on an aggregate basis, inventory prices have risen uninterruptedly in the 1970's. Some materials and

⁹ Source: John C. Hinrichs, U. S. Department of Commerce, Bureau of Economic Analysis. In inflation adjusted terms, the figure is probably now in excess of 40 percent [14].

Table IV
USE OF LIFO BY 600 MAJOR COMPANIES

	1972	1973	1974	1975	1976
Total companies surveyed	600	600	600	600	600
Firms using LIFO for a portion of inventories	150	150	303	315	331
Proportion of firms using LIFO	.25	.25	.51	.53	.55

Source: Accounting Trends and Techniques, American Institute of Certified Public Accountants, annual editions.

commodities (e.g., agricultural products), however, have been subject to large declines in price at times. In the case of falling inventory prices, LIFO charges the *lower* priced items to cost of goods sold—resulting in higher profits, higher taxes, and less cash flow than FIFO accounting.¹⁰ In brief, the use of LIFO during times when inventory prices are falling may *overstate* taxable profits, thereby increasing tax liabilities at a time the firm can least afford it.

A third factor perhaps limiting the potential benefits of LIFO to some individual companies is operational when inventories are liquidated. When inventories are being drawn down and LIFO is used, cost of goods sold include some inventory purchased and carried on the firm's accounts at earlier (lower) prices. LIFO would still report lower profits and, therefore, result in tax savings and an improved *realized* cash position compared to FIFO when inventories are liquidated. The discrepancy between reporting methods, however, is reduced in this situation. The incentive to switch to LIFO is partially reduced, therefore, for firms carrying excessive inventories.

Management presumably weighs the pluses and minuses of alternative accounting techniques and assesses their likely impacts on firm operations. Though LIFO has obviously reduced tax liabilities and improved cash flow for many firms in the inflationary 1970's, it does not necessarily follow that all firms would be similarly benefited. In addition, the adverse impact LIFO has on reported profitability is apparently judged by many firms to be too high a price to pay for improved corporate liquidity. These

¹⁰ This situation could result in an inverse relationship between sales and reported profits. If sales increased to the point where higher-priced inventory began to be used up, these additional sales would actually produce lower profits if the product price fell with the cost of inventory. Only if inventories are liquidated would the resultant capital losses on inventory stocks be realized. Conversely, when inventory inflation exists, inventory liquidation is a prerequisite to the realization of capital gains on inventory stocks.

firms, accordingly, have decided not to switch to LIFO.

Impact of a Switch to LIFO on Ending Inventories and I/S Ratios The method by which inventories are valued affects the reported book value of inventory stocks and, thus, I/S ratios. Since I/S ratios are sometimes used by managers and analysts as a measure of the adequacy of inventories relative to the level of sales, recognition of the accounting impact is essential. Sales reflect current period prices while the book value of ending inventory can report either earlier, lower prices (LIFO) or more current, higher prices (FIFO). LIFO accounting would report lower inventories and I/S ratios than FIFO with the same size of physical inventories. During an inflationary period, therefore, LIFO results in a downward bias in I/S ratios.

The impact a switch from FIFO to LIFO will have on the value of ending inventories depends on the following factors: (a) the rate of inventory price change, (b) the percentage of total inventories valued on a LIFO basis, (c) the length of time LIFO has been used, and (d) the change in the physical stock of inventories.

Regarding the first of these factors, LIFO and FIFO will report identical inventory stocks in a non-inflationary environment. If inventory has not experienced price increases, the book value of inventories and I/S ratios will not differ whether FIFO or LIFO is used. This would be true for individual firms or for the aggregate economy. Periods of price stability, however, have not been evident in recent years. As prices rise, other things remaining constant, LIFO accounting results in relatively smaller reported inventory stocks and, therefore, smaller I/S ratios than FIFO. The greater the inflation experienced, the larger will be the discrepancy between accounting methods.

The proportion of total business inventories valued using LIFO also affects the book value of reported inventories. Given inventory price inflation, the larger the percentage of LIFO inventories, the greater the downward bias in the I/S ratio. It follows, therefore, that if a significant portion of aggregate inventories are switched from FIFO to LIFO, the divergence is enlarged following the switch. This will adversely affect the direct comparability of inventory levels and aggregate I/S ratios over time.

The length of time LIFO accounting has been used for a portion of inventories is another factor that complicates comparisons of I/S ratios over time. With inventory inflation, the discrepancy in reported

inventories between FIFO and LIFO is cumulative. Some LIFO inventories may continue to be carried at purchase prices prevailing several years earlier. Those inventories will differ from replacement cost in relation to inventory price increases experienced in each of the intervening years.

Finally, the change in physical inventories during the period affects reported inventory stocks and I/S ratios. If inventory stocks are increasing or remain unchanged, physical inventories do not turn over and LIFO inventories may reflect inventory prices incurred several years earlier. Only if inventory stocks are being liquidated are some of the low price LIFO inventories removed from balance sheets. FIFO inventories are not affected in this manner.

A shift in inventory accounting methods alone, therefore, can result in sizable differences in reported inventories across several inflationary years. Table V illustrates the magnitude of the effect of a change in inventory accounting on reported inventories of a sample of department stores that maintained dual inventory records from 1940-1947.¹¹ The average annual reduction in ending inventories due to LIFO accounting was 4.6 percent. Further, the use of

¹¹ This was a period of serious inflation, comparable to the 1970's.

Table V
EFFECT OF LIFO ON END-OF-YEAR INVENTORY OF 18 OPERATING DEPARTMENT STORES¹

1940-1947
(Dollar figures in thousands)

Year	Inventories		Annual Reduction in Inventories Arising from LIFO		Cumulative Reduction in Inventories Arising from LIFO	
	Lower of Cost or Market ²	LIFO	Amount	Percent	Amount	Percent
1940	\$ 63,441	\$ 64,896	(\$ 1,455)	(2.3)	(\$ 1,455)	(2.3)
1941	86,349	81,159	6,645	7.7	5,190	6.0
1942	84,423	73,064	6,169	7.3	11,359	13.4
1943	87,257	73,060	2,838	3.3	14,197	16.3
1944	83,918	66,380	3,341	4.0	17,538	20.9
1945	97,485	77,186	2,761	2.8	20,299	20.8
1946	138,562	108,387	9,776	7.1	30,075	21.7
1947	148,186	107,906	10,205	6.9	40,280	27.2

¹ LIFO was applied to at least 75 percent of total inventories for all companies.

² Approximates FIFO except for 1940.

Source: John B. Stevenson, *Methods of Inventory Valuation and Their Effect on Balance Sheets and Operating Statements*, 1952, p. 68.

LIFO resulted in a 27 percent cumulative reduction in the book value of inventories over the eight-year period. Although the proportion of inventories valued by LIFO in this sample is considerably higher than presently applicable to the business sector as a whole, the example clearly illustrates the extent to which a switch to LIFO can alter the book value of inventories over time.

The exercise presented in Table VI cautions against the intertemporal comparison of I/S ratios when LIFO accounting is used for an increasing proportion of inventories. The inventories *switched* from FIFO to LIFO in 1974 alone are estimated to have reduced corporate profits by \$9 billion.¹² This represented approximately 3.4 percent of total business inventories that year. Assuming total inventories using LIFO doubled in 1974 (as they did in the manufacturing sector, see footnote 9), a rough estimate of the annual downward bias resulting from LIFO use *prior to* 1974 might approach three percent if inventory price increases were comparable. Table VI, however, is constructed assuming that the inventories already carried under LIFO prior to 1974 necessitate an annual upward adjustment of 1 percent in reported inventories to remove the downward bias in I/S ratios that LIFO inventories cause in an inflationary period. Similarly, following the switch to LIFO in 1974, a 2 percent annual adjustment in inventories is assumed necessary for 1975-1977.¹³

Reported I/S ratios, shown in Chart 1 and Table VI, suggest that businessmen were maintaining fairly lean levels of inventories relative to sales in 1977 when compared to earlier years. The table reveals, however, that the adjusted series describes an entirely different situation. Adjusted I/S ratios are, in fact, considerably higher than in 1972-1974. This exercise suggests that recently reported levels of business inventories may not be as lean as historical comparisons of unadjusted I/S ratios indicate. The last column in Table VI also shows a different picture from unadjusted ratios when all inventories and sales are reported in constant 1972 dollars.¹⁴ Com-

¹² John C. Hinrichs, U. S. Department of Commerce, Bureau of Economic Analysis.

¹³ These assumed adjustments are for demonstration purposes only and do not claim to exactly adjust I/S ratios for LIFO's effects. The adjustments are thought to be conservative estimates, however. Smaller adjustments in 1972-1973 and 1975-1977 than 1974 reflect lower rates of inflation.

¹⁴ The first and last columns do not report identical figures for 1972 because some inventories under column 1 are reported using lower (pre-1972) inventory prices while sales are in 1972 dollars.

Table VI

ADJUSTMENT OF MANUFACTURING AND TRADE INVENTORY-SALES RATIOS

Year	Reported I/S Ratios ¹	Percent Annual Adjustment	Percent Cumulative Adjustment	Adjusted I/S Ratios	I/S Ratios 1972 Dollars
1972	1.50	1.0	1.0	1.52	1.62
1973	1.44	1.0	2.0	1.47	1.58
1974	1.47	4.4	6.5	1.57	1.70
1975	1.58	2.0	8.6	1.72	1.80
1976	1.48	2.0	10.8	1.64	1.67
1977	1.44	2.0	13.0	1.63	1.65

¹ U. S. Department of Commerce, Bureau of Economic Analysis was the source for data in first column.

parisons of unadjusted I/S ratios over extended periods, therefore, should be interpreted with caution following the switch to LIFO accounting.

FIFO, LIFO, and Inventory Investment Recognition of the increased proportion of business inventories valued using LIFO, in addition, may contribute to understanding the large swings in inventory investment that have occurred in the first and fourth quarters of recent years. Undoubtedly, the recent quarterly pattern of sales (strong in fourth quarters, relatively weak in first quarters) has been a prime determinant of the pattern of inventory investment. Larger-than-expected fourth quarter sales might lead to an involuntary reduction in inventory stocks in the same quarter. Conversely, weaker-than-expected first quarter sales might result in involuntary inventory building.¹⁵ Financial considerations that are affected by inventory accounting decisions, however, may also affect the decision to invest in inventories.

This section will examine whether any financial incentive is present that may induce firms to alter their quarterly inventory investment pattern. Table VII presents the operation of a hypothetical firm with three alternative assumptions concerning changes in inventories.¹⁶ In addition, in each case the statements are presented using FIFO and LIFO inventory valuation for comparison. The firm is assumed to have revenue of \$200 from the sale of 10 product units and a beginning inventory of 8 units valued at \$64. Increases in the cost of inventory are assumed

¹⁵ Some firms apparently use LIFO only in the fourth quarter. For the remainder of the year they report monthly inventory stocks using the FIFO method. This may contribute to the swing in inventory investment from quarter to quarter [14].

¹⁶ Table VII assumes the firm has no production costs other than purchasing inventory.

Table VII

FIFO, LIFO, AND INVENTORY INVESTMENT

	I. Declining Inventory Levels		II. Inventory Levels Unchanged		III. Increasing Inventory Levels	
	FIFO	LIFO	FIFO	LIFO	FIFO	LIFO
Sales	10@20	\$200	\$200	\$200	\$200	\$200
Beginning Inventory	8@8	\$ 64	\$ 64	\$ 64	\$ 64	\$ 64
Inventory Purchased During Period	4@10 3@12	\$ 76	4@10 6@12	\$112	4@10 8@12	\$136
Total Inventory Available		\$140	\$140	\$176	\$176	\$200
Ending Inventory:	FIFO: (5) 3@12 2@10	LIFO: (5) 5@8	FIFO: (8) 6@12 2@10	LIFO: (8) 8@8	FIFO: (10) 8@12 2@10	LIFO: (10) 8@8 2@10
	\$ 56	\$ 40	\$ 92	\$ 64	\$116	\$ 84
Cost of Sales	\$ 84	\$100	\$ 84	\$112	\$ 84	\$116
Gross Profit	\$116	\$100	\$116	\$ 88	\$116	\$ 84
Taxes @ 50%	\$ 58	\$ 50	\$ 58	\$ 44	\$ 58	\$ 42
Gross Profit After Taxes	\$ 58	\$ 50	\$ 58	\$ 44	\$ 58	\$ 42
Change in Cash (Sales - Inventory Purchased - Taxes)	+\$ 66	+\$ 74	+\$ 26	+\$ 44	-\$ 2	+\$ 22
I/S Ratios:	.28	.20	.46	.32	.58	.42

to occur during the period. Three different levels of inventory purchases are assumed: (I) seven units, reducing ending inventory to five units, (II) ten units, leaving ending inventory unchanged at eight units, and (III) twelve units increasing ending inventory to ten units. Within this framework, the impact of FIFO and LIFO accounting on ending inventory, cost of goods sold, profit, taxes, and cash flow can be examined.

Table VII demonstrates that FIFO allocates the highest cost inventories to ending inventory in the balance sheet and the lowest cost inventories are charged against revenues in the income statement. LIFO allocates inventories in reverse manner, with high cost inventories applied to cost of sales and the low cost inventories remaining in ending inventory. Consequently, in each case of assumed inventory purchases, ending inventories and I/S ratios are smaller with LIFO than with FIFO. Conversely, the cost of sales is larger with LIFO than with FIFO. In each instance, reported profits and taxes using FIFO are higher than those using LIFO. A portion of FIFO profits, however, are tied up in inventory and the cash is not available unless inventories are liquidated. The higher taxes paid on these inventory profits result in a less favorable cash flow position for the firm if it uses FIFO inventory valuation compared with the use of LIFO. It is in this respect that LIFO is claimed to more accurately

reflect profits available for distribution as dividends or to be put into retained earnings.

With FIFO inventory accounting, the firm's reported profits and taxes are not altered by the inventory purchase decisions depicted in Table VII. Its end-of-period cash position, however, is significantly improved by limiting its inventory investment—at least until after the statement closing date. This action may be necessary, for instance, to pay dividends to stockholders.

Greater flexibility is provided the LIFO user. Both profits and cash flow improve as the firm limits inventory purchases. A LIFO firm desiring to maximize reported earnings, reward shareholders with sizable dividends, and/or in need of internally generated cash would have a strong incentive to limit inventory investment. On the other hand, the firm could reduce its tax liability by additional investment in inventories, although this action would reduce reported profits and cash flow.

Inventory behavior, therefore, affects the cash position of the firm under both accounting methods. FIFO firms with end-of-year cash needs could, in part, satisfy those requirements by limiting inventory investment. A similar incentive is present for LIFO firms, although, at any given level of physical inventory, cash flow is already enhanced by the use of LIFO itself. LIFO firms are provided an extra incentive for limiting inventory, however—improve-

ment in reported profitability. It may be expected, then, that LIFO firms are especially likely to postpone inventory purchases until after financial statement closing dates. The incentives to limit inventory stocks, of course, would not induce a firm to reduce inventories to the point where sales were adversely affected by shortages.

The switch to LIFO inventory accounting, by reducing taxes, has generated additional cash flow for American business. To gain perspective on the relative magnitude of this potential boost to cash flow, it is contrasted with the gain resulting from a reduction in the corporate income tax rate to 45 percent from the hypothetical 50 percent applied in Table VII. Using case II (where physical inventory levels are unchanged), the tax rate reduction reduces taxes and increases after-tax profits by approximately 10 percent while it increases retained earnings by approximately 38 percent (\$26 to \$35.80). This is considerably less than the firm's percentage gain in cash from switching from FIFO to LIFO (from \$26 to \$44, almost 70 percent).¹⁷ LIFO

¹⁷ The results of comparisons between tax rate reductions and a switch to LIFO are highly dependent on assumptions concerning the firm's operation and the inventory inflation it faces. The comparison results in the text are for demonstration purposes only and should not be generalized.

reduces effective corporate taxes by approximately 24 percent in this case. Since LIFO reduces *before-tax* profits, it reduces taxes and increases cash flow for the individual firm to a greater extent than a small reduction in the corporate tax rate.

Summary Though the "best" method for inflation-adjusting corporate financial statements is a controversial topic, business presently can (if it so chooses) eliminate inflation-related inventory profits during inflationary periods. Though LIFO may not be attractive to all firms, most firms can reduce tax liabilities and significantly improve corporate cash flow through its use. Potentially, a major switch to LIFO accounting could result in a larger gain in retained earnings and might provide a bigger boost to business investment than a modest reduction in the corporate income tax rate. Examination of other effects of a switch to LIFO accounting suggests that it renders intertemporal comparisons of inventory-sales ratios hazardous and may increase the quarter-to-quarter variability of inventory investment. Failure to recognize these effects may impair forecasts of inventory investment and, therefore, GNP.

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