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6. LIFO

While the principles underlying LIFO are simple, its application for large firms is complex. Firms using the LIFO method have many options: the dollar value method versus the unit method; the number of pools or natural business units used to aggregate individual items; the options available for revaluing physical increments during the year—early prices, average prices or late prices; the fact that within a firm and even within a single plant some inventories may be valued by LIFO and others not; and the ways in which the required index number calculations are made by LIFO firms. There are many other variations. All of these complications pose difficulties in the interpretation of accounting data designated simply as LIFO.

FEATURES OF LIFO

Early accounting theorists developed a base stock method in which a certain amount of inventory was viewed as a permanent part of an operating firm's tangible assets. Under the same theory, which maintains the value of buildings and machinery at their historical cost, the base inventory of a business would be retained at its historical cost even though prices might rise. The effect of this is to value cost of goods sold at relatively current prices in calculating net income.

The base stock theory can be illustrated in the following way. A business starts with an inventory of 100 widgets which it considers part of its base physical capital and which it values at original cost. A few years later the business expands in some way, for example, through opening a new facility. It may then conclude that for its present size the base stock is no longer 100 but 150 widgets. An additional 50 units are stated in the balance sheet at present-year prices and retained at that value in succeeding years. This, it is argued, is the same as buying a capital asset in the first year of business at a given price and retaining it at historical cost. A few years later a second asset of the same type is acquired at a higher price and is retained on the balance sheet in succeeding years at that purchase price.

If a business were reexamined and a new base stock determined each year the system would become, virtually, the LIFO method. Each increment to the base stock would be essentially what is now called the LIFO layer for the year. In the early years after enactment of a tax on business income, IRS declared the base stock method unacceptable, and it still does.

The History of LIFO

LIFO also was unacceptable to IRS for many years. It was first adopted by some oil companies in 1934 and first authorized for tax purposes in the Revenue Act of 1938 only for certain raw materials used by tanners and the nonferrous metal industries. In the Revenue Act of 1939 these restrictions were removed and the LIFO method became available to all taxpayers. The provisions of the 1939 Act were later embodied in the 1954 tax code.

Neither the regulations and attitude taken by IRS immediately following the passage of the 1939 Act, nor price movements and effective tax rates at that time were conducive to the adoption of LIFO. IRS permitted a single procedure in which physical inventories of individual, narrowly defined commodities were matched at the opening and closing balance sheet dates. (This is now called the unit or the specific goods LIFO method.) Hence, the method was used sparingly, mainly in the oil, steel and meatpacking industries where the types of goods in inventory did not change much from year to year. However, with the beginning of World War II, prices began to move sharply upward and tax rates on business income were increased. Regardless of attitudes toward accounting theory, the substantial rise in tax liabilities was a strong incentive for adopting LIFO.

In the early 1940's, accountants developed the dollar value LIFO method, which focused on aggregate inventories, measured in base period prices through the use of price indexes, rather than on specific kinds of goods in inventory. From a practical point of view there was always a strong case for aggregation for firms buying and selling thousands of different items. The case for aggregation gained support during the war when shortages of specific types of goods were common. The dollar value method permitted a firm to combine, for example, all shirts in inventory so a depletion of white shirts could be offset by an increase in blue shirts before charging to cost of goods sold the earlier period prices of the white shirts.

IRS resisted the dollar value method until, as a result of a number of legal actions, the Tax Court approved its use in 1947. In the landmark *Hutzler* case¹ dollar value LIFO as an option within the retail method was accepted by the court and in the *Basse*² case dollar value LIFO was approved for general use.

¹*Hutzler Bros. Co. v. Commissioner of Internal Revenue*, 8TC 4683 1947.

²*Edgar A. Basse v. Commissioner of Internal Revenue*, 10TC 3370 1948.

Determining LIFO Pools

Tax Court rulings permitted groupings of products as dollar value pools for retailers and wholesalers. Although IRS issued regulations for trade activities, it did not issue regulations covering manufacturing and processing firms until 1961. In the 1948-61 interval it resisted attempts at broad poolings by manufacturing firms. Obviously, if extremely narrow pools are required, dollar value LIFO converges with the units method and the full tax advantage is not available. Once again the Tax Court in 1959 ruled against IRS in the *Klein Chocolate Company* case³ in which the firm filed as one pool against IRS opposition. Out of this case evolved the use of natural business units for manufacturing firms and broad product pools for trade firms.

At the present time the degree of latitude allowed in defining pools for many types of retail firms is well established because of procedures fixed for department stores in the early 1950's. An arrangement was made among department store representatives, IRS, and the Bureau of Labor Statistics under which BLS (with costs covered by department store trade groups) compiles price indexes for 20 departments for use in the dollar value LIFO version of the retail method. These in turn represent pools which may also be adopted by other types of retailers. (See table 6.1.) In other industry divisions the number of pools or natural business units appears to be negotiable between the taxpayer and the revenue agent. IRS con-

Table 6.1. LIFO POOLS USED BY
DEPARTMENT STORES

Piece Goods
Domestics and Draperies
Women's and Children's Shoes
Men's and Boys' Shoes
Infants' Wear
Women's Underwear
Women's and Girls' Hosiery
Women's and Girls' Accessories
Women's Outerwear and Girls' Wear
Men's Clothing
Men's Furnishings
Boys' Clothing and Furnishings
Jewelry
Notions
Toilet Articles and Drugs
Furniture and Bedding
Floor Covering
Housewares
Major Appliances
Radio and Television Sets

Note: For each of these departments Bureau of Labor Statistics compiles price indexes, which are acceptable to Internal Revenue Service for LIFO accounting.

Source: Bureau of Labor Statistics.

³*Klein Chocolate v. Commissioner of Internal Revenue*, 32TC 47164 1959.

tinues to opt for narrowly defined pools whenever possible, presumably in order to maximize tax revenues.

The Dollar Value LIFO Method

Under dollar value LIFO an entire stock is arranged into one or more pools or natural business units. Increases or decreases in stock are determined for the pool taken as a whole. A depletion requiring use of lower prices (usually) from an earlier period is needed only when there is a decline in the dollar value of the stock in base period prices for an entire pool.

A firm using LIFO typically takes its FIFO, average cost, or standard cost values as the point of departure for LIFO calculations. The following table is a hypothetical example in which A and B are the only two commodities in a manufacturer's pool:

End of Year	Inven- tory in Units	FIFO Value	FIFO Unit Price	Base Period Unit Price	Value of inventory in Base Period Prices
Year 1					
A	5	15	3	2.0	10
B	10	50	5	2.5	25
Total. .		65			35
Year 2					
A	4	16	4	2.0	8
B	14	112	8	2.5	35
Total. .		128			43

The first step in driving a LIFO value of inventory involves deflating the FIFO value of the stock to base period prices. Usually this is done with index numbers, but here the actual base period prices are given. During period 2, the value of total inventory in base period prices has increased by 8 (43-35); this addition or increment is referred to as a LIFO layer. The firm then reflates the change measured in base period prices to reflect the same change measured in current period prices. To simplify matters assume the firm uses most recent prices to obtain a reflating index. Then the FIFO values, which embody the most recent prices, may be used to obtain the reflating index.

$$\text{Reflating index} = \frac{128}{43} = 2.98^4$$

This index multiplied by the physical change in base period prices yields the physical change in current period (most recent) prices. That is,

$$8 \times 2.98 = 23.84, \text{ which is rounded to } 24.$$

FIFO inventories have increased by 63 (128-65). If it is assumed that LIFO inventory at the beginning of period 2 was 50, LIFO inventories at the close of year 2 are 74 (50 + 24).

⁴This is equivalent to a Paasche price index in which the quantity weights are 4 and 14 for commodities A and B, respectively, in period 2.

The LIFO reserve is the difference between a given physical stock valued at FIFO, for example, and at LIFO. The LIFO reserve in the example has increased by 39.

Period	Inventory Valued by		LIFO Reserve
	FIFO	LIFO	
End of period 1.	65	50	15
End of period 2.	128	74	54
Difference	63	24	39

The increase in the LIFO reserve is roughly equivalent to the inventory valuation adjustment (IVA) in the national income accounts. It is also the increase in gross profit that would have occurred had the firm calculated its profit on a FIFO instead of a LIFO basis.

The distinction between unit method LIFO and dollar value LIFO can be illustrated by the following example. Under the unit method items A and B must be treated separately. Since A had a reduction in stock of one unit, the reduction would be subtracted in ending prices of Period 1. On this basis the combined unit method LIFO change during Period 2 would be 29 rather than the 24 calculated under dollar value LIFO above. Profits would have been higher by five and taxes higher, depending upon the applicable tax rate.

Year 2	Unit Change During Year	Applicable Price	Period 2 Increment
A	-1	3	-3
B	4	8	32
Total.			29

Retail Method Approximating LIFO

This is a variant approach combining the retail method with the dollar value LIFO method. To apply the retail LIFO method, most steps in the cost alternative of the retail method (left bank of data in table 2.8) must be performed. Retail price indexes are required to reflate the opening and closing stock at retail value to base period retail value. Assume price indexes of 1.5 for the opening inventory and 2.4 for the closing inventory:

Period	Retail Value Inventory ¹	Deflating Index	Retail Value in Base Period Price
Opening.	16	1.5	10.7
Closing	35	2.4	14.6
Increase in retail value of inventory in base period prices			3.9

¹From table 2.8.

To reflate the 3.9 figure to reflect current period prices, the closing price index is used as a reflating index to obtain 9.4 (3.9×2.4). To reduce the current year addition to cost, 9.4 is multiplied by the ratio 0.40 (from table 2.8) = 3.7.

This procedure is essentially the same as the general dollar value LIFO procedure. The retail method of LIFO can yield different results from those obtained by the unit method or the general dollar value method.⁵

Pricing Options

In essence LIFO is a procedure by which the physical change in inventories during the year is valued at current prices. Since prices may be changing throughout the year it is necessary for firms to indicate to IRS how they are interpreting current prices. Usually when firms elect to use the LIFO method they must choose one of three bases for valuing increments: early (in the year) prices, average prices for the year, or late prices. Early prices give firms some time advantage in preparing financial reports.

LIFO Coverage Within Firm

When firms adopt LIFO they have many options as to what goods or costs to include. For example, a manufacturing firm may decide to place only one raw material under LIFO and leave all other raw materials under another method. In that case it may apply LIFO to the raw material in all stages of production or limit LIFO to the raw material stage. A steel consumer may apply LIFO to all purchased steel and to the steel content of goods being processed through the finished goods stage. A firm may place several important materials under LIFO or include all production materials. It may limit LIFO to materials and labor, or to materials, labor and all applicable overhead. It may even treat materials, labor, and overhead through the work-in-process stage, as one pool and finished goods as another pool. Alternatively, finished goods can be treated on a nonLIFO basis.

Retailers may have some of their merchandise under LIFO and others on a different method. For example, a large department store explained that while most of its departments were under LIFO, several remained on FIFO. The merchandise not valued under LIFO included items with rapidly changing styles or other forms of obsolescence. Since the IRS LIFO regulations prohibit the writedown of such goods to net realizable value, the store chose to remain on an accounting method that permitted such writedowns for vulnerable merchandise. This, of course, is an attempt to minimize tax liability by rational selection.

Index Numbers

Under the dollar value LIFO method index numbers are used to determine the inventory layer for each year. Generally

⁵A more formal arrangement of the retail method approximating LIFO, which also shows how inventory reductions are taken into account, appears in IRS Revenue Procedure 72-21.

speaking IRS accepts any of three methods of arriving at the requisite index numbers. In accounting terminology these are (1) double extension, (2) index method, and (3) link chain. Briefly,

- *Double extension* involves a full item-by-item calculation and special procedures devised to take account of items that are dropped out or newly entered into the stock.
- *Index method* permits the use of sampling or reference to outside sources. At the present time BLS indexes for most goods sold in department stores are the only outside sources permitted.
- *Link chain* focuses on the changing composition of the inventory. Only goods in stock at both the beginning and end of a year are used to compute the index. Items dropped or items added are omitted from the calculation.⁶

PROBLEMS IN CONSTRUCTING APPROPRIATE INDEX NUMBERS

Very little is known about the price index calculations employed by different firms using the LIFO method. The problems of constructing appropriate index numbers are little discussed in IRS regulations, in its training manual, or in other IRS sources that were reviewed.

Specifications and Shifting Mixer

First, in considering the problem of fixed specifications, it is essential that items with identical characteristics or identical specifications be priced from one date to the next. In computing the Wholesale Price Index and the Consumer Price Index the Bureau of Labor Statistics is careful to ascertain that products of the same specification are being priced. But, it appears that only in the case of automobiles does IRS call attention to the subject of product specification, referring to it as "unique to the auto business."⁷ But the problem is not at all unique to automobiles; it exists for many, possibly a majority, of products.

When specifications change from one year to the next, IRS instructs its agents to adjust automobile inventories by "costing-out quality change." Take, for example, the case of a standard model with a 6-cylinder engine. Assume the only change in the following year's model has been a switch to an 8-cylinder engine, and car prices have changed from 100 to 110 for that next year. The difference between the cost of a 6- and of an 8-cylinder engine is somehow to be determined and the 10 percent price difference must be adjusted by the difference in cost between the two engines. How IRS agents determine whether this is done properly, given that design

alterations are often much more complex and tend to occur simultaneously, would be interesting to ascertain. Economists have struggled with such problems for many years.

Knowing whether the quality-change problem is ignored for other products would also be of interest. The training manual does not mention the problem for other products. Note that individual firms can reduce their tax liabilities if the price indexes they have generated have upward biases. This is because under dollar value LIFO the whole stock is deflated but only the change in the stock in base prices is reflat. Thus, if estimated price indexes rise more than actual prices, the increment in both base and current period prices will be biased downward and the cost of goods sold biased upward; this would lower reported profits and taxes.

A second index number problem, closely related to that of fixed specifications, is the shifting mix within a category of goods. For example, when BLS develops its price indexes it obtains prices for narrowly defined items. These prices are weighted together to form an aggregate index. In calculating their inventory price indexes for dollar value LIFO, however, firms must include all or a representative sample of their entire inventory. From discussions with many business executives and accountants it appears that firms use relatively broad groupings rather than detailed specification pricing. The prices recognized in this process are often average unit values as opposed to specification prices. Unit values, of course, are vulnerable to shifts in mix among items even when detailed prices are unchanged.

Index Numbers and Productivity

Problems raised by productivity gains also require attention. This may be illustrated very simply. Suppose that in period 1 a unit of labor with a cost of five is needed to make a unit of output. The firm starts with zero inventory and at the end of the first year has:

Units of inventory	Cost
1	5

In the second year, labor rates rise to six, the ending stock is two units, and the firm adopts LIFO. The LIFO inventory becomes:

End of Year	Units	LIFO Cost
1	1	5
2	2	11

In the third year labor rates rise to seven and units in stock rise to three. However, productivity increases so that 0.9 units of labor produce one unit of output. Hundreds of units are produced and again only one unit is added to inventory. What is the LIFO value of inventory?

So far as can be determined from a review of regulations, IRS has not issued rules directly addressed to this problem.

⁶ A detailed description of the three methods is included in Internal Revenue Service, "LIFO Method of Inventory Valuation," *Training* (June 1976), p. 90, reprinted in *Standard Federal Tax Reports*, Vol. 63 (Commerce Clearing House, October 14, 1976).

⁷ IRS *op. cit.*, p. 160.

Gains in productivity are a fact of economic life in the United States but virtually nothing is known about industry practices that account for the impact of productivity gains on LIFO stocks. There are three possible answers to the third year value of inventory.

3.a	18
3.b	17.3
3.c	15.9

The logic of an answer of 18 (3.a) is that the LIFO method only relates to cost changes and a base period technology that is frozen. Since the cost of labor rose to 7 per unit, and the productivity gain is to be ignored, the LIFO stock is 11 (opening value) plus 7 for the current year layer.⁸

At the other extreme is 15.9 (3.c), where the inventory is viewed as a stock of labor inputs. The stock of labor has increased from 2 units to 2.7 units (3 units at 0.9 labor units per unit of output). The current year physical increment of 0.7 units of labor multiplied by a labor price of 7 gives a layer valued at 4.9 for year 3 and a LIFO stock of 15.9 (11 + 4.9). This result would be obtained if dollar value LIFO is calculated in the following routine way. The firm will open the third year as follows:

FIFO value	12
Less: LIFO reserve	1
Total LIFO value	11

With the productivity change, the FIFO value at the end of the year using ordinary FIFO procedure will be 18.9 (3 x 7 x 0.9). The base year price of 5 will give a deflating index of 1.2 (6/5) for year 2. If the price of a unit of labor without regard to productivity is used to compile the index for year 3, this would yield an index value of 1.4 (7/5). Then,

End of Year	FIFO	Index	Base Year Value
2	12.0	1.2	10.0
3	18.9	1.4	13.5
Increment in base prices . .			3.5
Reflated by 1.4			4.9

Assets	End of Period	
	2	3
FIFO value	12	18.9
Less: LIFO reserve	1	3.0
LIFO inventory	11	15.9 (3.c above)

The result given as 3.b (17.3) falls between the other two and is based on the logic that the old technology (or productivity) is frozen into the prior period LIFO value. For the new period, year 3, both the new technology and the new wage rate should be taken into account in costing the new layer. Hence the LIFO layer should be 6.3 (0.9 x 7) in period 3. In the mechanical performance of the dollar value procedure, this result would be obtained if the price index were derived not on the basis of wage rates per unit of labor, but on the basis of labor cost per unit output. The price index for period 3 would be 1.26 (6.3 ÷ 5) and deflating the stocks and reflating the change in base period prices would give 6.3 as the LIFO layer. The dollar value calculations are shown below:

End of Year	FIFO	Index	Base Year Value
2	12.0	1.2	10
3	18.9	1.26	15
Increment in base prices . .			5
Reflated by 1.26			6.3

Assets	End of Period	
	2	3
FIFO value	12	18.9
Less: LIFO reserve	1	1.6
LIFO inventory	11	17.3

As noted above, no references or discussions of this subject are found in IRS publications nor is it mentioned in well known accounting sources, aside from the Blakely-Thompson article referenced in footnote 8. Lack of knowledge of how productivity advances are handled in the actual computation of dollar value LIFO by business firms causes another element of uncertainty about the nature of data reported for statistical purposes by LIFO firms to various Government agencies.

SIGNIFICANCE FOR INVENTORY STATISTICS

The detailed aspects of LIFO considered in this chapter have a direct bearing on the measurement of business inventories. Use of options of early, average, or late pricing, for example, results in differing valuations among firms with the same physical changes in inventories. Given lack of detailed information in this regard, the validity of the assumption made by the Bureau of Economic Analysis that, on average, firms use average prices is questionable. As has frequently been noted in other connections, this assumption probably does not affect estimates of inventory change in most years but could lead to sizable errors in years of rapid price change.

The fact that firms may only use the LIFO method for some of their inventories also is important in interpreting LIFO

⁸This method is espoused by Edward J. Blakely and Howard E. Thompson in "Technological Change and Its Effects on Dollar Value LIFO," *Management Accounting*, August 1969.

data. In the absence of knowledge of which commodities are specifically covered by LIFO, BEA assumes the commodity composition of inventories under LIFO is the same as those not under LIFO. This is an assumption BEA should modify. In manufacturing it is highly probable that LIFO accounting is applied to basic raw materials in much larger proportions than to other inventoriable materials and supplies, work in process, or finished goods. However, materials whose prices fluctuate widely and goods which are susceptible to large price reductions at the end of a selling season are less likely to be under LIFO.

Another problem, the extent and nature of pooling under dollar value LIFO, affects the calculation of price change. This was demonstrated in chapter 4 in connection with aggregation problems.

This recitation of shortcomings argues for collection of more information about LIFO, even with the important new initiatives that have already been taken. Elsewhere in this study it is recommended that the Census Bureau undertake some new one-time surveys to fill information gaps posed by these and other problems. (See appendix A.)

ECONOMIC EFFECTS OF LIFO

Effect on Earnings and Taxes

During periods of rising prices, FIFO and similar methods result in recording inventory holding gains or capital gains as an element of book profits. Such profits are then taxed at the full corporate rate even when holding gains are unrealized. Even though firms can choose to use a LIFO or a nonLIFO method, the taxation of nonLIFO holding gains is a serious issue. Students of this subject are split in their views; some consider it appropriate taxation while others view it as confiscation of operating capital. An intermediate position is that such holding gains ought to be taxed at less than the full rate whether the firm uses LIFO or nonLIFO accounting. The subject is beyond the scope of this report.

It is useful to consider the impact of the LIFO method on earnings and tax liabilities and hypothesize the effect on tax revenues if LIFO were used by all firms or by none. Table 6.2 presents some estimates on the subject.

Line 1 shows book profits and includes profits of LIFO and nonLIFO firms. Line 2 represents book profits plus the inventory valuation adjustment (IVA). For the related line 5 it is assumed that an effective rate of 43.5 percent is the tax savings that would accrue to firms presently not on LIFO; allowance also is made for firms that would not be able to use the full reduction in profits for tax purposes. Line 3 was calculated by first estimating a LIFO proportion for corporations in each of the years. The corporate IVA in the national accounts was then inflated to what it would have been if no firms used LIFO. The assumption is that if LIFO firms were not on LIFO, the ratio of nonLIFO book profits to IVA would be the same as the corresponding ratio for nonLIFO firms. A 43.5 percent tax rate was applied in deriving line 6.

Table 6.2. ESTIMATES OF THE EFFECTS OF USE OF LIFO ON EARNINGS AND TAX LIABILITIES

(Billions of dollars)				
Subject	1973	1974	1975	1976
Profits of all industries:				
1. Book profits as reported.....	116	127	124	157
2. If all corporations used LIFO (book profits plus IVA)....	97	86	111	143
3. If no corporations used LIFO.....	121	163	130	164
Corporate tax liability:				
4. As reported.....	49	52	50	65
5. If all corporations used LIFO.....	51	34	45	59
6. If no corporations used LIFO.....	51	68	52	68

Source: Lines 1, 2 and 4 are taken from the Survey of Current Business. Vol. 57 (July 1977). pp. 50-51. The remaining lines are rough estimates made to illustrate the text.

The effects of using different accounting methods would be expected to be most pronounced in 1974, because 1974 was the year of a major shift to LIFO and of very high inflation. Had all firms used LIFO in 1974 they would have incurred tax liabilities about \$18 billion less than actual liabilities of \$52 billion. Had LIFO been banned by law, tax liabilities of firms then using LIFO would have been \$16 billion higher. The tax effect of LIFO in other years is more modest, but still totals several billions.

Effect on Balance Sheets

The use of LIFO grossly understates values of inventories reported on balance sheets. Although each year's change in inventory will be stated at current year prices if there is a physical increase—or at prices of the preceding year(s) if there is a decline—aggregate inventory values are understated. After firms have used LIFO for a number of years, reported values of inventory become nonsensical. At the end of 1974, for example, the balance sheet in the annual report to stockholders of Allegheny Ludlum showed the data in column (a).

Item	(Millions of dollars)	
	As shown (a)	Revised (b)
Inventory.....	226	316
Total assets.....	656	746
Shareholders' equity.....	304	394

In a note with the balance sheet, the amount of the LIFO reserve at the end of 1974 was reported as \$90 million. Had average cost and FIFO methods been used rather than LIFO the results in column (b) would have appeared in the body of the balance sheet.

Because inventories of LIFO firms appear in balance sheets at previous years' prices, sometimes 20 years old, the economic position of firms can be grossly distorted. In the case of Allegheny Ludlum, not an extreme case, true shareholders' equity would be increased by about 30 percent, if current values were placed on inventories.

The profits of Allegheny Ludlum, by recording the holding gain on inventory as profits may also be calculated.

Net earnings in 1974 reported to shareholders	\$45 million
Beginning LIFO reserve	29
Ending LIFO reserve	90
Increase in LIFO reserve	61 million
Net earnings on average cost and FIFO methods	106 million

Managing LIFO Inventories

The recent spread in the use of the LIFO method of valuing inventories sometimes causes business firms using the method to function in uneconomic ways. While it carries obvious tax advantages when prices are rising, stocks are rising, and there are substantial "profits" on inventory holdings to be reduced for tax purposes, LIFO may have perverse tax effects if stocks are depleted in a year when prices have increased. This is because a depletion is charged to cost of goods sold at prior year unit costs; if the depletion exceeds the addition made the year before, prices of two years earlier may have to be used. To avoid inflating profits by using such old prices, LIFO firms tend to "manage" their inventories. As the year ends, tax considerations may cause a LIFO firm to seek to avoid depletions by purchasing materials it might otherwise have waited some months to acquire. It has even been noted that firms have curtailed or accelerated sales, in efforts to manage their inventory.⁹

There are numerous ways in which uneconomic actions might be taken, aside from the obvious case in which depletions are avoided. To cite one example: Suppose a growing business which expects to increase its inventory for several years uses the LIFO method and refiles based upon earliest prices for the year. Assume the unit cost of the main material input is one per pound in the early part of the year and that is the price at which physical increments will be entered into the LIFO layer for the year. In August or September suppose the unit cost of the main material rises to two per pound and it is clear the price will remain at two for many months to come. The LIFO firm may make a very large purchase at two per pound before yearend. It will be able to record the large

physical increase in stock at the early price of one per pound because it is using early period prices. It will, in effect, charge the difference between the LIFO price and the purchase price to cost of goods sold, reducing taxable profits substantially. If in the next year production increases enough to maintain the high level of inventory, the firm will have gained an advantage in terms of aggregate tax liability despite the added costs of carrying the stock, but it will have held too large an inventory for some months.

LIMITATIONS ON USE OF LIFO

If using LIFO does reduce firms' tax liabilities in periods of rising prices, why is LIFO not used more? There are several reasons, some of which are misconceptions.

1. Many firms do not adopt LIFO because of its complexity; LIFO appears to be used relatively more by large firms than by small firms. Even among some large firms that do not adopt LIFO, there is a lack of familiarity with procedures like the index number calculations required for dollar value LIFO. Costs must be incurred to acquire such expertise, and these could be decisive at the margin, especially for smaller firms.

2. It is said that some firms have been unwilling to shift to LIFO because using LIFO reduces reported earnings; some have been fearful of adverse stock market valuations. If this is a genuine concern of senior management, it implies a belief that the stock market does not take account of valuation methods employed by individual firms. This may have been correct a few years ago, but it is less likely now. Financial analysts have become more sophisticated following the severe inflation of 1973 and 1974.

An experience in the motor vehicle industry is of interest. In 1957 Chrysler shifted to LIFO but none of the other major auto producers followed suit. In 1970 Chrysler received permission from IRS to shift back to FIFO. One of the reasons for dropping LIFO given in the 1970 Chrysler annual report was that other auto firms were not on LIFO and Chrysler wished to conform to industry practice in reporting inventories and profits. Since then GM and Ford have shifted to LIFO. Chrysler would need advance approval from IRS to revert to LIFO; such approval, however, would probably be granted.

3. Firms in a loss position appear to have no incentive to switch to LIFO since the switch would make their reported losses even larger if their input prices were rising. However, since such firms expect to operate profitably in the future, the adoption of LIFO would at least provide large loss carry-forwards and reduce future tax liabilities.

4. There is a good deal of misunderstanding about LIFO. For example, a common belief is that using LIFO does not result in significant tax benefits for a firm that turns over its stock very rapidly. Typical of this mistaken thinking is the following statement by the treasurer of a large company in response to an inquiry on whether the firm's profits were

⁹Arthur Andersen & Co., "The Last-In First-Out Method of Valuing Inventories" *Client Inflation Clinic*, (Chicago:Arthur Andersen & Co., August 1974), p. 6.

¹⁰"Profits Are High But Are They Real?" *Forbes Magazine*, September 15, 1973.

inflated because of FIFO accounting: "It doesn't amount to a hill of beans. Our inventory is in and out in a month and a half."¹⁰ A few years later this firm adopted LIFO.

The tax savings for firms using LIFO are determined by sizes of stocks and the inflation rates of costs entering stocks, and not by turnover rates. When physical stocks are rising, when costs are rising, and when firms have sufficiently large tax liabilities, tax savings will be roughly the value of opening inventories multiplied by the price increase multiplied by the marginal tax rate. What is true about turnover rates is that if two firms have identical sales and their unit costs rise in unison, the one having the faster turnover will have a smaller inventory and therefore a smaller tax saving. Again, it is the size of the inventory that is important, not the turnover rate.

5. Another common belief is that adoption of LIFO is not warranted in cases where inventories fluctuate substantially in quantity or price. This point has validity when prices are fluctuating. A decline in prices after a firm has adopted LIFO will work to its disadvantage for tax purposes. The LIFO firm will have lower cost of goods sold than a FIFO firm and, as a consequence, higher pretax profits and taxes. If, however, the firm is sufficiently prescient to adopt LIFO when its purchase prices are low, it will fare better in terms of tax liability. Even if prices should rise and then drop again, as long as they do not fall below the price level at the time of LIFO adoption the firm, at a minimum, will have postponed its tax payments.

Some misunderstanding may exist regarding effects of using LIFO when there are fluctuations in quantities in inventory. So long as prices rise secularly LIFO firms will gain by lower taxes even when the quantity of goods in inventory drops. This can be demonstrated in the following example:

Item	LIFO firm			FIFO firm		
	Units	Unit value	Total value	Units	Unit value	Total value
Inventory..	{ 1 1	{ 9 10	19	2	10	20
Purchases..	1	11		1	11	
Sales.....	2			2		
Ending inventory.	1	9		1	11	
Cost of goods sold	{ 1 1	{ 11 10	21	2	10	20

The LIFO firm has a higher cost of goods sold and hence lower profits and a lower tax bill than the FIFO firm. Confusion in this regard probably arises from the fact that the LIFO firm would have had an even lower tax liability if it had purchased 2 units at 11 and had not depleted its inventory. It is in comparison with a LIFO firm's own potential that a quantity depletion becomes a problem, not in comparison with a FIFO firm.

6. Senior management may be unwilling to alter the method of calculating profits where management compensation systems

or union contracts have provisions that are tied to the level of profits.

7. Methods for treating past writedowns and current obsolescence sometimes keep firms from adopting LIFO. Reference was made earlier to a large department store that did not adopt LIFO for certain products; its experience illustrates an important point. When LIFO is first adopted, firms are required to restore any writedowns in value of "abnormal goods" (out-of-style, damaged, broken sizes, obsolete, etc.) to a cost basis. On the IRS form, Application to use LIFO Inventory Method, items 3(a) and 3(b) relate to this requirement (see Appendix E); in effect there is a tax to be paid for adopting LIFO for such goods. That is, the difference between original cost and the reduced value due to obsolescence must be "taken into income" (see 3(b)) and becomes taxable. In the succeeding years writedowns from cost are not permitted because LIFO is interpreted by IRS as a "cost only" method. Thus, in the case of goods which are susceptible to large and rapid losses in the true marketable value of the inventory, any gains from LIFO adoption may be offset.

A textile manufacturing firm gave the same reason for not adopting LIFO. The firm takes a large risk in printing or finishing some types of cloth for inventory. If the color or style of the finishing does not sell, the firm will suffer a loss. If it is using LIFO it cannot writedown the inventory and take the loss promptly. Firms involved in such risk-prone activities may opt for an accounting method that is adaptable to this problem. That is, from the point of tax minimization they may prefer a method of inventory valuation that permits a prompt writedown of obsolete inventory to net realizable value.

8. Finally, using the LIFO method will result in strict scrutiny by IRS; some firms may dislike this even though they are public companies already subject to public accounting standards, SEC and other Government regulations. The extent to which IRS has broadened its examination of accounting methods as a result of the shift to LIFO is not generally realized.

SOME INFORMATION ISSUES

Information issues are also affected by IRS regulations; these can have economic effects as far as investors and financial analysts are concerned. IRS is strict in its administration of the so-called conformity requirement as stated in Sections 472(c) and (e) of the 1954 tax code.

There are many aspects of income determination where firms may use one accounting method in reporting to IRS for calculating its tax liability and another for financial reporting to shareholders, creditors, and others. For example, a firm may use accelerated methods of depreciation for tax purposes but straight-line methods for reports to stockholders. A construction firm may use the completed contract method in reporting to IRS and the percentage completion method in financial reports to shareholders. However, if a firm has adopted LIFO, IRS bars use of a different valuation method for financial reporting to the public or to creditors. Failure to abide by this requirement may result in withdrawal of permission to

use the LIFO method for determining tax liability. LIFO is apparently viewed as a privilege which IRS grants and may revoke according to interpretations of the 1954 code. In the 1954 tax code it is specified that LIFO

shall apply only if the taxpayer establishes to the satisfaction of the Secretary [that] no procedure other than [LIFO has been used] to ascertain the income...for the purpose of a report... (1) to shareholders...or (2) for credit purposes."¹¹

The rationale for the IRS position is that a firm should not be permitted to report a low profit for tax purposes and a high profit to the public. Why the restriction should apply to LIFO but not to other methods of inventory valuation is, of course, the issue. IRS has had a strict attitude toward LIFO from the outset and, until recent years at least, has enforced the conformity requirement rigorously.

IRS has liberalized its posture on conformity in the face of mounting criticism that balance sheets issued by firms were misleading and detrimental to the interests of shareholders and the investing public. Clearly, the interests of the Securities and Exchange Commission in requiring full disclosure were at odds with the IRS stance. In Technical Information Release 1225, January 9, 1973 and later in Revenue Ruling 73-66 the IRS permitted certain additional information on inventory values to be reported. It suggested that firms may include in their published financial statements a footnote or parenthetical statement in language substantially as follows:

If the first in first out (FIFO) method of inventory accounting had been used by the company inventories

would have been \$_____ and \$_____ higher than reported at December 31, 19__ and December 31, 19__.

The ruling was clear about loss of the LIFO privilege if any additional comments relating to income, earnings per share, or other measures of profitability, were made.

Relaxation of the conformity requirement may have been permitted because the 1954 code specifically prohibits the reporting of income (but not of inventories) on a basis other than LIFO if LIFO is used for tax purposes. The relaxation permitted by Revenue Ruling 73-66 relates not to income but only to inventory values. However, it is a simple matter to calculate net income on a nonLIFO basis from the information on inventories which IRS now permits in footnotes to the balance sheet. (This was done for the Allegheny Ludlum Corporation.) The IRS posture on this matter is puzzling to say the least.

The IRS conformity requirement has hindered the compilation of inventory statistics. Census Bureau requests for information about inventory data of LIFO companies have been refused by some respondents on advice of legal counsel because of concern that the IRS conformity requirement would be violated. As a result of discussions between the Census Bureau and IRS this was rectified by the issuance of Revenue Procedure 76-36 (see Appendix F) in early November 1976. Under this IRS procedure LIFO firms are permitted to report financial information to the Census Bureau on a nonLIFO basis or to report details about LIFO computations without risking IRS disapproval of firms' use of LIFO for tax purposes. IRS noted in the procedure that data supplied to Census are privileged and confidential and not available to other Government agencies or persons. Under Revenue Procedures 76-36 the earlier conformity regulations are relaxed only for Census Bureau requests for such data and not for requests from other Government agencies.

¹¹ 26 U.S.C. 472(c).