The LIFO Inventory Training Basics & Audit Guide

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Section 1: LIFO Training Basics

Chapter 1: LIFO Method Definition & Overview

LIFO is an acronym for "last-in, first-out." LIFO is an inventory valuation method that uses a cost flow assumption that goods sold during the year are those purchased most recently and that goods remaining in inventory at year end are those acquired in chronological order since the company adopted the LIFO method. The LIFO cost flow assumption for most companies is the opposite of the actual physical flow of goods which usually is on the "first-in, first-out" or FIFO basis.

The effect of using LIFO is that the value of the most recently purchased, higher cost items (when there is inflation) are included in cost of goods sold while the older, lower cost goods remain in inventory. In other words, LIFO is designed to move some of the inflationary costs from the balance sheet (inventory) to the income statement. This results in a lower inventory valuation, higher cost of sales and lower taxable income which allows companies to defer income tax payments.

The U.S. Congress first permitted the use of the LIFO method in 1938 in response to the fact a company needs to replace inventory that has been sold before paying their income tax liability. The IRS LIFO rules specify that the inventory sold must be replaced before the end of the year for the replacement cost to be deducted. That means the LIFO basis cost of goods sold is not a just the theoretical cost of replacing the goods but the actual cost incurred during the year to replace the goods.

The IRS Tax Court view on LIFO is "The theory behind LIFO is that income may be more accurately determined by matching current costs against current revenues, thereby eliminating from earnings any artificial profits resulting from inflationary increases in inventory costs." Although LIFO is often characterized as a means for "eliminating inflation from profits," the method merely defers the tax until such time as the inventories are depleted (i.e., the LIFO taxable income deferrals will be recognized as income when the inventories are depleted). Nevertheless, LIFO benefits can be substantial, especially when no depletion of the inventory takes place over a long period of time.

IRS regulations originally required that the LIFO method be applied on an item-by-item basis. The IRS refers to this method as the specific goods LIFO method or unit LIFO method. Responding to taxpayer complaints that the specific goods LIFO method was not practical for companies with numerous inventory items, the IRS Regs. were amended in 1947 to allow for the use of the dollar-value LIFO method. The dollar-value method considers inventory to be a pool of dollars rather than specific goods. At the end of each period, dollar-value LIFO inventories are evaluated to determine whether a LIFO "layer" has been added in the current period or if a prior layer has been partially or completely depleted.

The primary reason the LIFO inventory method is commonly used in the U.S. is that it allows companies to defer income tax liabilities. IRS Reg. § 1.472-2, also referred to as the IRS "LIFO conformity rule" requires that the LIFO method must also be used for financial reporting purposes when LIFO is used for tax purposes. The GAAP theoretical justification for LIFO is that using this method provides for matching the cost of goods sold during the current period with the cost of goods most recently purchased.

A very small fraction of LIFO taxpayers now use the specific goods method. Not only are the recordkeeping requirements for this method impractical but the long-term tax deferrals are substantially less compared to the dollar-value method. This is because LIFO layer erosions (which reduce previous years' LIFO tax deferral benefits) occur for every item for each year for which there are fewer units on hand compared to the prior year. Essentially, there is a LIFO pool for each inventory item when this method is used. With the alternative dollar-value LIFO method, pools are established for broad types of goods so that increases and decreases in items on hand are netted together within the pool resulting in far fewer LIFO layer erosions and much less reduction of the desired LIFO tax deferrals.

When the dollar-value LIFO method is used, the calculation of the LIFO inventory balance is a "side" calculation, i.e., there is not an item-by-item calculation of the LIFO inventory value of each inventory item. Regardless of whether a company has elected to use the LIFO inventory method, their general ledger inventory entries and balances will be determined using the FIFO, average cost, specific identification or retail inventory method. The inventory balances booked using one of these methods are what the IRS refers to for LIFO taxpayers as the company's current-year cost method. The sum of current-year cost for each inventory item accumulated in the inventory accounting system will be what is used to book the general ledger entries.

The LIFO inventory balances will be calculated as a side calculation using the methods described in this guide using spreadsheet assisted manual calculations for some of the calculation steps. Internal index double-extension calculations are usually made using a computer-generated report. The LIFO-PRO software may be used for the portions of the calculations applicable to the LIFO-PRO software functionality.

The LIFO inventory balance calculation process can be viewed as being an inventory subsystem with the computerized inventory accounting system that is used to accumulate the current-year cost balances used to book the general ledger inventory entries being the primary inventory accounting system. The table below helps illustrate the concept that there is an item-by-item inventory accounting system used for companies using the LIFO method but that system is for the calculation of the current-year cost balance and a "side" calculation is used to calculate the LIFO inventory balance:

Current-year cost (FIFO, average cost, etc.) total balances per inventory accounting system = inventory g/l balances	Company's primary inventory accounting system
Minus LIFO inventory balance calculated as a side calculation	LIFO "Side" calculation or subsystem
Equals LIFO reserve booked as a g/l contra account entry	

Although very few companies use the specific goods LIFO method, a simple example of this method is helpful to illustrate the difference of the cost flows between the two methods, as shown below:

Simple LIFO v. FIFO example using specific goods LIFO method

	FIFO	LIFO	Difference
Opening inventory:			
Units on hand	100,000	100,000	-
Unit cost	$ 1.00	$ 1.00	-
Total inventory value	$ 100,000	$ 100,000	-
Purchases:			
Units	100,000	100,000	-
Unit cost	$ 1.05	$ 1.05	-
Total purchases	$ 105,000	$ 105,000	-
Cost of goods sold:			
Units sold	100,000	100,000	-
Cost of goods sold	$ 1.00	$ 1.05	(0.05)
Total Cost of goods sold	$ 100,000	$ 105,000	$ (5,000)
Ending inventory:			
Units on hand	100,000	100,000	-
Unit cost	$ 1.05	$ 1.00	0.05
Total inventory value	$ 105,000	$ 100,000	$ 5,000

The appendix to this guide includes two examples of more-detailed specific goods LIFO v. FIFO comparisons.

Chapter 2: Glossary of LIFO-Related Terms

Accounting and financial professionals who work with LIFO need to understand the associated jargon. This chapter defines a number of LIFO-related terms.

10 percent method – An IPIC LIFO submethod provided for in Reg. § 1.472-8(e)(3)(iii)(C)(2) which allows taxpayers to assign current-year cost balances to less-detailed BLS categories as long as these less-detailed categories do not subsume any more-detailed BLS categories that exceed 10 percent of the sum of current-year cost balances for that pool. The advantage of the 10 percent method is that assigning items to BLS categories can be less time consuming because less-detailed breakdowns are required. The disadvantage of using the 10 percent method is that the pool index calculation is more complicated and requires a more complicated two step weighted average calculation using both BLS weights and current-year cost dollars as the weighting factor and both arithmetic mean and harmonic mean math.

5 percent method – An IPIC LIFO submethod provided for in Reg. §§ 1.472-8(b)(4) and 1.472-8(c)(2) which allows IPIC method taxpayers to create LIFO pools based on CPI or PPI major commodity groups. When this rule is used, separate LIFO pools are established for each of the 8 CPI major groups or 15 PPI 2-digit codes that include 5% or more of the total current-year cost of inventories on LIFO. This pooling method is popular because it is an "audit proof" method favored by the IRS.

Appropriate month – This refers to which month's CPI or PPI indexes are used to calculate IPIC method category inflation indexes. IRS Reg. § 1.472-8(e)(3)(iii)(B)(3) provides rules regarding selection of "appropriate months." Taxpayers may elect to consistently use the same month every year, which is referred to as a "representative appropriate month."

Average cost – An inventory valuation method that calculates an average unit cost for each inventory item. While there are several average cost calculation methods, the most commonly used for modern inventory accounting systems is a moving average which recalculates the average unit cost with each inventory purchase for each item. The IRS refers to this method as the "rolling average" method in Rev. Proc. 2008-43 which specifies that this is a permitted LIFO current-year cost method under most circumstances.

BLS – The Bureau of Labor Statistics, a division of the Department of Labor. The BLS publishes Consumer Price Indexes (CPI) in the monthly *CPI Detailed Report*. It also publishes Producer Price Indexes (PPI) in the monthly *PPI Detailed Report*. These published indexes are used for IPIC method LIFO calculations.

Category inflation index – This is a term used in IRS Reg. § 1.472-8(e) to describe the LIFO index for a particular CPI or PPI category.

Cost LIFO – A term that describes a method of calculating LIFO inventory balances by first converting cost inventory balances to inventory at base balances using inflation indexes that are a measure of inflation in the cost of inventory items.

CPI (Consumer Price Index) – These are price indexes compiled and published monthly by the BLS in the *CPI Detailed Report*. IPIC method taxpayers can use the indexes in Table 3 of this report for LIFO calculations. Retailers can use either CPI or PPI indexes for LIFO purposes while non-retailers must use PPI indexes. There are over 300 CPI index categories in Table 3 and approximately 200 of these are for commodities. Service category indexes cannot be used for LIFO purposes.

Cumulative LIFO index – A LIFO index that is the measure of inflation from the base year to the current year end. For double-extension LIFO index calculations, the cumulative index is calculated by dividing the sum of

extensions at current year end prices (current year end on-hand quantity times current year end unit price) for all items by the sum of extensions at base-year prices (current year end on-hand quantity times prior year end unit price) for all items. For link-chain LIFO index calculations, the cumulative index for the current year end is calculated by multiplying the cumulative index for the prior year end times the current year LIFO index. Cumulative LIFO indexes are used to convert (by division) the current year end inventory cost to base-year dollars which is then compared to the prior year end inventory at base dollars to determine whether there is an increment or decrement for the year.

Current year LIFO index – An index that is the measure of LIFO inflation for the current year only. Current year LIFO indexes are used for link-chain LIFO calculations.

Current-year cost – A term used by the IRS that describes the year end inventory balance that is to be converted to base-year prices for companies using the dollar-value LIFO method. The current-year cost is usually the general ledger balance (for each LIFO pool) adjusted to exclude valuation reserves and to include adjustments for in-transit goods, shrink reserves, vendor discounts and other price reductions. The general ledger balance will usually be inventories stated at FIFO or average cost. There are four different current year method alternatives allowed by the IRS in Reg. § 1.472-8(e)(2)(ii).

Deflator index – LIFO index used to convert or "deflate" current-year cost inventory balances to inventory at base-year price values.

FIFO – This is an acronym for "first-in, first-out" which is an accounting method for determining the cost of inventories. Under this method, the first items purchased are treated as being the first items sold. Period-end inventories are valued using the unit cost of the last purchases made on an item-by-item basis.

Inflation effect – This is the portion of the change in the LIFO reserve for the current year that is attributable to the current year LIFO inflation or deflation. The amount of inflation effect for each separate LIFO pool is calculated by multiplying the prior year end current-year cost times the current year inflation or deflation percentage (current year LIFO index minus 1.00). The inflation effect will be expense if there was inflation for the current year and it will be income if there was deflation for the current year.

Inflator index – LIFO index used to multiply or "inflate" layer (or increment) at base prices to produce a layer valued at LIFO cost.

Internal indexes – A term used to describe non-IPIC method LIFO inflation indexes calculated using actual unit prices.

Inventory price index (IPI) – A measure of the current year's inflation for a particular pool. This term is used in IRS Reg. § 1.472-8(e)(3)(i) to describe a pool's weighted average index for taxpayers using the IPIC method. For link-chain taxpayers, a pool's IPI is multiplied times that pool's previous year's cumulative deflator index to produce the current year's cumulative deflator index, which is then used to "deflate" current-year cost balances to base-year prices.

Involuntary LIFO termination – Termination of a taxpayer's LIFO election by the IRS. The IRS can terminate a taxpayers LIFO election for the following reasons: 1) improperly electing LIFO, 2) violating the LIFO conformity rule, 3) using a current-year cost of inventories for the LIFO calculation that is net of valuation reserves, and 4) maintaining books and records that do not adequately document the calculation of LIFO indexes and inventory balances.

IPIC method – The Inventory Price Index Computation (IPIC) method was authorized by IRS Reg. § 1.472-8(e) starting in 1982. This method permits taxpayers to use published government inflation indexes, a.k.a. external indexes published by the BLS to calculate inflation for purposes of valuing LIFO inventories.

IRS Form 3115 – *Application for Change in Accounting Method*. Taxpayers must file Form 3115 for tax LIFO-related methods change including:

- Change from LIFO to a non-LIFO method (also referred to as LIFO termination)
- Change from one LIFO method to another LIFO method

There are many tax inventory methods considered by the IRS to be permissible that are "automatic approval" or "automatic consent" methods for which advance IRS consent is not required. The advantages of a change to an "automatic approval" method are that the filing deadline for this change is that for the annual tax return including extension and the Form 3115 is filed with the tax return (with a copy sent also to the Ogden, UT IRS office) and there is no IRS Users Fee ($8,600 per change). The Form 3115 for tax methods changes that are not "automatic approval" must be filed before the end of the year for the year of change. IRS Rev. Proc. 2015-13 and Rev. Proc. 2015-14 describe the IRS rules for tax method changes. Rev. Proc. 2015-14 and the Form 3115 instructions contain a list of the methods considered to be "automatic approval" methods.

IRS Form 970 – *Application to Use LIFO Inventory Method*. A Form 970 is required for:

- Initial LIFO election
- Expansion of scope of LIFO election
- Change from a non-IPIC method to the IPIC method

LIFO – This is an acronym for "last-in, first-out" which is a cost flow assumption used to value inventories. LIFO assumes that goods sold are those purchased most recently and that goods remaining in inventory at period end are those acquired in chronological order since the company adopted LIFO. This seldom matches the actual physical flow of goods. The theoretical justification for LIFO is that it matches goods sold during the current period with the cost of goods most recently purchased.

Compared to alternative inventory valuation methods (FIFO & average cost), the effect of using LIFO in times of rising prices is that the value of the most-recently purchased, higher cost items are included in the cost of goods sold while older, lower cost goods remain in inventory. In other words, the LIFO cost flow is designed to move some of the inflationary costs from the balance sheet (inventory) to the income statement. This results in a lower inventory valuation, higher cost of goods sold and lower taxable income.

LIFO conformity rule – Wording in IRS Reg. § 1.472-2 that requires the use of the LIFO method for financial reporting purposes for inventories included in the LIFO election scope for tax purposes.

LIFO decrement – This refers to a negative number resulting from subtracting a prior period's inventory at base from the current period's inventory at base. A LIFO layer is not created for years that have decrements. Instead, one or more prior years' layers are reduced. A LIFO decrement is not the same as a decrease in the LIFO reserve compared to the prior year LIFO reserve – this is instead referred to as LIFO income.

LIFO election scope – This describes inventories valued using the LIFO method. Neither the IRS Regs. nor GAAP require that taxpayers electing the LIFO method use it to value all of their inventories. A LIFO election that does not encompass all inventories is referred to as "partial" or "selective" LIFO election.

LIFO layer erosion – This occurs when a decrement reduces one or more previous years' layers.

LIFO layer erosion effect – This is the portion of the change in the LIFO reserve for the current year that is attributable to the current year decrement and this reflects the difference in the cumulative indexes of the

layers eroded and the current year cumulative index. The amount of the LIFO layer erosion effect for each separate LIFO pool is calculated as (current year cumulative deflator index minus weighted average cumulative index of layers eroded) times decrement at base prices. If the weighted average cumulative index of layers eroded is less than the current year index, the LIFO layer erosion effect will be income; otherwise it will be expense. The grand total of all pools' layer erosion effect for the year is the pre-tax amount of the LIFO layer erosion effect that is required by GAAP to be disclosed in the notes to the financial statements if material for financial reporting LIFO.

LIFO expense – This is the difference between the current period's LIFO reserve and the previous period's LIFO reserve (LIFO expense = current period's LIFO reserve - previous period's LIFO reserve) when this change is a positive balance (this change is referred to as LIFO income if the change is a negative balance). This is the amount that taxable income or financial reporting pre-tax income has been reduced for the current period by using LIFO.

LIFO income – This is a term used to describe a change in the LIFO reserve that results in income (prior year reserve exceeds current year reserve). LIFO income results from either a LIFO decrement, current year LIFO deflation or a combination of both. For companies using retail LIFO, LIFO income can also be a result of higher gross profit margins in the current year than in the previous year.

LIFO increment – The excess of the current period's inventory at base minus the previous period's inventory at base. This is also referred to as a "layer."

LIFO index – A ratio expressed in decimal format that is the measure of inflation for each pool for taxpayers using dollar-value LIFO.

LIFO layer – A LIFO layer is the same as a LIFO increment.

LIFO pools – For taxpayers using the dollar-value LIFO method, all inventory items included in the LIFO election scope are separated by type of item. Similar items are grouped together to establish separate pools. There are several different methods of grouping inventory items into LIFO pools allowed by the IRS in Reg. § 1.472-8(b), (c) & (d).

LIFO reserve – This is the difference between the FIFO value of inventory and the LIFO value of inventory (LIFO Reserve = FIFO - LIFO). The LIFO reserve is a measure of the cumulative amount that a company's taxable income or financial reporting pre-tax income has been reduced by using LIFO since the method was first adopted. The general ledger contra asset account used to record this difference is also referred to as the LIFO reserve.

Lower-of-cost-or-market (LCM) – Another term for market write-downs. IRS Reg. § 1.472-2(b) requires that market write-downs be eliminated for LIFO inventories.

Negative LIFO reserve – This occurs when the LIFO inventory balance is greater than the current-year cost (average cost or FIFO) balance.

New item – Inventory items that were purchased for the first time during the year and are on hand for the current year end. These present a problem for internal index calculations because an inventory accounting system will have no record of a prior year end unit price for the new item.

PPI (Producer Price Index) – These are price indexes compiled and published monthly by the BLS in the *PPI Detailed Report* reflecting average prices paid to producers (manufacturers and processors) for inventory purchase/sales transactions. IPIC method taxpayers generally use the indexes in Table 9 of this report for LIFO calculations – Table 11 indexes can be used but only if they are a better fit for the inventory items in question

than any Table 9 index. There are approximately 2,500 commodity PPI index categories in Table 9. Service category indexes cannot be used for LIFO purposes.

Published indexes – Indexes published by the federal government to measure inflation. These are used in the IPIC method to calculate LIFO indexes. Also referred to as "external indexes."

Retail Inventory Method (RIM) – An inventory method historically used by many retailers whereby merchandise department cost balances are calculated by multiplying departmental cost complements (of gross profit margins) times departmental retail inventory balances. RIM is used when perpetual inventory records by item are not practical. Physical inventories are taken using marked selling prices.

Retail LIFO – A term that describes the calculation of LIFO inventory balances by first converting retail inventory balances to retail basis inventory at base balances using inflation indexes that are a measure of retail price inflation. Layers at retail are then reduced to cost by multiplying them times the LIFO cost complements calculated for each pool.

Simplified LIFO – The IPIC method is commonly referred to as "simplified LIFO." Simplified LIFO is actually a term the IRS used to describe a more simplified LIFO method applicable only to very small businesses provided for in Reg. § 1.474 starting in 1981. This Reg. section became superseded after 1986.

UNICAP costs – This is the amount of labor and overhead that IRS Reg. § 263A requires taxpayers to capitalize as an add-on to inventory balances in addition to labor and overhead costs capitalized as required by GAAP. In other words, these are inventory related costs that should be treated as product costs instead of period costs according to the IRS. These costs are also referred to as Sec. 263A costs.

Weighted arithmetic mean – A method for calculation of weighted average pool indexes whereby current-year cost balances are multiplied times the current year inflation index for that CPI or PPI index category to determine an arithmetic mean "extension." The pool index is calculated by dividing by the sum of the arithmetic mean extensions for all index categories by the sum of the current-year cost. This method was used by most taxpayers prior to the issuance of the new IPIC LIFO Regs. in 2002.

Weighted harmonic mean – The math prescribed by IRS Reg. § 1.472-8(e) to calculate weighted average pool indexes for the IPIC method. Weighted harmonic mean math entails "deflating" current-year cost balances to prior year prices by division of the current-year cost by the current year inflation index for that CPI or PPI index category to determine a harmonic mean "extension." The pool index is calculated by dividing sum of the current-year cost for all index categories by the sum of the harmonic mean extensions.

Chapter 3: LIFO Methods Alternatives

A. Specific goods method – no submethods are listed because this method is used very rarely today

B. Dollar-value method

    1. LIFO election scope – Can be selective for each corporation except for manufacturers using NBU pools

    2. Item definition method:

        a. Individual inventory items identified by unique item number in inventory accounting system

        b. Fungible commodities measured in gallons, pounds, board feet, etc.

    3. Inflation comparison period:

        a. Link-chain method – Compares current year end prices to prior year end prices

        b. Double-extension method – Compares current year end prices to base-year prices

    4. Current-year cost and layer valuation method:

        a. Latest purchases during the year (FIFO)

        b. Earliest purchases during the year

        c. 12 month moving average

        d. Weighted average cost, also referred to as "rolling average cost" by the IRS

        e. Other method that clearly reflects income including specific identification

    5. LIFO pooling method:

        a. Resellers (retailers & wholesalers) – By line, type, or class of goods

        b. Manufacturers:

            i. Natural business unit (NBU) pools (separate pool required for parts purchased for resale)

            ii. Raw material content pools

            iii. Multiple pools

        c. Any IPIC method taxpayer – IPIC pooling method using PPI or CPI major groups

    6. Inflation measurement source:

        a. Internal indexes:

            i. All inventory items used

            ii. Representative sampling (index method)

        b. Published or external indexes using IPIC method:

            i. BLS table selection:

                1. CPI

                2. PPI:

                    a. Table 9 unless there is a more appropriate Table 11 category

                    b. Final or preliminary indexes

                    c. Discontinued categories treatment - Compound inflation or substitute index method

            ii. Weighted average method for pool index calculations:

                1. 10% method

                2. Most-detailed category method

            iii. Appropriate month selection:

                1. Annually select appropriate month

                2. One time binding selection of representative appropriate month

Overall LIFO Approach – Specific Goods v. Dollar-Value Methods

Specific goods method

This is also known as the unit LIFO method. This is an approach to applying LIFO in which a change in the quantity of individual types of inventory is the basis for determining whether the inventory levels have increased or whether a portion of the existing inventory has been liquidated. The specific goods method entails segregating physical quantities of inventory such as tons, gallons, or number of items. Each such unit is effectively a separate pool. The specific goods method was the only LIFO method allowed by the IRS from 1938 to 1947. It is seldom used today because it is cumbersome and almost always results in less tax benefits than the dollar-value method. This is because LIFO layer erosions occur for every item each year there are fewer units on hand compared to the prior year. These layer erosions reduce previous years' tax deferrals. Calculation of LIFO indexes is not necessary for this method because layers are valued at the unit price applicable to each item.

Dollar-value method

This is a LIFO method that groups inventory items into pools that are priced in terms of aggregate base-year cost. This precludes the need to account for the various unit cost values for individual inventory items. The result is compared with the pool's aggregate base-year cost as of the end of the prior year to determine whether the inventory level has increased or whether a portion of the inventory has been liquidated. The pool aggregate base-year cost for any year is calculated by dividing the year end current-year cost by the cumulative index for that year. When dollar-value LIFO is used, increases and decreases in items on hand are netted together which results in fewer LIFO layer erosions than if the specific goods method was used. Fewer layer erosions–compared to the specific goods method–is why almost all companies use the dollar-value LIFO method today.

Inflation comparison period – **Double-extension v. link-chain methods**

These are alternative methods for calculating inflation cumulative indexes. Double-extension method cumulative indexes are the quotient of current year item costs divided by base-year item costs, requiring a company to keep records of inventory item costs going back to the base year. Link-chain index calculations involve two steps: 1) calculate the "current year" inflation index by dividing the current year's item costs by the previous year's item costs, then 2) calculate the "cumulative" inflation index by multiplying the current year inflation index times the previous year's cumulative index. Link-chain indexes can be calculated using only the current year and previous year inventory cost records.

Double-extension and link-chain are terms that were originally used to describe internal index calculations using individual inventory item prices. The IRS also allowed a third method for calculating inflation indexes called the "index" method which was the double-extension method applied on a sampling basis. In practice, calculating inflation indexes using a sampling basis is common. For all years for which the dollar-value method has been permitted, the IRS the use of the double-extension method to be preferable to the link-chain method and required that a company justify its use of link-chain on the basis of the impracticality of using double-extension. This justification is not required when the IPIC method is elected and a change from a non-IPIC double-extension method to a link-chain IPIC method is an automatic approval method change.

Use of the double-extension method is especially problematic for a company that experiences fast turnover of items in inventory. The IRS requires that base-year prices be reconstructed for new items introduced into inventory. A retailer with a base year of 1980, for example, that carries a new item in 2005 would have to reconstruct what that item's cost would have been in 1980. If that is not possible the company would have to, in effect, use 2005 as the base year for that item. As older items are replaced by newer items, this has the effect of reducing the amount of inflation and, in turn, reducing the tax deferral benefit of using LIFO.

Another disadvantage of using the double-extension LIFO method is that it is much more likely to produce big swings in LIFO inflation or deflation from one year to the next, compared to using the link-chain method, when there are significant changes in the inventory mix. Current-year cost dollars are divided by cumulative indexes for each PPI category using the double-extension method (rather than current year indexes, as with the link-chain method) and the amount of inflation difference in cumulative indexes from one PPI code to another can be far greater than current year index differences. As a result, inventory mix changes from one year to the next can result in much larger changes in the pool cumulative index than when the link-chain method is used. An example of this is that one PPI code could have a cumulative index of 3.00 (200 percent inflation) while another PPI code might only have a cumulative index of 1.50 (50% inflation). Each of these PPI codes might only have a current year index of 1.02 (2% inflation) but there is 150% difference in the cumulative index inflation between the two. If the mix of dollars between the two changes significantly there can be a change in the pool cumulative index that indicates far more or less inflation than there was during the year. This can result in the amount of LIFO expense or income for the year being caused largely by a mathematical oddity rather than the actual PPI inflation or deflation. For this reason, we do not consider the double-extension method to be a reliable measure of LIFO inflation.

Most companies using the double-extension method use an internal index method but the double-extension method can also be used by companies using the IPIC method. This involves dividing current year CPI or PPI indexes by base-year CPI or PPI indexes for selected BLS categories. Double-extension is seldom used with the IPIC method because of the difficulty of reconstructing base-year costs for new items and the fact that the BLS regularly discontinues some PPI categories and introduces new ones. The IRS does not require a company to justify its use of the link-chain methodology when the IPIC method is used. A link-chain IPIC method index calculation involves dividing current year CPI or PPI indexes by previous year CPI or PPI indexes to calculate the current year inflation index which is then be multiplied times the previous year cumulative index to calculate the current year cumulative index.

Current-year cost methods
IRS Reg. § 1.472-8(e)(2)(ii) specifies these alternatives for calculation of current-year cost:
a.   By reference to the actual cost of the goods most recently purchased or produced.
b.   By reference to the actual cost of the goods purchased or produced during the taxable year in the order of acquisition.
c.   By application of an average unit cost equal to the aggregate cost of all of the goods purchased or produced throughout the taxable year divided by the total number of units purchased or produced.
d.   Pursuant to any other proper method which, in the opinion of the Commissioner, clearly reflects income.

Method A above is the FIFO method. Method B above is seldom used because a side calculation is required since this is not a normal inventory accounting system cost flow option. The average cost method (method C above) is known as the 12-month moving average method. This is not a normal inventory accounting system cost flow option either which means using this method would involve a side calculation. Current-year cost methods B and C are legacy methods permitted by the IRS in the 1940s before computerized inventory accounting systems were common.

One of the most popular inventory accounting system cost flow assumptions today is not specifically listed in methods A through C above. This method is an average cost method known as the weighted moving average cost method. Under this method, the average unit cost is recalculated with every purchase of each unit and each sale of an inventory item results in a decrease in both the numerator and denominator of the average unit cost calculation fraction. The IRS refers to this method as the "rolling average" method in Rev. Proc. 2008-43 which specifies that this is a permitted LIFO current-year cost method under most circumstances. This means that it fits the description of a "proper method" referred to in method D above. Another current-year cost method deemed to be a "proper method" by the IRS is the specific identification method in which each

inventory item is considered to be unique (such as an automobile) and the cost recorded for each item is the invoice cost.

Single index v. dual index method

Using the deflator index to also inflate the increase at base to calculate the increase at LIFO cost is referred to as the "single index method." Using different deflator and inflator indexes is referred to as the "dual Index method." The IRS no longer allows the use of dual index methods regardless of whether the IPIC method is used or not. The IRS made this position known in a 2003 Coordinated Issues Paper and the Form 970, *Application to use LIFO Inventory Method* published beginning with the Dec. 2005 revision. The new IPIC LIFO Regs. published in 2002 prohibit the use of dual indexes. GAAP does not proscribe use of the dual index method.

LIFO pooling methods

A LIFO pool is a grouping of similar inventory items. Separate indexes are calculated and layer histories maintained for each LIFO pool. To maximize tax savings, companies should use as few pools as possible because this will reduce the likelihood of decrements. This is because decreases in inventory values for some items will be offset by increases in others included in the same pool. Decrements result in lower-cost goods being included in cost of goods sold which increases taxable income. The following are alternative pooling methods permitted by the IRS:

o **By line, type, or class of goods** – Wholesalers and retailers can use separate pools for each major line, type, or class of goods. Customary business practices for a particular trade or industry determine what constitutes a major line, type, or class of goods. Authorized by Reg. § 1.472-8(c)(1).

o **IPIC pooling method** – The IRS Regs. authorize companies using the IPIC method to create pools based on CPI or PPI major commodity groups using a "5% rule." When this rule is used, separate LIFO pools are established for each of the 8 CPI major groups or 15 PPI 2-digit codes that include 5% or more of the total current-year cost of inventories on LIFO. Reg. § 1.472-8(b)(4) describes this method for manufacturers and Reg. § 1.472-8(c)(2) for resellers (retailers and wholesalers). This pooling method is popular because it is an "audit proof" method favored by the IRS. A change to this method is also an automatic approval change while changes to most of the other pooling methods are advance approval changes.

Pooling methods available only to manufacturers:

o **Natural business unit pooling** – This is a pooling method authorized by Reg. § 1.472-8(b)(1) for manufacturers. A natural business unit (NBU) includes all inventory items related to a product line or related product lines, including raw materials, work-in-process, and finished goods. Distinct business units require separate pools. A natural business unit may be defined based on divisions established by internal management, separate production facilities or processes, or separate financial records. Manufacturers that also purchase goods for resale are required by the IRS in Rev. Rul. 79-290, Rev. Rul. 82-192 and PLR 8842061 to use separate pools for manufactured goods vs. goods purchased for resale.

o **Multiple pools** – Companies may group together similar items in a pool even if they are not all within the same natural business unit. Grouping goods together to form a pool may be based on such factors as the similarity or interchangeability of raw materials, the similarity of the production processes, the similarity of the use of the products, standard practices within the trade or industry, and whether the goods are treated similarly by a company's management. Authorized by Reg. § 1.472-8(b)(3)(i).

o **Raw material content** – Goods with similar raw materials, including the raw material content of work-in-process and finished goods may be grouped together to form a pool for manufacturers. Raw materials that are not similar in nature may not be grouped together in the same pool even if they are processed or manufactured into the same finished product. Authorized by Reg. § 1.472-8(b)(3)(ii).

Inflation measurement source – **IPIC method (published indexes) v. internal index methods**

These are alternative methods for calculating the inflation indexes necessary to convert current-year costs to inventory at base-year costs. Companies using the IPIC method assign their current-year cost balances to

categories defined by the Bureau of Labor Statistics (BLS) and use either PPI or CPI indexes published by the BLS to calculate a weighted average pool inflation index.

The alternative to the IPIC method is to use internal indexes. Internal indexes compare the company's actual unit prices for year end on-hand inventories to calculate LIFO indexes. The unit costs compared are the current year ends to the prior year ends for the link-chain method while the double-extension LIFO method compares current and base year costs.

IPIC Submethods

BLS table selection – PPI v. CPI
The Bureau of Labor Statistics (BLS) publishes monthly Producer Price Indexes (PPI) and Consumer Price Indexes (CPI). Retailers using the IPIC method can choose to use either CPI Table 3 or PPI Table 9 indexes, while non-retailers must use PPI indexes. For taxpayers using PPI indexes, Table 9 of the *PPI Detailed Report* must be used unless the taxpayer can demonstrate that another PPI table is more appropriate. Use of PPI Table 11 indexes rather than Table 9 PPI indexes is rare because the main difference between these tables is in organization (Table 9 is organized by commodity type and Table 11 by industry type) and there are Table 9 index categories corresponding to almost every Table 11 index category. Some retailers use PPI for tax purposes and CPI for financial reporting because there has been consistently more PPI than CPI inflation for certain types of retailers.

Preliminary PPI indexes v. final PPI indexes
This is an issue for companies using PPI indexes for IPIC calculations. The BLS publishes preliminary PPI indexes approximately two weeks after the end of a month (e.g., preliminary July 2014 PPI indexes were published in the middle of August 2014) and final PPI indexes were published four months later (e.g., final July 2014 PPI indexes were published in the middle of December 2014). Companies using the IPIC method may select either preliminary or final PPI indexes but must do so consistently. The final PPI indexes reflect the receipt of price surveys from producers not received in time to be included in the preliminary index compilations and corrections of data originally reported. Final PPI indexes are less commonly used than preliminary PPI indexes because most companies do not want to wait the additional four months entailed by the use of final indexes. CPI indexes are based on marked retail selling prices. No changes to CPI indexes are made after they are published.

10 percent method v. most-detailed categories method
These are alternative methods for assigning inventory balances to BLS categories and calculating inflation indexes when using the IPIC method. A company using the IPIC method must elect to use one of these methods. The most-detailed categories method provided for in Reg. § 1.472-8(e)(3)(iii)(C)(1) requires assigning the current-year cost balances associated with each item in inventory to a most-detailed BLS category (a category that does not subsume another category). The 10 percent method allows taxpayers to assign current-year cost balances to less-detailed BLS categories as long as these less-detailed categories do not subsume any more-detailed BLS categories that exceed 10 percent of the sum of current-year cost balances for that pool. The 10 percent method, which was mandated by the original 1982 IPIC Regs. and was retained as an optional method by the 2002 Regs. (§ 1.472-8(e)(3)(iii)(C)(2)), simplifies the task of assigning items in inventory to BLS categories.

While the 10 percent method makes the task of assigning inventory to BLS categories less burdensome, there is a trade-off involved because the math required to calculate category inflation indexes is more complicated. When the 10 percent method is used, the following two separate steps are required to calculate the pool index for each pool after the current year index for each BLS category (i.e. c/y PPI index divided by p/y PPI index) has been calculated:

1. Calculate the 10 percent categories' weighted average index of the more-detailed BLS categories included in the 10 percent category using the BLS weights of relative importance as the weighting factor using arithmetic mean math.
2. Calculate the weighted average pool index of the various index categories using the current-year cost of each as the weighting factor using harmonic mean math.

Taxpayers using the most-detailed categories method only use inventory dollars to weight inflation indexes. The rules governing 10 percent category assignments and the resulting index calculations can seem convoluted and confusing, especially for companies using numerous BLS categories.

The advantage of using the most-detailed categories method is the simplicity of the index calculation math and tends to be used by companies with relatively few items in inventory. The advantage of the 10 percent method is that assigning items to BLS categories can be less time consuming because a lesser number of more-detailed category breakdowns are required. This method is more likely to be used by companies with many different items in inventory.

Appropriate month selection
IRS Reg. § 1.472-8(e)(3)(iii)(B)(3) provides rules regarding selection of an "appropriate month." This refers to which month's CPI or PPI indexes to use to calculate IPIC method category inflation indexes. For example, a company using December as their appropriate month would calculate 2004 year end category inflation indexes using December 2004 PPI or CPI divided by December 2003 PPI or CPI. In the case of a retailer using the retail method, the appropriate month is the last month of the retailer's taxable year. In the case of all other taxpayers, the appropriate month is the month most consistent with the method used to determine the current-year cost of the dollar-value pool. A taxpayer not using the retail method may either annually select an appropriate month for each dollar-value pool or make an election on Form 970, *Application to Use LIFO Inventory Method* to use a representative appropriate month (a.k.a. representative month) consistently for the year of the IPIC LIFO method election and all future years.

Advantages of Using the IPIC LIFO Method

Higher inflation indexes possible – Some companies have found CPI or PPI inflation rates to be consistently higher than their internal index inflation. For most large supermarket chains the advantage of using CPI vs. internal indexes has been substantial. An annual positive differential of 1% between CPI or PPI inflation and a company's internal index inflation would reduce taxable income by $1 million annually for a company with $100 million in total inventory at FIFO cost at the beginning of a year.
Fewer pools possible – Supermarket chains not using IPIC LIFO are required to maintain as many as 12 pools. The IPIC method allows pooling based on the 8 different CPI major groups or 15 different 2-digit PPI codes. Supermarket chains using IPIC LIFO typically use the 5% rule which results in 3 to 6 pools. Having fewer pools will produce additional LIFO benefits because layer erosions are less likely.
Index calculation simpler than internal index – Use of a published index precludes the need to calculate an internal index unless companies switch for tax LIFO only. Internal index calculations are usually a major undertaking and can be avoided if companies switch to IPIC for book LIFO also. IPIC LIFO weighted average index calculations can also be complicated if made manually but this problem is solved with automated LIFO software.
Treatment of "new items" in inventory – These are inventory items that were purchased for the first time during the year and are on hand for the current year end. New items present a problem for internal index calculations because the inventory accounting system has no record of a prior year end unit price for the new item. The two methods for dealing with new items allowed by the IRS in calculating LIFO internal indexes are either potentially very time consuming or tend to understate the actual inflation. These problems go away completely using the IPIC method.

Simple way for manufacturers to use LIFO for labor and overhead inventories – It is fairly common for manufacturers to exclude labor and overhead inventories from the LIFO election scope because the IRS does not allow separate LIFO pools for these costs (this is called the components-of-cost method). This means that for labor and overhead inventories to be included in the LIFO election scope for LIFO internal index calculations, those costs must be added to the unit cost of each item. Unless a manufacturer uses standard cost accounting, inclusion of these labor and overhead costs for each item is not practical. This problem goes away using the IPIC method because WIP and finished goods inventory items (raw materials, labor and overhead) are assigned to the appropriate PPI commodity code applicable to the ultimate finished good.

PPI inflation is often less volatile than Internal index LIFO inflation for manufacturers – Manufacturers that purchase commodity-type raw materials for which the prices are volatile are especially prone to big changes in LIFO indexes from year-to-year particularly if an internal index method is used to measure LIFO inflation. When an internal index method is used, the index for the year should correlate closely to the inflation or deflation for the raw materials. Even if a large portion of the inventories are work-in-process (WIP) and finished goods, the raw materials component of these inventories will probably constitute a large part of the value of these inventories. While the long term LIFO inflation for a manufacturer may be about the same for PPI indexes as it is for internal indexes, the tax PPI index LIFO inflation is less likely to be as volatile as the book LIFO internal index inflation. This is because of the way in which PPI IPIC method LIFO inflation is calculated for WIP and finished goods inventories. The IRS IPIC LIFO Regs. specify that the PPI codes applicable to the finished goods will be used for all WIP and finished goods dollars including the labor and overhead components of WIP and finished goods. The PPI finished goods inflation is usually less volatile than raw material inventory prices. The further along in the stage of production an inventory item is and the closer that item is to being in the hands of the end user of that product, the less likely big price changes are.

Easy means of switching from the double-extension submethod – The IRS has been reluctant to permit changes from use of double-extension to link-chain methodology, especially for companies whose annual turnover of inventory items is not rapid. Taxpayers can make this change without IRS consent when electing the IPIC method and the link-chain submethod as an automatic approval change.

IPIC LIFO need not be also used for financial reporting – Companies may adopt IPIC for tax purposes while continuing to use internal indexes for book LIFO. Higher tax LIFO expense may result without increasing the amount of the book LIFO expense if the internal indexes used for financial reporting are less than the IPIC tax indexes.

IRS audit exposure reduced for past years – Companies switching to the IPIC method are provided a "safe harbor" by the IRS with respect to methods used in years prior to the change. IRS audit exposure may be eliminated in these areas:

- **Pooling** – Many companies use pooling methods not authorized by the IRS. Taxpayers may elect the optional IPIC pooling rules thereby establishing an acceptable pooling method.

- **Statistical sampling** – Many companies use internal index sampling methods not acceptable to the IRS. For example, a company's sampling method may exclude new items.

- **Other** – Some manufacturers still use the components of cost method despite its prohibition by the IRS. Some manufacturers also incorrectly apply raw-materials-only indexes to total inventory dollars including labor and overhead dollars. Companies can eliminate exposure from use of these methods by adopting IPIC.

Chapter 4: LIFO Calculation Steps

All dollar-value method LIFO calculations, regardless of the methods used, consist of two primary steps for each LIFO pool:
1) Calculation of the current period's inflation index
2) Calculation of the current period's value of inventory at LIFO cost

Most companies are required by IRS Reg. Sec. 1.263A to capitalize inventory related labor and overhead costs over and above that required by GAAP. For LIFO taxpayers using a simplified Sec. 263A method, these costs are added to various LIFO layers that remain at any given year end which means that the calculation of these additional costs for tax return purposes requires this calculation to be made using the tax LIFO layer history schedules.

Descriptions and examples of LIFO calculation steps are shown below:
Pool index calculations
Companies must either calculate inflation indexes based on their actual unit prices (i.e., internal indexes) or use price indexes published by the U.S. government (i.e., the IPIC method). The following two examples show pool index calculations using non-IPIC methods.
Non-IPIC (internal index) link-chain method
The example shown below is for an internal index link-chain method calculation. Current year end item quantities (column B) are extended using the prior year's and current year's prices (columns C & D, respectively). The sum of the current year's price extensions are then divided by the sum of the prior year's price extensions (25.02 ÷ 23.86 = 1.0486) to calculate the current year's inflation index. The current year's cumulative inflation index (1.0486 x 1.2 = 1.2583) is a product of the current year's inflation index multiplied times the prior year's cumulative inflation index (from the prior year's LIFO index calculation schedule).

A	B End of year Quantity on hand	C Prior year end's Unit Price	D Current year end's Unit Price	B x C E C/Y Quantity at P/Y Price	B x D F C/Y Quantity at C/Y Price
Item 1	1	6.54	6.60	6.54	6.60
Item 2	2	2.33	2.31	4.66	4.62
Item 3	3	4.22	4.60	12.66	13.80
Totals				23.86	25.02
Current year inflation index = col. F sum/col. E sum =					1.0486
Prior year cumulative index (from prior year schedule)					1.2
New cumulative index = product of previous 2 rows' indexes					1.2583

This example is greatly simplified. Non-IPIC index calculations are often made on a sampling basis.

No new items (items that were not on hand at the previous year end) are shown in the example above. If the policy for pricing of the new items is to set the prior year item cost equal to the current year end item cost for new items, the prior year end item cost column must be populated with the current value. Another way to

make this calculation is to leave the prior year end item cost value blank and use formulas to accumulate the extended cost for new items v. existing items separately in order to properly apply this pricing policy.

Non-IPIC double-extension method

The example shown below is for an internal index double-extension method. Current year end item quantities (column B) are extended using the base year's and current year's prices (columns C & D, respectively). The sum of the current year's price extensions are then divided by the sum of the base year's price extensions (25.02 ÷ 17.00 = 1.4718) to calculate the cumulative inflation index.

A	B	C	D	B x C E	B x D F
	End of year Quantity on hand	Base year's end Unit Price	Current year's end Unit Price	C/Y Quantity at Base Price	C/Y Quantity at C/Y Price
Item 1	1	5.00	6.60	5.00	6.60
Item 2	2	1.50	2.31	3.00	4.62
Item 3	3	3.00	4.60	9.00	13.80
Totals				17.00	25.02
Cumulative index = col. F sum/col. E sum =					1.4718

In contrast to the link-chain method the math used for the double-extension method results in the direct calculation of the cumulative index.

IPIC method pool index calculations

Companies using published indexes assign their year end current-year cost inventory dollars to categories defined by the Bureau of Labor Statistics (BLS) and then use either PPI or CPI indexes published by the BLS to calculate a weighted average inflation index for each pool. Companies must choose either the most-detailed categories method or the 10 percent method. The following two examples show IPIC pool index calculations using the most-detailed categories and the 10 percent methods. Both examples use the link-chain method because the use of the double-extension method is very rare for IPIC method taxpayers.

Calculation of LIFO Inventory Balance

The value of inventory at LIFO cost can be calculated after a cumulative inflation index has been computed and the current-year cost balance determined for each pool. Each pools' current-year cost (FIFO or average cost) is divided (or "deflated") by the cumulative index to determine the value of current inventory quantities at base-period prices, which is then compared to the prior year's inventory valued at base-period prices. If the current year's inventory at base is greater than the previous year's inventory at base, this increment is multiplied times the cumulative index to price the LIFO layer. If the current year's inventory at base is less than the previous year's inventory at base, this decrement erodes a previous layer (or multiple layers, in reverse chronological order) and is priced using the cumulative index(es) originally used to price the layer(s).

The examples shown on the following pages illustrate LIFO inventory calculation steps for these three different situations:

Example 1 – LIFO calculation with a 2001 base year and a LIFO increment

Example 2 – LIFO calculation with a 2001 base year and a LIFO decrement

Example 3 – LIFO calculation with a 2000 base year, a LIFO increment in 2001, a decrement partially eroding the 2001 layer in 2002 and a decrement in 2003 eroding both the 2000 and 2001 layers.

The following LIFO-PRO reports are shown in these examples:

- **Report 23 – IPIC LIFO Index Calculation Report:** This shows the details of the pool index calculations using Harmonic Mean Weighting specified in the IRS Regulations.
- **Report 18a – LIFO Reserve Calculation Report:** Balances shown include inventory current year cost (FIFO or average cost), current and cumulative indexes, LIFO inventory, reserve and expense and Sec. 263A (UNICAP) costs (if applicable). This report shows all the steps necessary to calculate a given year's LIFO reserve, and shows the details of decrement calculations where applicable. This report shows these calculations for all pools and in total for a given year. The bottom section of this report (except where retail LIFO is used) shows the breakdown of the LIFO expense or income components between the inflation index effect and the layer erosion effect which is also a proof of the accuracy of the current year LIFO reserve balance. The layer erosion effect (a.k.a. LIFO layer liquidation) is the pre-tax amount that is required by GAAP to be disclosed in the notes to the financial statements (if material) for financial reporting purposes.
- **Report 17 – LIFO Inventory History Detail Report:** This is a one page per pool LIFO history for all years which includes all data contained in Report 16 but also shows the remaining balance of all layers for all years.
- **Report 16a – LIFO Layer History Report:** The top rows of Report 18a show the steps required to calculate the LIFO reserve for a given year and the bottom rows show the proof of the accuracy of the change in the LIFO reserve. Report 17 is a carryforward format LIFO layer history schedule showing the layers at base and at LIFO cost for all years of the LIFO election. Report 16a is a proof of the decrement calculations. Report 16a it shows the prior years' layers to which each decrement is allocated using the LIFO principle and shows the math of the decrement calculations. All three reports are required for comprehensive documentation of the LIFO calculations. The Report 17 shows all values for all years but does not show the math of a decrement calculation for decrements for which multiple prior years' layers are eroded. The Report 18a describes the math steps of the LIFO reserve calculation for a year including row number references but reference must be made to Reports 17 and 16a for an accounting of the LIFO layers and decrements.

The examples shown are for a company using the cost LIFO method. Different calculation steps are required for companies using the retail LIFO method.

Example 1- LIFO calculation with a 2001 base year & LIFO increment:
IPIC LIFO Index Calculation Report (Report 23) – Most Detailed Category Assignment Method

1	B	C	D	E	F	G	H
2	**IPIC Method Most-Detailed Categories Method Pool Index Calculation Example**						
3							
4							**Harmonic**
5	**BLS**		**Current-Year**			**Category**	**Dollars**
6	**Category**		**Cost**	**Dec03**	**Dec02**	**Inflation**	**Weighted**
7	**Number**	**Category Description**	**Balance**	**CY PPI**	**PY PPI**	**Index**	**Extension**
8	02	PROCESSED FOODS AND FEEDS					
9	026	Beverages and beverage materials					
10	0261	Alcoholic beverages					
11	026101	Malt beverages		147.7	145.5		
12	02610101	Bottled beer	25,000	132.2	131.9	1.002274	24,943
13	02610103	Canned beer	20,000	*147.7*	*145.5*	1.015120	19,702
14	02610105	Barrels and kegs	17,000	172.8	166.5	1.037838	16,380
15	02610107	Other malt beverages	7,000	175.0	163.1	1.072961	6,524
16	026102	Distilled spirits exc brandy (bulk & bottles)					
17	02610215	Bottled liquor, except brandy	7,000	173.1	175.2	0.988014	7,085
18	026104	Wines, brandy and brandy spirits		143.4	148.1		
19	02610431	Grape table wines	12,000	138.1	142.0	0.972535	12,339
20	02610434	Dessert wines	3,000	133.9	133.6	1.002246	2,993
21	02610435	Sparkling wines	2,000	132.5	157.0	0.843949	2,370
22	02610438	Non-grape, fortified, & specialty wine or coolers	6,000	117.5	111.7	1.051925	5,704
23	02610439	Beverage brandy and neutral fruit/brandy spirits	1,000	*143.4*	*148.1*	0.968265	1,033
24		Pool Total FIFO $s =	100,000				
25		Sum of Harmonic Dollars Weighted Extensions =					99,073
26	**Pool Index = Total CYC $s / Sum of Harmonic Dollars Wtd. Extensions = 100,000 / 99,073 =**						**1.009356**

Explanation of Most-Detailed Categories method pool index calculations:
LIFO-PRO, Inc. refers to the IPIC method steps that are not using the optional 10 percent method as the Most-Detailed Categories method. The IRS has not given the the use of the alternative to the 10 percent method a name.

Current-year cost inventory dollars for a sample beer and wine distributor using a single dollar-value LIFO pool and December as the appropriate month are shown in column D.

Step 1 - Calculate Category Inflation Indexes (column G) by dividing the current-year PPI (column E) by the previous-year PPI (column F) for each most-detailed category.

Step 2 - Calculate Harmonic Dollars Weighted Extensions (column H) by dividing category current-year cost dollars (column D) by Category Inflation Indexes (column G).

Step 3 - Calculate the pool's index (cell H26) by dividing the sum of the pool's current-year cost dollars (cell D24) by the sum of the pool's Harmonic Dollars Weighted Extensions (cell H25).

There were missing indexes for two most-detailed categories. Reg. § 1.472-8(e)(3)(iii)(D)(2) specify that the indexes for the next less-detailed category should be used when the most-detailed category indexes are not published for a given month. A December 2003 PPI is not available for 02610103 because no indexes were published by the BLS for this category for 2003, so the current-year and previous-year indexes for 026101 are used (cells E13 & F13). The index were first published for 02610439 in September 2003 (this is a new category added by the BLS) so no December 2002 PPI is available for this category and the current-year and previous-year indexes for 026104 are used (cells E23 & F23) for this calculation. The Regs. permit the use of a reasonable method when BLS categories are added or discontinued & this is a reasonable method.

The example shown above is similar to and includes the same data as the LIFO-PRO software Reports 23 & 24 for a company not using the 10 percent method.

There are changes made every six months in the PPI codes published by the BLS. Some of the PPI codes shown in this example have been discontinued since this example was first written but the use of these codes is still valid to illustrate the index calculation steps.

The IRS rules for the IPIC method steps not using the 10% method are contained in Reg. § 1.472-8(e)(3)(iii)(C)(1).

Example 1- LIFO calculation with a 2001 base year & LIFO increment:

IPIC LIFO Index Calculation Report (Report 23) – Ten Percent Category Assignment Method

	BLS Category Number	Category Description		Current-Year Cost Balance	Category % to Pool Total	Dec03 CY PPI	Dec02 PY PPI	Current-Year Inflation Index	2002 BLS Weight	BLS Weighted Extension	Category Inflation Index	Harmonic Dollars Weighted Extension	Index Category BLS Number
2	IPIC 10% Percent Method Pool Index Calculation Example												
8	02	PROCESSED FOODS AND FEEDS											
9	026	Beverages and beverage materials											
10	0261	Alcoholic beverages											
11	026101	Malt beverages											
12	02610101	Bottled beer		25,000	21.6%	132.2	131.9				1.002274	24,943	<-02610101
13	02610103	Canned beer		20,000	17.2%	*147.7*	*145.5*				1.015120	19,702	<-02610103
14	02610105	Barrels and kegs		32,000	27.6%	172.8	166.5				1.037838	30,833	<-02610105
15	02610107	Other malt beverages		8,000	6.9%								0261
16	026102	Distilled spirits exc brandy (bulk & bottles)											
17	02610215	Bottled liquor, except brandy		5,000	4.3%								0261
18	026104	Wines, brandy and brandy spirits											
19	02610431	Grape table wines		12,000	10.3%	138.1	142.0				0.972535	12,339	<-02610431
20	02610434	Dessert wines		3,000	2.6%								026104
21	02610435	Sparkling wines		2,000	1.7%								026104
22	02610438	Non-grape, fortified, & specialty wine or coolers		8,000	6.9%								026104
23	02610439	Beverage brandy and neutral fruit/brandy spirits		1,000	0.9%								026104
24		Pool Total FIFO $s =		116,000									
25													
26	Calculations for Categories Requiring BLS Weighting & 10% Roll-ups:												
27	0261	Alcoholic beverages		13,000	11.2%	∑ BLS Wts. & Wtd. Extns.=			0.077	0.077181	1.002356	12,969	
28	02610107	Other malt beverages		8,000	6.9%	175.0	163.1	1.072961	0.013	0.013948			
29	02610215	Bottled liquor, except brandy		5,000	4.3%	173.1	175.2	0.988014	0.064	0.063233			
30													
31	026104	Wines, brandy and brandy spirits		14,000	12.1%	∑ BLS Wts. & Wtd. Extns.=			0.039	0.037289	0.956119	14,643	
32	02610434	Dessert wines		3,000	2.6%	133.9	133.6	1.002246	0.009	0.009020			
33	02610435	Sparkling wines		2,000	1.7%	132.5	157.0	0.843949	0.013	0.010971			
34	02610438	Non-grape, fortified, & specialty wine or coolers		8,000	6.9%	117.5	111.7	1.052	0.010	0.010519			
35	02610439	Beverage brandy and neutral fruit/brandy spirits		1,000	0.9%	*143.4*	*148.1*	0.968265	0.007	0.006778			
36								Sum of Harmonic Dollars Weighted Extensions =				115,430	
37	**Pool Index = Pool total current-year cost $s / Sum of Harmonic Dollars Weighted Extentions = 116,000 / 115,430 =**											**1.004942**	

Explanation of 10 Percent method pool index calculations:

Current-year cost inventory dollars for a sample beer and wine distributor using a single dollar-value LIFO pool and December as the appropriate month are shown in column C. In practice, a company using the 10 Percent method would assign inventory dollars only to those categories that 1) were not likely to exceed 10% of the pool total, and 2) were not likely to include any more-detailed categories that themselves exceeded 10% of the pool total.

Step 1 - Calculate Category Inflation Indexes for categories not requiring BLS weighting (i.e., most-detailed categories that exceed 10% of the pool total, or less-detailed categories where the 10% threshold is met and all of the more-detailed categories included in the less-detailed category are present in inventory). In this example the current-year cost dollars assigned to 026101, 026103, 02610105, & 02610431 each exceed 10% of the pool total. The Category Inflation Indexes for these categories (column L) are calculated by dividing the current-year PPI (column G) by the previous-year PPI (column H).

Step 2 - Calculate Category Inflation Indexes for categories requiring BLS weighting (i.e., less-detailed categories where the 10% threshold is met but not all of the more-detailed categories encompassed by the less-detailed category are included in the computation). In this example the current-year cost inventory dollars for 02610107, 02610215, 02610434, 02610435, 02610438, & 02610439 are each less than 10% of the pool total.
The required substeps are:
   A. Calculate Current-Year Inflation Indexes (column H) by dividing current-year PPI (column G) by previous-year PPI (column H).
   B. Calculate BLS Weighted Extensions (column K) by multiplying BLS Weights (column I) times Current-Year Inflation Indexes.
   C. Calculate Category Inflation Indexes (column L) by dividing the sum of the BLS Weighted Extensions (cell K27 for 0261, cell K31 for 026104) by the sum of the BLS Weights (cell J27 for 0261, cell J31 for 026104). This is referred to by the IRS as "arithmetic mean math" which the Regs. specify should be used for this step rather than the harmonic mean math used for the pool index calculation.

Step 3 - Calculate Harmonic Dollars Weighted Extensions (column M) by dividing category current-year cost dollars (column E) by Category Inflation Indexes (column L).

Step 4 - Calculate the pool's index (cell M37) by dividing the sum of the pool's current-year cost dollars (cell E24) by the sum of the pool's Harmonic Dollars Weighted Extensions (cell M36).

There were missing indexes for two most-detailed categories. Reg. § 1.472-8(e)(3)(iii)(D)(2) specify that the indexes for the next less-detailed category should be used when the most-detailed category indexes are not published for a given month. A December 2003 PPI is not available for 02610103 because no indexes were published by the BLS for this category for 2003, so the current-year and previous-year indexes for 026101 are used (cells G13 & H13). The index were first published for 02610439 in September 2003 (this is a new category added by the BLS) so no December 2002 PPI is available for this category and the current-year and previous-year indexes for 026104 are used (cells G35 & H35) for this calculation. The Regs. permit the use of a reasonable method when BLS categories are added or discontinued & this is a reasonable method. No 2002 BLS Weight is available for 02610439 so the 2003 BLS Weight for that category is used (cell J35).

The example shown above is similar to and includes the same data as the LIFO-PRO software Reports 23 & 24 for a company using the 10 percent method.

There are changes made every six months in the PPI codes published by the BLS. Some of the PPI codes shown in this example have been discontinued since this example was first written but the use of these codes is still valid to illustrate the index calculation steps.

The IRS rules for the 10% method steps are contained in Reg. § 1.472-8(e)(3)(iii)(C)(2).

Example 1- LIFO calculation with a 2001 base year & LIFO increment:
LIFO Reserve Calculation Report (Report 18a)

Sample Company			
CALCULATION OF LIFO RESERVE **REPORT 18a**			
2001			
Data path:y:\LIFOPRO1\ABC\EG1			
Pool number			**1**
Pool name	Row	Formula/Source	**All goods**
Current-year cost	7	Inventory total	12,000,000
Current year deflator index	8	Pool index calculated	1.050000
Prior year cumulative deflator index	9	Layer history Report 16 or 17	1.000000
Current year cumulative deflator index	10	Row 8 times Row 9	1.050000
Current year inventory at base	11	Row 7 divided by Row 10	11,428,571
Prior year inventory at base	12	Layer history Report 16 or 17	10,000,000
Increase(decrease) at base	13	Row 11 minus Row 12	1,428,571
Current year cumulative inflator index	14	Same as Row 10 for increment	1.050000
Increase(decrease) in LIFO cost	15	Row 13 x Row 14	1,500,000
Prior year LIFO inventory	16	Layer history Report 16 or 17	10,000,000
Current year LIFO inventory	17	Row 15 plus Row 16	11,500,000
Current year LIFO reserve	18	Row 7 minus Row 17	500,000
Prior year LIFO reserve	19	Layer history Report 16 or 17	0
Current year LIFO expense(income)	20	Row 18 minus Row 19	500,000
Proof of current year LIFO expense(income):			
Current year inflation(deflation)	22	Row 8 minus one as a percentage	5.00%
Prior year FIFO inventory balance	23	Layer history Report 16 or 17	10,000,000
C/Y expense(income) due to inflation	24	Row 22 times Row 23	500,000
C/Y cum. def. index minus avg. index of layers eroded	25	n/a-No Decrement was created	n/a
Expense(income) due to layer erosions	26	n/a-No Decrement was created	n/a
Total current year LIFO expense(income)	27	Row 24 plus Row 26(ties to Row 20)	500,000

Rows 7-20 of this report show all the steps necessary to calculate the LIFO reserve for this year. Rows 22-27 show the proof to verify the accuracy of the Row 14 balance.

2001 Increase at Base x 2001 Inflator Index = 2001 Increase at LIFO Cost 1,428,571 x 1.050 = 1,500,000