The Materiality of LIFO Accounting Distortions on Liquidity Measurements

David Coffee
Western Carolina University

Reed Roig
University of North Carolina at Asheville

Roger Lirely
Western Carolina University

Phillip Little
Coastal Carolina University

ABSTRACT

With the pending US adoption of International Financial Reporting Standards (IFRS) and the potential elimination of last-in-first-out (LIFO) as an accepted inventory valuation method, the use of LIFO is receiving renewed attention in the financial community. This study examines accounting distortions created by the use of LIFO inventory valuation and the materiality of these distortions on liquidity measurements. Our sample consists of three-hundred-five active publicly traded US Companies with a positive LIFO reserve. We measure the materiality of LIFO balance sheet distortions relative to net assets, inventory turnover, total working capital, and current ratio. We conclude that the use of LIFO inventory valuation generates significant balance sheet distortions across a broad spectrum of company sizes and industries. These distortions, and the related comparability problems they create, provide evidence that, at least for this aspect of generally accepted accounting principles, IFRS provides a more transparent reporting model for users of financial statement information.

Keywords: inventory valuation method, LIFO, IFRS, accounting distortions, liquidity measures

INTRODUCTION

Last-in-first-out (LIFO) is an inventory accounting technique which allocates the most recent inventory prices to cost of goods sold and the oldest inventory prices to items remaining in the inventory. In a period of increasing prices, this assumption assigns the recent and higher prices to cost of goods sold and the older lower prices to inventory. LIFO became an important inventory valuation method in the 1930s, and in 1939, Congress allowed companies to use LIFO for income tax purposes. Under current tax law, Internal Revenue Code section 472 permits a company to use LIFO for tax purposes only if it also uses LIFO for financial reporting purposes (the "conformity rule"). Jennings, Mest and Thompson (1992) reported that during the inflationary pressures of the 1970s almost a quarter of the manufacturing and merchandising companies traded on the NYSE and American Stock Exchange either adopted or extended their use of LIFO. Bloom and Cenker (2009) reported that approximately 5 percent of U.S. publicly traded companies currently use LIFO as their primary inventory valuation method.

Unless there is action by Congress to relax the "conformity rule", the pending US adoption of International Financial Reporting Standards (IFRS) in 2014 will require US publicly traded companies that currently use LIFO inventory valuations to change inventory accounting methods. First-in-first-out (FIFO) and average-cost are currently the only two acceptable inventory costing methods permitted under IFRS. Alternatively, there could be pressure on the International Financial Accounting Standards Board (IASB) to change their standards to allow the LIFO inventory valuation method. The purpose of this study is to evaluate the relative magnitude of the dollar impact of LIFO inventory measurements on US publicly traded companies and to measure certain accounting distortions created by the use of LIFO accounting.

PRIOR RESEARCH

Maurice Moonitz, one of the early noted accounting theorists, pointed out the balance sheet distortion of LIFO's "gross understatement" of inventory values (Moonitz, 1953). It has been frequently argued that LIFO results in enhanced income statements and distorted balance sheets (Jennings, Simko and Thompson., 1996). The enhanced measurement of periodic income results from LIFO's better matching of current sales prices with current costs. Because current costs are closer to replacement costs, the result is a gross profit measurement which many believe is more sustainable and represents a higher quality of earnings. Conversely, the balance sheet's distortion of the current value of inventory produces a measurement of inventory and current assets which is understated under inflationary conditions. The amount of the understatement is a function of the level of price increases, the pattern of inventory changes, and the number of years of LIFO use.

The enhanced income statement/distorted balance sheet dilemma has generated a "non-articulation" view (Sprouse, 1978). The non-articulation view asserts that articulation between the income statement and balance sheet is unnecessarily restrictive. This view advocates the use of LIFO for the income statement and FIFO for the balance sheet. This proposal may be illogical to proponents of asset/liability or even expense/revenue theories of income measurement, but the very nature of the dilemma creates at least some support for non-articulation. For example, in 1986 the American Institute of Certified Public Accountants (AICPA) considered a method they labeled LIFO/FIFO which would uses LIFO to measure cost of goods sold and FIFO to measure

inventory (AICPA, as cited in Reeve and Stanga, 1987). The AICPA Executive Standards Committee rejected the proposal by a narrow eight to six vote.

Before 1972, disclosure of LIFO valuation differences was not required, and therefore evaluation of the materiality of balance sheet differences was difficult. Holdren (1964) attempted to study the differences in the current ratios, inventory turnovers, and net profit margins of LIFO and non-LIFO companies. His sample was derived from surveys and was limited because only 12 of the 71 LIFO companies contacted provided all the information requested. Holdren found the largest differences to be in inventory turnover (which was computed by dividing net sales by ending inventory). Smaller differences were found in current ratios and profit margins. However, the small sample size limits the inferences that can be made from the study.

Since 1972, the Securities and Exchange Commission has required publicly traded companies to disclose the excess of current cost or replacement cost of inventory over LIFO values stated on the balance sheet when these differences are material (Regulation S-X, 17 C.F.R. 210.5-02 6.(c)). This reported amount has come to be known as the LIFO reserve. The LIFO reserve serves as a direct indicator of the materiality of the balance sheet distortions which may result from LIFO use over a period of time. Reeve and Stanga (1987) studied the LIFO reserve for 56 companies responding to their questionnaire and for which they were able to obtain annual reports. They found that for the companies in their survey, the LIFO reserve averaged 38 percent of the reported LIFO inventory. Reeve and Stanga concluded that LIFO reserves are a relatively large amount, and these large amounts support the belief that LIFO distorts the balance sheet. Their study also indicated that for companies that have recently adopted LIFO, a significant positive relationship exists between the years a company has been using LIFO and the LIFO reserve, as well as between the magnitude of the price changes and LIFO reserve. This relationship was not as pronounced for companies which had been using LIFO a long time, a result which Reeve and Stanga attributed to the combined effect of LIFO liquidations and specific price changes.

The relevance of LIFO as an indicator of firm value has received research attention. Carroll, Collins and Johnson (1993) and Pincus and Wesley (1994) conducted studies examining the quality of LIFO earnings as an improved indicator of sustainable future cash flows when compared with non-LIFO earnings measurements. The studies examined earnings before and after adoption of LIFO or before and after abandoning LIFO. The results of these studies were inconclusive.

Guenther and Trombley (1994), looking at the value relevance of the LIFO reserve, found a surprising negative relationship between equity values and the size of the LIFO reserve. This could indicate that large LIFO reserves signal to the market an inflationary environment and the perception of a higher cost of capital or as suggested by Dhaliwal, Trezevant & Wilkins (2000), that investors consider the future cash flow effects of the tax burden of liquidation of the LIFO reserve in their valuation of the firm.

In another study of value relevance, Jennings et al. (1996) compared LIFO income statements and balance sheets with “as if” non-LIFO income statements and balance sheets, reconstructed using LIFO reserve disclosures. Their purpose was to determine which set of financial statements (LIFO or non-LIFO) for their sample of 991 LIFO users better explained the cross-sectional distribution of equity values. Essentially, the study viewed the LIFO and “as if” non-LIFO financial statements as competing summaries of the available information set and determined the summary which better explained the distribution of equity values as being the

most useful. Consistent with the view that LIFO income statements are more useful than non-LIFO income statements, they found that LIFO income statements explained slightly more of the cross-sectional variation in equity values. But, in contrast with the widely held view that non-LIFO balance sheets are more useful than LIFO balance sheets, the study found that LIFO balance sheets explained more of the cross-sectional variation in equity values than their non-LIFO counterparts. In addition, like Guenther and Trombley (1994), they found a systematic negative relationship between equity values and the size of the LIFO reserves.

ACCOUNTING DISTORTIONS GENERATED BY LIFO INVENTORY VALUATION

Accounting distortions are deviations of reported information in financial statements from the underlying business reality (Wild and Subramanyam, 2009). These distortions can arise from accounting standards, estimates inherent in the accounting process, latitudes in application, and the inability of accounting to capture, in a representational way, the economic substance of certain transactions and events. Wild and Subramanyam referred to LIFO's enhanced income statement/distorted balance sheet dilemma as an accounting distortion:

> …an accounting rule that improves one statement often does so to the detriment of the other.…FIFO inventory rules ensure the inventory account in the balance sheet reflects current cost of unsold inventory. Yet, LIFO inventory rules better reflect current cost of sales in the income statement (p. 107).

In this study, we define the LIFO reserve, which measures the difference in LIFO inventory valuation and current cost valuation determined on a FIFO, average cost, or replacement cost basis, as an accounting distortion of the balance sheet.

OBJECTIVES OF THIS STUDY

With the pending move to IFRS, there is a popular view that the use of LIFO as an inventory valuation method is about to end. This may or may not be true. Bloom and Cenker (2009) suggested a number of events which could result in the continued use of LIFO as an accepted accounting technique. Non-public companies, which will not fall under the SEC's reporting requirements, may continue to report under existing U.S. GAAP and therefore may continue using LIFO. It is possible that two sets of financial statements, one prepared under IFRS and the other based on the Financial Accounting Standards Board's Statements of Financial Accounting Standards, which permit LIFO valuation, could be allowed. Finally, LIFO could continue to be used for tax purposes, especially if the conformity rule is relaxed.

This study focuses on two objectives: (1) to describe the usage of LIFO inventory accounting among US publicly traded companies scheduled for transition to IFRS in 2014; and (2) to measure the magnitude of the balance sheet accounting distortions of LIFO companies by comparing LIFO balance sheet liquidity measurements with reconstructed current cost balance sheet liquidity measurements. We limit our study to balance sheet accounting distortions involving liquidity measurements, which are more simple and direct, and avoided earnings quality and firm valuation impacts, on which most of the prior LIFO research has focused.

RESEARCH METHOD

We acquire data for the 2007 fiscal year from Standard and Poor's Compustat North America database, comprising 9,917 actively-traded companies as of October 31, 2008. A preliminary sample of 306 companies was derived by limiting our sample to primary-issue, non-ADR, U.S. companies with a positive LIFO reserve and complete data for analysis. One additional company was eliminated when a review of the footnotes indicated that it had changed its method of inventory valuation from FIFO to LIFO in 2007. The screening resulted in a set of 305 companies.

Table 1 contains descriptive statistics for the sample. The mean and maximum size of the LIFO reserve, $269 million and $25.4 billion, respectively, suggest that the use of LIFO has the potential to cause significant accounting distortions.

We examine these companies to identify the level of accounting distortions resulting from the use of LIFO inventory valuations. Specifically, we compare inventory, inventory turnover, working capital, and current ratio, as reported in the financial statements for each company, with those same measures after adjusting for the amount of LIFO reserve. The adjusted measures are constructed as follows:

ADJINV = year-end inventory + LIFO reserve

ADJINVTO = cost of goods sold ÷ the average of beginning and ending ADJINV

ADJWC = working capital + LIFO reserve

ADJCR = (current assets + the LIFO reserve) ÷ current liabilities

Note that we did not adjust reported cost of goods sold in our adjusted inventory calculation for the change in the LIFO reserve between years. We did this to match the approximate current costs of inventory with the approximate current costs in cost of goods sold. Computations based on adjusted cost of goods sold did not yield materially different results in our calculations.

We define accounting distortion as the percentage difference in each measure as a result of the LIFO reserve adjustment.

RESULTS OF THE RESEARCH

Table 2 contains industry comparisons for the 305 companies in the sample. Eighty-seven of these did not use LIFO as their primary inventory valuation method. Of the 218 companies using LIFO as their primary inventory valuation, nearly all of them (214) were in manufacturing or wholesale/retail. Note also that the largest mean LIFO reserves, and therefore, the largest potential dollar accounting distortions, were also in companies engaged in manufacturing, trailed by companies in transportation, agriculture and wholesale/retail activities. In short, other than manufacturing, the potential for accounting distortions appears to be independent of industry affiliation.

Table 1
2007 Descriptive Statistics
(in MMs)

	Mean	Median	Maximum	Minimum
Total Assets	7,168.6	1,804.4	242,082.0	12.0
Net Sales	8,930.3	2,289.7	358,600.0	15.8
Stockholders' Equity	2,919.1	663.7	121,762.0	-1,595.0
Inventory	773.8	246.8	11,089.0	2.4
LIFO Reserve	268.6	29.5	25,400.0	0.0
Current Assets	2,414.2	699.5	85,963.0	9.3
Current Liabilities	1,780.9	400.2	58,312.0	0.9

Table 2
Industry Comparisons

Industry	N	Percent of Sample	# of Firms Primarily LIFO	# of Firms Primarily FIFO	# of Firms Primarily Other	Average LIFO Reserve ($MM)
Agricultural	2	0.7%	1	1	0	107.5
Mining	5	1.6%	2	0	3	57.0
Manufacturing	244	80.0%	168	65	11	321.9
Transportation	2	0.7%	1	0	1	119.0
Wholesale/Retail	52	17.0%	46	4	2	91.8
Total	305	100.0%	218	70	17	268.6

Comparisons of the amount of LIFO reserve to total assets for the twenty companies with the largest dollar amount of LIFO reserve are reported in Table 3. Exxon Mobil stands out as having the largest LIFO reserve in terms of absolute dollar amount - $25.4 billion. Although there is representation from large manufacturers (such as Alcoa, US Steel, Nucor, Caterpillar and Dow Chemical) and large retailing firms (Kroger and Rite Aid), the six largest reserves and nine of the twenty largest reserves belong to oil and gas producers.

Table 3
20 Largest LIFO Reserves
(In $MM)

Rank	Company	LIFO Reserve	Total Assets	% of Total Assets
1.	Exxon Mobil	25,400	242,082	10.49
2.	Chevron Corp	6,958	148,786	4.68
3.	Conoco Phillips	6,668	177,757	3.75
4.	Valero Energy Corp	6,200	42,722	14.51
5.	Marathon Oil Corp	4,034	42,746	9.44
6.	Sunoco Inc	3,868	12,426	31.13
7.	Caterpillar Inc	2,617	56,132	4.66
8.	Dow Chemical	1,511	48,801	3.10
9.	Tesoro Corp	1,400	8,128	17.22
10.	Alcoa Inc	1,069	38,803	2.75
11.	Hess Corp	1,029	26,131	3.94
12.	US Steel Corp	910	15,632	5.82
13.	Archer-Daniels Corp	784	37,056	2.12
14.	Murphy Oil Corp	710	10,536	6.74
15.	Du Pont	630	34,131	1.85
16.	Kroger Co	604	22,299	2.71
17.	Nucor Corp	582	9,826	5.92
18.	Rite Aid	563	11,488	4.90
19.	AK Steel Holding Corp	539	5,197	10.37
20.	Eastman Chemical	510	6,009	8.49

In Table 4, we compare the dollar amount of the LIFO Reserve to the dollar amount of net assets as a second measure of the materiality of the LIFO Reserve. Although this produces a different list of companies than Table 3, five companies (Sunoco, AK Steel, Tesoro, Valero, and Rite Aid) are included in both tables. In addition, as in Table 3, oil and gas producers are disproportionately represented with six of the twenty most material LIFO reserves as a percentage of net assets. Between Tables 3 and 4, we identify twelve of the fourteen oil and gas producing companies (86%) in our sample as having material LIFO reserves. The data in Table 4 clearly reflect the materiality of the LIFO Reserve for these twenty companies. The LIFO reserve for this subsample ranges from 153% of net assets for Sunoco to almost 31% of the net assets for Standard Register.

Table 4
20 Most Material LIFO Reserves as a Percentage of Net Assets

Rank	Company	LIFO Reserve/Net Assets
1.	Sunoco Inc	152.70%
2.	Hancock Fabrics Inc	134.54%
3.	Central Steel & Wire	110.93%
4.	Alpine Group Inc	87.25%
5.	Strum Ruger & Co Inc	61.64%
6.	AK Steel Holding Corp	61.63%
7.	Carpenter Technology Corp	53.38%
8.	Miller (Herman) Inc	51.28%
9.	Tesoro Corp	45.87%
10.	AEP Industries Inc	42.95%
11.	American Biltrite Inc	38.25%
12.	Castle (AM) & Co	36.91%
13.	Omnova Solutions Inc	35.53%
14.	Alon USA Energy	35.27%
15.	Finlay Enterprises Inc	33.89%
16.	Western Refining Inc	33.85%
17.	Holly Corp	33.58%
18.	Valero Energy Corp	33.50%
19.	Rite Aid Corp	32.89%
20.	Standard Register Co	30.84%

Table 5 contains the primary results of our research. Here we stratify our sample into deciles based on net sales and measure balance sheet accounting distortions created by LIFO by comparing inventory valuations under LIFO with the reconstructed adjusted inventory valuations as previously defined We show these differences as mean percentages for each decile. The accounting distortions for the balance sheet inventory valuations range from a low of 12.8% for the seventh decile, to a high of 50.6% in the tenth decile. All of the deciles show mean differences exceeding 12%. We note that these distortions, which average 34.7% across all companies, are similar to the 38% distortion found by Reeve and Stanga (1987).

Next, we compute the adjusted measures for inventory turnover, working capital, and the current ratio and compare them to their unadjusted (LIFO) counterparts. With the exception of the eighth decile, which shows an 11.8% distortion, percentage differences for inventory turnovers exceed 16%. The average turnover distortion across all companies is 23.1%. Mean percentage differences for working capital exceed 12% in each of the ten deciles, ranging from a low of 12.6% in the ninth decile to a high of 82.0% in the tenth decile. The average percentage difference in working capital across all the companies is 42.4%.

Table 5
Accounting Distortions by Company Size (Based on Net Sales) from Smallest to Largest Decile
(Dollar amounts in $MM)

Decile	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
INV	$22.2	$70.7	$107.6	$145.1	$289.1	$362.7	$461.7	$694.8	$1,303.6	$4,336.1
ADJINV	27.5	84.0	129.6	176.3	335.6	422.8	520.7	811.0	1,475.3	6.531.6
Distortion	24.0%	18.8%	20.4%	21.5%	16.1%	16.6%	12.8%	16.7%	13.2%	50.6%
INVTO	5.93	4.83	7.28	7.82	5.86	8.20	10.29	8.70	11.99	12.63
ADJINVTO	4.68	3.93	5.88	6.20	4.90	6.82	8.54	7.68	7.70	7.93
Distortion	-21.2%	-18.6%	-19.2%	-20.8%	-16.4%	-16.8%	-17.1%	-11.8%	-35.8%	-37.2%
WC	$32.0	$101.7	$148.7	$206.4	317.6	422.6	304.3	795.1	1,361.4	2,676.5
ADJWC	37.3	115.0	170.7	237.6	364.1	482.7	363.3	911.4	1,533.0	4,871.9
Distortion	16.7%	13.0%	14.8%	15.1%	14.7%	14.2%	19.4%	14.6%	12.6%	82.0%
CR	3.02	2.84	2.47	2.25	1.98	1.92	1.46	1.77	1.61	1.26
ADJCR	3.32	3.11	2.71	2.46	2.13	2.05	1.54	1.90	1.70	1.41
Distortion	9.9%	9.5%	9.8%	9.2%	7.6%	6.7%	5.1%	7.4%	5.4%	12.3%

INV = reported year-end inventory
ADJINV = year-end inventory + LIFO reserve

INVTO = cost of goods sold ÷ the average of beginning and ending INV
ADJINVTO = cost of goods sold ÷ the average of beginning and ending ADJINV

WC = reported working capital
ADJWC = working capital + LIFO reserve

CR = reported current ratio
ADJCR = (current assets + the LIFO reserve) ÷ current liabilities

All amounts reported are the means of the above calculations for each decile

Table 6
Accounting Distortions by Size of LIFO Reserve - from Smallest to Largest Decile
(Dollar amounts in $MM)

Decile	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
INV	$257.0	$101.9	$142.8	$276.7	$599.6	$651.7	$596.4	$651.7	$1,524.5	$2,960.2
ADJINV	258.1	106.1	152.1	292.1	624.2	688.4	650.5	738.6	1,692.1	5282.5
Distortion	.4%	4.1%	6.5%	5.6%	4.1%	5.6%	9.1%	13.3%	11.0%	78.4%
INVTO	6.08	8.10	5.80	8.17	9.38	7.39	7.45	6.45	11.90	12.85
ADJINVTO	5.55	7.04	5.00	7.25	8.03	5.78	6.28	5.28	6.84	7.20
Distortion	-8.7%	-13.1%	-13.7%	-11.3%	-14.5%	-21.7%	-15.7%	-18.2%	-42.5%	-44.0%
WC	$227.0	$225.1	$178.1	$227.9	422.4	492.0	450.8	636.1	981.9	2,521.6
ADJWC	228.1	229.4	187.4	243.3	447.0	528.8	504.9	723.0	1,149.6	4,843.9
Distortion	.5%	1.9%	5.2%	6.8%	5.8%	7.5%	12.0%	13.6%	17.1%	92.1%
CR	2.48	2.54	2.42	1.95	2.00	2.03	1.77	2.06	1.68	1.66
ADJCR	2.55	2.63	2.56	2.06	2.16	2.27	1.94	2.27	1.91	1.98
Distortion	2.8%	3.5%	5.9%	5.7%	8.3%	11.8%	9.8%	9.8%	13.8%	19.7%

All variables are computed consistent with descriptions in Table 5

All amounts reported are the means of the above calculations for each decile

Current ratios show the least material mean percentage differences. Current ratios show differences of less than 10% in nine of the ten deciles; ranging from a low of 5.1% in the seventh decile to a high of 12.3% in the tenth decile. The average difference is 8.5% percent across all the companies.

Taken as a whole we find the results reported in Table 5 clearly reflect material accounting distortions created by the use of LIFO inventory valuations. One-tailed t-tests were significant at $p < .01$ for all differences except inventory turnover comparisons for the ninth decile ($p < .10$).

Because of the range of values of LIFO reserves ($0.034 to $25,400.0) and LIFO reserves relative to reported inventory (0.0% to 538.0%), in Table 6 we also examine the calculations of inventory values, inventory turnover, working capital, and current ratio distortions in deciles formed from the smallest to the largest LIFO reserves. Not unexpectedly, the percentage distortions in all the measures generally increase from the lowest decile to the highest (the obvious exceptions are the unusually high turnover and current ratio percentages in the sixth decile). However, as with the results of Table 5, one tailed t-tests were significant at $p < .01$ with only a few exceptions. The inventory turnover difference for the first decile was significant at $p = 0.019$ and for the ninth decile at $p = 0.067$, and the current ratio difference for the seventh decile was significant at the $p = 0.012$ level. This provides further evidence that even for the smallest LIFO reserves, the distortions in inventory values and liquidity measures is material.

CONCLUSION

Our study provides evidence that the use of LIFO inventory valuation produces material accounting distortions, both in terms of absolute dollar amounts and in amounts relative to other assets and liabilities included on the balance sheet. The financial community may accept these distortions for two reasons. First, it is a distortion on the side of conservative accounting, understating the liquidity measures of current assets, working capital and working capital ratios. Secondly, the disclosure of the LIFO reserve allows adjustment, assuming the analyst has sufficient knowledge to understand the concept of the LIFO reserve.

The use of LIFO inventory will be given a closer look with the approaching adoption of IFRS, which currently does not allow LIFO. We believe our study provides evidence that the transparency of financial reporting could be improved by eliminating LIFO, and that material accounting distortions related to liquidity measurements on the balance sheet could be eliminated for some publicly traded companies.

REFERENCES

Bloom, R., and Cenker, W. (2009). The death of LIFO? Changing inventory method requires managing the accounting-tax differences. *Journal of Accountancy, 207,* 44-49.

Carroll, T., Collins, D. W., and Johnson, W. B. (1993). The LIFO-FIFO choice and the quality of earnings signals. Working Paper, University of Iowa.

Dhaliwal, D. S., Trezevant, R. H., & Wilkins, M. S. (2000). Tests of a deferred tax explanation of the negative association between the LIFO reserve and firm value. *Contemporary Accounting Research, 17*(1), 41-59.

Guenther, D., and Trombley, M. (1994). The "LIFO Reserve" and the value of the firm: Theory and empirical evidence. *Contemporary Accounting Research 10,* 433-452.

Holdren, G. C. (1964). LIFO and ratio analysis. *Accounting Review 39,* 70-85.
Jennings, R., Mest, D., Thompson II, R. B. (1992). Investor reaction to disclosures of 1974-75 LIFO adoption decisions. *The Accounting Review, 67,* 337-354.
Jennings, R., Simko, P. J., and Thompson II, R. B. (1996). Does LIFO inventory accounting improve the income statement at the expense of the balance sheet? *Journal of Accounting Research, 34,* 85-109.
Moonitz, M. (1953). The case against LIFO as an inventory pricing formula. *Journal of Accountancy 95,* 682-690.
Pincus, M., and Wasley, C. (1994). LIFO adoptions and the informativeness of earnings. Working Paper, Washington University
Reeve, J. M., and Stanga, K. G. (1987). Balance sheet impact of using LIFO: An empirical study. *Accounting Horizons* (September), 9-15.
Sprouse, R. T. (1978). The importance of earnings in the conceptual framework. *The Journal of Accountancy*: 64-71.
Wild, J. J., and Subramanyam, K. R. (2009). *Financial statement analysis* (10th ed.) Boston: McGraw-Hill/Irwin.