1 Gross margin equals sales less cost - of - products - sold. The adjusted cost - of - goods - sold is derived by reducing the reported amount by the change in the LIFO reserve during the year. As the LIFO reserve declined in 1998, 2000 and 2001 (due to declining prices), FIFO cost - of - goods - sold exceeds LIFO cost - of - goods - sold for those years. 71015

In 1998, we have a strange situation. Inventories increased based on LIFO, but decreased based on FIFO. How could this be ? Since LIFO inventory increased, inventory in units must have increased. We can take unit cost as $1.00 at the end of 1997. All the LIFO inventory increase must have come from purchases made at the beginning of 1998 - say at cost $1.00 and the value and units are 29.09
As LIFO reserve decreased, there must have been a huge decrease in unit costs. In fact a 1998 footnote in the 10-K says

3. Inventories:
Inventories consist of approximately 50% raw materials and supplies, and 50% finished and semi-finished products in 1998 (60% and 40% in 1997). Inventories valued using the last-in, first-out (LIFO) method of accounting represent approximately 85% of total inventories in 1998 (90% in 1997). If the first-in, first-out (FIFO) method of accounting had been used, inventories would have been $5,120,960 higher in 1998 ($100,575,518 higher in 1997). Use of the lower of cost or market reduced inventories by $25,059,973 in 1998 (none in 1997).

Analysis

From FIFO values	**FIFO**				**units**	**Ending**	$mn
Beginning inventory	$441.01	/	**$1.000**	=	441.01	LIFO inventory	464.98
Additions	$29.09	/	$ 1.000	=	29.09	LIFO reserve	28.59
Ending inventory	$470.10				470.10	Current cost	493.57
							(23.47)

Unit cost	$493.57	/	470.100	=	$1.05	
Write-offs on additions	1.000	-	1.050	=	(0.050)	per unit
Write-offs on additions	(0.050)	x	29.090	=	(1.452)	$ mn
Write-offs on beginning inventory	25.060	-	(1.452)	=	26.512	$ mn

This means that some of the beginning LIFO inventory was valued at more than the ending unit cost of $1.05

2 Over the period, gross margins held steady, declined from 2001. Gross margins as a percent of sales also followed the same pattern. FIFO gross margins show a similar trend. FIFO gross margins are more volatile relative to sales than the reported amounts, as price changes magnify operating changes. Not surprisingly, prices rose in periods of strong demand growth (and profitability). The contrast between reported and adjusted amounts is particularly striking in 1998 vs. 1997. (the FIFO decline is much higher).

3 The adjustment to gross margins must be carried down to pretax income, and then to net income. The final step, multiplying the pretax adjustment by (1 - t), requires the marginal tax rate t. Here we will use the implied tax rate rather than the marginal tax rate. The net income (and earnings per share) trends are similar to those of gross margins. The reported (LIFO) amounts are more stable as they exclude the price effects. The reported EPS show a slightly higher growth rate.

4 The adjustment to Nucor's book value per share (BVPS) is simply the LIFO reserve. As elsewhere in the text and problems, we make this adjustment pretax as there is little possibility that the LIFO reserve will be liquidated. (Nucor's rapid sales growth reduces this likelihood further.) The adjusted BVPS is computed using the same number of shares Nucor uses to report (unadjusted) BVPS. The adjustment increases BVPS each year, although the percentage adjustment is lower for years when the LIFO reserve declines. The adjustment slightly reduces the growth rate of BVPS (using 1990 as the base year) . Given the variability of the LIFO reserve, the effect on BVPS varies with the choice of base and ending years.

5 The effect of LIFO on cash from operations (CFO) is the tax effect, equal to the LIFO effect (change in LIFO reserve) multiplied by the tax rate t.

6 LIFO reduces the carrying value of inventory, lowering working capital and the current ratio. The adjusted amounts are, therefore, higher as the LIFO reserve is added (pretax) to current assets. The adjusted current ratio is always higher. The adjusted amounts are, however, more volatile, as they include the effect of price changes on Nucor's inventory. Note however that the differences between FIFO and LIFO disappear in 1998 and are much smaller in 1999 as a result of the sharp decline in the LIFO reserve.
LIFO also affects return on equity. Adjustments to FIFO always increase the denominator (equity); the effect on return (net income) varies. The most striking differences are in 1996 and 1998. In those years, when prices declined, the adjusted ROE is significantly lower

7 The inventory turnover ratios calculated in exhibit 6CS-1 vary, as expected, with the inventory method. The LIFO ratios are always higher as the ratio denominator (average inventory) is understated by the LIFO reserve. The FIFO and current cost ratios are similar, as discussed in the text. The current cost method, using LIFO COPS in the numerator and FIFO inventory in the denominator, is the best measure of economic turnover. By this measure, Nucor's inventory turnover declined over the period, from 8.00 to 7.45. Growth in inventory was greater than growth in sales.

8 The major advantages to Nucor of using the LIFO method are:

F Reduced volatility of reported gross margin and income (answers 2 and 3 above)

F Higher cash flow due to tax savings (answer 4)

F Higher reported inventory turnover ratio

The major disadvantages of the LIFO method are:

F Reduced reported income in most years (answer 3)

F Lower reported stockholders' equity (answer 5) Ratios that use equity (such as the debt - to - equity ratio) are understated.

F Lower current ratio (answer 6) . Ratios that use total assets are also understated.

9 Prices have declined dramatically, especially in 1998 and 2005
The major implication is the reduced cash flows in the years the LIFO reserve declined (1996 and 1998) as Nucor had to pay higher taxes. Declining prices in some years offset the benefits of LIFO when prices rise. On the other hand, the price declines increase LIFO income as well as balance sheet ratios, as the difference between FIFO and LIFO inventory declines.

10 When a company switches from LIFO to FIFO, it must pay taxes on the accumulated LIFO reserve. Thus, the best time to switch would have been at the end of 1998 when the LIFO reserve was smallest – mitigating the tax consequences.

11 A switch to FIFO would have signaled that Nucor expects the price of steel scrap to continue to decline. In that environment, the switch to FIFO would be motivated by the desire to lower taxes, and the elimination of the record keeping requirements of the LIFO method.

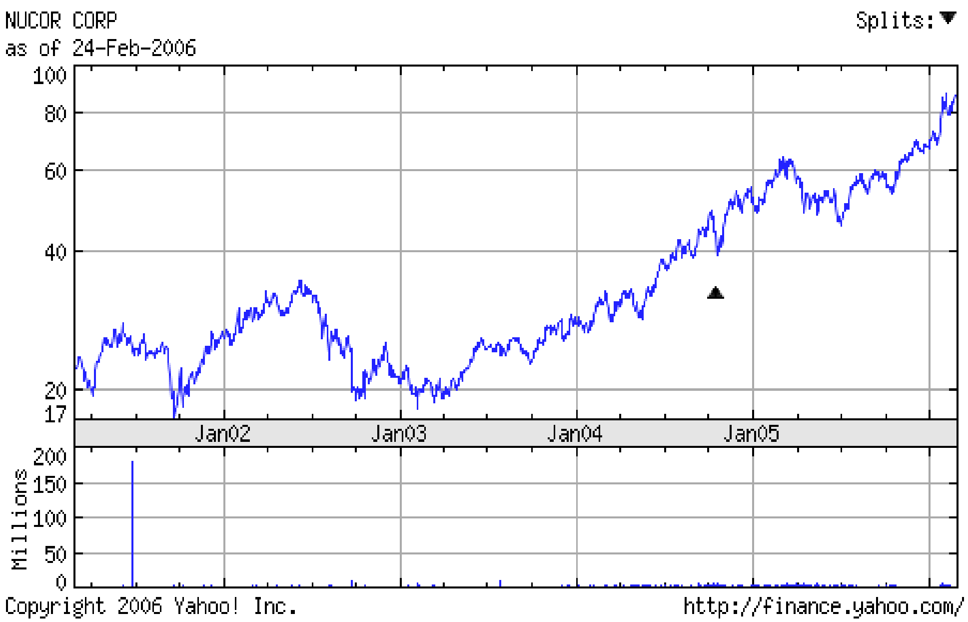
12 Nucor says the following about sales:
Net sales for 2004 increased 82% to $11.38 billion, compared with $6.27 billion in 2003. The average sales price per ton increased 66% from $359 in 2003 to $595 in 2004, while total shipments to outside customers increased 9%. Approximately 85% of the increase was due to higher average selling prices resulting from increased demand for our products, which affected base prices, and the implementation of a raw materials surcharge to address historically high scrap costs. The remaining 15% of the sales increase was due to higher sales volume resulting from increased demand and the additional production capacity obtained from the acquisition of assets from Corus Tuscaloosa and

Worthington in the second half of 2004 and the ramp-up of production at Nucor Steel Decatur, LLC throughout the year.

Nucor says the following about costs:
The major component of cost of products sold is raw material costs. The average volume of raw materials used increased 12% from 2003 to 2004, The average price of raw materials increased 67% from 2003 to 2004.
As a result of the increases in the cost of scrap and scrap substitutes, Nucor incurred a charge to value inventories using the last-in, first-out ("LIFO") method of accounting of $375.9 million in 2004 compared with a charge of $115.0 million in 2003

In the cash flow section, they report an increase in inventory of 196.99.

13



	Price	Annual Return
Jan 1 2003	21.00	
Jan 1 2004	31.00	48%
Jan 1 2005	50.00	61%
Jan 1 2006	65.00	30%

In the 2004 annual report, Nucor summarized the quarterly earnings:

18. QUARTERLY INFORMATION (UNAUDITED):

18. QUARTERLY INFORMATION (UNAUDITED):

(in thousands, except per share data)

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
2004				
Net sales	**$2,286,416**	**$2,761,822**	**$3,239,592**	**$3,088,998**
Gross margin(1)	**270,047**	**527,906**	**806,074**	**643,929**
Net earnings (2)	**113,238**	**251,442**	**415,387**	**341,418**
Net earnings per share:				
Basic	**0.72**	**1.59**	**2.62**	**2.14**
Diluted	**0.72**	**1.58**	**2.59**	**2.12**
2003				
Net sales	$1,480,271	$1,520,461	$1,604,011	$1,661,080
Gross margin(3)	73,846	66,315	71,154	57,961
Net earnings (4)	17,782	8,425	16,022	20,552
Net earnings per share:				
Basic	0.11	0.05	0.10	0.13
Diluted	0.11	0.05	0.10	0.13

As we can see, the earnings per share just boomed in that 2-year period. The market is just reacting to that. Why did the EPS explode ? - mainly due to sales increase. The annual report also says that NUE has been able to raise steel prices substantially in 2004 passing the cost increases to customers.

NUE also seems to have bought a lot of other companies just before eth steel boom.

14 Steel Dynamics Inc

	1997	1998	1999
Sales		514.79	618.82
COGS		398.30	448.36
Depreciation and Amortization		30.68	39.27
Total COGS		428.98	487.63

Gross margin		85.81	131.19
% of sales		16.67%	21.20%
Net income		31.68	39.43
Ending equity	337.59	351.06	391.37
Average equity		344.33	371.22
Return on equity		9.20%	10.62%
Ending inventory	60.16	126.71	106.74
Average inventory		93.44	116.73
Turnover ratio		4.59	4.18

We should convert STLD results to LIFO. We start by using Nucor data to estimate the 1998 and 1999 (disinflation rates:

		1998	1999
Change in LIFO Reserve		23.47	(9.23)
FIFO Opening Inventory	/	441.01	493.57
(disinflation rates:		5.32%	-1.87%
Beginning inventory	x	60.16	126.71
LIFO effect		3.20	(2.37)
FIFO COGS		428.98	487.63
Thus LIFO COGS is estimated at		432.18	485.26

Alternate method		1998
		23.47
valued at LIFO	85.00%	374.86
		6.26%
		60.16
		3.77
		428.98
		432.75

Recomputing STLD's ratios:

	1997	1998	1999	**Alternate method** 1998
Sales		514.79	618.82	514.79
Adjusted COGS		432.18	485.26	432.75
Gross margin		82.61	133.56	82.04
% of sales		16.05%	21.58%	15.94%
Net income		31.68	39.43	31.68

After tax LIFO effect				
65.00%		2.08	(1.54)	2.45
Adjusted net income		29.60	40.97	29.23
Ending equity	337.59	351.06	391.37	
Average equity		344.33	371.22	344.33
Adjusted return on equity		8.60%	11.04%	8.49%
Ending inventory	60.16	126.71	106.74	
Average inventory		93.44	116.73	
Turnover ratio		4.63	4.16	

We use LIFO adjusted COGS to estimate the gross margin ratio as it better measures current costs. Relative to reported numbers, the ratio improves for 1998 and declines in 1999. In keeping with the policy of using LIFO for income statement values and FIFO for balance sheet numbers, the ROE and inventory turnover are calculated with net income and COGS on a LIFO basis and equity and inventory using FIFO. As a result, all the ratios are on a current cost basis.

Since prices declined in 1998, COGS on a LIFO basis was lower than COGS on a FIFO basis; when prices increased in 1999 the reverse was true.

The adjusted (current cost) ratios provide a more useful comparison as they remove the effects of the volatile price changes. Using the gross margin percentage as an example, the reported numbers indicate a sharp increase of 4.5% from 1998 to 1999 (16.7% -> 21.2%). After removing the effects of inflation (holding gains and losses) we find a more stable year-to-year relationship; an increase of only 1.2% as the gross margin percentage rose from 18.9% to 20.1%.

The effects of adjustment can be illustrated by comparing the two companies' ROE over the two years on a reported as well as adjusted basis

	Reported basis		LIFO		FIFO	
	1998	1999	1998	1999	1998	1999
ROE						
Nucor	11.28%	14.15%	11.28%	14.15%	11.93%	13.78%

STLD	9.20%	10.62%	8.60%	11.04%	9.20%	10.62%
Difference	2.08%	3.53%	2.69%	3.12%	2.73%	3.16%

On a reported basis, relative to STLD, Nucor's 1998 ROE is superior by almost 50%. In 1999, however, the ROE differences almost disappear, as Nucor's ROE declined and STLD's ROE increased. These effects primarily reflect the difference in inventory accounting methods, rather than real changes in relative profitability.

When we use the same accounting methods for both companies, we find that:
§ Nucor's 1998 ROE is still superior to STLD's but by a much smaller amount (18% on a LIFO basis and 8% on a FIFO basis rather than 50% as reported).
§ The differences between Nucor and STLD's ROE remained stable in 1999 as the change of ROE was similar for both companies.[1]

The direction of change depended on whether LIFO or FIFO was used; i.e. whether price changes (inventory holding gains or losses) were included or excluded. On a LIFO basis, excluding price changes, ROE fell for both companies. On a FIFO basis, with inventory profits included (as prices rose in 1999), ROE increased.

This example illustrates the difficulty of comparing firms using different inventory methods. Reported data cannot be compared without adjustment. Some adjustments can be made simply; others are difficult or impossible given lack of data. Some ingenuity may be required to obtain meaningful comparisons. Once reported data have been made comparable, the analyst can focus on real operating differences.

Years ended December 31 ($ millions)			**Dec-96**	**Dec-97**	**Dec-98**	**Dec-99**	**Dec-00**	**Dec-01**	**Dec-02**	**Dec-03**	**Dec-04**	**Dec-05**	**Dec-06**
R	71015	*Std dev*											
1	Sales		3,647.03	4,184.50	4,151.23	4,009.35	4,586.15	4,139.25	4,801.78	6,265.82	11,376.83	12,701.00	14,751.27
	LIFO Cost of Products Sold		2,956.93	3,360.18	3,338.66	3,223.84	3,666.11	3,531.24	4,025.88	5,632.44	8,732.37	9,710.34	10,919.19
	Depreciation, Depletion, & Amortiz		182.23	218.76	253.12	256.64	259.37	289.06	307.10	364.11	383.31	375.05	363.94
2	LIFO Cost of Goods Sold		3,139.16	3,578.94	3,591.78	3,480.48	3,925.48	3,820.30	4,332.98	5,996.55	9,115.68	10,085.39	11,283.13
3	LIFO gross margin		507.87	605.56	559.45	528.87	660.67	318.95	468.80	269.27	2,261.15	2,615.61	3,468.14
	LIFO gross margin %	*3 ÷ 1*	13.93%	14.47%	13.48%	13.19%	14.41%	7.71%	9.76%	4.30%	19.88%	20.59%	23.51%
	Standard Deviation	5.67 %											
4	LIFO reserve		73.90	100.58	5.12	28.59	19.36	8.29	42.61	157.59	533.50	381.90	387.20
5	Change in LIFO reserve			26.68	(95.46)	23.47	(9.23)	(11.07)	34.32	114.98	375.91	(151.60)	5.30
	FIFO Cost of Goods Solc	*2 - 5*		3,552.26	3,687.24	3,457.01	3,934.71	3,831.37	4,298.66	5,881.57	8,739.77	10,236.99	11,277.83
	FIFO gross margin			632.24	463.99	552.34	651.44	307.88	503.12	384.25	2,637.06	2,464.01	3,473.44
	FIFO gross margin %			15.11 %	11.18 %	13.78 %	14.20 %	7.44 %	10.48 %	6.13 %	23.18 %	19.40 %	23.55 %
	Standard Deviation	6.05 %											
6	LIFO Pretax income		387.77	460.18	415.31	379.19	478.31	173.86	309.53	90.83	1,812.17	2,127.04	2,913.04
	LIFO Net income		248.17	294.48	263.71	244.59	310.91	112.96	162.08	62.78	1,121.49	1,310.28	1,757.68
	LIFO Earnings per share		$2.83	$3.35	$3.00	$2.80	$3.80	$1.45	$2.08	$0.80	$7.08	$8.34	$5.73
7	No. of shares for income		87.69	87.87	87.86	87.25	81.76	77.71	78.09	78.27	158.38	157.13	306.62
	FIFO pretax income	*6 - 5*		486.86	319.85	402.66	469.08	162.79	343.85	205.81	2,188.08	1,975.44	2,918.34
8	1 - Tax rate (efffective)		65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%	65.00%
	FIFO Net Inc. - LIFO Ne	*8 x 5*		17.34	(62.05)	15.26	(6.00)	(7.20)	22.31	74.74	244.34	(98.54)	3.45
9	FIFO net income			311.82	201.66	259.85	304.91	105.76	184.39	137.52	1,365.83	1,211.74	1,761.13
	FIFO EPS	*9 ÷ 7*		$3.55	$2.30	$2.98	$3.73	$1.36	$2.36	$1.76	$8.62	$7.71	$5.74
	LIFO CFO		450.61	577.33	641.90	604.83	820.76	495.12	497.22	494.62	1,029.72	2,136.62	2,251.23
	Tax effect of LIFO	*35% x 5*		9.34	(62.05)	15.26	(6.00)	(7.20)	22.31	74.74	244.34	(98.54)	3.45
	FIFO CFO		450.61	567.99	703.95	589.57	826.76	502.32	474.91	419.88	785.38	2,235.16	2,247.79

			Dec-96	Dec-97	Dec-98	Dec-99	Dec-00	Dec-01	Dec-02	Dec-03	Dec-04	Dec-05	Dec-06
10	LIFO inventory		385.80	397.05	435.89	464.98	461.15	466.69	588.99	560.40	1,239.89	945.05	1,141.19
	Change			11.25	38.84	29.09	(3.83)	5.54	122.30	(28.59)	679.49	(294.84)	196.14
11	FIFO inventory	*4 + 10*	459.70	497.63	441.01	493.57	480.51	474.98	631.60	717.99	1,773.39	1,326.95	1,528.39
	Change												
12	LIFO reserve		73.90	100.58	5.12	28.59	19.36	8.29	42.61	157.59	533.50	381.90	387.20
13	LIFO reserve (after tax)	*12 x 8*	48.04	65.38	3.33	18.58	12.58	5.39	27.70	102.43	346.78	248.24	251.68
14	LIFO Stockholders' equity		1,609.29	1,876.43	2,072.55	2,262.25	2,130.95	2,201.46	2,322.99	2,342.08	3,455.99	4,279.79	4,825.99
	FIFO Stockholders' equi	*13 + 14*	1,657.33	1,941.81	2,075.88	2,280.83	2,143.53	2,206.85	2,350.69	2,444.51	3,802.77	4,528.03	5,077.67
	Shares Outstanding at Year End		87.80	88.00	87.35	87.13	77.58	77.82	78.18	78.59	159.51	155.11	300.95
	LIFO Book value / share		$ 18.33	$ 21.32	$ 23.73	$ 25.96	$ 27.47	$ 28.29	$ 29.71	$ 29.80	$ 21.67	$ 27.59	$ 16.04
	FIFO Book value / share		$18.88	$22.07	$23.77	$26.18	$27.63	$28.36	$30.07	$31.10	$23.84	$29.19	$16.87
15	LIFO Current assets		828.38	1,125.51	1,129.47	1,538.51	1,381.45	1,373.67	1,424.14	1,620.56	3,174.95	4,071.55	4,675.04
	LIFO Current liabilities		465.65	524.45	486.90	531.03	558.07	484.16	591.54	629.60	1,065.79	1,255.70	1,450.03
	LIFO Working capital		362.73	601.06	642.57	1,007.48	823.38	889.51	832.60	990.96	2,109.16	2,815.85	3,225.01
	LIFO Current ratio		1.78	2.15	2.32	2.90	2.48	2.84	2.41	2.57	2.98	3.24	3.22
	FIFO Current Assets	*15 + 4*	902.28	1,226.09	1,134.59	1,567.10	1,400.81	1,381.96	1,466.75	1,778.15	3,708.45	4,453.45	5,062.24
	FIFO Working Capital		436.63	701.64	647.69	1,036.07	842.74	897.80	875.21	1,148.55	2,642.66	3,197.75	3,612.21
	FIFO Current Ratio		1.94	2.34	2.33	2.95	2.51	2.85	2.48	2.82	3.48	3.55	3.49
	LIFO Return on equity			16.90 %	13.36 %	11.28 %	14.15 %	5.21 %	7.16 %	2.69 %	38.68 %	33.88 %	38.61 %
	FIFO Return on equity			17.33 %	10.04 %	11.93 %	13.78 %	4.86 %	8.09 %	5.74 %	43.73 %	29.09 %	36.67 %
	Inventory turnover												
	LIFO			9.14	8.62	7.73	8.48	8.23	8.21	10.43	10.13	9.23	10.82
	FIFO			7.42	7.86	7.40	8.08	8.02	7.77	8.72	7.02	6.60	7.90
	Current Cost	*2 ÷ Ave of 11*		7.48	7.65	7.45	8.06	8.00	7.83	8.89	7.32	6.51	7.90