

5 A The present value of the cash flows, discounted at 10 %, is \$60 for each asset.

B.

	IRR	10.00%		Depreciation expense	Ending Book Value	ROA
		Cash Flow	Income			
Asset A		(60.00)			60.00	
		26.00	6.00	20.00	40.00	10.00%
		24.00	4.00	20.00	20.00	10.00%
		22.00	2.00	20.00	-	10.00%

	IRR	10.00%		Depreciation expense	Ending Book Value	ROA
		Cash Flow	Income			
Asset B		(60.00)			60.00	
		36.00	6.00	30.00	30.00	10.00%
		23.00	3.00	20.00	10.00	10.00%
		11.00	1.00	10.00	-	10.00%

	IRR	20.00%		Depreciation expense	Ending Book Value	ROA
		Cash Flow	Income			
Example a		(60.00)			60.00	
	1	32.00	12.00	20.00	40.00	20.00%
	2	28.00	8.00	20.00	20.00	20.00%
	3	24.00	4.00	20.00	(0.00)	20.00%

	IRR	20.00%		Depreciation expense	Ending Book Value	ROA
		Cash Flow	Income			
Example b		(60.00)			60.00	
	1	42.00	12.00	30.00	30.00	20.00%
	2	26.00	6.00	20.00	10.00	20.00%
	3	12.00	2.00	10.00	(0.00)	20.00%

C. The pattern for Asset A is the sum-of-the-years' digits method. The pattern for Asset B is the straight-line method.

6.A. \$ (14) - \$27 - \$19 \$ (60) [No cumulative effect and 1991 earnings increase would not have occurred.]

B. We can infer that the level of production in all three years was lower than the "normal" level at which the accounting change would make no difference. At higher levels of production, pro forma net income would be lower as depreciation expense would be higher under the units-of-production method.

C. The change in depreciation method had no effect on cash flow in 1991 as depreciation is a noncash expense.

D. The change in method should tend to stabilize Cummins' net income in future years, as depreciation expense has become a variable cost rather than a fixed cost.

7 A The accounting change applied only to newly acquired property so no restatement of prior year depreciation was required.

B The trend of depreciation expense will be lower because depreciation expense on older property (accelerated methods) will be declining while depreciation expense on new property (straight-line method) will be lower than it would have been under accelerated methods. The net effect will be to increase reported net income.

8 A Buildings

Ratio /Year		1991	1992	1993	1994
Relative Age	Accum	525/1,942	715/2,320	865/2,551	921/2,544
Depr. /	Gross Assets	27.03%	30.82%	33.91%	36.20%
Average	depreciable	1,942/68	2,320/80	2,551/92	2,544/20
life	Gross Assets	28.6 years	29.0 years	27.7 years	21.2 years
Deprec.	Exp.				
Average age	Accum.	525/68	9 15/16	5/92	921/120
Depr. /	Deprec. Exp.	7.7 years	8.9 years	9.4 years	7.7 years

Machinery

Ratio /Year		1991	1992	1993	1994
Relative Age	Accum	1,830/3,337	2,750/4,513	3,326/5,130	3,385/5,019
Depr. /	Gross Assets	54.84%	60.94%	64.83%	67.44%
Average depreciable		3,337/34T-	4,513/381	5,130/479	5,019/491
life =	Gross Assets	9.6 years	11.9 years	10.7 years	10.2 years
Deprec.	Exp.				
Average age	Accum. Depr.	1,830	2,750	3,326	3,385
/Deprec.	Exp.	348	382	479	491
		5.3 years	7.2 years	6.9 years	6.9 years

B. Relative age indicates whether a firm's fixed asset base is old or new. If the firm is using straight-line depreciation, relative age is a good indicator of asset age as a percentage of depreciable life. It is not affected by changes in asset mix or the timing of purchases. However, this measure is affected by changes in depreciable lives and estimated salvage values. Atlas Copcols machinery shows an increasing relative age suggesting an aging fixed asset base that may need to be replaced.

The average depreciable life is affected by changes in asset mix and when assets are placed into service. Declining capital expenditures, writeoffs, newer assets with shorter lives, or special (extra) depreciation may have contributed to the significant decline in 1994.

The computation of average age is affected by changes in asset mix and acquisitions & divestitures. In 1994, the average age in years declined for buildings. However, this may be due

to lower capital expenditures, writeoffs, or extra depreciation.

However, all measures are useful in comparing a firm with its competitors and enable analysts to better forecast capital expenditures.

- 9A.** There are no cash flow consequences as it is a noncash charge and the tax benefits will be received only when the output of these properties is sold.
- B.** 1995 income was reduced relative to reported 1994 income because of the impairment charge. 1996 income will increase relative to 1994 and 1995 because the charge reduces the depreciable base and may include any operating gains that occur in that year (1996).
- C.** (i)Future returns on assets will be higher because lower depreciation expense will result in higher income and the impairment charge reduced asset balances. (ii)Similarly, future asset turnover ratios will increase because of lower asset balances.
- D.** It is likely that prior years' depreciation expense was understated leaving higher unrecoverable costs on the balance sheet.

10A Caterpillar tractor

	Accumulated Depreciation	/	Depreciation Expense	=	Average Age Years		Gross Investment	/	Depreciation Expense	=	Average depreciable Life
1990	3599	/	488	=	7.38		7585	/	488	=	15.54
1991	3741	/	548	=	6.83		7790	/	548	=	14.22
1992	3889	/	591	=	6.58		7842	/	591	=	13.27
1993	4138	/	598	=	6.92		7965	/	598	=	13.32
1994	4454	/	588	=	7.57		8230	/	588	=	14.00
1995	4659	/	580	=	8.03		8303	/	580	=	14.32

- B** Accelerated methods leads to high depreciation expense in the early years. As a result both ratios are depressed in early years.
- C** Declining capital expenditures lower the depreciation expense over time. Increasing depreciation expense is observed during 1990 - 1993 followed by decreases in reported depreciation expense. Accelerated depreciation methods resulted in high depreciation in the early years with a sharp decline in later years. The sharp decline in capital expenditures exacerbates this effect.
- D** Straight line depreciation would have resulted in a longer lasting trend of depreciation expense as the effect of prior year capital expenditure persists longer.