

**Company C:**

30129

Highly automated  
 Coordination with suppliers and customers  
 Tight control of inventories

⇒ Higher fixed operating costs  
 ⇒ COGS less driven by sales  
 ⇒ Higher plant assets

**A. Common-size statements**

	2001	2002
Sales	100.00%	100.00%
COGS	58.33%	66.67%
Selling and administrative expenses	17.78%	20.00%
Interest	3.89%	4.67%
Taxes	5.00%	2.17%
Total	85.00%	93.50%
Net income	15.00%	6.50%
	Automated	
	Company C	

	2001	2002
	100.00%	100.00%
	63.89%	66.67%
	19.44%	20.00%
	1.67%	2.00%
	3.75%	2.83%
	88.75%	91.50%
	11.25%	8.50%
	Not automated	
	Company L	

2002 ratios

	Company C
Inventory turnover	16.667
Receivable turnover	11.111
Payable turnover	25.000
Long-term debt to capital	0.429

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 JIT inventory  
 Prompt collections  
 Prompt payments  
 More interest

	Company L
Inventory turnover	6.667
Receivable turnover	7.407
Payable turnover	4.444
Long-term debt to capital	0.195

**B.**

	Company C	Company L
Cash from operations	52,750	28,250
÷ CFO/CL ratio	5.275	0.942
= Current liabilities	10,000	30,000
Current liabilities	10,000	30,000
x Current ratio	9.475	3.592
= Current assets	94,750	107,750
Current liabilities	10,000	30,000
x Quick ratio	8.875	3.192
= Cash + receivables	88,750	95,750
Current assets	94,750	107,750
- (Cash + receivables)	88,750	95,750
= Inventory 2002	6,000	12,000
- Change		(6,000)
= Inventory 2001	6,000	18,000
Average inventory	6,000	15,000
x inventory turnover	16.667	6.667
= COGS	100,000	100,000

For 2001, sales for both companies would have been 6/5 of 2002 sales, as sales dropped by 1/6th for both companies.
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**Income statement**

Using COGS and the common-size statement	Company C		Company L	
	2001	2002	2001	2002
Revenue	180,000	150,000	180,000	150,000
COGS	105,000	100,000	115,000	100,000
Gross Profit	75,000	50,000	65,000	50,000
SG&A expense	32,000	30,000	35,000	30,000
Earnings before Interest and Taxes	43,000	20,000	30,000	20,000
Interest	7,000	7,000	3,000	3,000
Earnings before Taxes	36,000	13,000	27,000	17,000
Taxes	9,000	3,250	6,750	4,250
Tax rate 25.00%				
Net income	27,000	9,750	20,250	12,750

**C**

	Company C	Company L
Revenue decrease	(30,000)	(30,000)
COGS decrease	(5,000)	(15,000)
Variable cost % = COGS decrease / Revenue decrease	16.67%	50.00%
Variable COGS, 2002 (^% x Revenue)	25,000	75,000
Fixed COGS (= COGS - Var. COGS)	75,000	25,000
SG&A decrease	(2,000)	(5,000)
Variable cost % = SG&A decrease / Revenue decrease	6.67%	16.67%
Variable SG&A, 2002 (^% x Revenue)	10,000	25,000
Fixed SG&A (= SG&A - Var. SG&A)	20,000	5,000

**D.** Sales will increase by

-20.00%

-20.00%

**Income statement**

		Company C		Company L	
		2003	2003	2003	2003
Revenue		120,000		120,000	
COGS	Variable	16.67%	20,000	50.00%	60,000
	Fixed		75,000		25,000
SG&A expense	Variable	6.67%	8,000	16.67%	20,000
	Fixed		20,000		5,000
Interest			7,000		3,000
Earnings before taxes			(10,000)		7,000
Taxes		25.00%	(2,500)	25.00%	1,750
Net income			(7,500)		5,250

Company C has higher

Higher

Fixed costs	⇒	Operating leverage
Interest costs	⇒	Financial leverage

E	Company C			Company L		
	2001	2002	2003	2001	2002	2003
% change in revenue from 2002	20.00%		-20.00%	20.00%		-20.00%
Net income	27,000	9,750	(7,500)	20,250	12,750	5,250
% change in NI from 2002	176.92%		-176.92%	58.82%		-58.82%
<b>Total leverage effect</b>	8.846		8.846	2.941		2.941

(= % change in NI / % change in revenue)

### Financial leverage and operating leverage

2002 statements into a variable costing format		Company C		Company L	
Revenue		150,000		150,000	
COGS	Variable	16.67%	25,000	50.00%	75,000
SG&A expense	Variable	6.67%	10,000	16.67%	25,000
Contribution margin		115,000		50,000	
COGS	Fixed	75,000		25,000	
SG&A expense	Fixed	20,000		5,000	
Operating income		20,000		20,000	
Interest		7,000		3,000	
Earnings before taxes		13,000		17,000	
Taxes		25.00%	3,250	25.00%	4,250
Net income		9,750		12,750	
Interest after tax	75.00%	5,250		2,250	
NOPAT = Operating Income x	75.00%	15,000		15,000	

Operating leverage effect (OLE)			
= Contribution margin AT / NOPAT		5.750	2.500
Financial leverage effect (FLE)			
= NOPAT / Net Income		1.538	1.176
			Multiply
Total leverage effect (TLE) =			
= Contribution margin AT / Net Income		8.846	2.941

**Total leverage**

$$\begin{aligned}
 &= \frac{\text{Change in Net Income}}{\text{Net Income}} \quad X \quad \frac{\text{Revenue}}{\text{Change in Revenue}} \\
 &= \frac{\text{Change in units} \times \text{CM per unit} \times (1 - \text{Tax rate})}{\text{Net Income}} \quad X \quad \frac{\text{Units} \times \text{Unit price}}{\text{Change in Units} \times \text{Unit Price}} \\
 &= \frac{\text{Units} \times \text{CM per unit} \times (1 - \text{Tax rate})}{\text{Net Income}} \\
 &= \frac{\text{Contribution Margin AT}}{\text{Net Income}}
 \end{aligned}$$

Also

**Total leverage**

$$\begin{aligned}
 &= \boxed{\text{Operating Leverage}} \quad X \quad \boxed{\text{Financing Leverage}} \\
 &= \frac{\text{Contribution Margin AT}}{\text{NOPAT}} \quad X \quad \frac{\text{NOPAT}}{\text{Net Income}} \\
 &= \frac{\text{Contribution Margin AT}}{\text{Net Income}}
 \end{aligned}$$

**4 - 12: Background calculations**

	Company C	2002	Company L
Average receivables = Sales ÷ Receivables Turnover	13,500		20,250
Increase in receivables	(3,000)		(4,500)
Cash Flow = CFO + CFI + CFF	51,750		23,250
COGS	100,000		100,000
Increase in inventory			(6,000)
Purchases	100,000		94,000
Average payable = Purchases ÷ payable turnover	4,000		21,150
Increase in payable			(5,000)
Average equity = NI ÷ ROE	75,000		76,500
Equity increase = NI (as there are no dividends)	9,750		12,750

**12 A. Balance sheet**

	Company C		Company L	
	2001	2002	2001	2002
Cash (Quick assets - receivable)		76,750		77,750
Cash 2002 - Cash flow	25,000		54,500	
Accounts receivable				
(From average & increase)	15,000	12,000	22,500	18,000
Inventory (from 4-11 B)	6,000	6,000	18,000	12,000
Gross plant asset (Given)	175,000	175,000	65,000	65,000
(Accumulated depreciation) Plug [Total - assets]	(79,875)	(119,875)	(29,800)	(39,800)
Total	141,125	149,875	130,200	132,950
Accounts payab (From average & increase)	4,000	4,000	23,650	18,650
Short term debt (Current liabil - payables)	7,000	6,000	16,350	11,350
Long term debt (Equity x ratio / (1-ratio))	60,000	60,000	20,075	20,075
Equity (From average & Change)	70,125	79,875	70,125	82,875
Total	141,125	149,875	130,200	132,950

**Alternate Check:**

	Company C	Company L
Net Income	9,750	12,750
+ Depreciation expense (= increase in Acc. Deprn)	40,000	10,000
- Increase in receivables	3,000	4,500
- Increase in inventory		6,000
+ Increase in payable		(5,000)
CFO Equals the given figure	52,750	28,250

**12 B. Background calculations**

	Company C	Company L
Average receivables = Sales ÷ Receivables Turnover	10,800	16,200
Average inventory = COGS ÷ Turnover	Same	12,750
COGS		85,000
Increase in inventory		1,500
Purchases		86,500
Average payable (= Purchases ÷ turnover)		19,463

**12 B. 19x3 Balance Sheet (forecast)**

		Company C	Company L
Cash (Plug)		111,650	96,725
Receivable (from Average & Last Year)		9,600	14,400
Inventory	same	6,000	from aver. 13,500
Gross plant assets		175,000	65,000
(Depreciation)		(159,875)	(49,800)
Total assets		142,375	139,825
Payable	same	4,000	from aver. 20,275
Short term debt		6,000	11,350
Long term debt		60,000	20,075
Equity (From average & Change)		72,375	88,125
Total equities		142,375	139,825

**Alternate Check:**

Net Income	(7,500)	5,250
+ Depreciation	40,000	10,000
- Decrease in receivable	2,400	3,600
- Decrease in inventory		(1,500)
+ Increase in payable		1,625
CFO	34,900	18,975
Cash, 2002	76,750	77,750
Cash, 19x3	111,650	96,725