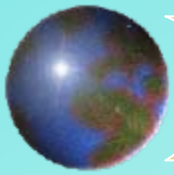


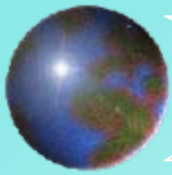
Lecture 10

Logistics and Corporate Profit Performance

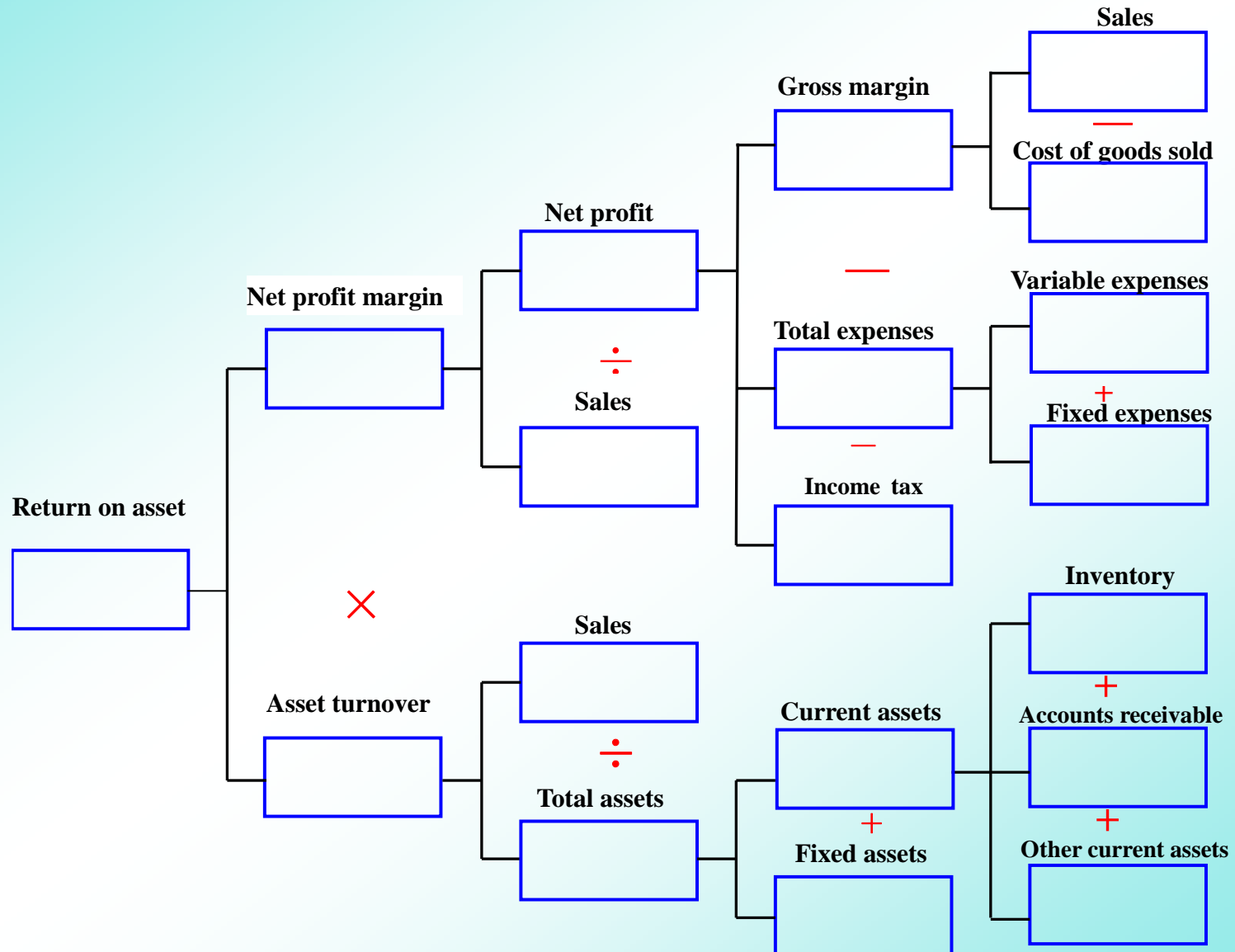


Contents in this unit

- Strategic profit (DuPont) model
- DuPont model analysis
- Impacts of logistics on corporate profit performance



1. The strategic (DuPont) model





Return on net worth

Net profit

Net worth

=

Return on asset

Net profit

Total assets

×

Financial leverage

Total assets

Net worth = shareholder's equity



Table 1: Income Statement for ABC incorporated.

Income Statement for ABC Incorporated
For the Year Ended December 31, 20__ (\$000, 000)

Sales revenues		\$100
Cost of goods sold		<u>55</u>
Gross margin on sales		45
Operating expenses:		
Variable expenses	\$15	
Fixed expenses	<u>20</u>	<u>35</u>
Net profit before taxes		10
Income taxes		<u>5</u>
Net profit		<u><u>\$5</u></u>

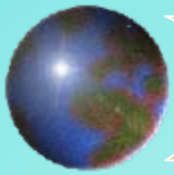


Table 2: Balance Sheet for ABC Incorporated.

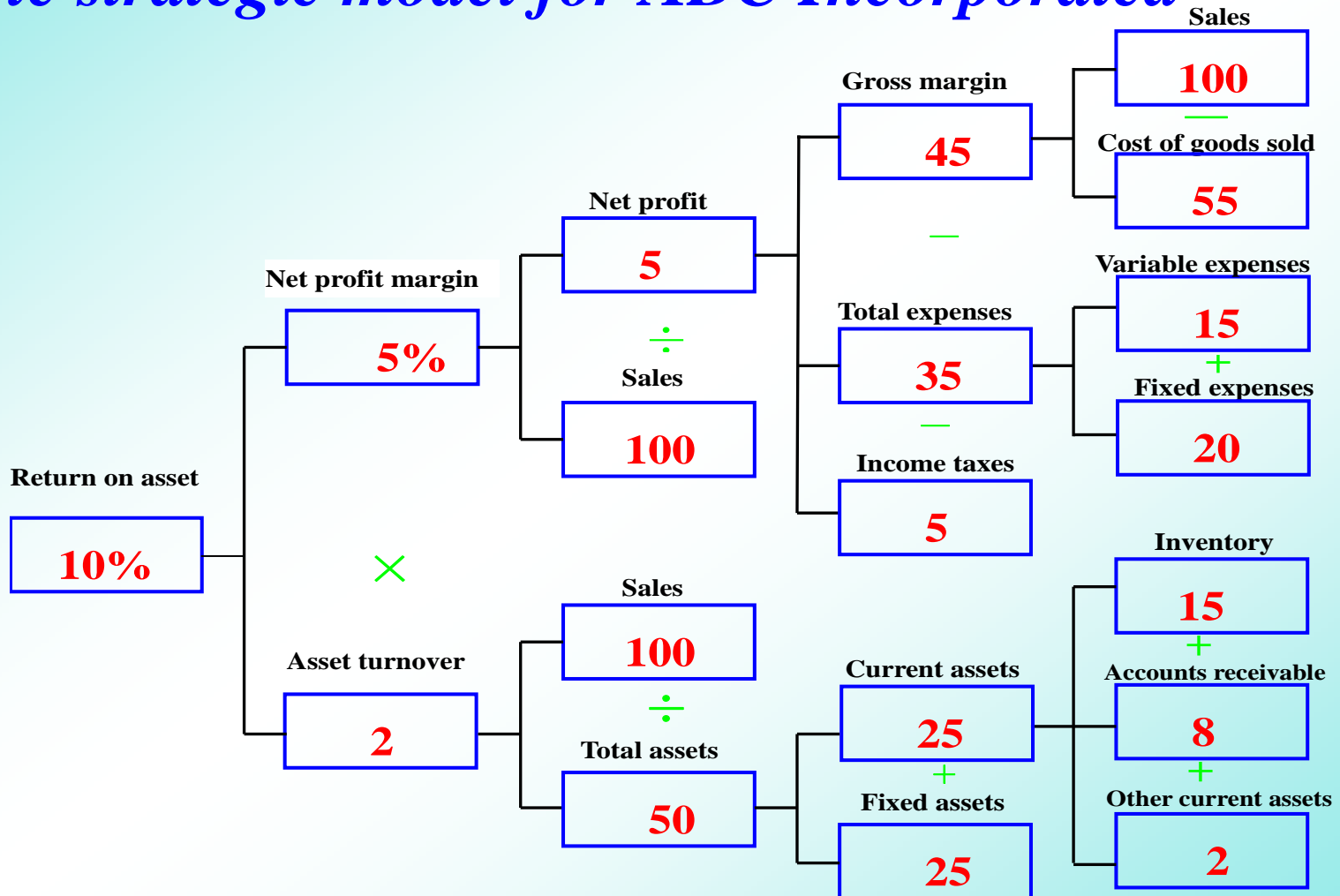
Balance Sheet for ABC Incorporated

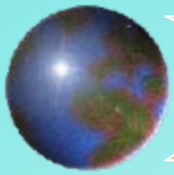
For the Year Ended December 31, 20__ (\$000, 000)

Assets		Liabilities and shareholders' Equity	
Current assets:		Liabilities:	
Cash	1	Accounts payable	8
Accounts receivable	8	Notes payable, current	<u>2</u>
Inventories	15	Total current liabilities	10
Other current assets	<u>1</u>	Long term notes	<u>15</u>
Total current assets	<u>25</u>	Total liabilities	<u>25</u>
Fixed assets:		Stockholders' equity:	
Land	4	Capital stock	5
Plant and equipment	25	Retained earnings	<u>20</u>
Less:		Total liabilities and	
Accumulated depreciation	<u>10</u> 15	stockholders' equity	<u>50</u>
Other fixed assets (net)	6		
Total assets	<u><u>50</u></u>		



The strategic model for ABC Incorporated





Return on net worth

20%

Net profit

Net worth

=

Return on asset

10%

Net profit

Total assets

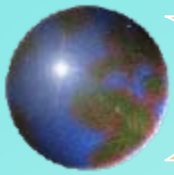
×

Financial leverage

2

Total assets

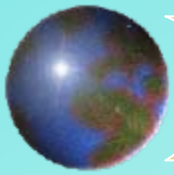
Net worth = shareholder's equity



2. Dupont model analysis

- Question: If management wants to increase return on assets from 10% to 12%, there are three methods:
 - ❏ (1) To increase sales (please calculate the sales that should be increased)
 - ❏ (2) To reduce costs or expenses (calculate the expenses that should be reduced)
 - ❏ (3) To reduce assets

Assume income tax rate is 50%



Answer1: $ROA' = \text{net profit} / \text{total assets}$

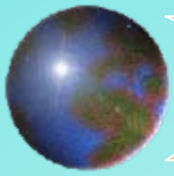
$$12\% = \frac{[100(1+x) - 55(1+x) - 15(1+x) - 20] * (1-50\%)}{50}$$

$$(100 - 55 - 15 - 20)(1 - 50\%) + (100 - 55 - 15)(1 - 50\%) x = 6$$

$$\frac{P + \Delta P}{TA'} = ROA'$$

↓

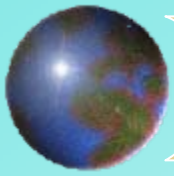
$$X = 6.67\%$$



Answer2:

● $5 + x^*(1-50\%) = 6$

● $X = 2$

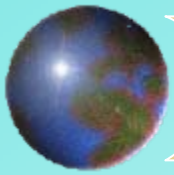


Question 3 and answer

Reducing assets may be accomplished by reducing inventories by \$4 million and accounts receivable by \$2 million. Assume the proceeds would be used to retire \$6 million of debts bearing an interest rate of 12%.

Please calculate the return on assets.

$$\begin{aligned} \text{ROA}' &= \frac{P + \Delta P}{\text{TA}'} = \frac{5 + 6 * 12\% * (1 - 50\%)}{50 - 6} \\ &= 12.18\% \end{aligned}$$

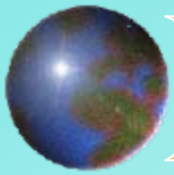


Exercise

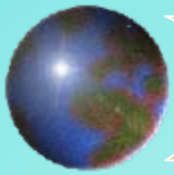
- Assume that the financial data for ABC Co. for the year ended Dec. 31, 2007 are as follows:

(\$million)

● Sales	6073.6
● Net profit	239.0
● Net profit margin	3.9%
● Total assets	4759.8
● Accounts receivable	1004.5
● Inventory	1089.5



- Using the above data, show return on assets would be affected if the company implemented an advanced order processing system capable of reducing accounts receivable by 50 million and inventory by \$100. For your analysis, assume the money could be invested in other assets that would generate a return of 20% after taxes, and that the increased communications cost of \$400000 per year would be offset by saving of \$400000 in transportation and warehousing costs.



Cues

● Before system is changed

- ▣ Return on assets is $239.0/4759.8 = 5.02\%$

● After system is changed

- ▣ Total assets = $4759.8 - (50 + 100) + (50 + 100) = 4759.8$

- ▣ Profit = $239.0 + (0.4 - 0.4) * (1 - 50\%) + 150 * 20\%$

- ▣ Return on assets = profit/assets

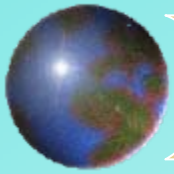
- ▣ Return on assets increased = $R_2 - R_1$



3. Impacts of logistics on corporate profit performance

Key points:

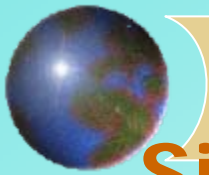
- (1) The two most common strategies to improve cash flow and return on assets are: reducing accounts receivable and reducing the investment in inventory. (Why?)
- (2) In absence of technological change or changes in the logistics system, arbitrarily reducing accounts receivable or inventories can greatly increase logistics cost and have a devastating impact on profit performance.
- (3) Technological changes can bring some advantages all together



🕒 Terms to be explained

price components:

- ❏ basic price
- ❏ terms of sale
- ❏ payment period



Simply reducing accounts receivable:

For the manufacturer itself:

Reduction of terms of sale → altering price competitive position
→ decreased sales

For channel members:

Reduction of terms of sales → forcing faster payment →
complicating cash flow → reducing inventories → placing
smaller, more frequent orders → increasing total logistics cost
→ stock-outs → reduced sales



Arbitrarily reducing inventory may:

escalate transportation costs

escalate production setup costs

→ increase total logistics cost

Pressure to reduce expenses may preclude the use of :

premium transportation

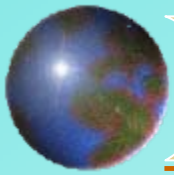
increased production setups



customer service levels would be eroded

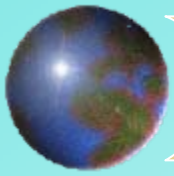


market share would be decreased



The advantages of technological changes

It can lower inventories, decreased transportation costs and higher customer service level, etc. Especially, improvements in return on assets and cash flow achieved through increased productivity (a system change) have an additional benefit: They do not force other channel members to react in a way that would have a negative impact on channel efficiency. Of course, the primary benefit to the manufacturer's own operation is that the cost savings associated with a reduction in accounts receivable or inventories are not offset by the costs of reduced service levels or increased transportation costs.

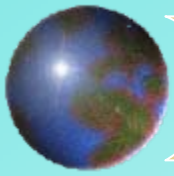


A Case Study

ABC co. has sales of \$100 million, cost of goods sold of \$60 million, variable expenses of \$16 million, fixed expenses of \$18 million. On the balance sheet, current assets of \$25 million are composed of inventory of \$17 million, accounts receivable of \$6 million and other current assets of \$2 million; the fixed assets are \$15 million. Financial leverage is 2.5. Assume that:

- a. The rate of income taxes is 50%*
- b. If the company adopts an advanced processing system, it can result in a \$8million reduction in inventories on a company-wide basis. The \$8 million reduction would be invested in a new plant equipment. These investments would be depreciated on a straight line basis over a 8-year period. On the other hand, it is estimated that the annual cost of the advanced system will be \$750,000; the savings in transportation and warehousing costs will be \$350,000*
- c. The new investment would generate a return of 20% after taxes.*
- d. The inventory carrying cost would be 10% of the average inventory value.*

How a system change would affect corporate return on net worth?



Answer

Before system change:

$$NP = (100 - 60 - 16 - 18) * (1 - 50\%) = 3$$

$$NW = 40 / 2.5 = 16$$

$$\text{Return on net worth} = 3 / 16 = 18.75\%$$

After system change

$$NP' = 3 + 8 * 20\% + (8 * 10\% + 0.35 - 0.75 - 8/8) * (1 - 50\%)$$

$$= 3 + 1.6 - 0.3 = 4.3$$

$$\text{Return on net worth}' = 4.3 / 16 = 26.88\%$$