

CH0401 Process Engineering Economics

Chapter 2 – Balance Sheet and Cost Accounting

Lecture 2e

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- 1 Capital requirements for process plants
- 2 Balance Sheets
- 3 Earnings, process and returns (Income statements)**
- 4 Economic production, break even analysis charts
- 5 Cost accounting - pre construction cost estimation - allocation of cost.

At periodic intervals, the accountants prepare an income statement that compares the total income with total expense and shows the disposition of the difference. The income statement is usually made up as same as the balance sheet and the two (balance sheet/ income statement) are reported in an annual report prepared for the stockholders to summarize a company's operation.

Balance sheet shows the distribution of the investment whereas the income sheet shows the distribution of the income or revenue of a company.

Process Engineering Economics – *A typical Example*

Particulars	Dollars, \$	Value ,%
Gross Sales	= 100.20	
Excise taxes, Discounts	5.00	
Net Sales (Gross Sales - Taxes and Discounts)	= 95.20	95.20
Cost of Sales (or Total Investment)		
Fixed Cost	= 40.00	
Variable Cost	= 45.50	
Total Cost of Sales (Fixed + Variable Costs)	= 85.50	85.50
Gross Profit (Net Sales - Total Costs of Sales)	= 9.70	9.70
Profit Tax	= 3.50	3.50
Net Profit (Gross Profit - Profit Tax)	= 6.20	6.20
Distribution of Profit form Net Profit		
(i) Financial Costs	= 0.50	8 %
(ii) Dividends	= 2.00	32 %
(iii) Earnings reatined or Surplus	= 3.70	60 %
	6.20	100 %

A typical example of a income statement and all the figures reported are in million US dollars

The income statement ratios evaluates the two things

1. The business operations (credit standing, sales efficiency etc.)
2. The economy of operations (Profits and Earnings)

For computing the income statement ratios, data from income statement is sufficient but for some cases balance sheet data are required.

Process Engineering Economics – *Income Statement Ratios*

$$\text{Operating ratio} = \frac{\text{Cost of sales}}{\text{Net Sales}} \times 100$$

$$\text{Margin ratio} = \frac{\text{Gross Profit}}{\text{Net Sales}} \times 100$$

$$\text{Capital turnover} = \frac{\text{Net Sales}}{\text{Total investment}}$$

$$\text{Interest turnover} = \frac{\text{Net profit}}{\text{Financial Costs}}$$

$$\text{Inventory turnover} = \frac{\text{Net sales}}{\text{Inventory (salesprice)}}$$

$$\text{Profit ratio} = \frac{\text{Total investment}}{\text{Net profit}}$$

$$\text{Capital ratio} = \frac{\text{Total investment}}{\text{Net sales}}$$

$$\text{Receivable ratio} = \frac{\text{Accounts receivable}}{\text{Net sales}} \times 100$$

Operating ratio and Margin ratio are the measure of gross profit expressed as a percentage of selling price and indicate the success of the venture on the basis of a unit dollar of sales. The sum of the two (Operating and Margin ratio) is 100.

Capital turnover is measure of what annual volume of business in being carried out on a basis of total investment

Interest turnover is the measure of risk involved for the bond holders. Values for this ratio above 3 for process industries may be considered satisfactory.

Inventory turnover indicates the number of items each unit of merchandise stored is sold each year.

Profit ratio computes the number of years required for the net profit to equal the investment.

Note: Capital ratio is the reciprocal of capital turnover

- Herbert E. Schweyer. (1955) *Process Engineering Economics*, Mc Graw Hill
- Max S. Peters, Kaus D. Timmerhaus, Ronald E. West. (2004) *Plant Design and Economics for Chemical Engineers*, 5th Ed., Mc Graw Hill
- Max Kurtz. (1920) *Engineering Economics for Professional Engineers' Examinations*, 3rd Ed., Mc Graw Hill
- Frederic C. Jelen, James H. Black. (1985) *Cost and Optimization Engineering*, International Student edition, Mc Graw Hill
- Grant L. E, Grant Ireson. W, Leavenworth S. R. (1982) *Principles of Engineering Economy*, 7th Ed., John Wiley and Sons.