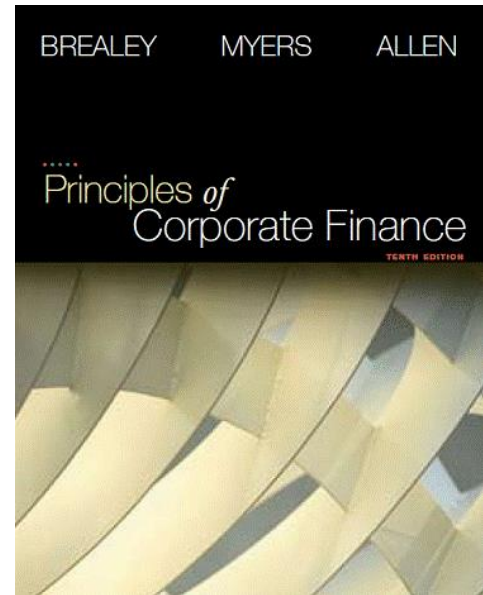


Chapter 28

Financial Analysis

Principles of Corporate Finance Tenth Edition



Financial statements

- The balance sheet reports the financial position (resources and claims at a particular moment in time (balance sheet date)). → 'snapshot'
- The income statement (also called profit and loss account) presents the results of operating activities of an entity over a period. Operating activities result in revenues (making sales) or in expenses (consumption of business resources). → 'video'

Balanço - Balance Sheet

ACTIVO - ASSETS	CAPITAL PRÓPRIO - SHAREHOLDERS' EQUITY
Activo não corrente – Non current Assets	Capital– Capital
Investimentos Financeiros - Financial Investments	Reservas legais - Legal reserves
Activos fixos tangíveis Líquidos – Tangible Fixed Assets less Accumulated Depreciation	Resultados transitados – Retained Earnings
Activos fixos intangíveis – Intangible Fixed Assets	Resultado líquido do período – Net income
Activo corrente – Current Assets	PASSIVO – LIABILITIES
Inventários - Inventory	Passivo não corrente – Long-term Liabilities
Clientes – Accounts Receivable	
Estado e outros entes públicos – Deferred tax assets	Financiamentos obtidos – Long-term debt (bank loans and bonds)
Outras contas a receber - Other current assets	Outras contas a pagar – Other non credit liabilities
Caixa e depósitos bancários – Cash and Marketable securities	Passivo corrente – Current Liabilities
	Fornecedores – Accounts payable
	Estado e outros entes públicos – Deferred tax liabilities
	Financiamentos obtidos – Short-term debt (bank loans and bonds)
	Outras contas a pagar – Other current liabilities

Demonstração de Resultados por Funções – Income statement by function

Vendas – Net Sales
Custo das vendas e prestação de serviços – Cost of goods and services sold
RESULTADOS BRUTOS – GROSS INCOME
Out. Rendimentos Operacionais – Other operating income and gains
Gastos de distribuição – Selling Expenses
Gastos administrativos – Administrative Expenses
Out. Gastos Operacionais – Other operating expenses
RESULTADOS OPERACIONAIS – OPERATING INCOME – EBIT – EARNINGS BEFORE INTEREST AND TAXES
Rendimentos de Aplic. Financ. – Interest revenues
Juros e custos similares – Interests expenses
RES. ANTES DE IMPOSTOS – EBT – EARNINGS BEFORE TAXES – TAXABLE INCOME
Imposto sobre o rend. do período – Income Taxes
RESULTADO LÍQ. DO PERÍODO – NET INCOME

Contribution margin income statement

Sales

- Variable production expenses (such as materials, supplies, and variable overhead)
 - Variable selling and administrative expenses
-

Contribution margin

- Fixed production expenses (including most overhead)
 - Fixed selling and administrative expenses
-

Net income

Income statement by nature

Sales

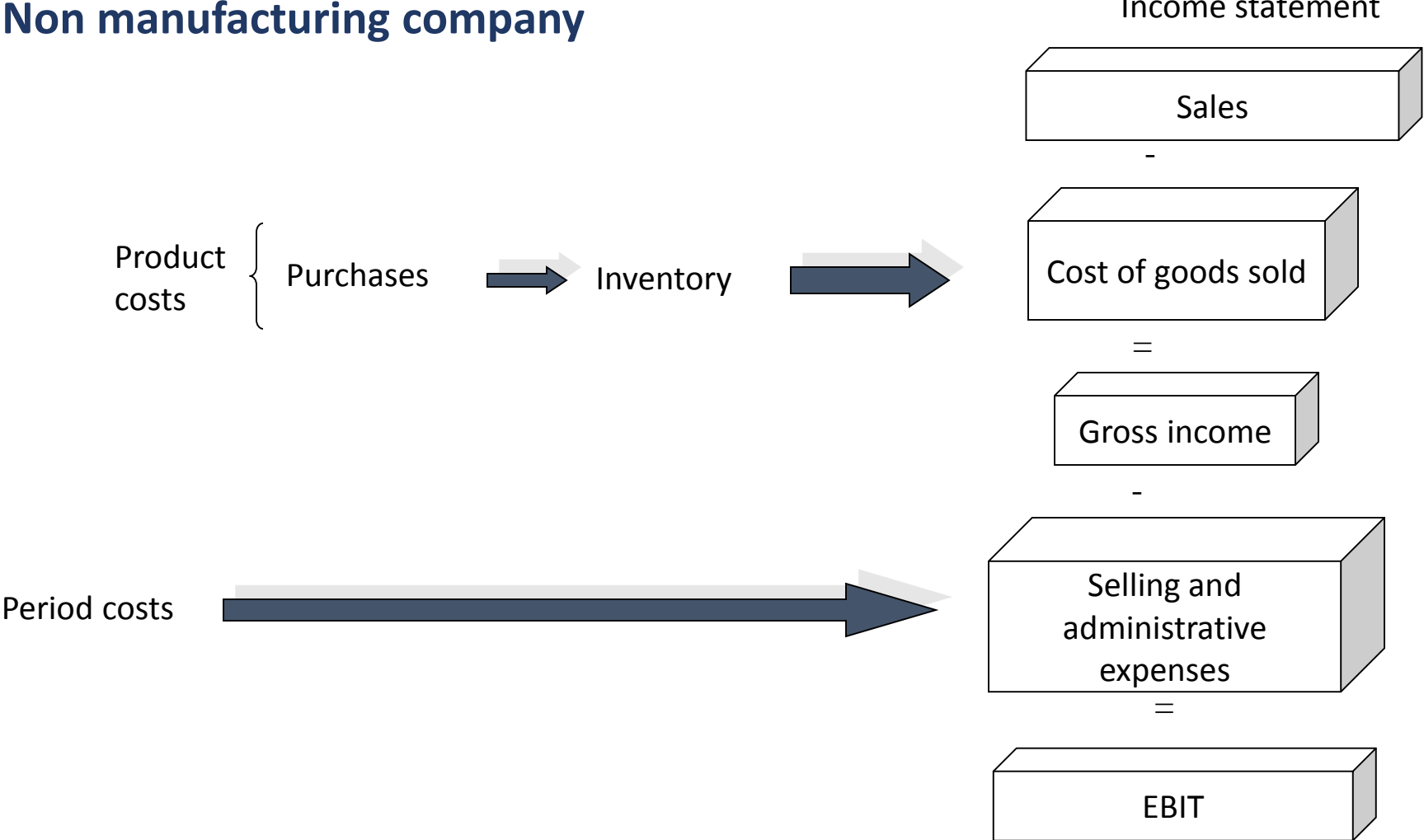
- Changes in inventories of finished goods and work in progress
- Raw materials and consumables used
- Employee benefits expense
- Depreciation and amortization expense
- Other expenses

- Total Expenses

EBIT

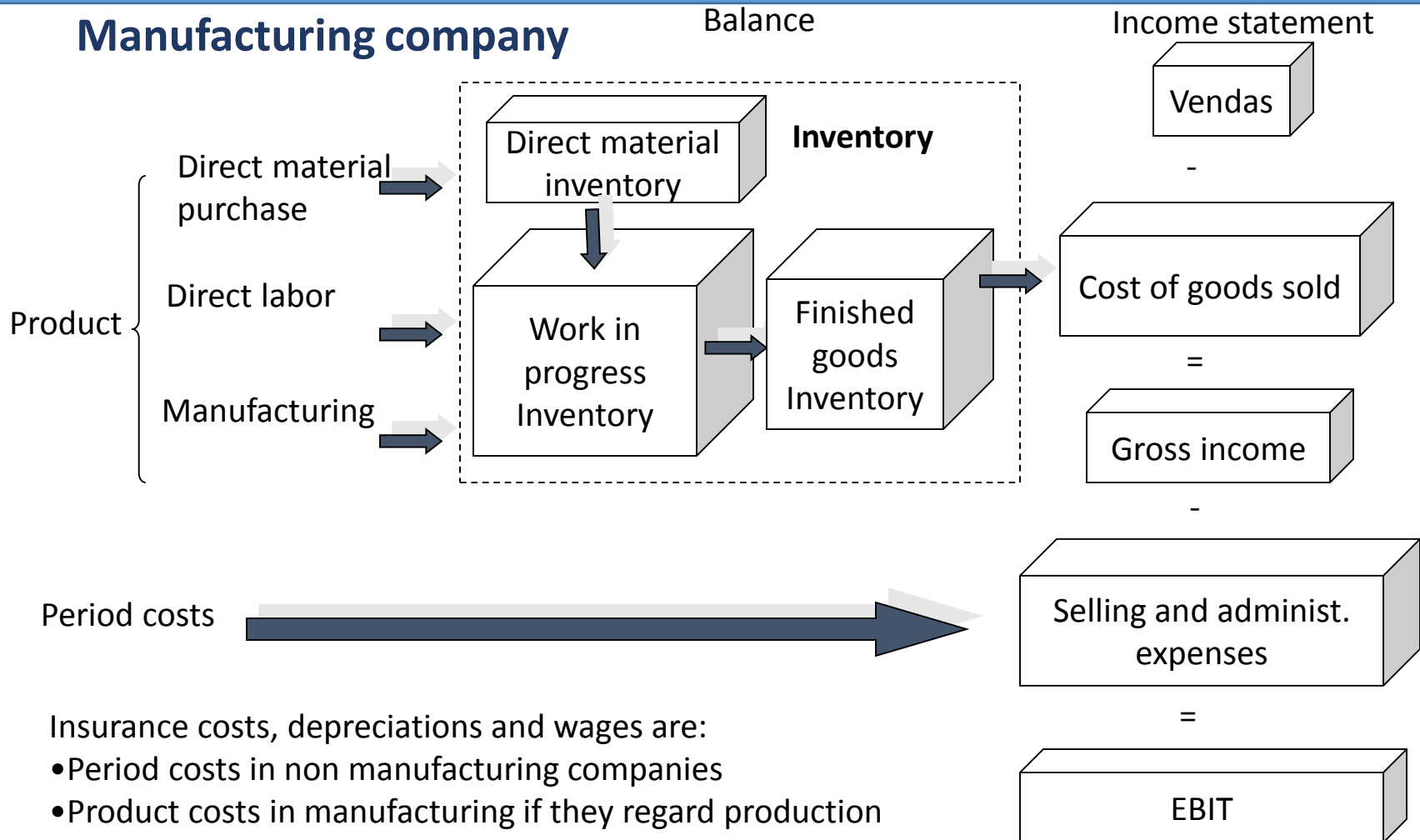
Product and period costs

Non manufacturing company



Product and period costs

Manufacturing company



Insurance costs, depreciations and wages are:

- Period costs in non manufacturing companies
- Product costs in manufacturing if they regard production activities

Example: Lowe

Balance sheet (\$mil)			Balance sheet (\$ mil)		
	2008	2007		2008	2007
Assets			Liabilities and Shareholders' Equity		
<i>Current assets</i>			<i>Current liabilities</i>		
Cash and marketable securities	661	530	Debt due for repayment	1,021	1,104
Accounts receivable	166	247	Accounts payable	4,543	4,137
Inventories	8,209	7,611	Other current liabilities	2,458	2,510
Other current assets	215	298	Total current liabilities	8,022	7,751
Total current assets	9,251	8,686			
<i>Fixed assets</i>			Long-term debt	5,039	5,576
Tangible fixed assets			Deferred income taxes	660	670
property plant and equipment	31,477	28,836	Other long-term liabilities	910	774
Less accumulated depreciation	<u>8,755</u>	<u>7,475</u>	Total liabilities	14,631	14,771
Net tangible fixed assets	22,722	21,361	Common stock and other paid-in capital	735	729
			Retained earnings and capital surplus	17,320	15,369
Long -term investments	253	509	Total shareholders' equity	18,055	16,098
Other long-term assets	460	313			
Total assets	32,686	30,869	Total liabilities and shareholders' equity	32,686	30,869

Example: Lowe

Income (\$ mil)	2008
Net sales	48.230
Cost of goods sold	31.729
Selling, general, and administrative expenses	11.158
Depreciation	1.539
Earnings before interest and taxes (EBIT)	3.804
Interest expense	298
Taxable income	3.506
Tax	1.311
Net income	2.195
Dividends	491
Addition to retained earnings	1.704

Example: Lowe

Other Data (end of 2008)

Net working capital (Fundo de maneio) = current assets - current liabilities

$$= 9,251 - 8,022 = \$1,229 \text{ million}$$

EBIT = Total revenues - costs - depreciation =

$$48,230 - 42,887 - 1,539 = \$3,804 \text{ million}$$

1,470 million shares outstanding

Stock price = \$18.19 per share

Tax rate = 35%

Measuring performance

Market Capitalization (capitalização de mercado)

Total market value of equity, equal to share price times number of shares outstanding.

$$\text{Market Capitalization} = \$18.19 \times 1,470 = \$26,739$$

Market Value Added (valor acrescentado pelo mercado)

Market capitalization minus book value of equity.

$$\text{MVA} = \$26,739 - \$18,055 = \$8,684 \text{ million}$$

Measuring performance

Market-to-Book Ratio

Ratio of market value of equity to book value of equity

$$\begin{aligned}\text{Market - to - book ratio} &= \frac{\text{market value of equity}}{\text{book value of equity}} \\ &= \frac{\$26,739}{\$18,055} \\ &= 1.5\end{aligned}$$

Example: Increase in value

Company	Book value of equity (€M)	Stocks (M)	Stock price (€)	Market value of equity (€M)	Market-to-book ratio = Market value/Book value
EDP	8681,000	3656,500	3,218	11766,617	1,355
Millenium	4212,500	54195,000	0,066	3560,612	0,845
Novabase	86,837	31,401	2,214	69,523	0,801
NOS	1050,311	515,161	5,236	2697,385	2,568

Cotações à data de 31.12.2014

Measuring performance

Economic Value Added (EVA[®])

$$\text{EVA} = [\text{After Tax interest} + \text{Net Income}] - [\text{Cost of Capital} \times \text{Capital}]$$

- cost of capital includes debt and equity
- takes into account the cost of these two sources of funding:
 - debt - interest rate
 - equity - opportunity cost of capital

Capital = Capital Permanente = Long-term debt + Equity

Measuring performance

or

$$\text{EVA} = \left(\frac{\text{After Tax interest} + \text{Net Income}}{\text{Capital}} - \text{Cost of Capital} \right) * \text{Capital}$$

$$\begin{aligned} \text{EVA} &= \left(\frac{(1 - .35) \times 298 + 2,195}{21,674} - .074 \right) * 21,674 \\ &= \$785\text{mil} \end{aligned}$$

Capital = Capital Permanente = Long-term debt + Equity

Measuring performance

Weighted average cost of capital - WACC (custo médio ponderado do capital)

$$WACC = (1 - t)r_D \left(\frac{D}{V} \right) + r_E \left(\frac{E}{V} \right)$$

= tax rate

r_D = Interest rate

r_E = Cost of equity – to be seen later

D = Debt (Passivo)

E = Equity (Cap. Próprio)

V = D + E

Measuring performance

$$EVA = \left(\frac{\text{After Tax interest} + \text{Net Income}}{\text{Capital}} - \text{Cost of Capital} \right) * \text{Capital}$$

$$EVA = (\text{Return on Capital} - \text{Cost of Capital}) * \text{Capital}$$

Ex. Lowe's:

If Return on Capital (or Return on Investment) = 11,02%
and WACC = 7.4%, then

$$EVA = (.1102 - .074) * \$21,674 = \$785\text{mil}$$

Ratio Analysis

1. Profitability ratios (rácios de rentabilidade):
 - How efficiently the the firm uses its assets
2. Liquidity ratios (short-term solvency - rácios de liquidez):
 - Evaluate the firm's ability to pay its bills over the short-run
3. Leverage ratios (long-term solvency - rácios de solvabilidade):
 - Evaluate the firm's long-run ability to meet its obligations
4. Operating efficiency ratios (operating efficiency ratios - rácios de funcionamento/atividade):
 - How efficiently or intensively the firm uses its assets to generate sales
5. Market-based ratios (rácios baseados no mercado):
 - Reveal how the investors and lenders value the firm

Measuring profitability

Lowe's Profitability Ratios:

$$\begin{aligned}\text{Return on capital (ROC)} &= \frac{\text{after tax interest} + \text{net income}}{\text{capital}} \\ &= \frac{(1 - .35) \times 298 + 2,195}{21,674} = .1102\end{aligned}$$

$$\text{Return on equity (ROE)} = \frac{\text{net income}}{\text{equity}} = \frac{2,195}{16,098} = .136$$

$$\begin{aligned}\text{Return on assets (ROA)} &= \frac{\text{after tax interest} + \text{net income}}{\text{total assets}} \\ &= \frac{(1 - .35) \times 298 + 2,195}{30,869} = .077\end{aligned}$$

Measuring profitability

Lowe's Profitability Ratios:

$$\begin{aligned}\text{Return on sales (profit margin)} &= \frac{\text{net income}}{\text{sales}} \\ &= \frac{2,195}{48,230} = .0455\end{aligned}$$

$$\begin{aligned}\text{Operational Return on sales} &= \frac{\text{EBIT}}{\text{sales}} \\ &= \frac{3,804}{48,230} = .0789\end{aligned}$$

Measuring liquidity

Rácio de liquidez geral ou

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}} = \frac{9,251}{8,022} = 1.153$$

Rácio de liquidez reduzida ou

$$\begin{aligned} \text{Quick ratio (acid test)} &= \\ &= \frac{\text{Current assets} - \text{Inventories}}{\text{Current liabilities}} = \frac{9,251 - 8,424}{8,022} = 0.103 \end{aligned}$$

Measuring liquidity

Rácio de liquidez imediata ou

$$\text{Cash ratio} = \frac{\text{Cash + marketable securities}}{\text{Current liabilities}} = \frac{661}{8,022} = 0.082$$

Fundo de maneoio ou

$$\begin{aligned} \text{Net working capital} &= \text{Current assets} \\ &- \text{Current liabilities} = 9,251 - 8,022 = 1,229 \end{aligned}$$

Measuring leverage

Rácio de endividamento ou

$$\text{Total debt ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}} = \frac{14,631}{32,686} = 0.448$$

Rácio de endividamento de longo-prazo ou

$$\text{Long - term debt ratio} = \frac{\text{Long - term Debt}}{\text{Total Assets}} = \frac{6,609}{32,686} = 0.202$$

Rácio da estrutura do endividamento ou

$$\text{Long - term debt - to - total liabilities} = \frac{\text{Long - term debt}}{\text{Total liabilities}} = \frac{6,609}{14,631} = 0.452$$

Measuring leverage

Rácio da autonomia financeira (solvabilidade total) ou

$$\text{Leverage ratio} = \frac{\text{Equity}}{\text{Total assets}} = \frac{18,055}{32,686} = 0.552$$

Rácio da solvabilidade reduzida*

$$\text{Solvabilidade reduzida} = \frac{\text{Equity}}{\text{Total liabilities}} = \frac{18,055}{14,231} = 1.269$$

* O Debt-to-equity ratio é o inverso da Solvabilidade reduzida.

Rácio da cobertura dos encargos financeiros ou

$$\text{Times interest earned ratio} = \frac{\text{EBIT}}{\text{Anual Interest Expense}} = \frac{3,804}{298} = 12.77$$

Measuring operating efficiency

Rotação do activo ou

$$\text{Asset turnover ratio} = \frac{\text{Sales}}{\text{Average total assets}} = \frac{48,230}{(30,869 + 32,686)/2} = 1.52$$

Rotação do inventário ou

$$\text{Inventory turnover ratio} = \frac{\text{Cost of goods sold}}{\text{Average inventory}} = \frac{31,729}{(7,611 + 8209)/2} = 4.01$$

Measuring operating efficiency

Prazo médio de recebimentos ou

$$\text{Average collection period} = \frac{\text{Average receivables}}{\text{Sales}} * 365 =$$
$$\frac{(247 + 166)/2}{48,230} * 365 = 0.003 * 365 = 1.095$$

Prazo médio de pagamentos ou

$$\text{Average Payment Period} = \frac{\text{Average Accounts Payable}}{\text{Purchases}} * 365 = \frac{(4137 + 4543)/2}{32,327} * 365 = 49 \text{ days}$$

Inventories at start of the year + Purchases = Cost of goods sold + Inventories at end of the year

$$7,611 + \text{Purchases} = 31,729 + 8,209$$

$$\text{Purchases} = 32,327$$

Market-based ratios

Resultados por acção ou

$$\text{Earnings per share} = \frac{\text{Net income}}{\text{Shares outstanding}} = \frac{2,195}{1,470} = 1.49$$

P/E (PER) ou

$$\text{Price Earnings Ratio} = \frac{\text{stock price}}{\text{earnings per share}} = \frac{18.19}{1.49} = 12.2$$

Rendimento em dividendos ou

$$\text{Dividend yield} = \frac{\text{dividend per share}}{\text{stock price}}$$

Du Pont system

A breakdown of ROE and ROA into component ratios:

$$\text{Profit Margin} = \frac{\text{Net Income}}{\text{sales}} = \frac{2,195}{48,230} = 0.0455$$

$$\text{Operating Profit Margin} = \frac{\text{After tax interest} + \text{Net Income}}{\text{sales}} =$$

$$\frac{(1 - 0.35) * 298 + 2,195}{48,230} = 0.0495$$

Du Pont system

$$\begin{aligned} \text{Return on assets (ROA)} &= \frac{\text{after tax interest} + \text{net income}}{\text{total assets}} \\ &= \frac{(1 - .35) \times 298 + 2,195}{30,869} = .077 \end{aligned}$$

$$\text{ROA} = \frac{\text{sales}}{\text{assets}} \times \frac{\text{Net Income} + \text{after} - \text{tax interest}}{\text{sales}}$$

Asset turnover

Operating profit margin

Du Pont system

Versão mais simples:

$$\text{ROE} = \frac{\text{assets}}{\text{equity}} \times \frac{\text{sales}}{\text{assets}} \times \frac{\text{Net Income}}{\text{sales}}$$

Du Pont system

$$\text{ROE} = \frac{\text{assets}}{\text{equity}} \times \frac{\text{sales}}{\text{assets}} \times \frac{\text{EBIT}}{\text{sales}} \times \frac{\text{Net Income}}{\text{EBIT}}$$

↑ ↑ ↑ ↑

leverage asset profit debt
ratio turnover margin burden

ROA

Instead of EBIT, one can use Net income + after-tax Interest

Du Pont system

$$\text{ROE} = \frac{\text{assets}}{\text{equity}} \times \frac{\text{sales}}{\text{assets}} \times \frac{\text{EBIT}}{\text{sales}} \times \frac{\text{income}}{\text{EBIT}} \times \frac{\text{Net Income}}{\text{Before tax income}}$$

Before tax

The diagram illustrates the Du Pont system equation for Return on Equity (ROE). The equation is presented as a product of five ratios. Below each ratio, a red arrow points upwards to a specific term in the equation. The terms are: leverage ratio (pointing to assets/equity), asset turnover (pointing to sales/assets), profit margin (pointing to EBIT/sales), interest burden (pointing to income/EBIT), and tax burden (pointing to Net Income/Before tax income). The text 'Before tax' is positioned above the fourth ratio.

leverage ratio asset turnover profit margin interest burden tax burden

Versão mais completa

Exemplo: EDP

	2013	2014
Activo	42066	42873
Cap. Próprio	11528	11969
Vendas	16280	16294
EBIT (RO)	2193	2118
Before tax income (RAI)	1406	1636
Net Income (RL)	1005	1040

Exemplo: EDP

	2013	2014
Activo/Cap PP	3,65	3,58
Vendas/Activo	0,39	0,38
RO/Vendas	0,135	0,13
RL/RO	0,46	0,49
RL/Vendas	0,061	0,064
RAI/RO	0,64	0,77
RL/RAI	0,72	0,64