MBA in Food & Agribusiness
Financial Management

Financial Statement Analysis with Ratios

LEARNING OUTCOMES

You should be able to:

Identify the major categories of ratios that can be used for analysing financial statements

Calculate key ratios for assessing the financial performance and position of a business and explain their significance

Discuss the use of ratios in helping to predict financial failure

Discuss the limitations of ratios as a tool of financial analysis

Financial Statement Analysis

–Horizontal and vertical analysis: Benchmarking

–Financial ratios

- Ability to pay current liabilities
- Ability to sell inventory and collect receivables
- Ability to pay debts
- Profitability

Horizontal analysis

- Study of percentage changes from year-to-year
- Two steps:
  - 1. Compute dollar amount of change
  - 2. Divide dollar amount of change by base-period amount

Performing a horizontal analysis of an Income Statement

Prepare a horizontal analysis of the comparative income statements of Sensible Music Co. Round percentage changes to the nearest one-tenth percent (three decimal places)

Sensible Music Co.
Comparative Income Statements
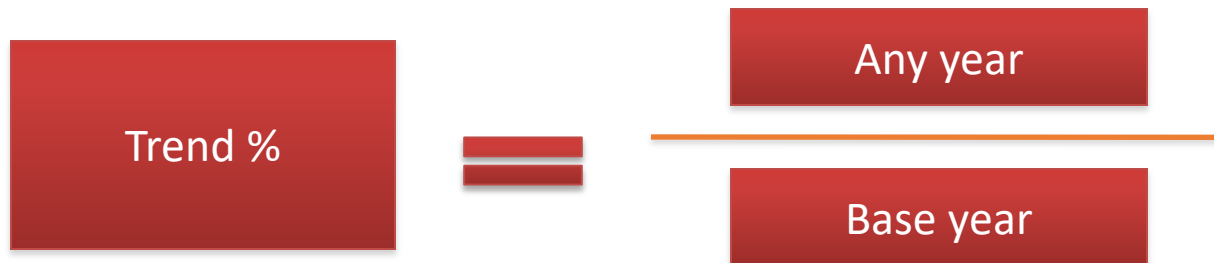**Year ended December 31, 2010 and 2009**

	2010	2009
Total Revenue (in $)	**852000**	**912000**
Expenses		
Cost of sales	402000	408000
Selling and general	232000	261000
Interest expense	9200	10500
Income Tax	83000	84000
Total expenses	**726200**	**763500**
Net Income	**125800**	**148500**

	2010	2009	$ Change	% Change
Sensible Music Company **Comparative Income Statements** **Years Ended December 31, 2010 and 2009**				
Total revenue	$852,000	$912,000	($60,000)	(6.6%)
Expenses:				
Cost of goods sold	$402,000	$408,000	(6,000)	(1.5%)
Selling & gen'l expense	232,000	261,000	(29,000)	(11.1%)
Interest expense	9,200	10,500	(1,300)	(12.4%)
Income tax expense	83,000	84,000	(1,000)	(1.2%)
Total expenses	726,200	763,500	(37,300)	(4.9%)
Net income	$125,800	$148,500	(22,700)	(15.3%)

Trend percentages

- Form of horizontal analysis
- Base year selected and set equal to 100%
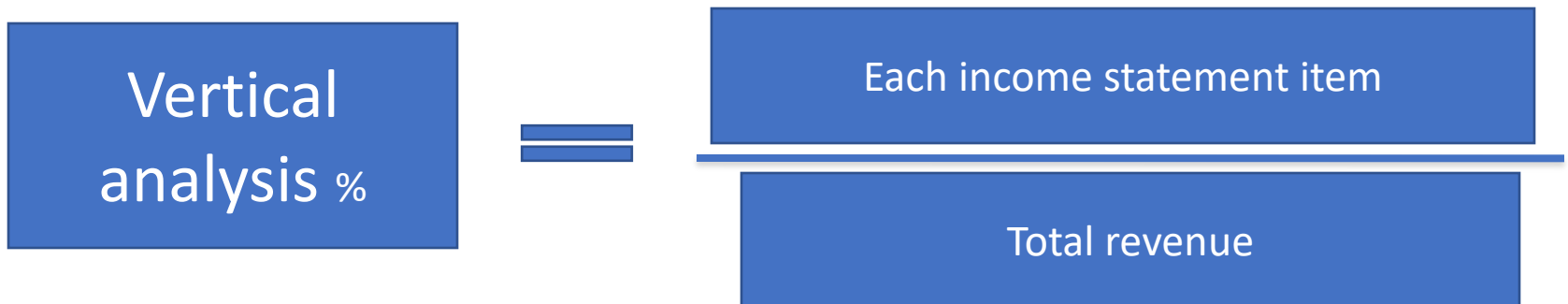 - Amount of each following year stated as a percent of base

$$\text{Trend \%} = \frac{\text{Any year}}{\text{Base year}}$$

Vertical analysis

- Shows relationship of a financial-statement item to its base
  - For Income Statement, total revenue is the base

$$\text{Vertical analysis \%} = \frac{\text{Each income statement item}}{\text{Total revenue}}$$

 - For Balance Sheet, total assets is the base

Benchmarking

- Compares one entity to another
- Compare against
  - Direct competitor in same industry,
  - Peers in broader market, or
  - Any other "aspiration" entities
- Gives context to interpret data

Common-size statements

- Report only percentages
  - No currency amounts
- Help in the comparison of different companies
  - Financial results in terms of a common denominator
  - Currency and size differences are eliminated

The key aspects of financial health
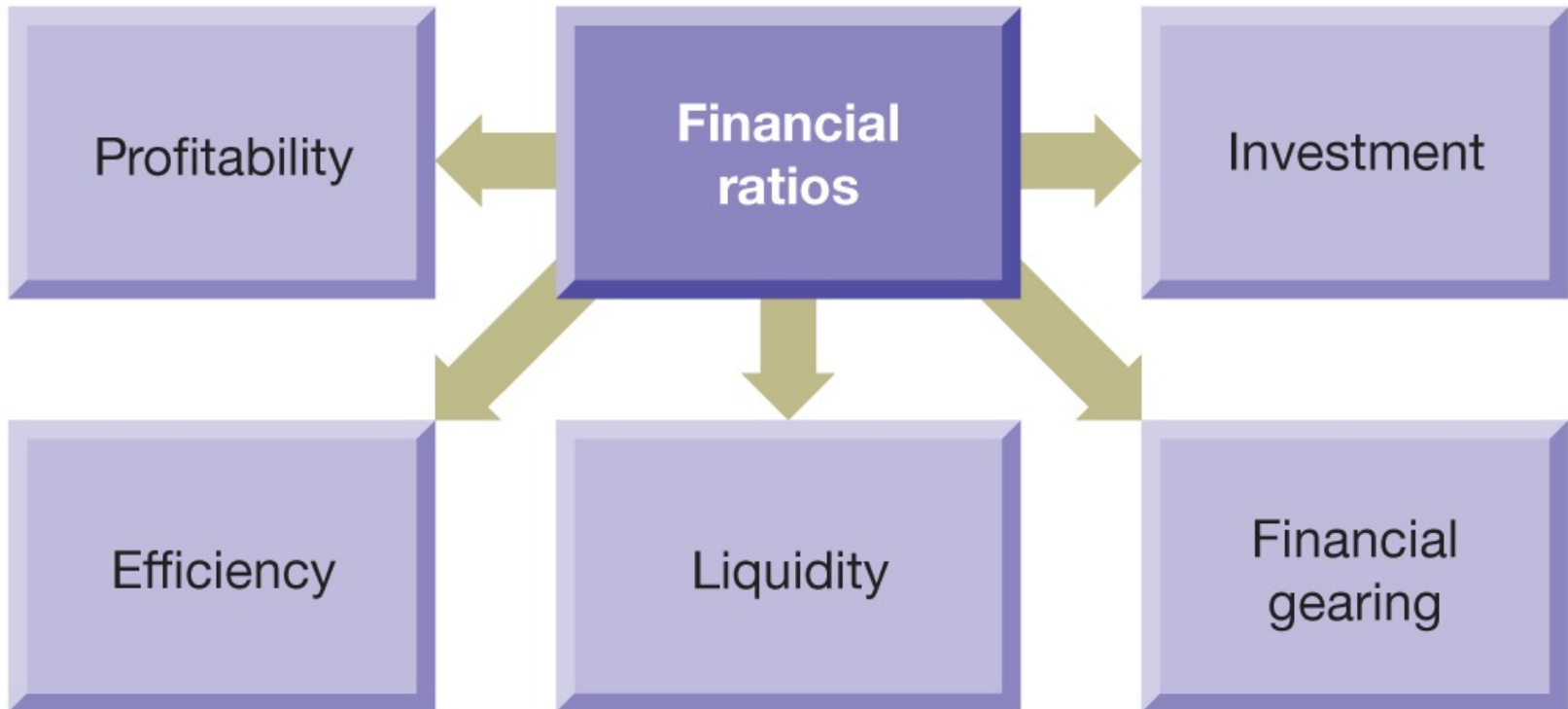
The commonly used bases of comparison for financial ratios

Past periods ← **Bases of comparison of financial ratios** → **Planned performance**

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Similar businesses
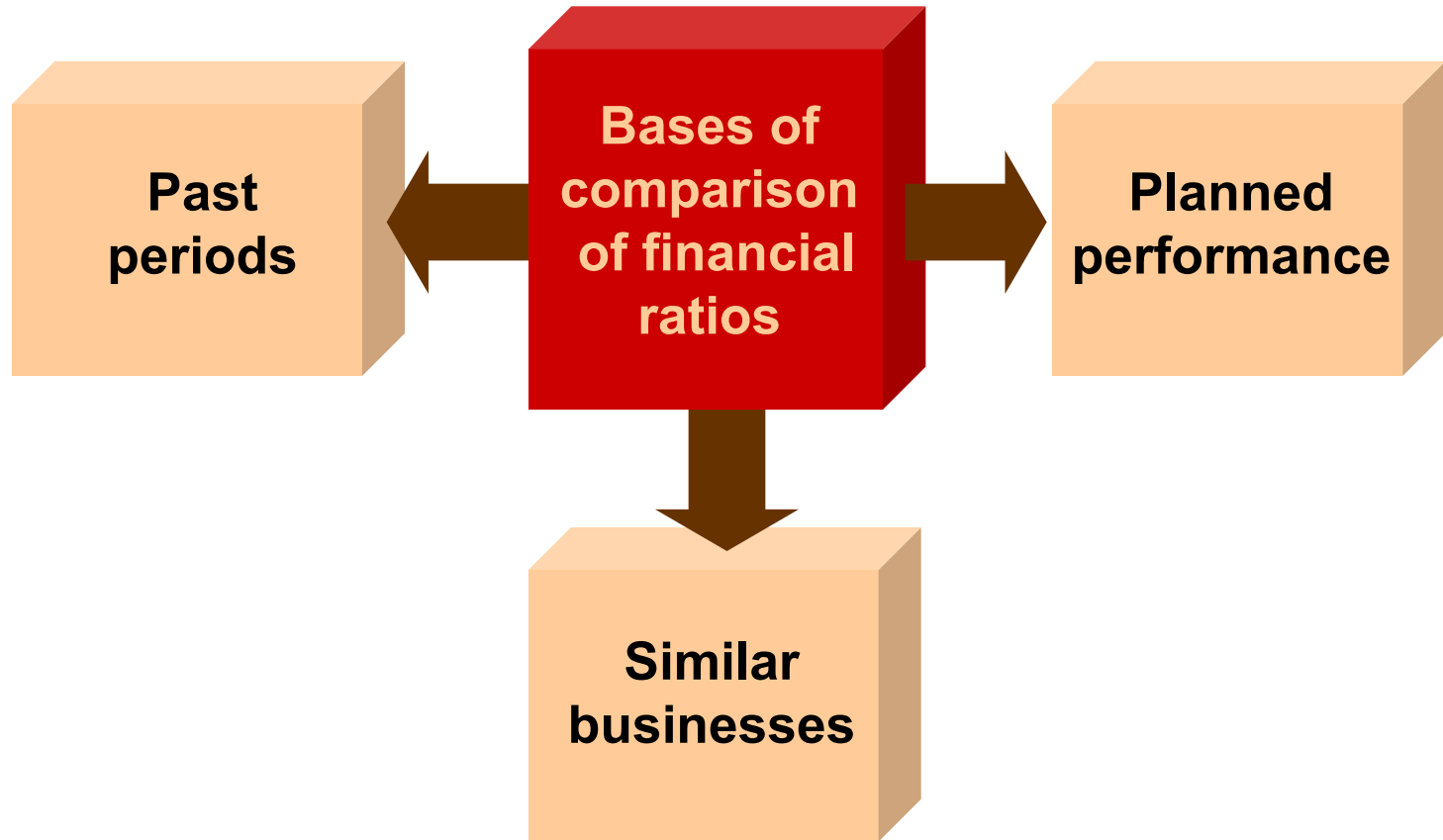
Financial ratios

Ability to pay current liabilities

Cash conversion cycle

Ability to pay long-term debt

Profitability

Analyze shares as an investment

Ability to pay current liabilities (Liquidity Ratios)

Working capital

Current ratio

Acid-test ratio

Cash ratio

Working capital and current ratio

Working capital $=$ Current assets $-$ Current liabilities

$$\text{Current ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Acid-Test Ratio

Cash + Short-term investments + Net current receivables

Current liabilities

Cash Ratio

Cash generated from operations

Current liabilities

Ability to sell inventory and collect receivables (Efficiency Ratios)

Inventory turnover	Accounts receivable turnover
Accounts Payable Turnover	Days Ratios
Sales revenue to capital employed	Sales revenue to number of employees

Inventory turnover

$$\frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

(Beginning inventory + Ending inventory)/2)

Inventory Resident Period = 365/Inventory Turnover

Accounts Receivable Turnover

Net (credit) sales

Average net accounts receivable

(Beginning net receivables + Ending net receivables)/2)

Receivables Collection Period = 365/Receivables Turnover

Accounts Payables Turnover

Cost of goods sold (or Credit Purchases)

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Average accounts payables

(Beginning payables+ Ending payables)/2)

Payables Outstanding Period = 365/Payables Turnover

Sales revenue to capital employed ratio

$$\frac{\text{Sales Revenue}}{\text{Share Capital + Reserves + Non-Current Liabilities}}$$

Sales revenue per employee

$$\frac{\text{Sales Revenue}}{\text{Number of employees}}$$

Cash conversion cycle
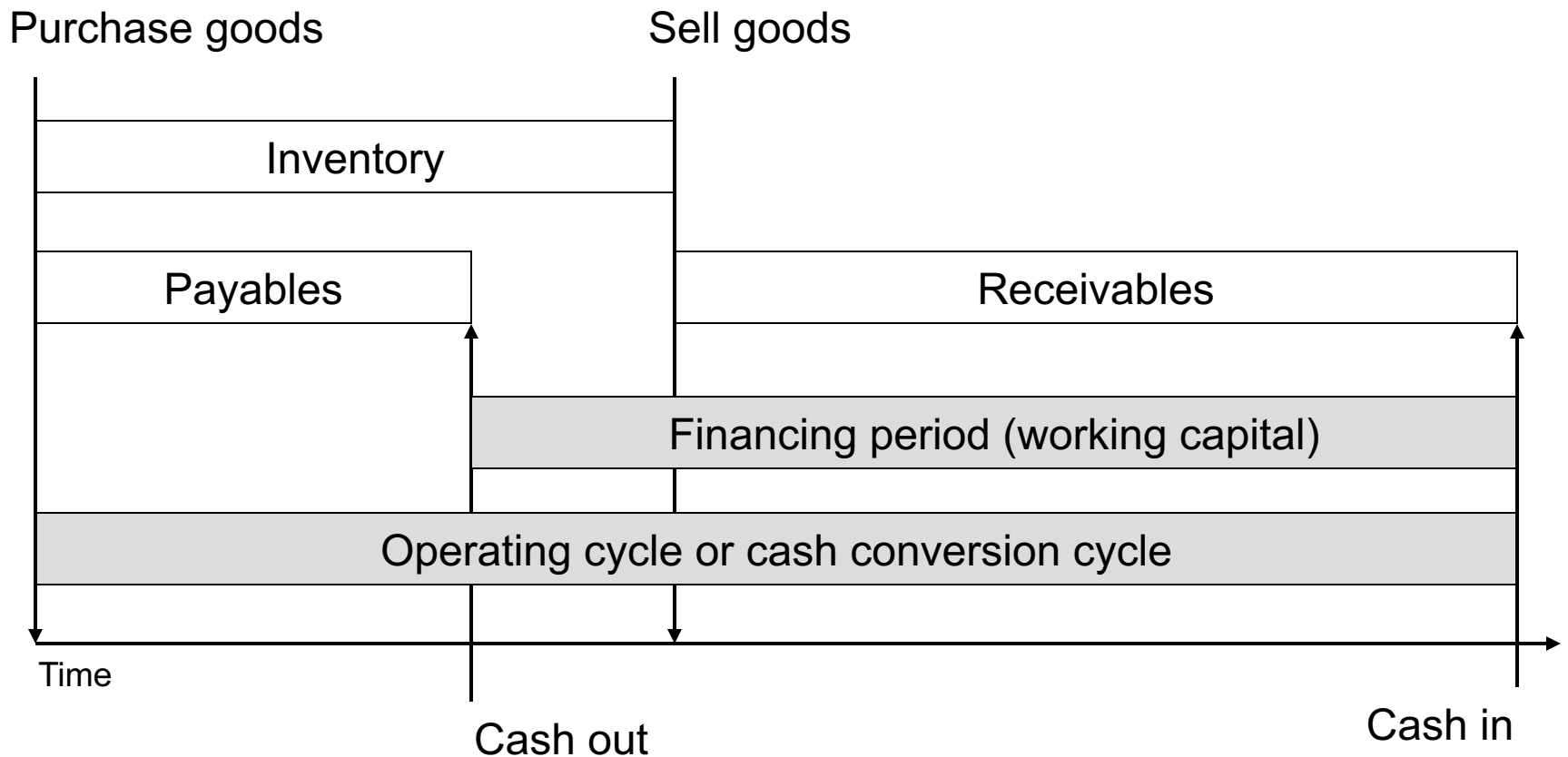
Receivables collection period

+

Inventory resident period

−

Payables outstanding period

The financing period

Exercise

The financial statements of Smith News, Inc., include the items shown in this slide: Compute the following ratios for the current year: a. Current ratio; b. Acid-test ratio; c. Inventory turnover; d. Accounts receivable turnover; e. Days' sales in average receivables (Round your answers to a through d to two decimal points. Round your answer to e to the nearest whole number.)

	Current year	Preceding year
Balance Sheet:		
Cash	$26,000	32,000
Short-term investments	14,000	20,000
Net receivables	50,000	73,000
Inventory	94,000	76,000
Prepaid expenses	9,000	8,000
Total current assets	193,000	209,000
Total current liabilities	129,000	96,000
Income Statement:		
Net credit sales	$490,000	
Cost of goods sold	274,000	

Solution

Current ratio $=$ Current assets $\div$ Current liabilities

$193{,}000 \div 129{,}000 = 1.50$

Solution

Acid- test ratio =

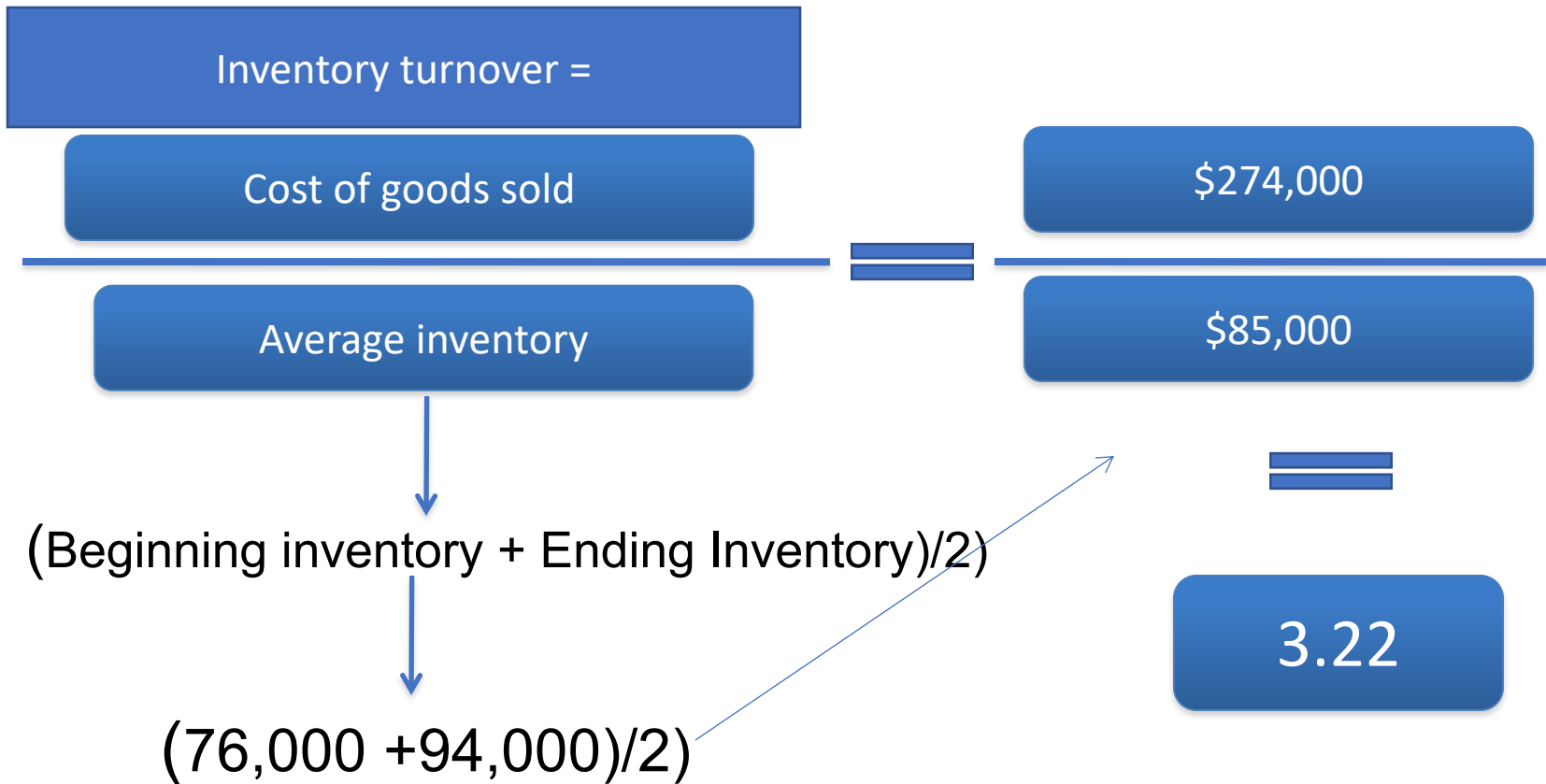Cash + Short-term investments + Net current receivables
_____

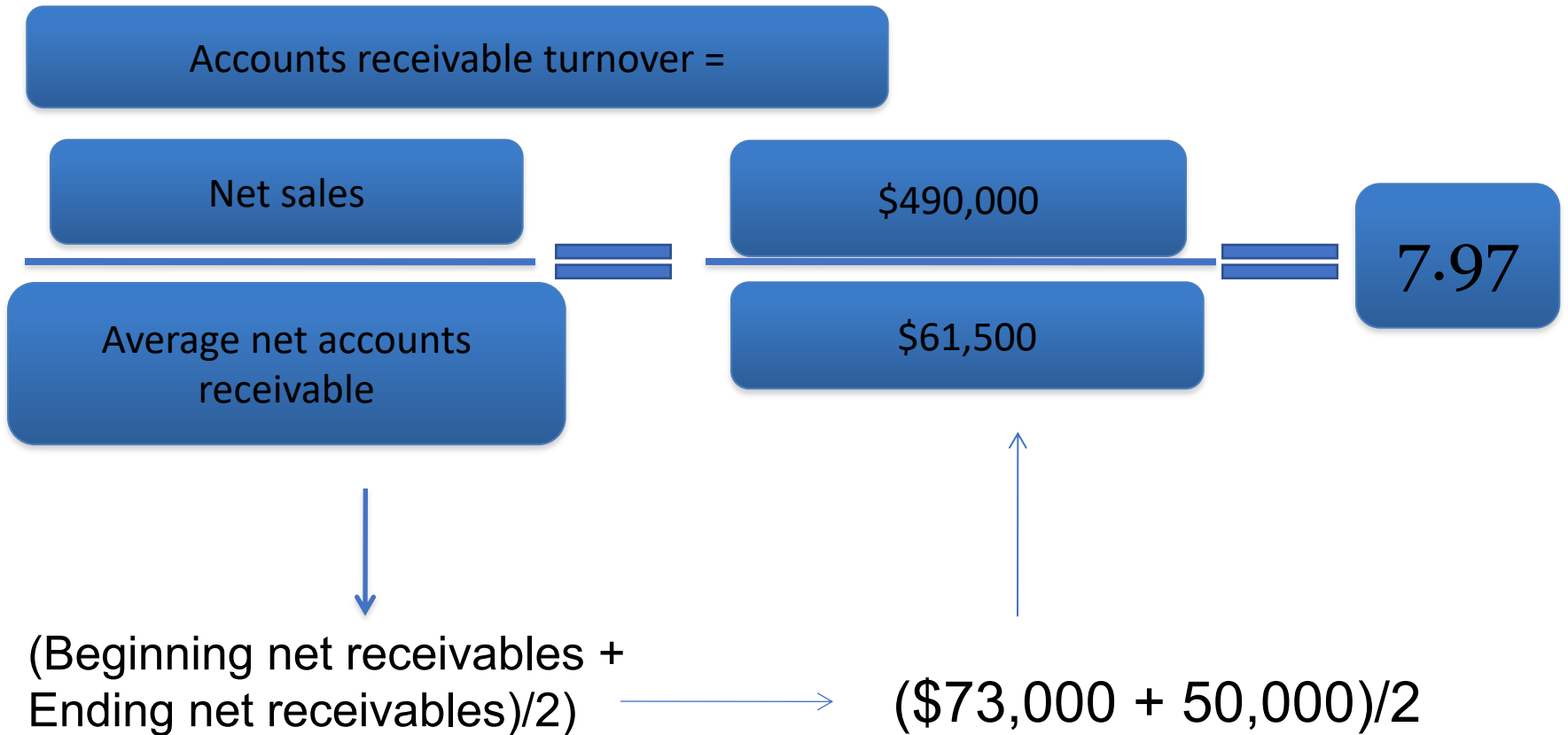Current liabilities

$26,000 +14,000 + 50,000
_____

$129,000

= .70

Solution

Inventory turnover =

Cost of goods sold	$274,000
Average inventory	$85,000

(Beginning inventory + Ending Inventory)/2)

(76,000 +94,000)/2)

3.22

Solution

Accounts receivable turnover =

Net sales		$490,000		
	=		=	7.97
Average net accounts receivable		$61,500		

(Beginning net receivables + Ending net receivables)/2)

($73,000 + 50,000)/2

Solution

Receivables Collection Period

1.

One day's sales	$=$	Net sales
		365 days

$1,342.47	$=$	$490,000
		365 days

Solution

Receivables Collection Period

2.

Days' sales in average accounts receivable	=	Average net accounts receivable
		One day's sales

($73,000 + 50,000)/2

46 days	=	$61,500
	$1,342.47	One day's sales

Measuring ability to pay debts (Gearing Ratios)

Debt ratio

Times-interest-earned

Gearing ratio

Gearing Ratio

$$\frac{\text{Long Term (non – current) Liabilities}}{\text{Share Capital + Reserves + Long Term (non-current) Liabilities}}$$

Times-Interest-Earned

$$\frac{\text{Income from operations}}{\text{Interest expense}}$$

Measuring profitability (Profitability Ratios)

Return on sales	Return on assets
Return On Average Shareholders' Equity	**Return on equity**

Rate of Return on Sales
(Net, Operating and/or Gross Profit Margins)

$$\frac{\text{Net, Operating, Gross Profit}}{\text{Sales}}$$

Rate of Return on Total Assets

$$\frac{\text{Net income + Interest expense}}{\text{Average total assets}}$$

Rate of Return on Ordinary Shareholders Equity

Net income – Preference dividends

Average ordinary shareholders' equity

Return on Capital Employed

Operating Income (or Net income)

Share capital + Reserves + Non-current Liabilities

Leverage

- Borrowing at a lower rate than invested funds earn
  - Increases profits during good times
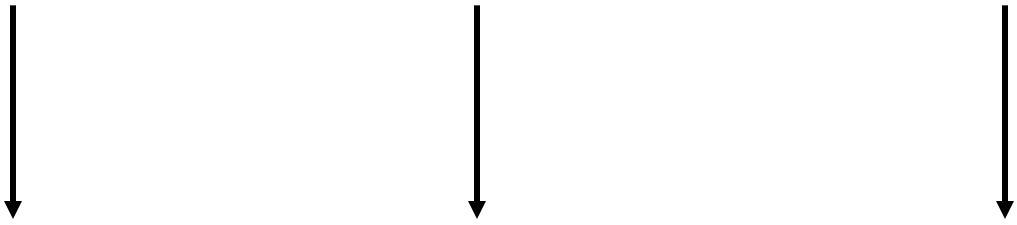 - Compounds losses during bad times

Decomposing ROE – Traditional approach (DuPont Decomposition)

Return on assets (ROA)

ROE = Return on sales (ROS) × Asset turnover (AT) × Financial Leverage

$$ROE = \frac{\text{Net Income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total Assets}} \times \frac{\text{Total Assets}}{\text{Equity}}$$

Limitations with traditional approach

- ROA numerator (NI) only includes earnings **available to equity holders**

  Denominator includes assets claimed **by all providers of capital**

- Net income is not split between operating and financing components

- Fail to recognise that cash and short term investments are, in essence, **'negative debt'** that can be used to pay down debt on a company's balance sheet *almost immediately*

Decomposing ROE – alternative approach

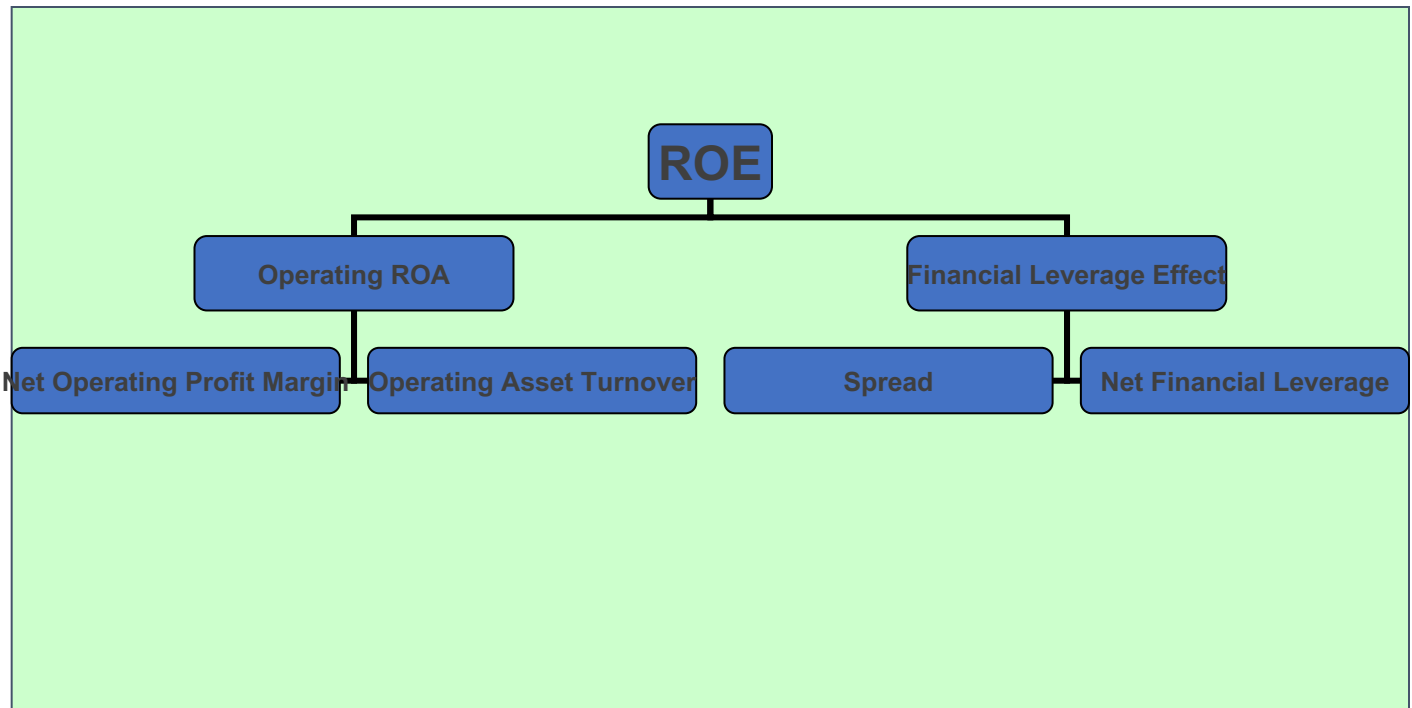**ROE** = **Operating ROA + Spread * Net financial leverage**

- [Operating ROA = NOPAT/Net Assets]
- [Net financial leverage = Net Debt/Equity]
- Spread = (Operating ROA – Effective interest rate after tax)

Alternative Framework for Financial Ratio Analysis

Operating ROA

= NOPAT / Net Assets

Net Operating Profit Margin = NOPAT / Sales

Operating Asset Turnover = Sales / Net Assets

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                    ROE
         ┌───────────┴───────────┐
   Operating ROA          Financial Leverage Effect
    ┌──────┴──────┐           ┌──────┴──────┐
Net Operating   Operating      Spread    Net Financial
Profit Margin  Asset Turnover            Leverage
```

Spread = Operating ROA - Effective interest rate after tax

Effective Interest Rate After Tax = NIEAT / Net Debt

Net Financial Leverage = Net Debt / Equity

Reformulation of BS and IS to improve analysis

Net interest expense after tax

(Interest expense - Interest income) x (1 - Tax rate)

Net operating profit after taxes (NOPAT)

Net income + Net interest expense after tax

Operating working capital (OWC)

(CA – Cash and marketable securities) – (CL – Current debt and current portion of LTD)

Net long term assets (NLTA)

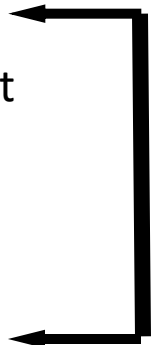Total long term assets – non-interest bearing long term liabilities (e.g. deferred taxation)

Net debt

Total interest bearing Long term liabilities + Current debt and current portion of long term debt - cash and marketable securities

Net (operating) assets (OWC + NLTA)

Net capital

Net debt + shareholders' equity

Analyzing share investments (Investment Ratios)

Earnings per Share

Price/Earnings ratio

Dividend yield, payout, cover

Book value

Earnings per Share

Net income – Preference dividends

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Weighted average number of ordinary shares outstanding

Price/Earnings Ratio

$$\frac{\text{Market price per share of ordinary shares}}{\text{Earnings per share}}$$

Dividend Yield

$$\frac{\text{Dividend per share of ordinary shares}}{\text{Market price per share of ordinary shares}}$$

Dividend Payout

Dividend announced for the year

Earnings for the year available for dividend

Dividend Cover

$$\frac{\text{Earnings for the year available for dividends}}{\text{Dividend announced for the year}}$$

Cash Generated from Operations per Share

$$\frac{\text{Cash generated from operations less preference dividend (if any)}}{\text{Number of ordinary shares outstanding}}$$

Book Value

$$\frac{\text{Total shareholders' equity} - \text{Preference equity}}{\text{Number of ordinary shares outstanding}}$$

Red flags in financial statement analysis

- Earnings problems
- Decreased cash flow
- Too much debt
- Inability to collect receivables
- Buildup of inventories
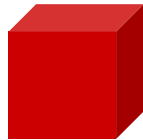- Trends of sales, inventory and receivables
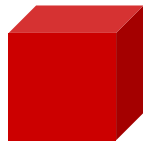
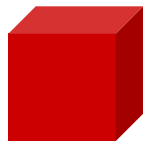# Limitations of ratio analysis
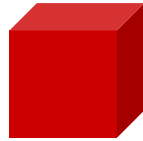
Quality of financial statements
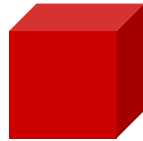
Inflation

Restricted view of ratios

The basis for comparison

Statement of financial position ratios