

Finance Management & Planning

Financial Ratios – Introduction

- Recap of Last week
 - Ratios – an introduction
- This Week
 - Assignment discussion
 - Ratios – an introduction
- Time reliant or next week
 - Profitability Ratios
 - Activity Ratios

- **Assessment**

- Business Report – max 3000 words +/- 10%
- Powerpoint Presentation of a new project opportunity within your business (up to 10 slides)

- **Reading texts**

- Atrill and McLaney – Accounting and Finance for Non Specialists
- Fields (2006) the essentials of Finance and Accounting for Non Financial Managers
- Fridson and Alvarez (2002) Financial Statement analysis – A Practitioners Guide

Setting the Scene

- What is a Ratio ?
- What do they mean to you ?
- Do you use them ?

Financial Ratios

Statistical Information within your business



Statistical Information within your business

- Units per Hour
- Failures per Hour
- Machine Efficiency
- Downtime
- Marketing Costs per campaign
- Budget v Actual
- Quality costs
- No of Employees (Direct and Indirect)
- Non Productive time
- Lead times
- Delivery days
- Payment terms
- Accident Free Days

What are Ratio's used for within organisations ?

- Measure critical dimensions of the economic performance of an organisation
- Managers can use ratios to guide, measure & reward workforce

What is a ratio?

A ratio is a pair of numbers used to make comparisons

They can be presented in different ways:

3 to 2

3:2

$\frac{3}{2}$

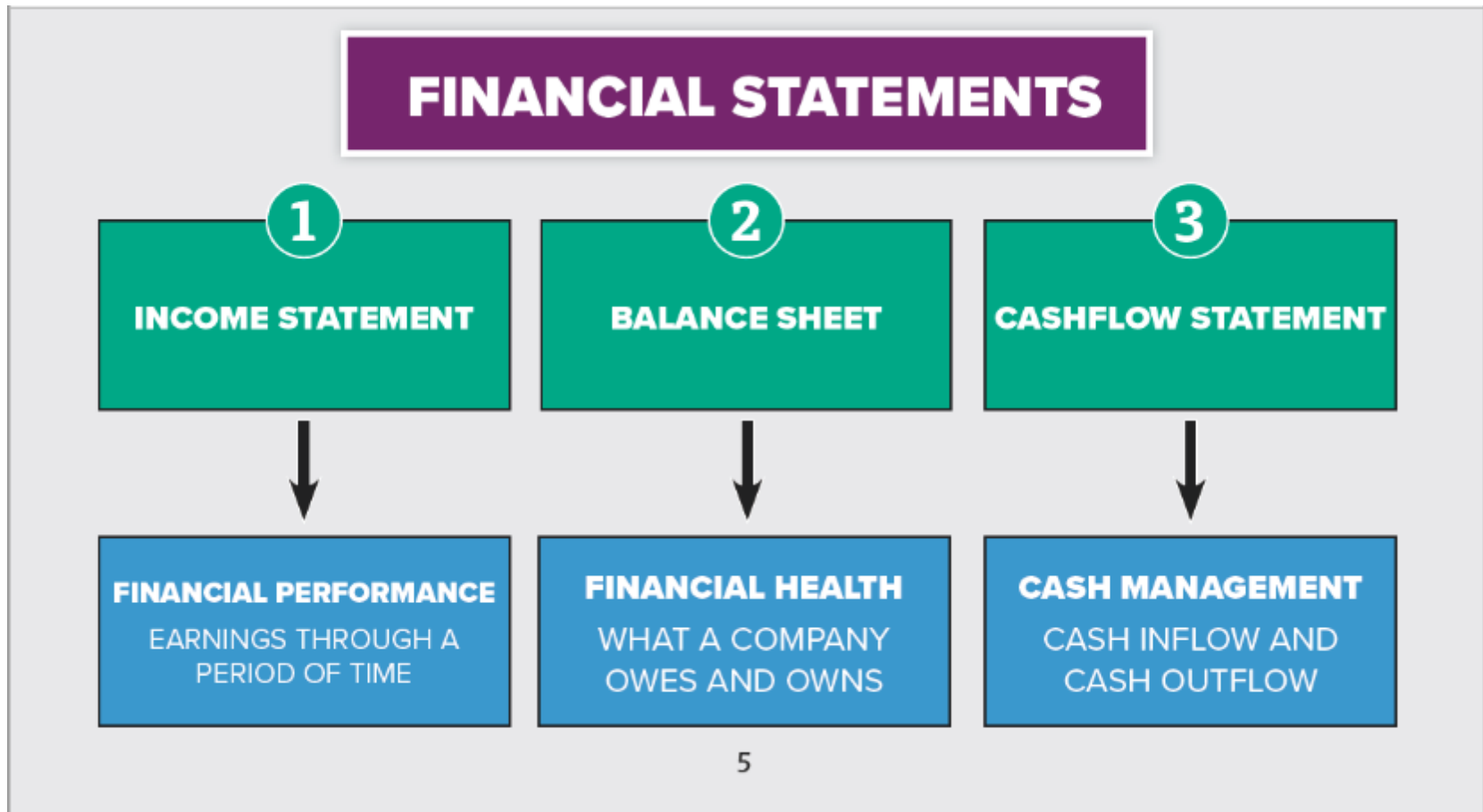
150%

Where do we use Ratios ?

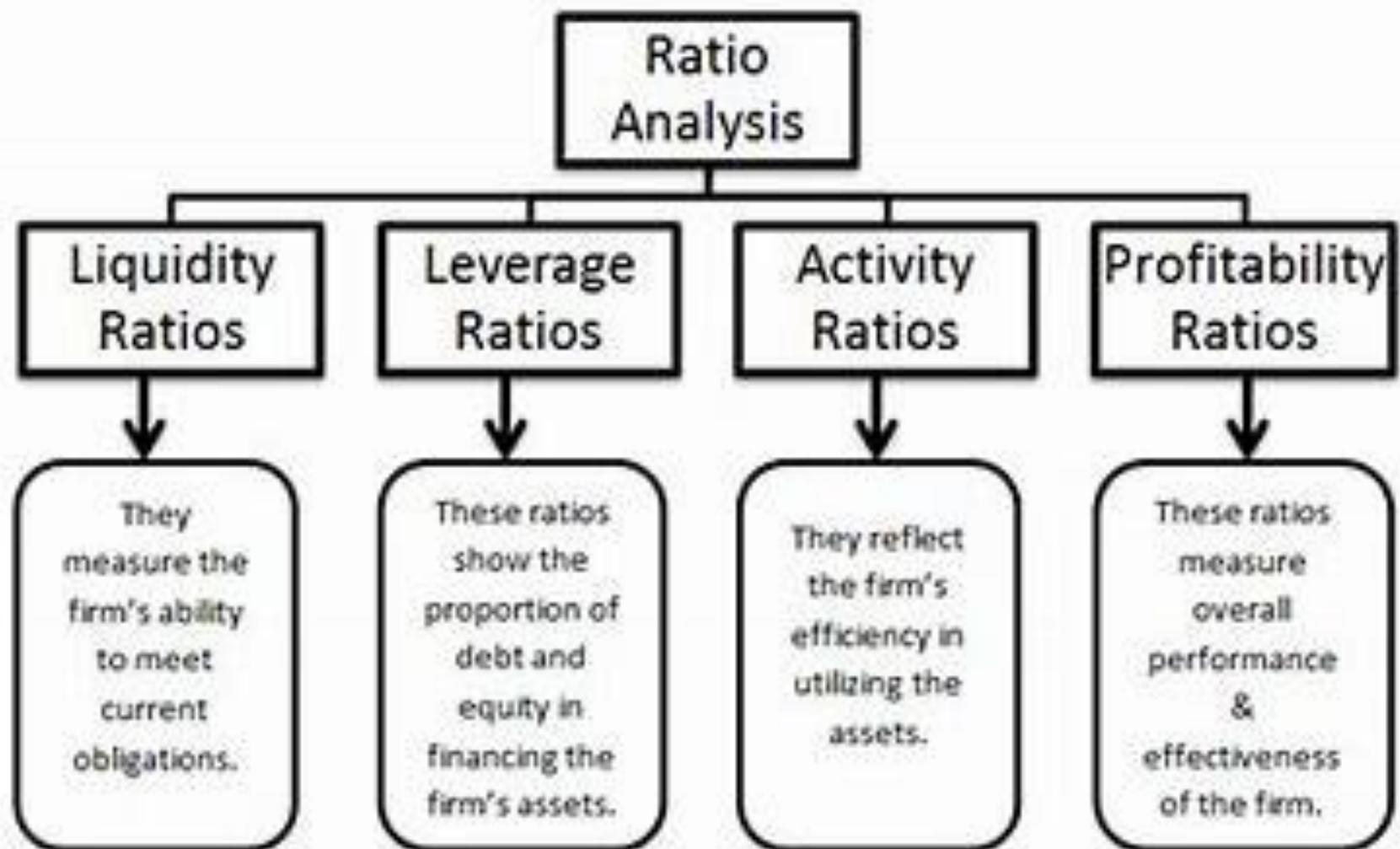
- **Time Series Comparisons**
 - compare past periods in same business
- **Benchmarking**
 - against similar businesses or planned performance
- **Cross-Sectional Comparisons**
 - against competition or industry for the same or past periods

The Financial Statements

Financial statements measure the financial health of the organisation:



- Grouped into categories relating to a particular aspect of financial performance or position.
 - Profitability
 - Efficiency
 - Liquidity
 - Financial Gearing
 - Investment (of more interest to external stakeholders)
- Atrill & McLaney chapter: 6
 - Analysing and interpreting financial statements



Let's consider an example of a financial ratio

I sell 10 items at £100 per item and the total cost of the product delivered is £75

What is my Gross Margin ?

Example of financial ratio

For now, let's ignore all of the other costs involved in making the products:

Revenue Recognised	£1,000
COGS	£ 750

Q: What ratio am I getting in terms of margin from my sales revenue?

Financial ratio's

Gross Margin %	=	<table><tr><td>Gross Margin</td></tr><tr><td>Revenue</td></tr></table>	Gross Margin	Revenue	=	<table><tr><td>250</td></tr><tr><td>1000</td></tr></table>	250	1000
Gross Margin								
Revenue								
250								
1000								

This can also be expressed as:

250 to 1000

or

25:100

Or

0.25:1

Or

25%

This is an example of a ratio but what does it mean?

It means that for every £1,000 of Sales we make a Gross Margin of 25% which relates to £250 of Gross Margin / Profit so for every £100 of Revenue we make £25.

We can use these better or worse comparisons to measure our performance against:

- **our competitors in the same industry**
- **our own performance against that of previous years**
- **our current performance against planned performance that we want to achieve for the future**

Other financial ratios generally work in a similar way, and although they vary in what they are measuring (e.g. profitability or efficiency), the general principle is the same.

Often there is no ‘ideal’ ratio value; ratios may sometimes only be compared, and managers need to look at the underlying reasons for those values before making decisions to take action.

In our example, if management decides that the ratio for Gross Margin level needs to be improved (because it's relevant for the business), then how could they go about that?

For this ratio, improving it means increasing the Sales Price or decreasing the Cost of Goods Sold How can we make that number bigger?

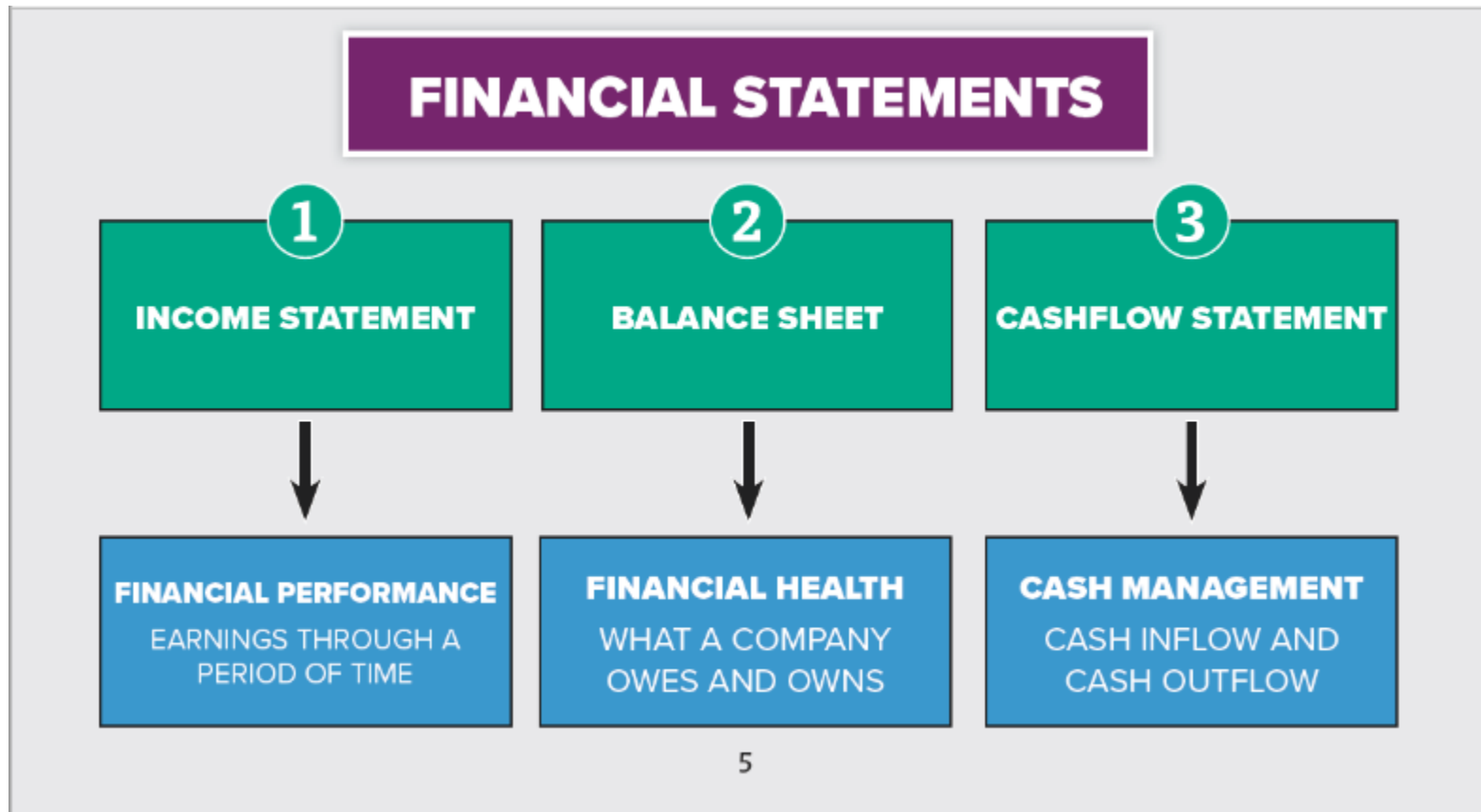
To do this we either need to make the sales revenue bigger or the COGS smaller or both.

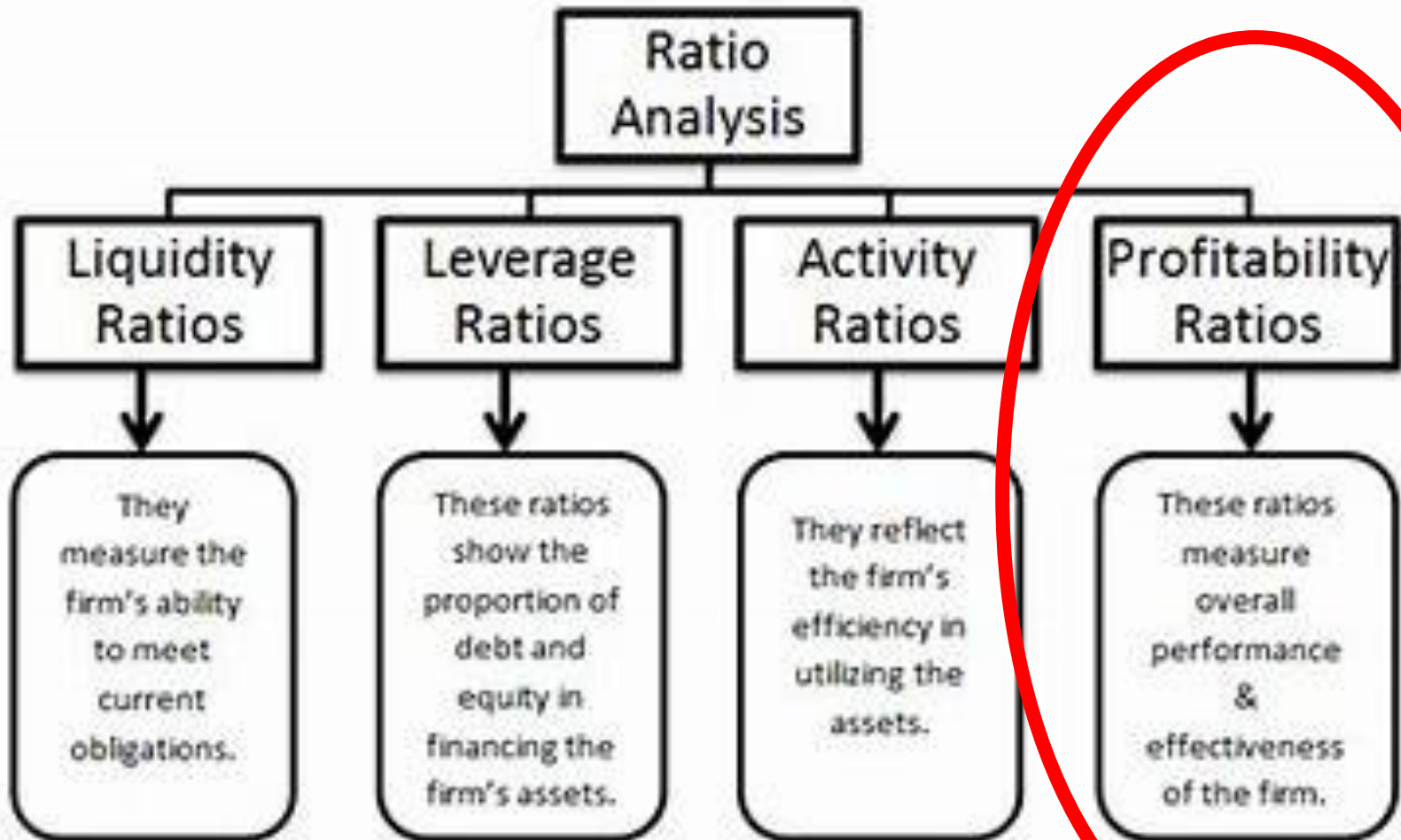
What options do we have to make the sales revenue bigger?

Increase sales revenue by increasing the price

What options do we have to make the Cogs Smaller?

Reduce Material costs
Reduce Production costs
Reduce Distribution costs





Profitability Ratios Formula

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

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

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Assets}} \times 100$$

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholder's Equity}}$$

- **Types of Profitability Ratios**
- Margin Ratios – Shows the ability for a company to convert sales into profitability.
- Return Ratios – Shows the companies ability to generate returns to its shareholders.

Ratio Reference

	2018	2019	2020
Revenue	185000	250000	300000
Material	100000	100000	150000
Labour	35000	75000	95000
Other Costs	10000	20000	25000
Cost of Goods Sold	145000	195000	270000
Gross Profit	40000	55000	30000
Gross Profit %	21.62%	22.00%	10.00%
Sales Cost	10000	10000	15000
Admin Cost	2500	5000	3500
General Costs	5000	5000	7500
Depreciation	3000	5000	5000
Total Operating Expenses	20500	25000	31000
Operating Profit	19500	30000	-1000
Interest Paid	0	0	1000
Tax @ 20%	3900	6000	0
Net Income	15600	24000	-2000

Profitability Ratios

- Gross Profit Margin %

$$\frac{\text{Gross Profit}}{\text{Revenue}} = \text{Gross Profit Margin \%}$$

Where Gross Profit is Revenue less Cost of Goods Sold

$$\frac{\text{Gross Margin}}{\text{Revenue}} = \text{Gross Margin \%}$$

Year	2017	2018
Revenue	100000	150000
COGS	80000	110000

Gross Profit	20000	40000
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Gross Margin %	20.0%	26.7%
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$$\frac{\text{Gross Profit}}{\text{Revenue}} = \text{Gross Profit Margin \%}$$

Product A

Sold at	£100 per unit
Materials	£ 65 per unit
Labour	£ 20 per unit
Distribution	£ 5 per unit

So Revenue for item	£100.00
Cost of Goods Sold	£ 90.00
Gross Profit	£ 10.00

Product A

$$\frac{10}{100} = 10\%$$

$$\frac{\text{Gross Profit}}{\text{Revenue}} = \text{Gross Profit Margin \%}$$

Product B

Sold at £130 per unit

Materials at £75

Labour at 2 Hrs at £15 per hour and 1 Hr at £20 per hour

Product C

Sold at £75 per unit

Materials at £25 per unit

Labour at 1 Hrs at £15 per hour and ½ Hr at £20 per hour

Product D

Sold at £50 per unit

Materials at £27.50 per unit

Labour ½ Hr at £15 per hour

Distribution costs for all Products is £5 per unit

$$\frac{\text{Gross Profit}}{\text{Revenue}} = \text{Gross Profit Margin \%}$$

Product A

$$\frac{10}{100} = 10\%$$

Product B

$$\frac{0}{130} = 0\% \quad \text{Gross Profit (Revenue £130 - Mats £75 - Lab £50 - Distrib £5)}$$

Product C

$$\frac{20}{75} = 27\% \quad \text{Gross Profit (Revenue £75 - Mats £25 - Lab £25 - Distrib £5)}$$

Product D

$$\frac{10}{50} = 20\% \quad \text{Gross Profit (Revenue £50 - Mats £27.50 - Lab £7.50 - Distrib £5)}$$

$$\frac{\text{Gross Profit}}{\text{Revenue}} = \text{Gross Profit Margin \%}$$

		Split by Product			
	Total	A	B	C	D
Revenue	100,000	27,500	5,000	57,500	10,000
COGS	80,000	24,750	5,000	42,250	8,000
Gross Profit	20,000	2,750	0	15,333	2,000
Gross Margin %	20.0%	10.0%	0.0%	26.7%	20.0%

- Increase Product A and B Revenue by 10% and restate Gross margin%

$$\frac{\text{Gross Profit}}{\text{Revenue}} = \text{Gross Profit Margin \%}$$

Price increase on Product A + B of 10%

		Split by Product			
	Total	A	B	C	D
Revenue	103,250	30,250	5,500	57,500	10,000
COGS	80,000	24,750	5,000	42,250	8,000
Gross Profit	23,250	5,500	500	15,250	2,000
Gross Margin %	22.5%	18.2%	9.1%	26.5%	20.0%

5% improvement on COGS

		Split by Product			
	Total	A	B	C	D
Revenue	100,000	27,500	5,000	57,500	10,000
COGS	76,000	23,513	4,750	40,137	7,600
Gross Profit	24,000	3,988	250	17,363	2,400
Gross Margin %	24.0%	14.5%	5.0%	30.2%	24.0%

$$\frac{\text{Gross Profit}}{\text{Revenue}} = \text{Gross Profit Margin \%}$$

If Both Achieved

		Split by Product			
	Total	A	B	C	D
Revenue	103,250	30,250	5,500	57,500	10,000
COGS	76,000	23,513	4,750	40,137	7,600
Gross Profit	27,250	6,738	750	17,363	2,400
Gross Margin %	26.4%	22.3%	13.6%	30.2%	24.0%

Achieved Price increase on B , Price increase of 5% on A , Cogs improved by 3%

		Split by Product			
	Total	A	B	C	D
Revenue	101,875	28,875	5,500	57,500	10,000
COGS	77,600	24,008	4,850	40,982	7,760
Gross Margin	24,275	4,868	650	16,518	2,240
Gross Margin %	23.8%	16.9%	11.8%	28.7%	22.4%

Financial Ratios

$$\frac{\text{Operating Profit}}{\text{Revenue}} = \text{Operating Profit \%}$$

Year	2017	2018
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Revenue	100,000	150,000
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COGS	80,000	110,000
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Gross Margin	20,000	40,000
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Gross Margin %	20.0%	26.7%
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SG&A	10,000	15,000
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Operating Profit	10,000	25,000
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Operating Profit %	10%	17%
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		Split by Product			
	Total	A	B	C	D
Revenue	100,000	27,500	5,000	57,500	10,000
COGS	80,000	24,750	5,000	42,250	8,000
Gross Profit	20,000	2,750	0	15,333	2,000
Gross Margin %	20.0%	10.0%	0.0%	26.7%	20.0%
SG&A	10,000	1,500	2,000	4,000	2,500
Operating Profit	10,000	1,250	-2,000	11,333	-500
Operating Profit %	10.0%	4.5%	-40.0%	19.7%	-5.0%

Gross Margin % – we reviewed product A and B

Operating Profit % - we would review B and D first

Financial Ratios

$$\frac{\text{Net Income}}{\text{Revenue}} = \text{Net Profit \%}$$

Year	2017	2018
Revenue	100000	150000
COGS	80000	110000
Gross Profit	20000	40000
Gross Margin %	20.0%	26.7%
SG&A	10000	15000
Operating Profit	10000	25000
Operating Profit %	10.0%	16.7%
Interest + Tax	5000	10000

Net Income	5,000	15,000
Net Profit %	5.0%	10.0%

Financial Ratios

Exercise

Year	2019	2020
Revenue	165,000	180,000
COGS	120,000	128,000
SG&A	25,000	25,000
Interest + Tax	8,000	10,800

Calculate

Gross Margin %

Operating Margin %

Net Profit %

Financial Ratios

Exercise

Year	2017	2018	2019	2020
Revenue	100000	150000	165000	180000
COGS	80000	110000	120000	128000
Gross Profit	20000	40000	45000	52000
Gross Margin %	20.0%	26.7%	27.3%	28.9%
SG&A	10000	15000	25000	25000
Operating Profit	10000	25000	20000	27000
Operating Profit %	10.0%	16.7%	12.1%	15.0%
Interest + Tax	5000	10000	8000	10800
Net Income	5,000	15,000	12,000	16,200
Net Profit %	5.0%	10.0%	7.3%	9.0%

Return Ratios

$$\frac{\text{Net Income}}{\text{Assets}} = \text{Return on Assets}$$

$$\frac{\text{Net Income}}{\text{Shareholders Equity}} = \text{Return on Shareholders Equity}$$

- Used to evaluate how management are utilising the capital within the business
- Assets includes Debt
- Shareholders Equity utilised the investment into the business and retained earnings.

$$\frac{\text{Net Income}}{\text{Assets}} = \text{Return on Assets}$$

Net Income	5,000	15,000
Net Profit %	5.0%	10.0%

Balance Sheet		
Year	2017	2018
Fixed Assets	100,000	90,000
Current Assets	75,000	80,000
Total Assets	175,000	170,000

Current Liabilities	60,000	45,000
Long Term Liabilities	50,000	45,000
Total Liabilities	110,000	90,000
Assets Less Liabilities	65,000	80,000

Ordinary Shares	60,000	60,000
Retained Earnings	5,000	20,000
Shareholders Equity	65,000	80,000

Return on Assets	2.9%	8.8%
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$$\frac{\text{Net Income}}{\text{Shareholders Equity}} = \text{Return on Shareholders Equity}$$

Shareholders' equity = total assets – total liabilities

Net Income	5,000	15,000
Net Profit %	5.0%	10.0%

Balance Sheet		
Year	2017	2018
Fixed Assets	100,000	90,000
Current Assets	75,000	80,000
Total Assets	175,000	170,000

Current Liabilities	60,000	45,000
Long Term Liabilities	50,000	45,000
Total Liabilities	110,000	90,000
Assets Less Liabilities	65,000	80,000

Ordinary Shares	60,000	60,000
Retained Earnings	5,000	20,000
Shareholders Equity	65,000	80,000

Return on Shareholder Equity	7.7%	18.8%
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Financial Ratios

Year	2017	2018	2019	2020
Net Profit	5,000	15,000	12,000	16,200

Balance Sheet				
Year	2017	2018	2019	2020
Fixed Assets	100,000	90,000	80,000	70,000
Current Assets	75,000	80,000	90,000	108,200
Total Assets	175,000	170,000	170,000	178,200
Current Liabilities	60,000	45,000	38,000	35,000
Long Term Liabilities	50,000	45,000	40,000	35,000
Total Liabilities	110,000	90,000	78,000	70,000
Assets Less Liabilities	65,000	80,000	92,000	108,200
Ordinary Shares	60,000	60,000	60,000	60,000
Retained Earnings	5,000	20,000	32,000	48,200
Shareholders Equity	65,000	80,000	92,000	108,200

Return on Assets	2.9%	8.8%	7.1%	9.1%
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Return on Shareholder Equity	7.7%	18.8%	13.0%	15.0%
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Profitability Ratios Formula

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

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

$$\text{Operating Profit Margin} = \frac{\text{Operating Profit}}{\text{Sales}} \times 100$$

$$\text{Return on Assets} = \frac{\text{Net Income}}{\text{Assets}} \times 100$$

$$\text{Return on Equity} = \frac{\text{Net Income}}{\text{Shareholder's Equity}}$$

Next Week

Activity Ratios

Liquidity Ratios

Preparation

The Essentials of Finance and Accounting for Non Finance Managers

Third Edition Fields (2016) available

<https://www.pdfdrive.com/the-essentials-of-finance-and-accounting-for-nonfinancial-managers-third-edition-e184141322.html>

Read Chapter 6, Pages 124 to 147 which covers the above ratios and profitability ratios

Reading List

<https://bizfluent.com/about-6195930-purpose-financial-ratios.html>

<https://www.investopedia.com/ask/answers/070914/what-are-main-differences-between-return-equity-roe-and-return-assets-roa.asp>

<https://www.investopedia.com/terms/p/profitabilityratios.asp>

<https://corporatefinanceinstitute.com/resources/knowledge/finance/profitability-ratios/>