

Appendix B - Management accounting fundamentals

Contents

Appendix B - Management accounting fundamentals	2
B.1 Introduction.....	2
B.2 Learning objectives	2
B.3 Breakeven point – cost-volume-profit analysis (CVP).....	2
B.4 Product mix decisions	9
B.5 Budgets.....	11
B.6 Cash budgets	14
B.7 Financial analysis	18
B.8 Review questions	26
B.9 References.....	31
B.10 Solutions to review questions.....	32

Appendix B - Management accounting fundamentals

B.1 Introduction

This section covers some of the fundamental techniques that underpin the management accounting support provided to managers. The purpose is to provide some background knowledge for those readers who are new to management accounting to enhance their understanding of the techniques described in the main sections of this learning resource.

B.2 Learning objectives

After studying the techniques in this appendix, you will be able to:

- Understand the different types of cost behavior and perform cost-volume-profit analysis for a single product
- Understand how the profit contribution can be used in product mix decisions
- Calculate a contribution per limiting factor to ascertain a preferred product mix of production
- Understand the principle of a flexed budget and the variances that can be used to understand the reasons for variations from plan
- Understand the importance of managing cash and the principle of preparing a cash budget
- Understand and calculate common financial ratios and interpret financial performance

B.3 Breakeven point – cost-volume-profit analysis (CVP)

One of the critical factors to consider when starting a new business is answering the question, how many products does the organization need to sell, or what level of service provision does the organization need to achieve, to breakeven? That is the volume at which it covers its costs so that neither a profit nor a loss is made. The breakeven point can have implications for pricing, methods of operations, geographic coverage, and many more business decisions.

The breakeven point can be calculated with three pieces of financial information: the price, the variable costs of providing the product or service, and the level of fixed costs.

Variable costs do precisely that – they vary with the level of output, and in many cases, they will vary directly with the volume of production. The costs of producing one unit of production are also referred to as direct costs. The typical direct costs of manufacture are materials and labor. The basic analysis, however, assumes that manufacturing labor is paid on a piece-rate basis where

employees are paid a fixed rate for every unit they produce. It means that the labor cost for each unit would be the same.

Over the last 50 years, however, there has been a shift towards manufacturing labor being rewarded on a time rate basis; that is, they are paid a fixed rate per hour or even a fixed salary. This change was driven by advances in technological manufacturing systems and trade union bargaining. A study of U.S. manufacturing organizations was undertaken by Helper et al. (2010). They identified that 30% of employees were paid piece rates in the 1930s, 14% in the 1980s, and less than 5% in 2003. The trend does not appear to be reversing. This means that for today's costing methods, labor is becoming more of a fixed cost. It is, however, still possible in many cases to calculate the labor cost of producing one unit of a product by multiplying the pay rate per hour by the time it takes (which may be an average time) to create one unit.

A logical place to begin the CVP analysis is by looking at cost behavior.

B.3.1 Cost behavior

The behavior pattern of variable costs is illustrated in Figure B.1.

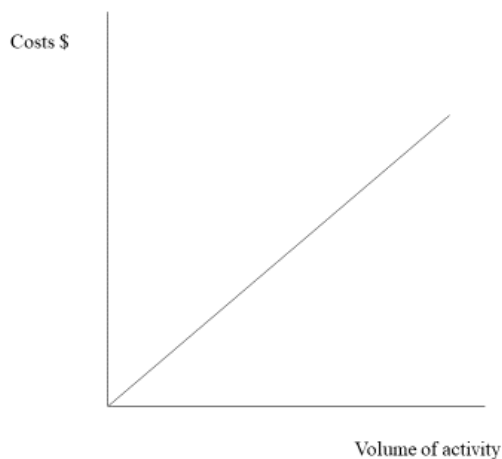


Figure B.1 Variable cost behavior as output increases

Figure B.1 illustrates that as each unit produced costs the same, the cost rises directly in proportion to output. Therefore, variable costs are often referred to as direct costs.

Besides the materials and labor, there are always other costs to consider, such as the establishment costs, for example, rent, energy, and so on. For illustrative purposes, we will assume that these are all fixed; that is, they do not vary with the level of output. Figure B.2 illustrates this graphically.



Figure B.2 Fixed cost behavior as output increases

As Figure B.2 illustrates, the fixed costs remain the same at every level of output.

In some cases, a stepped fixed cost may occur. As a simple example, assume that an organization rents premises in which components are assembled into finished products. As volume increases, more space is required, and so a second building is rented. There is a rise in the fixed costs at a given level of output, as illustrates in Figure B.3.

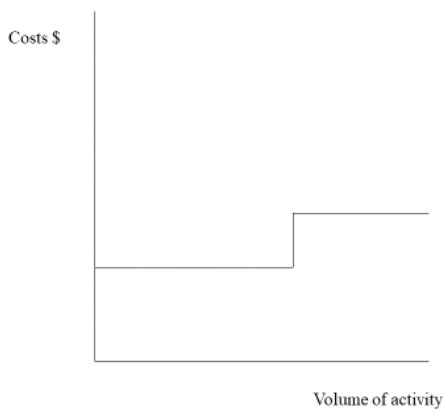


Figure B.3 Stepped fixed costs

Some costs may have a fixed element and a variable element. The classic example is a landline telephone, where the rental for the landline is fixed, but then a variable charge is made for the calls.

In a factory setting, there may be a few costs that have this kind of behavior. For example, there is always some level of energy usage within a factory unit, and as production increases, energy usage may increase but not in a direct relationship to output. Using historical data, however, we could plot the energy costs incurred at various levels of production and, using regression analysis, estimate the fixed and variable element. This is illustrated in Figure B.4.

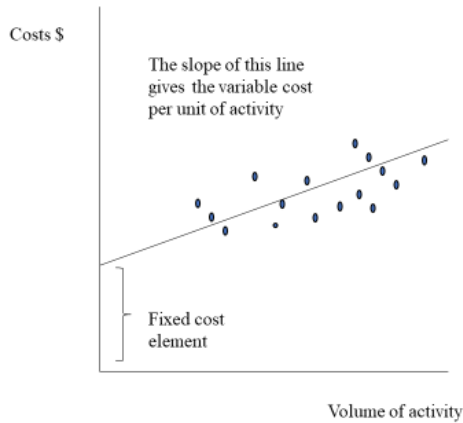


Figure B.4 Using regression analysis to ascertain the fixed element of a cost.

B.3.2 Calculation of the breakeven point.

The distinction between fixed and variable costs can be used to calculate the breakeven point. Figure B.5 shows the total cost curve, that is, fixed costs to which the variable costs are added on top.

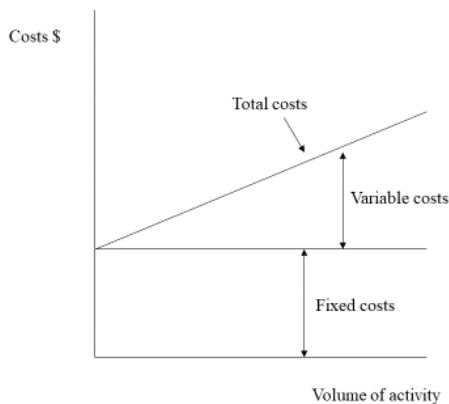


Figure B.5 Total costs – fixed costs plus variable costs.

A line can now be introduced to represent the sales value. If the selling price remains the same, then as volume sales increase, the sales value will be illustrated by a straight line, as shown in Figure B.6.

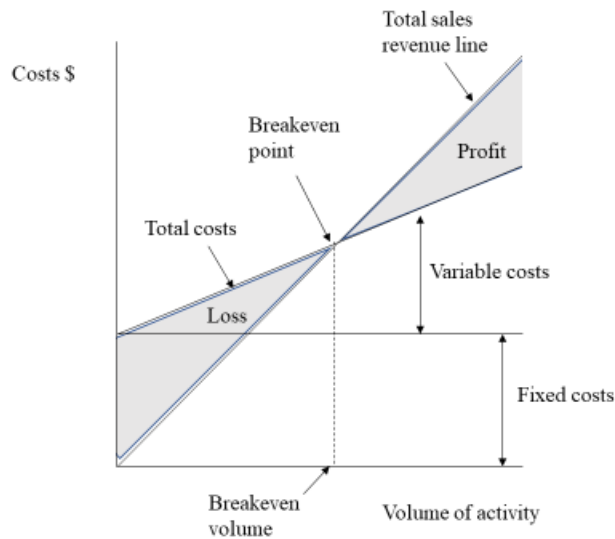


Figure B.6 The breakeven point

The sale value begins at zero when a loss is being made. A specific volume needs to be sold before the variable, and the fixed costs are covered. This occurs at the point where the sale line cuts the total cost line, and neither a profit nor a loss is being made. The breakeven volume is where the vertical line from the breakeven point cuts the volume axis. The organization can make a judgment as to whether it believes enough units can be sold to make the product a viable proposition.

The breakeven point can be calculated using a simple formula.

$$\frac{\text{Fixed costs}}{\text{Contribution per unit}} = \text{Breakeven volume}$$

The contribution per unit, illustrated in Table B.1, is the difference between the sales price and direct costs and represents the contribution made towards the fixed costs and profit.

Table B.1 Contribution per product

	\$
Sales price	10
Less direct variable costs	(5)
Contribution per unit	5

Every time a product is sold, a contribution of \$5 is made towards the fixed costs and profit.

If the fixed costs are \$5,000. The number of products the organization needs to sell to breakeven is:

$$\frac{\$5,000}{\$5} = 1,000 \text{ products}$$

A short profit and loss statement can be prepared, as shown in Table B.2, to illustrate how this works.

Table B.2 Profit and loss statement for the sale of 1,000 products

		\$
Sales	1,000 x \$10	10,000
Less direct variable costs	1,000 x \$5	(5,000)
Contribution		5,000
Less fixed costs		(5,000)
Profit/(Loss)		0

The B/E calculation is quite a powerful formula as it could be used to calculate the level of output that needs to be sold to make a required level of profit.

Suppose that Eleanor is thinking of starting a business and has estimated that to cover her living expenses without any luxuries, a profit of \$1,000 per month is required. Eleanor is planning to sell a product for \$12 per unit. The components can be purchased for \$5 per unit, and labor can be employed to assemble them for which Eleanor intends to pay a piece-rate of \$2 per unit. A small, fully serviced business unit can be rented for \$500 per month. Based on this information, Eleanor can calculate the level of sales that she needs to achieve each month.

Remembering that the contribution is the contribution towards fixed costs and profit, and the contribution is selling price less all direct variable costs. Using the following formula:

$$\frac{(\text{Fixed costs} + \text{Profit required})}{\text{Contribution per unit}} = \text{volume sales}$$

$$\frac{(\$500 + \$1,000)}{(\$12 - \$5 - \$2)} = 300 \text{ units}$$

As a quick check, Table B.3 illustrates the monthly profit and loss report for Eleanor.

Table B.3 Profit and loss statement for Eleanor

		\$
Sales	300 x \$12	3,600
Direct variable costs:		
Components	300 x \$5	(1,500)
Labor	300 x \$2	(600)
Contribution		1,500
Fixed costs		(500)
Profit		1,000

B.3.3 Margin of safety

When starting a business or launching a new product, part of assessing the viability of the idea is to estimate the likely market demand. In the case of a new business, this is important to ensure that the volume will grow enough to cover the fixed costs, that is, to reach the breakeven point. But if the business is to grow, it will need to invest, and therefore demand needs to exceed the breakeven point. The degree to which the estimated likely demand exceeds the breakeven point is known as the margin of safety. This can be thought of as the degree to which the expected demand can be wrong before a loss is made.

For example, Catrina has persuaded a local garden center to allow her to set up a business making fully arranged hanging baskets to order for customers during the summer. Catrina will rent a section of the garden center floor space for which they will charge her \$500 per month. Catrina can buy the baskets for a wholesale price of \$2 each. The selection of plants from which customers can choose will come from the garden center stock for which Catrina has negotiated a cost of \$18 per basket. Catrina believes that she will be able to sell 150 baskets per month for \$30 per basket.

Catrina can calculate the breakeven point and the margin of safety.

Contribution per unit is $\$30 - \$2 - \$18 = \10 per basket.

Breakeven point is $\$500 / \$10 = 50$ baskets.

The margin of safety is calculated by taking the estimated demand and deducting the breakeven volume.

In this case, the margin of safety is $150 - 50 = 100$ baskets. Therefore, Catrina could be 100 baskets wrong in her estimate before she loses money.

As an absolute number is not that useful, for example, is it 100 out of 150 or 100 of 15,000, which would not be so good. It is, therefore, normal to express the margin of safety as a percentage of the estimated demand.

$$\frac{(150 - 50)}{150} \times 100 = 66.66\%$$

Therefore, Catrina can be relatively confident about making some profit from the venture.

B.3.4 Limitations of breakeven analysis

Although breakeven analysis is a useful tool, some limitations should be noted.

- It assumes that the split between variable costs and fixed costs is relatively easy to ascertain. Some costs have fixed and variable elements, and therefore it is not always possible to put a high degree of accuracy on the fixed costs but to apply the best estimate.
- The analysis assumes that fixed costs remain constant over the volume range considered. If there is a rise in fixed costs at a given output due to stepped fixed costs, there may a loss incurred until the second level of production is reached that covers the additional fixed costs.
- Breakeven charts in their pure form only deal with one product at a time.

B.4 Product mix decisions

The contribution per product is a useful tool in decision making. In most businesses, there will be several product lines being made and sold. Not all products will make the same contribution as there will be differences in market prices and direct variable costs. In situations such as this and wherever possible, the organization will want to maximize the total contribution being generated by the sale of products. Given the market demand, the organizations will want to focus on the products with the highest contribution first. There are, however, situations where it might be beneficial to market products that do not make the highest margin, for example, in the case of loss-leader products or complementary products where a higher margin product is attractive due to the presence of other products. In this situation, both the loss-leader and higher margin complementary products would be produced.

B.4.1 Contribution per limiting factor

In cases where there is a short term shortage of inputs such as labor or materials, it is useful to calculate the contribution per limiting factor. For example, suppose that an organization produces three products A, B, and C. Table B.4 contains data relevant to the next accounting period.

Table B.4 Basic data for the next accounting period

	A	B	C	
Selling price	\$30	\$40	\$50	
Materials \$2 per kg	2 kg	4 kg	4 kg	
Labor \$10 per hour	2 hrs	2 hrs	3 hrs	
Anticipated sales volumes	1,500	1,000	500	
Total hours required	3,000 hrs	2,000 hrs	1,500 hrs	6,500 hrs

Materials are in abundant supply due to stocks held, but due to lockdown restrictions imposed because of the covid-19 virus, the labor hours available during the period are only 4,000 hours. The contribution of each product is shown in Table B.5.

Table B.5 Contribution for products A, B, and C

	A	B	C
	\$	\$	\$
Selling price	30	40	50
Materials	4	8	8
Labor	20	20	30
Contribution	6	12	12

As labor is the limiting factor, the contribution per limiting factor (shown in Table B.6) is calculated as follows:

$$\frac{\text{Contribution}}{\text{Labor hours}} = \text{contribution per labor hour}$$

Table B.6 Contribution per labor hour (limiting factor)

	A	B	C
Contribution per labor hour (limiting factor)	\$3	\$6	\$4

Product B provides the highest contribution per limiting factor so the organization should use the available labor to produce the products it believes it can sell of product B, followed by product C and any hours left can be used to produce product A. It should allocate labor as shown in Table B.7 and produce the products in the preferred order of B, C, and A.

Table B.7 Preferred production volumes

	A	B	C	
Production labor hours required	500	2,000	1,500	4,000
	Remaining hours	Allocated 1 st	Allocated 2 nd	
Production	250	1,000	500	

There are, of course, other factors at play, such as would it be possible to increase the price of product A to improve the contribution for those it can produce? Also, how accurate is the estimate of demand? The limiting factor approach does, however, provide some guidance as to the short term decision facing the organization.

B.5 Budgets

A budget is a detailed plan which sets out, in volumes and monetary value, the plans for the level of activity, resources, and income and expenditure, in respect of a future period. It is prepared and agreed in advance of the period concerned together with the strategy to achieve the objectives.

The starting point is the key strategic objectives and assumptions that have been made in the strategic plan. The detailed functional budgets can then be established based on achieving the predicted level of sales activity. The actual sales budget will be based on the sales forecast but also considers the resources available and any limiting factors to the actual level of sales that can be achieved.

B.5.1 Flexible budgets

When the budget is set at the beginning of the period, it is set for a given level of expected sales and hence a given level of production. Changes in the environment, however, will inevitably mean

that the actual levels of activity are not always the same as the planned levels. In this instance, it would not make sense to compare the original budget with the actual performance but to flex the budget for the variable costs to take account of the different levels of activity.

Consider the results of XYZ Inc for the first month of the budget shown in Table B.8.

Table B.8 Basic data and results for XYZ Inc. for month 1.

Basic data related to month 1					
		Original budget		Actual for month	Variance
Sales units		20,000		16,000	
	Usage	\$	Usage	\$	
Sales price		20.00 per unit		21.00 per unit	
Direct materials kgs Standard usage is 0.6 kg per unit	12,000	5.00 per kg	10,000	6.00 per kg	
Direct labor hrs Standard is 1 hr per unit	20,000	10.00 per hr	17,000	11.00 per hr	
Variable overhead		3.00 per labor hr		2.50 per labor hr	
Fixed overhead		14,000.00		15,000.00	
Income statement (Profit and loss account) for Month 1					
		\$		\$	\$
Sales		400,000		336,000	(64,000)
Direct materials		60,000		60,000	0
Direct labor		200,000		187,000	13,000
Variable overheads		60,000		42,500	17,500
Fixed overheads		14,000		15,000	(1,000)
Profit		66,000		31,500	(34,500)

The comparison of the original budget with the actual performance indicates an adverse variance (negative) of \$34,500. If, however, the budget is flexed to take account of the level of

activity, the actual can be compared to what it should have cost to sell and produce 16,000 units. This is because only the variable costs to produce 16,000 units would have been incurred, and therefore it is more meaningful to compare the budgeted costs for a level of output of 16,000. Note that this ignores any inventory and assumes that production and sales are the same. Also, the variable overheads are charged to products based on a rate per labor hour. The flexed budget compared with the actual is shown in Table B.9.

Table B.9 Flexed budget compared to actual for month 1

	Budget for 16,000 units	Flexed budget	Actual	
Flexed budget		\$	\$	\$
Sales	16,000 * \$20	320,000	336,000	16,000
Direct materials	16,000 x 0.6 kg x \$5	48,000	60,000	(12,000)
Direct labor	16,000 x 1 hr x \$10	160,000	187,000	(27,000)
Variable overheads	16,000 x 1 hr x \$3	48,000	42,500	5,500
Fixed overheads		14,000	15,000	(1,000)
Profit		50,000	31,500	(18,500)

The comparison of actual performance with the flexed budget still shows an adverse variance, but it is not as high.

The variances shown can be analyzed into a volume-related elements and price or cost rate related elements. The calculations and variances are shown in Table B.10.

Table B.10 Analysis of variances from budget for XYZ Inc. month 1.

	Planned			Actual			
	Level of activity	Price/rate \$	Should be \$	Activity	Price/rate \$	Was \$	Variance \$
Sales volume	20,000	20.00	400,000	16,000		320,000	(80,000)
Sales price		20.00	320,000	16,000	21.00	336,000	16,000
Total sales variance							(64,000)

Direct materials usage	9,600	5.00	48,000	10,000		50,000	(2,000)
Direct materials rate		5.00	50,000	10,000	6.00	60,000	(10,000)
Total materials variance							(12,000)
Direct labor efficiency	16,000	10.00	160,000	17,000		170,000	(10,000)
Direct labor rate		10.00	170,000	17,000	11.00	187,000	(17,000)
Total labor variance							(27,000)
Variable overhead efficiency	16,000	3.00	48,000	17,000		51,000	(3,000)
Variable overhead expenditure		3.00	51,000	17,000	2.50	42,500	8,500
Total variable overhead variance							5,500
Fixed costs			14,000			15,000	(1,000)

The sales volume variance is effectively eliminated when the budget is flexed, but the remaining sales variance is then due to the sale price. The direct materials and direct labor variances can be analyzed between those relating to usage and the rate. As the variable overhead is allocated to products based on labor hours, an efficiency variance and expenditure variance can be calculated. The fixed costs by their nature are fixed, so only the total variance is shown. In an absorption costing system, however, where fixed overheads are absorbed based on a rate per material usage, labor hour, or other bases per unit, it is possible to calculate a fixed overhead volume and expenditure variance.

The variance analysis helps managers to understand why variances have occurred and inform decision making about any corrective action required.

B.6 Cash budgets

Cash Budgets are used by organizations to identify their future cash requirements. Organizations are then able to ensure that finance is available when required or to make changes to their operating plans to manage the cash resources more effectively.

Cash budgets can be prepared for normal business operations or specific projects. They are frequently prepared on an annual basis and updated regularly. Typically, the budget will be prepared, showing the cash receipts, cash payments, and closing cash balance for each month. A typical format is shown in Table B.11.

Table B.11 Typical layout of cash budget

	Feb	Mar	Apr	May	Jun	Jul
Cash Inflow	\$	\$	\$	\$	\$	\$
Cash received from sales						
40% 1 month from sale	104,000	100,000	84,000	108,000	120,000	124,000
60% 2 months from sale	40,000	156,000	150,000	126,000	162,000	180,000
Total cash inflows	144,000	256,000	234,000	234,000	282,000	304,000
Cash outflows						
Purchases	175,000	120,000	120,000	150,000	200,000	180,000
Dividend					30,000	
Tax						25,000
Admin and finances	16,875	21,875	21,875	21,875	21,875	21,875
Selling and Distribution	35,000	40,000	40,000	40,000	40,000	40,000
Total cash outflows	226,875	181,875	181,875	211,875	291,875	266,875
Net Cash flows	(82,875)	74,125	52,125	22,125	(9,875)	37,125
Opening balance	(200,000)	(282,875)	(208,750)	(156,625)	(134,500)	(144,375)
Closing balance	(282,875)	(208,750)	(156,625)	(134,500)	(144,375)	(107,250)

The technique for producing a cash budget is to allocate the receipts in the month in which the cash is received and payments in the month in which the payment is made.

For sales made on credit, that is, the customer pays in the month following the sale, then the cash is entered in the cash budget when the customer pays and not when the sale is made. So for example, if in January sales were made of \$10,000, but the customer did not pay the money to you until February, the sale is shown in the Profit and Loss Account (Income Statement) in January, but the cash is entered into the Cash Budget in the month of February.

Similarly, payments are made when the cash is paid. So, for example, if you buy goods from a supplier in January, but pay for them in February, although under an accruals system, the profit and loss account would record the transaction in January, the Cash Budget records the transaction in February.

The complication arises with the timing of cash receipts and payments when you calculate that only some of your customers pay when they are supposed to pay, while others take a little longer. Typically, you may find that 60% of the customers pay in the next month following a sale, but that 40% take two months to pay.

This situation can be accounted for in the cash budget by taking the sales and planning for the receipts spread over the following two months.

For example, suppose ABC Inc. makes the following sales, shown in Table B.12.

Table B.12 Sales by month for ABC Inc.

	January	February	March	April	May	June
	\$10,000	\$12,000	\$14,000	\$16,000		

All sales are made on credit terms where customers are required to pay in the month following, that is, the next month.

So, the cash would be received, as shown in Table B.13.

Table B.13 Cash receipts from sales for ABC Inc.

	January	February	March	April	May	June
		\$10,000	\$12,000	\$14,000	\$16,000	

However, suppose that only 60% pay in the next month, and that the remaining 40% pay in two months. The cash receipts would be, as shown in Table B.14.

Table B.14 Cash receipts for ABC when 60% pay in one month, 40% in two months

	January	February	March	April	May	June
60%		\$6,000	\$7,200	\$8,400	\$9,600	
40%			\$4,000	\$4,800	\$5,600	\$6,400

B.6.1 A simple example

1. On January 1, Entrepreneur Inc. was started by the introduction of \$25,000 capital. The capital was placed in the bank account on January 1.
2. Sales are expected to be \$40,000 per month
3. Purchases are planned of \$30,000 per month
4. Sales will all be made on credit terms of payment within one month of sale, and the cash is usually received in the month following the sale.
5. Suppliers will be paid one month following the purchase being made.
6. Selling and distribution costs are expected to be \$5,000 per month and paid in the month in which they are incurred.
7. Tax liability is expected to be paid in April of \$2,000
8. Noncurrent assets are purchased on January 2 for \$20,000.

Calculate the anticipated cash budget for the period of January 1 – June 30.

The resultant cash budget from the data given above is shown in Table B.15.

Table B.15 Cash budget for Entrepreneur Inc.

Description	January	February	March	April	May	June	Total
	\$	\$	\$	\$	\$	\$	\$
Capital	25,000						25,000
Sales		40,000	40,000	40,000	40,000	40,000	200,000
Purchases		(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(150,000)
Selling and distribution	(5,000)	(5,000)	(5,000)	(5,000)	(5,000)	(5,000)	(30,000)
Taxation				(2,000)			(2,000)
Non current assets	(20,000)						(20,000)
Net cash flow	0	5,000	5,000	3,000	5,000	5,000	23,000
Opening balance	0	0	5,000	10,000	13,000	18,000	
Closing balance	0	5,000	10,000	13,000	18,000	23,000	

The example in table B.15 illustrates the impact on cash flows of customers paying a month later. This is one of the reasons why it is so important to keep control of the length of time it takes to customers to pay. It not only illustrates the level of working capital required to start a business but impacts on the length of the working capital cycle.

The working capital cycle can be calculated as the number of days that need to be financed. For example, raw materials are purchased and can be used immediately on delivery to produce the product, which takes 30 days to manufacture. The purchases must be paid for 30 days from the date of receipt. The items are on average held in inventory for 15 days before a sale is made, and customers take, on average, 45 days to pay.

The working capital cycle is the number of days to manufacture (during which labor and production expenses need to be paid), plus the days in inventory, plus the credit period taken by customers before the organization gets reimbursed with the money, but we can deduct the credit received from suppliers. So, $30 + 15 + 45 - 30$ days = 60 days. The level of working capital required must enable the organization to operate for 60 days.

The following example is the same as the previous example in Table B.15 with the one difference that customers do not all pay within the standard credit terms. Note how this affects the closing balance in the early months and the ending balance after six months, shown in Table B.16. It illustrates the need for good credit control and working capital management.

1. On January 1, Entrepreneur Inc. was started by the introduction of \$25,000 capital.
2. Sales are expected to be \$40,000 per month

3. Purchases are planned of \$30,000 per month
4. Sales will all be made on credit terms of payment within one month of sale. 60% of the customers are expected to pay in the month following the sale and 40% two months from the date of sale.
5. Suppliers will be paid one month in arrears (following the month of purchase).
6. Selling and distribution costs are expected to be \$5,000 per month and paid in the month in which they are incurred.
7. Tax liability is expected to be paid in April of \$2,000
8. Noncurrent assets are purchased on January 1 for \$20,000.
9. Calculate the anticipated cash budget for the period of January 1 – June 30.

Table B.16 Cash budget for Entrepreneur Inc. when customers pay 60% in month following and 40% two months from date of sale.

Description	January	February	March	April	May	June	Total
	\$	\$	\$	\$	\$	\$	\$
Capital	25,000						25,000
Sales – 60%		24,000	24,000	24,000	24,000	24,000	120,000
Sales 40%			16,000	16,000	16,000	16,000	64,000
Purchases		(30,000)	(30,000)	(30,000)	(30,000)	(30,000)	(150,000)
Selling and distribution	(5,000)	(5,000)	(5,000)	(5,000)	(5,000)	(5,000)	(30,000)
Taxation				(2,000)			(2,000)
Non current assets	(20,000)						(20,000)
Net cash flow	0	(11,000)	5,000	3,000	5,000	5,000	7,000
Opening balance	0	0	(11,000)	(6,000)	(3,000)	2,000	
Closing balance	0	(11,000)	(6,000)	(3,000)	2,000	7,000	

B.7 Financial analysis

Financial analysis is undertaken as part of the routine reporting within management accounts. The ratios also provide a means of comparison between various business units within a business, and with other organizations. It is, therefore, useful for competitor analysis and can be used as part of

benchmarking financial performance against industry standards. The financial ratios are used by investors to assess the performance of the organization and are of interest to other stakeholders in understanding the performance. Strengths and weaknesses that are due to the financial performance and the balance sheet situation can also be ascertained.

The following ratios are not comprehensive coverage of all the ratios that can be calculated concerning management accounts but include the most common ratios.

Gross Profit Percentage

$$\frac{\text{Gross profit}}{\text{Sales revenue}} \times 100 = x\%$$

Gross profit is the difference between the sales value and the cost of goods sold. In a manufacturing environment, the cost of goods sold would include the cost of manufacturing, the individual elements of which would be monitored closely via cost control measures. In an organization that purchases products for onward sale, this can be used as a measure of purchasing effectiveness and can indicate the potential emergence of supplier power or buyer power in the industry. For example, if costs are rising and the organization is unable to pass on cost increases to customers, the margin will reduce. Similarly, if there is downward pressure on prices from customers, and increasing levels of competition on price, the margin will reduce. Ideally, the organization is seeking to maintain the margin from year to year, at least. Reductions in margins can be an early warning sign of problems to come later.

Operating Profit Percentage

$$\frac{\text{Operating profit}}{\text{Sales revenue}} \times 100 = x\%$$

By deducting the operating costs from the gross margin, the operating profit is obtained. Further analysis can be undertaken to ascertain trends within the operating costs that require attention. A reduction in operating profit could result from a gross margin reduction but can also indicate that the operating costs need careful investigation. The operating profit is also taken before interest and tax. This is significant when using this ratio for competitor analysis, as this makes the comparison more meaningful.

Interest payments are affected by the way an organization has chosen to finance itself. Therefore this could affect profit levels taken after interest payments, and tax reflects the tax regimes where the organization does business. However, it is a valid assumption that organizations in the same sector face similar operating costs, and therefore a difference in operating profit (before interest and tax) could be due to different operational decisions and efficiencies.

Return on Capital Employed (ROCE)

$$\frac{\textit{Operating profit}}{\textit{Capital employed}} \times 100 = x\%$$

The return on capital employed provides a means of measuring how effectively the organization is using the capital employed within the business. Capital employed can be analyzed into share capital and loan capital. The mix of this is known as the capital structure and can be monitored via the gearing ratio. The definition of capital employed can be slightly different in that some definitions will include total equity (shareholders' funds) and all the noncurrent liabilities. In contrast, other definitions will consist of total equity and only long-term borrowings. So long as the ratio is calculated consistently, a valid comparison between years and with competitors can be made. This is true of any ratio—the inclusion of items on a consistent basis provides a valid comparison.

Asset Turnover

$$\frac{\textit{Sales revenue}}{\textit{Capital employed}} = \textit{number of times}$$

The asset turnover is another ratio where various formats can be used. It is also possible to use the total assets, or net assets, or noncurrent assets to produce a ratio. The ratio shown here uses the capital employed as this creates a relationship between the operating profit and the return on capital employed. It provides a means of monitoring how well the organization is using the capital within the business.

The asset turnover, as shown, indicates the revenue that is generated from every dollar of capital invested. The higher this figure becomes, the more effective the organization is at generating income from the capital invested. It can be used in divisional performance management to set targets for both operating profit and asset turnover. An increase in either will result in an increase in return on capital employed. This is illustrated below.

$$\frac{\textit{Operating profit}}{\textit{Sales revenue}} \times \frac{\textit{Sales revenue}}{\textit{Capital employed}} = \frac{\textit{Operating profit}}{\textit{Capital employed}}$$

The sales revenues in the equation will cancel each other out to leave the formula for return on capital employed.

Gearing Ratio

$$\frac{\text{Long term borrowings}}{\text{Equity} + \text{Long term borrowings}} \times 100 = x\%$$

The gearing ratio indicates the proportion of total capital that is represented by borrowings. The significance is that loans require contractual interest payments, so they must be paid whether the organization makes a profit or not. High levels of gearing become problematic when economic conditions make trading difficult, thus putting downward pressure on the gross profit and operating profit. As the interest must still be paid, it could put the organization into financial difficulties. The mix of capital will have an impact on how easy it is for an organization to raise funds to finance new strategic initiatives. It also affects the cost of capital, which is often used as a discount factor in investment appraisals (see section 8.5), and therefore the management accountant has an interest in the capital structure of the organization.

Return on Shareholders' Funds or Equity

$$\frac{\text{Profit after interest and tax}}{\text{Total equity (also known as shareholders funds)}} \times 100 = x\%$$

The return on shareholders' funds provides an indicator of performance from the shareholder perspective. The profit here is after interest and tax so that the profit is what is left for shareholders. Like the gearing ratio, this can also have an impact on an organization's ability to raise finance for future strategies.

Working Capital Management

An organization requires a certain amount of capital to manage the operations. For example, staff and suppliers may need to be paid before the organization receives money from the customers, especially if credit periods apply. This is called working capital, and a series of ratios can be used to monitor this aspect of the business. This links to the cash budget as the management of working capital can have a significant impact on the cash levels available.

Working Capital Ratio—Current Ratio

$$\frac{\text{Current assets}}{\text{Current liabilities}} = \text{number of times}$$

An organization needs to know that it can pay its current liabilities when required. As a rule, to have some comfort, this ratio needs to indicate that current assets exceed current liabilities, but it is dependent on the industry sector. For example, in some businesses where customers usually pay

in cash or via credit card such as retailing, organizations can survive quite happily on a ratio of less than 1:1. Supermarkets typically operate on a current ratio of 0.6.

Quick Ratio

$$\frac{\text{Current assets} - \text{inventory}}{\text{Current liabilities}} = \text{number of times}$$

As it takes time to convert inventory into cash, if it is sold on credit, the quick ratio tests whether an organization can fulfill its current liability obligations at short notice from more liquid sources. The receivables element of current assets can be turned into cash quite quickly by using the services of a collection agency that provides the cash to the organization (usually less a fee) and then recoups the cash from the organization's customers. The impact this may have on customer relationships needs to be considered if an organization chooses this as a collection strategy, as customers may resent being approached by a third party. It highlights the need to consider the broader implications of decisions and not to make decisions based on numerical analysis only.

Receivables Days

$$\frac{\text{Trade receivables}}{\text{Sales revenue from credit sales}} \times 365 = \text{number of days}$$

The receivables days measures how long it takes customers to pay for the goods. It is more appropriate to use credit sales as the divider to this equation as these are the sales that generate the receivables on the balance sheet. When calculating the ratio for competitors from published accounts, however, it is often not possible to distinguish the credit sales from cash sales. This is where experience can help as if an organization typically makes very few cash sales, then it is a fair assumption that competitors have the same split of cash and credit sales.

Payables Days

$$\frac{\text{Trade payables}}{\text{Purchases}} \times 365 = \text{number of days}$$

The payables days measures how long it takes the organization to pay its suppliers. Trade payables should be paid within the agreed credit terms, but this does not always happen. Ideally, organizations do not want to pay their suppliers faster than they receive cash from their customers. Hence, the balance between the receivables days and payables days is significant for cash flow. When calculating the ratio for competitors, the purchases figure is not always available. Therefore the use of the cost of goods sold can be used as a substitute for purchases.

Inventory Days

$$\frac{((\textit{Opening} + \textit{Closing inventory})/2)}{\textit{Cost of goods sold}} \times 365 = \textit{number of days goods held in inventory}$$

The inventory days measure the average time that the organization holds goods in inventory before the sale. In inventory management, this would be calculated for most product lines or groups to identify the presence of slow-moving items. However, the overall number of days is useful as a measure from year to year to ensure that the amount of capital tied up in inventory is not excessive. When calculating the ratio for competitors, it may be necessary to use the closing inventory figure rather than calculating the average inventory.

Interest Cover

$$\frac{\textit{Profit before interest and tax}}{\textit{Interest charges}} = \textit{number of times}$$

The interest cover indicates how easily the organization can meet its obligations to debt providers and pay the interest when due. This links closely to the level of gearing as high gearing can mean high interest charges and could put the organization in financial difficulties if, during the process of environmental scanning (section 3.6), it is noticed that interest rates may be increased in the future.

Earnings Per Share

$$\frac{\textit{Profit for the year (after interest and tax)}}{\textit{Number of shares in issue}} = \textit{value of earnings per share}$$

The earnings per share (EPS) is an investment indicator and can determine how easily an organization can attract additional funds from equity markets. The higher the EPS, the more attractive the organization's share may be.

B.7.1 An example of ratio analysis

Suppose that both X Inc. and Y Inc. sell electrical goods to retailers, that is, they are in the same industry sector, but are based in different geographical areas of the same country. The income statements and balance sheets for one year are shown in Table B.17, and the resultant ratios are shown in Table B.18.

Table B.17 Income statement and Balance Sheets for X Inc. and Y Inc.

Income statement for the year ended January 31, 20xx.

		X Inc.		Y Inc.
	\$000	\$000	\$000	\$000
Revenue		4,000		6,000
Cost of sales				
Opening stock	200		800	
Purchases	<u>3,200</u>		<u>4,800</u>	
	3,400		5,600	
Less: closing stock	<u>400</u>		<u>800</u>	
		<u>3,000</u>		<u>4,800</u>
Gross profit		1,000		1,200
Expenses				
Distribution costs	200		150	
Administration expenses	<u>290</u>		<u>250</u>	
Total expense		<u>490</u>		<u>400</u>
Operating profit		510		800
Interest paid		<u>10</u>		<u>400</u>
Profit before tax		500		400
Taxation		<u>120</u>		<u>90</u>
Net profit for the period		<u>380</u>		<u>310</u>

Balance sheets as on January 31, 20xx

		X Inc.		Y Inc.
	\$000	\$000	\$000	\$000
Noncurrent assets				
Warehouse and office buildings	1,200		5,000	
Equipment and vehicles	<u>600</u>		<u>1,000</u>	
		1,800		6,000
Current assets				
Inventory	400		800	
Trade receivables	800		900	
Other receivables	150		80	
Cash and cash equivalents	<u>0</u>		<u>100</u>	
	1,350		1,880	

Less current liabilities			
Trade payables	800		800
Other payables	80		100
Short-term borrowing (overdraft)	200		0
Current tax payable	<u>120</u>		<u>90</u>
	1,200		990
Net current assets		<u>150</u>	<u>890</u>
		1,950	6,890
Less long-term loan (10% p.a.)		<u>0</u>	<u>4,000</u>
Net assets		<u>1,950</u>	<u>2,890</u>
		\$000	\$000
Equity			
Share capital		1,000	1,600
Revaluation reserve		0	500
Retained profits		<u>950</u>	<u>790</u>
		<u>1,950</u>	<u>2,890</u>

Table B.18 Financial ratios for X Inc. and Y Inc.

	X Inc.	Y Inc.
Gross profit percentage	25.0	20.0
Operating profit percentage	12.75	13.3
Return on capital employed	26.15%	11.6%
Return on equity	19.5%	10.7%
Asset turnover	2.05	0.87
Current ratio	1.1	1.9
Quick ratio/acid test	0.79	1.09
Gearing	N/A	58%
Interest cover	N/A	2
Inventory days	48.7	61
Receivables days	73	55
Payables days	91	61

The best approach would be to analyze the performance over a number of years. Still, for the purposes of illustration, we could make the following observations based on the financial statements for one year.

X Inc. has a higher gross profit percentage than Y Inc. This could be due to differences in the pricing strategy as well as sales volumes and product mix. It might also be due to the supplier relationship that X or Y has developed and their ability to negotiate costs with suppliers. For example, if X were able to purchase goods at lower prices, the company would be able to keep costs lower and increase its margin. Another explanation may be that as the companies operate in different parts of the country, the economic conditions in the different parts of the country may impact on the prices that can be charged.

The operating profit percentage is about the same level for both companies. This indicates that X has higher operating costs, for example, distribution, selling, and administration costs, than Y. Following through the fact that they operate in different parts of the country, this may also contribute to the difference in operating costs, for example, establishment costs such as rent, distribution costs, salary levels, and so on. However, this would need investigating further.

X achieves a higher ROCE than Y, which is due to better asset utilization (asset turnover). This means that X utilizes the capital employed much more effectively than Y. It is also followed through into the return on equity, where X achieves a better return for the shareholders.

Concerning liquidity, Y has a higher current ratio than X and therefore is slightly more liquid, which means it is in a better position to pay its current liabilities as they fall due. X should not be too worried as its current ratio is 1.1 and therefore is in a position to pay its obligations. When looking at the quick ratio, however, X falls below 1, whereas Y is at 1.09:1, leaving Y in a better position.

Y, however, has gearing of 58 percent, which is relatively high, creating a high interest charge, but it can cover this twice, so is managing to pay its interest from profit. X, on the other hand, has no gearing, using long-term finance entirely from equity sources.

Y has inventory days of 61 and X of 48.7. It would be useful to identify what level of inventory is typical for this business. Still, both companies could probably benefit from reducing this level and releasing the cash tied up in inventory. In terms of receivable days and payable days, X has 73 and 91 days, respectively, whereas Y has 55 and 61 days, respectively. Both companies could benefit from managing their receivables and payables at lower levels. X, with creditor days of 91, is probably becoming unethical in its treatment of suppliers unless it has negotiated longer credit terms as part of the supplier agreement.

B.8 Review questions

(See section B.10 for solutions to these review questions).

Question 1 – Breakeven analysis

John sells product X for \$10 each. During the year he can sell 40,000 products.

John buys product X for \$5 each.

His operating fixed costs for the year are \$150,000.

How much profit does John make in the year?

What is the breakeven point for John?

What is his margin of safety?

Question 2 – Breakeven analysis

John sells product X for \$12 each. During the year he can sell 35,000 products.

John buys product X for \$8 each.

His operating fixed costs for the year are \$100,000

How much profit does John make in the year?

What is the breakeven point for John?

What is his margin of safety?

Question 3 – Limiting factor

In cases where there is a short term shortage on inputs such as labor or materials, it is useful to calculate the contribution per limiting factor. For example, suppose that an organization produces three products A, B, and C. The following data is available for the next accounting period.

	A	B	C
Selling price	\$40	\$50	\$60
Materials \$3 per kg	2 kg	4 kg	5 kg
Labour \$10 per hour	2 hr	2 hr	3 hr
Anticipated sales volumes	2,000	1,500	1,000

Materials are in abundant supply due to stocks held, but due to lockdown restrictions imposed due to the covid-19 virus, the labor hours available during the period are only 8,000 hours.

Required:

Calculate the contribution per limiting factor (labor hour) and the preferred level of output for each of the products A, B, and C.

Question 4 – Flexed budgets

Consider the results of XYZ Inc for the first month of the budget.

		Original budget		Actual for month
Sales units		30,000		28,000
	Usage	\$	Usage	\$
Sales price		20.00		21.00
Direct materials kgs	15,000	5.00	13,500	6.00
Direct labor hrs	30,000	10.00	27,000	11.00
Variable overhead per labor hr		3.00		3.10
Fixed overhead		100,000.00		102,000.00

Required

- Calculate the original budgeted profit and actual profit and the variance for XYZ.
- Flex the budget for the actual volume sold and calculate the following variances.

Sales volume
Sales price
Total sales variance
Direct materials usage
Direct materials rate
Total materials variance
Direct labor efficiency
Direct labor rate
Total labor variance
Variable overhead efficiency
Variable overhead expenditure
Total variable overhead variance
Fixed costs

Question 5 – Cash budgets

1. On January 1, Entrepreneur Limited was started by the introduction of \$100,000 of capital.
2. Sales are expected to be \$250,000 per month
3. Purchases are planned of \$175,000 per month
4. Sales will all be made on credit terms of payment within one month of sale. 60% of the customers are expected to pay in the month following the sale and 40% two months from the date of sale, i.e., 60% of the money for the sales made in January is received in February, and the remaining 40% is received in March.
5. Suppliers will be paid one month in arrears (following the month of purchase), i.e., the purchases made in January will be paid for in full in February.
6. Selling and distribution costs are expected to be \$10,000 per month and paid in the month in which they are incurred.
7. A legal liability of \$5,000 is expected to be paid in February.
8. Noncurrent assets in the form of equipment are purchased on January 1 for \$150,000. A payment schedule has been agreed with the supplier of the machine to pay for this as follows: January \$100,000, with \$25,000 payable in March and the balancing \$25,000 is payable in June.

Required:

- (a) Calculate the net cash flow for each month and the closing bank account balance at the end of each month for the period January to June.
- (b) Discuss ways in which Entrepreneur Limited could manage the cash shortage in the early months.
- (c) Briefly discuss the importance of proper cash management for an organization.

Question 6 – Ratios

The following are the financial statements of MNO Inc. for 2019 and 2020. MNO Inc. manufactures electrical goods which it supplies to high street retailers.

Income Statement for the year ended December 31

	2019	2020
	\$000	\$000
Sales revenue	499	602
Cost of sales	<u>(335)</u>	<u>(423)</u>
Gross profit	164	179
Operating expenses	<u>(127)</u>	<u>(148)</u>
Operating profit (before interest and taxation)	37	31
Interest payable	<u>(13)</u>	<u>(22)</u>
Profit before taxation	24	9
Taxation	<u>(8)</u>	<u>(3)</u>
Profit after taxation	<u><u>16</u></u>	<u><u>6</u></u>

Balance Sheet as at December 31

	2019	2020
	\$000	\$000
Noncurrent assets	110	134
Current assets		
Inventory	68	83
Trade receivables (Debtors)	80	96
Cash	<u>6</u>	<u>2</u>
	<u>154</u>	<u>181</u>
Current Liabilities		
Trade payables (Creditors)	(71)	(116)
Taxation	<u>(8)</u>	<u>(3)</u>
	<u>(79)</u>	<u>(119)</u>
Net Current Assets	<u>75</u>	<u>62</u>
	185	196
Noncurrent liabilities		
Borrowings (long-term debt)	<u>(55)</u>	<u>(60)</u>
Net Assets	<u><u>130</u></u>	<u><u>136</u></u>
Equity		
Ordinary shares of \$0.50 each	13	13
Capital reserves	33	33
Retained profit	<u>84</u>	<u>90</u>
Total equity (Shareholders funds)	<u><u>130</u></u>	<u><u>136</u></u>

The Financial Director has extracted comparative figures from an industry report and has calculated the following ratios showing the industry average.

The industry average for electrical goods manufacturers.

	2019	2020
Return on capital employed	20%	15%
Return on equity (Shareholders funds)	15%	10%
Gross profit margin	30%	25%
Operating profit margin	10%	5%
Current ratio	1.5:1	1.5:1
Quick assets ratio	1.0:1	1.1:1
Gearing ratio	25%	25%
Trade receivables collection period (days)	45 days	50 days
Trade payables collection period (days)	35 days	45 days

Required:

- (a) For MNO Inc. calculate the following ratios for both 2019 and 2020
- (i) Return on capital employed
 - (ii) Return on equity (Shareholders funds)
 - (iii) Gross profit margin
 - (iv) Operating profit margin
 - (v) Current ratio
 - (vi) Quick assets ratio
 - (vii) Gearing ratio
 - (viii) Trade receivables collection period
 - (ix) Trade payables collection period
- (b) Comment on the performance of MNO Inc. by comparing the performance in 2020 with the performance in 2019, **AND**, also, in relation to the industry average.

B.9 References

Helper, S., Kleiner, M. and Wang, Y. (2010) *Analyzing Compensation Methods in Manufacturing: Piece Rates, Time Rates, or Gain-Sharing?* Cambridge, MA: National Bureau of Economic Research.

B.10 Solutions to review questions

Question 1 – Breakeven analysis

Sales	$\$10 \times 40,000 =$	\$400,000
Cost of sales	$\$5 \times 40,000 =$	<u>\$200,000</u>
Contribution		\$100,000
Fixed costs		<u>\$150,000</u>
Profit		\$ 50,000

It is also possible to arrive at the contribution by multiplying the contribution per unit by the volume of sales. Then deducting the fixed costs provides the profit.

Contribution per unit

Sales	\$10
Less direct cost	<u>\$5</u>
Contribution	\$5

Breakeven point.

Fixed costs / contribution per unit = B/E point

$\$150,000 / \$5 = 30,000$ units

Margin of safety = sales – B/E sales

Margin of safety is $40,000 - 30,000 = 10,000$

25%

Question 2 – Breakeven analysis

Sales	$\$12 \times 35,000 =$	\$420,000
Cost of sales	$\$8 \times 35,000 =$	<u>\$280,000</u>
Contribution		\$140,000

Fixed costs	<u>\$100,000</u>
Profit	\$ 40,000

Contribution per unit

Sales	\$12
Less direct cost	<u>\$8</u>
Contribution	\$4

Breakeven point

Fixed costs / contribution per unit = B/E point

$\$100,000 / \$4 = 25,000$ units

Margin of safety = sales – B/E sales

Margin of safety is $35,000 - 25,000 = 10,000$

28.57%

Question 3 – Contribution per limiting factor

The contribution of each product is:

	A	B	C
	\$	\$	\$
Selling price	40	50	60
Materials	6	12	15
Labor	20	20	30
Contribution	14	18	15

As labor is the limiting factor, the contribution per limiting factor is calculated as follows:

Contribution / labor hours

	A	B	C
Contribution per limiting factor hr	7	9	5

Product B provides the highest contribution per limiting factor so the organization should use the labor to produce the products it believes it can sell of product B, followed by product A and any hours left can be used to produce product C. It should allocate labor as shown:

	A	B	C	Total
Production hrs	4,000	3,000	1,000	8000
Production	2,000	1,000	333	

Question 4 - Flexed budgets

		Original budget		Actual for month	Variance		
Sales units		30,000		28,000			
	Usage	\$	Usage	\$			
Sales price		20.00		21.00			
Direct materials kgs	15,000	5.00	13,500	6.00			
Direct labor hrs	30,000	10.00	27,000	11.00			
Variable overhead		3.00		3.10			
Fixed overhead		100,000.00		102,000.00			
		\$		\$	\$		
Sales		600,000		588,000	(12,000)		
Direct materials		75,000		81,000	(6,000)		
Direct labor		300,000		297,000	3,000		
Variable overheads		90,000		83,700	6,300		
Fixed overheads		100,000		102,000	(2,000)		
Profit		35,000		24,300	(10,700)		
	Budget for 28,000 units						
Flexed budget		\$		\$	\$		
Sales	28,000 * \$20	560,000		588,000	28,000		
Direct materials	28,000 x 0.5 kg x \$5	70,000		81,000	(11,000)		
Direct labor	28,000 x 1 hr x \$10	280,000		297,000	(17,000)		
Variable overheads	28,000 x \$3	84,000		83,700	300		
Fixed overheads		100,000		102,000	(2,000)		
Profit		26,000		24,300	(1,700)		
	Planned			Actual			
	Level of activity	Price/rate	Should be	Activity	Price/rate	Was	Variance
Sales volume	30,000	20.00	600,000	28,000		560,000	(40,000)
Sales price		20.00	560,000	28,000	21.00	588,000	28,000
Total sales variance							(12,000)
Direct materials usage	14,000	5.00	70,000	13,500		67,500	2,500
Direct materials rate		5.00	67,500	13,500	6.00	81,000	(13,500)
Total materials variance							(11,000)
Direct labor usage	28,000	10.00	280,000	27,000		270,000	10,000
Direct labor rate		10.00	270,000	27,000	11.00	297,000	(27,000)
Total labor variance							(17,000)
Variable overhead efficiency	28,000	3.00	84,000	27,000		81,000	3,000
Variable overhead expenditure		3.00	81,000	27,000	3.10	83,700	(2,700)
Total variable overhead variance							300
Fixed costs			100,000			102,000	(2,000)

Question 5 - Cash budget

Part (a)

Description	January	February	March	April	May	June	Total
Capital	100,000						100,000
Sales – 60%		150,000	150,000	150,000	150,000	150,000	750,000
Sales 40%			100,000	100,000	100,000	100,000	400,000
Purchases		(175,000)	(175,000)	(175,000)	(175,000)	(175,000)	(875,000)
Selling and distribution	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(10,000)	(60,000)
Legal fees		(5,000)					(5,000)
Noncurrent assets	(100,000)		(25,000)			(25,000)	(150,000)
Net cash flow	(10,000)	(40,000)	40,000	65,000	65,000	40,000	160,000
Opening balance	0	(10,000)	(50,000)	(10,000)	55,000	120,000	
Closing balance	(10,000)	(50,000)	(10,000)	55,000	120,000	160,000	

Part (b)

When starting a business, it is a good idea to calculate the working capital cycle and to inject enough cash to see the business through the first few months. The initial capital injection could be increased, and then once the business is established, if desirable by the owner, some cash could be paid in the form of a dividend. It is also possible to consider making part of the initial injection of cash in the form of a loan.

If good credit control is used, the customers could be encouraged to pay earlier, which would increase the cash received each month and would reduce the deficit in the first month of trading. Ethically it is not good to delay payment to creditors, but this could be considered via negotiating with the suppliers. The same could be done with the legal expenses, but this already appears to be two months after the service is provided.

Delaying the additional expenditure in noncurrent assets would also relieve the early months. A delay by one month would improve the positive cash flow in March.

Part (c)

Many businesses fail while making a profit due to running out of cash and credit facilities. Proper cash management is essential for a business start-up. Planning the expenditure on noncurrent assets and making sure that the working capital cycle can be adequately covered in the early months is important. Cash is required to grow a business, and if sufficient resources are not available, it will stifle any future growth, and the business will be more likely to fail.

Question 6 - Financial ratios and interpretation

Part (a) calculation of ratios.

	2019	2020
Return on capital employed	20%	15.8%
Return on equity (Shareholders funds)	12.3%	4.4%
Gross profit margin	32.9%	29.7%
Operating profit margin	7.4%	5.1%
Current ratio	1.9:1	1.6:1
Quick assets ratio	1.1:1	0.8:1
Gearing ratio	29.7%	30.6%
Trade receivables collection period (days)	58.5 days	58.2 days
Trade payables collection period (days)	77.4 days	100.1 days

Part (b)

The gross margin of MNO Inc. has reduced in 2020 by 3.2%. This is not a big concern as the industry average has decreased by 5%, so there may be some environmental factors causing an increase in the costs of the industry members, or competition is forcing prices down. MNO Inc. has fared slightly better than the industry average.

When considering the operating margin together with the drop in the gross margin, however, there is cause for concern as the difference between the two, being the operating costs is 24.6% in 2020 for MNO Inc. compared to 20% for the industry. This implies that MNO Inc. does not have as much control over its operating costs as some of the other industry members. If this trend continues, MNO Inc. will be operating at a lower level of profit than the industry, which may begin to cause discontent amongst the shareholders.

Currently, the return on capital employed is at about the same level of the industry, but the shareholder return is much lower, 4.4% for MNO Inc. in 2020 compared to 10% for the industry. Both of which have seen a reduction from 2019 levels.

The gearing level of MNO Inc. is higher than the industry standard; in fact, it has increased by a small amount since 2019. Although MNO Inc. would not be considered as highly geared, the

low return on investment means that any future finance might be difficult to raise on equity markets which would mean loan capital may be the best option. This could be problematic as the interest charge has increased in 2020, and if additional loan capital is raised, this will put pressure on the net profit, which will impact shareholders' returns. MNO Inc. needs to address its operating costs to ensure that the operating profit does not continue to fall until it reaches a non-sustainable level.

The current ratio of MNO Inc. is slightly higher than that of the industry average. The level in 2019 could be said to be too high. The level of inventory held by MNO Inc. is higher than that of the industry as the quick asset ratio falls by more than the industry average, so that it is below the industry. Neither the current ratio nor the quick asset ratio of MNO Inc. is cause for concern. In fact, they have improved to more comparable levels in 2020, but the management team will need to manage the working capital at acceptable levels.

The debtor days are higher than the industry average and ideally could do with more credit control to reduce the length of time customers are taking to pay. The payables, however, are a cause for concern as part of the movement in the current ratio is due to an increase in payables days. MNO Inc. is in danger of unethical behavior as they are taking more than three months to pay their suppliers. A plan for reducing this and managing the cash levels, possibly by gradually reducing inventory and getting control of the receivables would assist this. It would not be advisable to inject loan capital to address this issue as long-term finance should only be used for long term projects.

Overall, MNO Inc. is not in any worse shape than the industry average, except for the poor return to shareholders. As a strategy, MNO Inc. should put measures in place to control the operating costs ensuring that they do not rise anymore and increase the monitoring and control of working capital.