

Revision – A2 Finance and accounting

Approaches to costing

- Businesses take differing approaches to how they calculate the cost of a particular product. A business might be divided up into sections, with each of them being required to monitor and control their own costs as well as to function profitably, i.e. cost and profit centres.
- When calculating costs, it is essential that all costs are included. As well as the identifiable variable costs, businesses will also need to cover their fixed costs (overheads).
- There are two main methods that businesses use to calculate the cost information required for decision making.

Costs

Contribution costing (marginal costing)

- **Contribution costing** is the calculation of the cost of producing one extra product. Any revenue gained above the marginal cost is a contribution to fixed costs and will be profit after all fixed costs have been covered.
- In contribution costing the business is only concerned with the total variable costs for a product or service. Fixed costs or overheads are not included so

the 'full cost' of making a product is not covered. The role of contribution costing is to consider whether the product makes a positive contribution to fixed costs or not. If a positive contribution is made, it is worth the business manufacturing the product or providing the service.

- Contribution costing is only used in exceptional circumstances because ultimately all costs have to be covered.

Differences between absorption and contribution costing

Absorption costing

- **Absorption costing** requires all of the costs of a business to be 'absorbed' into the costs of the products made by the business. The variable costs identifiable with a particular product or service together with identifiable indirect costs must both be covered. Indirect costs that cannot be directly linked to one product or another also need to be covered. Some means of sharing out (apportioning) those costs between the various products or departments must be found.
- Absorption costing is used when a business produces a range of products or services and needs to calculate the price it should charge for a specific product or service. The business needs to know the full cost of each product that must be covered.
- The apportioning of indirect costs can vary depending on which indirect cost is involved. The cost of rent of a business might be apportioned according to how much space each of the products uses. The cost of the human resources department is more likely to be apportioned according to how many people are employed in each cost centre.
- A business might also decide to allocate all indirect costs based on the number of employees in each department.
- The business can use the full cost of a product to decide what price can be charged that would cover all of the costs involved. Some businesses will also include a desired level of profit into their calculation of full costs.

Absorption costing: requires that all costs (fixed and variable) are included in the cost of production of a product.

Contribution costing: when only the variable costs of a product are considered.

Appropriate circumstances for using contribution costing

'One-off' special orders

A business has been asked to supply a batch of products at a price much lower than they would normally sell for. If the business were to use the absorption costing method, the order would be rejected because the total costs (FC + VC) of producing the order would not be covered by the price that the customer is willing to pay.

Example

Compot Ltd makes ready meals that sell to retailers for \$2 each. A major supermarket has approached Compot Ltd to supply 10,000 ready meals but it is only willing to pay \$1.50 per meal. The planned output per year is 150,000 units. Fixed costs per annum are \$80,000.

Based on the planned level of output, the costs of production are as follows:

- direct labour cost is \$0.25 per unit
- materials cost \$0.95 per unit
- fixed costs are \$0.50 per unit

Should Compot Ltd accept the order from the supermarket?

The full cost of production is \$1.70 ($0.25 + 0.95 + 0.50$) meaning that it would make a loss of \$0.20 per meal sold. However, the fixed costs are already covered by the planned output.

Using contribution costing it is only the marginal cost of the order that needs to be considered. Therefore, the costs of the extra order for 10,000 ready meals would be \$1.20 ($0.25 + 0.95$) meaning that a **contribution** towards fixed costs and profits of \$0.30 would be made per meal.

This type of costing for an additional order can only work if the business has some spare capacity and if its current regular customers do not hear that it has been selling ready meals at this lower price.

Contribution: the difference between selling price and variable costs.

'Make or buy' decisions

A business might need to make a decision whether it should continue to manufacture all its products or whether it would be more profitable to buy them in from another business.

The business will be getting a contribution to fixed costs if the price that it receives for the product is higher than the variable cost of its manufacture. If it decided to stop production and buy the products in from another manufacturer, the contribution to fixed costs would be lost. The remaining products manufactured by the business would have to cover more of the fixed costs than previously.

Example

Creative Arts manufactures large wooden ornaments that it sells to retailers at a price of \$25 per item. Its planned output for the year is 6,000 ornaments. Fixed costs are \$24,000. The variable costs per ornament are:

- direct labour \$8
- direct materials \$10

Creative Arts has recently been approached by a local artist who has offered to supply it with identical ornaments but at a price of only \$21. Should Creative Arts stop manufacturing ornaments and buy them from the local artist?

Using absorption costing, the ornaments cost Creative Arts \$22 to manufacture, giving it a profit of \$3 dollars per ornament.

If it orders from the local artist it would pay \$21 per ornament. If it continues to sell the ornaments at \$25 it now has a profit of \$4 — or does it? It still has to cover its fixed costs. Therefore, it has achieved a contribution to fixed costs of \$4 per ornament not a \$4 profit.

Fixed costs are \$24,000, which is \$4 per ornament, and still need to be covered whether or not Creative Arts manufactures the ornaments. This means that the actual cost of each ornament bought in would be \$25 (\$21 + \$4).

Creative Arts might still consider buying in the ornaments rather than make them if the production capacity could be used to produce another product that could make a greater contribution to fixed costs.

To decide whether to stop production of a product

The revenue from the sale of a product might not cover the full cost of production but should a business stop production of that item? Contribution costing can be used to make the decision.

Example

Jamelee Ltd manufactures coordinating leisure wear. It makes trousers, shirts and jumpers in matching colours. The fixed costs for Jamelee are \$60,000, which are apportioned to the three items 50%, 30% and 20% respectively. The business produces 18,000 shirts, 10,000 pairs of trousers, and 4,000 jumpers per year. The costs and revenues are as follows:

	Trousers (\$)	Shirts (\$)	Jumpers (\$)
Fixed costs	30,000	18,000	12,000
Fixed cost per unit	3	1	3
Direct materials per unit	10	8	8
Direct labour per unit	16	12	6
Total cost per unit	29	21	17
Selling price	34	24	16
Profit/loss per unit	5	3	(1)

Trousers provide a total profit of \$150,000 and the shirts produce a profit of \$54,000. The jumpers produce a loss of (\$12,000). Should Jamelee Ltd cease production of jumpers?

The answer is no. The jumpers are not providing a profit but they provide a positive contribution to fixed costs of \$3 each, meaning that jumpers give a contribution for the year of \$12,000. If the production of jumpers ceased, the \$12,000 of fixed costs would need to be covered by the remaining two products.

The shirts would need to cover extra fixed costs of \$7,500 ($12,000 \times 50/80$) and the trousers an extra \$4,500 ($12,000 \times 30/80$). The \$12,000 fixed costs would be apportioned between trousers and shirts by calculating, 50% of 80% and 30% of the 80%.

The profit per unit for trousers would be \$4.25 rather than \$5, and the profit per unit for shirts would then be \$2.75 rather than \$3. The profitability of the two remaining products has decreased as a result of having to cover more fixed costs.

Revision activity

Draw up a table as in the example above to show the new figures per unit for trousers and shirts if jumpers were no longer produced. Calculate the total profit for the business after stopping production of jumpers.

A business might have other possible reasons, besides profitability, to continue the production of a loss-making product. In the case of the jumpers, it might be because customers buying a shirt and trousers prefer to buy the matching jumper from the same producer. In this case, if production of jumpers ceased, the business could find that demand for its shirts and trousers would fall.

The business would also be maximising the use of its production capacity in terms of both labour and equipment.

To decide between the production of two competing options

Sometimes there is insufficient production capacity to produce the whole range of products that has been made by a business. A decision must be made about which product to stop producing.

In such a case the business could calculate the contribution to fixed costs and profits made by each product by multiplying the predicted production/sales by the contribution per unit. The product with the lowest **total contribution** would no longer be produced.

When entering a new market

Contribution costing can be used when a penetration price is to be charged on products when entering a new market. In the longer term, the fixed costs must also be covered but in the shorter term, the business might only focus on covering all of the variable costs, such as direct labour and materials. Once the product has become established in the new market, the price can be raised so that all costs will be covered in the long term.

Difference between contribution and profit

Contribution should perhaps be more accurately known as 'contribution to fixed costs and profit'. Contribution per unit is a contribution towards covering the fixed costs of production. Once the fixed costs have been fully covered, the remaining contributions are profit. Contribution only becomes profit after all fixed costs have been covered.

For example, a business producing 10,000 units of a product has fixed costs of \$5,000 and a contribution per unit of \$2. It will take 2,500 contributions of \$2 to cover all the fixed costs. The 2501st unit and subsequent units produced will make a \$2 contribution to profit because the fixed costs have now been fully covered by the first 2,500 contributions per unit.

Budgets

The purposes of budgets

Budgets are future financial plans drawn up with the aim of giving some focus and parameters for business activity. They can encompass financial budgets and non-financial activities.

Performance

Budgets are frequently set for:

- cash
- sales
- marketing
- production
- administration

The use of budgets can improve the performance of a business because they can:

- help with overall business planning
- provide targets and/or limitations for the business and/or its departments
- aid the effective allocation of resources to the various business functions
- add an element of control as actual figures can be compared to the budgeted ones
- act as a motivational tool as departmental managers will aim to work within their budgets
- help departmental managers to understand their role in the achievement of overall business objectives

Benefits and drawbacks of the use of budgets

Benefits

- They introduce an element of financial control.
- They allow senior managers to identify parts of the business that are underperforming and to take corrective action.
- Targets can be motivating if they are realistic.
- They can allow managers to see the impact of their budget and those of other managers on the overall aims of the business.

Drawbacks

- Unrealistic budgets can be demotivating.
- Managers might argue a case for a higher budget than is necessary.
- A manager who has under-spent might buy unnecessary items to avoid having the budget reduced the following year.
- Inflexible budgets might prevent a business from reacting to a sudden change in the market.
- Lack of information can make it difficult to draw up a realistic budget for a new business or for a one-off project.

How budgets might be produced

- Budgets can take the overall business objective(s) as a starting point.
- They can break down the business objective(s) into departmental or divisional budgets.
- They are frequently based on what has happened in previous years together with what the business realistically expects to happen in the future.
- Discussion often takes place with the **budget holder(s)** to agree the budget based on the business objective(s) and other available relevant information, e.g. current material costs.
- Budgeted figures often use last year's figures as a starting point. This often results in the current year's budget being last year's figure plus a small increase.
- They are set perhaps monthly or quarterly.

Use of flexible budgets and zero budgeting

Flexible budgets

It is usual to flex budgets when differences appear between the budgeted and the actual figures, e.g. if actual output or sales are higher or lower than expected. The costs associated with the output or sales would be flexed to match the actual level of output or sales achieved. If output were lower than the budgeted level, it would be unrealistic for the production department to budget for the same amount of materials. If 1,000 metres of fabric was budgeted for to make 800 shirts and only 600 shirts were actually produced, the amount of fabric required and budgeted for should also be lower. The budget would be flexed to reflect the lower level of output. The budget would include only 750 metres of fabric if only 600 shirts were being produced.

Zero budgeting

Zero budgeting ignores any previous budgets and requires that each budget holder puts forward a case for the next period's budget. They need to produce a plan for what they expect to achieve and what they need to achieve it. They must be able to justify all of their figures.

This method prevents 'budget creep' when departmental budgets are increased slightly each year without any detailed analysis taking place into whether or not an increase is necessary. This can be wasteful and might not reflect the changing needs of the different departments in a business.

Purposes of budgets for allocating resources and controlling and monitoring a business

Resource allocation

The setting of budgets is likely to encourage a detailed plan of what resources will be needed and how resources are to be allocated in order to achieve the best outcome for the business.

For example, budgeting can cause a business to identify that if a market becomes more competitive, it might be sensible to allocate more resources to the marketing department. The marketing department might see its budget increased to allow it to react to the market situation.

Controlling and monitoring

- Inefficient use of resources can be identified and corrected.
- Progress towards achieving corporate or department objectives can be measured.
- Over-spending budget holders can be identified and the cause of any over-spend can be investigated (not all over-spending is unnecessary; circumstances might have changed since the budget was set).
- The performance and progress of a department or division can be measured against the budget.
- Departments requiring additional funding can be identified.

Role of budgets in appraising a business

The success of a business can be measured by how well it meets the targets contained in its budgets. These budgets may be closely related to business objectives. A business that exceeds the expectations in the budgets would be judged to be successful, while one that continually fails to meet the expectations outlined in its budgets would need to investigate the reasons for the underperformance. It might be that the budgets were set at an unrealistic level.

Variance: the difference between the budgeted figure and the actual figure achieved.

Variance analysis: the process of determining the cause of any difference between budgeted and actual figures and whether the variance is favourable or adverse.

Adverse variance: when the actual figure is a poorer outcome for the business than the budgeted figure.

Favourable variance: when the actual figure achieved is a better outcome for the business than the budgeted figure.

Variances: adverse, favourable

The meaning of variances

When an actual outcome is different from the budgeted outcome it is said to vary. The difference between the budgeted outcome and the actual outcome is known as the **variance**.

An actual figure achieved can be better or worse than the budgeted figure. When the actual figure is worse, the variance is said to be **'adverse'** and when the actual figure is better than the budgeted figure, the variance is said to be **'favourable'**.

Variance analysis is the when the causes of any differences are investigated.

Calculation and interpretation of variances

A restaurant has the following information regarding its budgeted figures and the actual figures for the month.

Table 1 Calculation and interpretation of variances

Item	Budget (\$)	Actual (\$)	Difference (\$)	Favourable (F) or Adverse (A)
Rent	1,850	1,850	0	Neutral
Ingredients	2,450	2,800	350	A
Heat and light	320	300	20	F
Wages	600	630	30	A

Often a higher actual figure indicates an adverse variance but not always. In the case of output, a higher actual figure than the budgeted one is a favourable variance because this indicates that the business achieved a higher than expected level of output.

In the case of the restaurant above, if the budgeted number of meals had been 1,000 but actually 1,150 meals were prepared and served, this would be a favourable variance on the budgeted meals. An increase in the number of meals served could also account for the higher cost of the ingredients and wages. Such variances in costs should also be assessed in terms of the output that they contributed towards.

Contents of published accounts

Construction or amendment of an income statement

AS Accounting fundamentals looked at the contents of an income statement but for A level you are required to be able to make changes based on information given. For example, if a business had to pay a higher price to purchase goods for sale, the cost of goods sold would increase. If the selling price of the goods was left unchanged, the gross profit for the business would decrease.

This would be recorded in the trading section of the income statement. For example, the price of goods to the business is increased by 10%. The effect on the trading section would be as follows:

	Before the change		After the 10% increase	
	\$000	\$000	\$000	\$000
Sales revenue		300		300
Opening inventory	80		80	
Purchases	<u>100</u>		<u>110</u>	
	180		190	
Less closing inventory	<u>40</u>		<u>40</u>	
Cost of goods sold		<u>140</u>		<u>150</u>
Gross profit		160		150

Some changes will impact on the profit and loss section of the income statement rather than the trading section. For example, if the cost of electricity to the business or the wages of its workers increased, this would increase the value of the expenses borne by the business and as a result would reduce the profit for the year (net profit). So, if wages and electricity increased by 10%, the profit and loss section would be affected as follows:

	Before change		After price increases	
	\$000	\$000	\$000	\$000
Gross profit		160		160
Rent	10		10	
Wages	80		88	
Electricity	10		11	
Office supplies	8		8	
Sundry expenses	<u>2</u>	<u>110</u>	<u>2</u>	<u>119</u>
Net profit (profit for the year)		50		41

Any changes affecting the income statement will affect the statement of financial position (balance sheet). An increase in the recorded expenses will decrease the retained earnings to be carried forward to the statement of financial position.

Intangible asset: an asset that can be assigned a monetary value but which does not have a physical presence, e.g. goodwill, patents and copyright.

Goodwill: the difference between the purchase price paid for acquiring a business and the actual value of the net assets purchased in the acquisition.

The balance sheet (statement of financial position)

The balance sheet (statement of financial position) records the value of assets and liabilities on a particular day. The values recorded in the statement of financial position (balance sheet) will change, e.g. if an asset is sold or if a new asset is purchased.

The sale of a non-current asset would reduce the value of non-current assets (fixed assets) and increase the value of cash and cash equivalents. If the asset had been purchased using a long-term loan, the loan would be repaid, therefore reducing the value of non-current liabilities.

The purchase of a non-current asset would have the reverse effect. The value of non-current assets would increase and the value of cash and cash equivalents would fall if the asset was purchased using money from cash or bank accounts. If a loan were used to purchase the asset, there would be an increase in the liabilities of the business.

Intangible assets

How intangible assets are treated in the balance sheet (statement of financial position)

Examples of **intangible assets** include a trade mark, **goodwill**, patents and copyright. Intangible assets have a perceived value to the business, but it can be difficult to put an accurate value on them.

The price paid to acquire a business is usually much higher than the value of the assets being obtained; the difference is goodwill. This might be to take into account the value of the reputation of the business being purchased but there is no guarantee that the reputation will be maintained by the new owners.

Intangible assets appear on the statement of financial affairs (balance sheet) as an asset. Potential investors are likely to ignore the value of any intangible assets when analysing the financial statements of a business because their stated value cannot be verified or guaranteed in future and, if the business was to become insolvent, the intangible assets might have little or no value.

Inventory valuation

The value of inventory is recorded in the statement of financial position (balance sheet). This is done at the end of a financial period, which is usually 1 year.

It is important that the inventory valuation is as accurate as possible. It should be valued at cost or its **net realisable value**, whichever is the lower value.

The difficulties of valuing inventory

- 1 The price paid for inventory (historical cost) would give a factually correct value but that was in the past. The current value might be higher or lower. Items that are no longer fashionable are likely to fall in value, whereas items that are sought after and now in short supply might have risen in value.
- 2 Damaged stock is unlikely to sell unless repairs are undertaken. This adds to the cost of the inventory. Therefore, the cost of repair must be added to the price paid for the items.
- 3 Inventory is valued on one day. The value might be different on every other day due to issues mentioned in (1) and (2) or because purchases or sales of inventory had taken place.
- 4 Some items might never be sold and so their value is of little or no benefit to the business.
- 5 If the inventory valuation is not completed on the day stated on the statement of financial position, the actual value of inventory might differ from that on the financial statement.

Example

An asset is purchased at a cost of \$40,000 and is expected to have a useful life of 8 years when it is believed that the machine will have a residual value of \$8,000.

The depreciation would be: $\frac{40,000 - 8,000}{8} = \$4,000$ per annum

\$4,000 depreciation would be recorded as an expense on the income statement each year. On the statement of financial position, the original costs, the accumulated depreciation and the carrying amount (net book value), would be recorded, which after the first year would be:

	\$	\$	\$
Equipment	40,000	4,000	36,000 (carrying amount)

There are other methods of calculating the depreciation of assets. It can be difficult to compare the financial statements of different businesses if they use different methods. It is important that businesses are consistent with the method used so that comparisons made between the financial documents of different years can be useful and more accurate. If not, it is not possible to compare like with like.

The estimated useful life of an asset is the basis for the depreciation calculation, but this can be difficult to estimate due to varying rates of obsolescence. For example, computers and other high technology equipment are likely to have a short useful life due to the rapid pace of change in such assets.

Depreciation

The role of depreciation in the accounts

Depreciation is a method that spreads the cost of a non-current asset over its estimated economic life. Depreciation is recorded as an expense and can be seen to reduce the profit for the year. However, the taxation department of most countries will dictate how much depreciation can be applied to a specific asset. For example, if a government wants to encourage investment, higher rates of depreciation might be allowed. This will reduce the profit for the year (net profit) further and therefore reduce the tax to be paid by the business. Depreciation allowances are set so that businesses cannot overstate the amount of depreciation simply to reduce their tax liability.

The straight line method assumes that the cost of an asset is spread evenly over its expected lifetime. It also assumes that the equipment is likely to have a residual value (resale value) at the end of that time.

The formula is:

$$\text{depreciation} = \frac{\text{cost of equipment} - \text{residual value}}{\text{estimated life of the asset}}$$

value: the actual or
3 price of an item less all
3d in bringing that item

to the market.

Analysis of published accounts

Interested parties often use ratio analysis to gain more information about the performance of a business from the limited data contained in published accounts.

Profitability ratio

Return on capital employed (ROCE)

ROCE measures the rate at which the assets of a business generate profit. It shows how efficient the assets of a business are at generating profit and can be an indicator to potential shareholders of the return they might expect from any money invested in the business.

The calculation of ROCE uses net profit (operating profit), i.e. the business profit after all overhead expenses have been deducted. The capital employed is the shareholders' equity plus long term loans, reserves and debentures.

$$\text{return on capital employed} = \frac{\text{profit before tax and interest (net profit)}}{\text{capital employed}} \times 100$$

For example, the ROCE of a business with a profit for the year (net profit) of \$500,000 with capital employed of \$7,150,000 would be calculated as follows:

$$\begin{aligned}\text{ROCE} &= \frac{500,000}{7,150,000} \times 100 \\ &= 6.99\% \text{ (6.9930069)}\end{aligned}$$

To judge whether or not 6.99% is a good return, this figure would need to be considered in terms of the:

- return that could have been gained from placing the money in a bank account or by investing it in an alternative venture
- return from previous years
- return enjoyed by other businesses in the same industry
- prevailing economic climate

Financial efficiency ratios

Inventory turnover

Inventory turnover is a measure of the rate at which inventory enters and leaves the business. It can be calculated as follows:

$$\text{inventory turnover} = \frac{\text{cost of goods sold}}{\text{inventory}}$$

It is usual to use the average inventory figure for the year, i.e. the average of the opening and closing inventory.

The calculation reveals how many times the amount of average inventory is sold each year or, on average, in how many days inventory sold.

Example

A business has the following inventory information:

	\$
Opening inventory	40,000
Purchases	<u>200,000</u>
	240,000
Closing inventory	<u>30,000</u>
Cost of goods sold	210,000

$$\begin{aligned}\text{inventory turnover} &= \frac{210,000}{35,000} \quad (\$40,000 + \$30,000 \text{ divided by } 2, \text{ i.e. averaged}) \\ &= 6 \text{ times per year or every 61 days } (365 \div 6 = 60.83)\end{aligned}$$

Is this inventory turnover efficient? This can depend on the type of inventory involved, e.g. bread sold after 61 days would not be acceptable but a television might be acceptable.

This ratio must also be compared to rates from previous years and also with those of other businesses in the industry.

Trade receivables turnover (debtor days): measures the average number of days taken by debtors to settle their debts with a business.

Return on capital employed (ROCE): measures the rate at which assets generate profit.

Trade receivables turnover (days' sales in trade receivables)

This is the average number of days that trade receivables (debtors) take to settle their debts with a business. It is calculated by:

$$\frac{\text{trade receivables (debtors)}}{\text{credit sales}} \times 365$$

For example, a business has \$325,000 of credit sales in a year and trade receivables of \$48,000 at the end of the year.

$$\text{trade receivables turnover} = \frac{48,000}{325,000} \times 365 = 53.9076 = 54 \text{ days rounded up}$$

Can the business be happy that its trade receivables are settling its debts after an average of 54 days? This can depend on:

- The credit that is extended to the business by its suppliers; if it has to pay for its supplies within 30 days then the 54 day period could cause liquidity problems.
- If the business does most of its business on a cash basis and the \$325,000 of credit sales is a small proportion of the total sales revenue, it might not be a problem to the business.
- One or two large customers who might take a long time to pay and who distort the overall picture.

Gearing

The **gearing** ratio shows the relationship between the amount of capital that has been supplied by people or businesses external to the business that requires interest payments to be made and the capital provided by the owners of a business.

It shows how dependent a business is on money borrowed from an external source:

$$\text{gearing} = \frac{\text{non-current liabilities (long-term loans)}}{\text{shareholders' equity} + \text{long-term loans}} \times 100$$

A gearing ratio above 50% is usually considered to be high; one lower than 50% is usually considered to be low. A high gearing ratio can put a business at risk if interest rates are high because the business might find it difficult to repay the loan and the interest.

- high gearing + high interest = high risk
- low gearing + low interest = low risk
- the lower the ratio, the lower the risk to the business

The gearing ratio can determine the sources of finance that are available to a business. A business with a high ratio is likely to experience difficulty obtaining a loan from a bank. Shareholders might hesitate to buy more shares if they fear the business will be unable to pay reasonable dividends on the money invested because high interest payments must be made.

If a business is yielding high profits, the interest payments might not pose a problem. When profitability is lower, the business might find itself unable to service its debt. Interest payments must be made regardless of how profitable a business is and can threaten the liquidity of a business.

The trend for interest rates might be a factor in any decision made by a potential lender.

Gearing: measures the relationship between the amount of capital supplied from outside a business that requires interest to be paid and the capital supplied by the owners of a business.

Investor ratios

Investor ratios are used by existing and potential shareholders to determine the financial benefits of retaining or buying shares in a particular business. They can assess the level of dividends received and compare them to other investment opportunities.

Dividend yield

The return on an ordinary share based on the current market value is known as the **dividend yield**.

$$\text{dividend yield} = \frac{\text{dividend per share}}{\text{market price per share}} \times 100$$

Dividend yield: shows the return on an ordinary share in relation to the current market value of the share.

$$\text{dividend per share} = \frac{\text{total amount of dividends}}{\text{number of issued ordinary shares}}$$

The dividend yield might be considered in terms of:

- the return that could be obtained by placing the money in an interest yielding bank account
- the dividend yield of other companies
- the level of risk involved — a higher yield might be required to encourage investment in a high risk company

Dividend cover

The **dividend cover** is a calculation of how many times the total dividend could be paid out of the company's profit after tax and interest. This can give an indication of the 'quality' of the dividend cover and how likely it is that the level of dividends being paid can be maintained in future years.

$$\text{dividend cover} = \frac{\text{profit after tax and interest}}{\text{dividend paid}}$$

For example, a company pays out a total of \$184,000 in dividends to the holders of ordinary shares. The profit for the year after tax and interest was \$568,000.

$$\text{dividend cover} = \frac{568,000}{184,000} = 3.1 \text{ times (3.086 rounded up)}$$

In this example the profit earned by the business can cover the dividend to be paid to shareholders 3.1 times.

Dividend cover: shows how many times the total dividend could be paid out of the company's profit after tax and interest.

Price/earnings ratio

The **price/earnings ratio** illustrates the relationship between the earnings per share and the current market price of an ordinary share. Shareholders tend to have more confidence in shares that have a higher ratio.

$$\text{price/earnings ratio} = \frac{\text{current market price per share}}{\text{earnings per share}}$$

In an examination you might be given the value of the earnings per share but if not, you will need to calculate it as follows:

$$\text{earnings per share} = \frac{\text{profit after tax}}{\text{number of ordinary shares}}$$

For example, a company has a profit after tax of \$370,000 and 400,000 issued ordinary shares with a current market price of \$5.50.

$$\text{earnings per share} = \frac{370,000}{400,000} = \$0.925$$

$$\text{price/earnings ratio} = \frac{5.50}{0.925} = 5.95 \text{ (rounded up from 5.9459)}$$

This shows that the current market price of the ordinary share is 5.95 times larger than the earnings per share.

Price/earnings ratio: the relationship between the earnings per share the current market price of an ordinary share.

Practical uses of ratio analysis

Practical uses of ratio analysis include:

- To identify any trends over time.
- To allow comparisons to be made either of the ratios from the financial statements of previous years or with those of other businesses.
- To help with the investment decisions of the current and potential shareholders of the company.
- To judge how efficiently resources are being used in a business.
- To allow potential lenders, such as banks, to assess the risk involved in offering a loan to a business.

Expert tip

When discussing the strategies to improve ratio results, analysis could be to discuss the implications of the actions taken. For example, if a business reduces spending on R&D and is in a fast-moving, high-technology industry, it is likely that it will fall behind the competition in terms of product development and lose market share as a result.

Strategies to improve ratio results

A business trying to improve liquidity ratios might:

- arrange for extra funds into the business, e.g. from the owner(s) or a bank loan
- decide to sell some unused equipment to bring more cash into the business
- sell or lease unused premises to another business — leasing would bring a regular flow of cash into the business
- sell inventory, perhaps offering a discount to encourage purchases — this would only improve the acid test ratio and not the current ratio

A business seeking to improve profitability ratios might:

- try to increase labour productivity to decrease costs per unit produced, or perhaps reduce labour costs through the introduction of more machinery and the use of fewer employees
- increase the selling price of the product/service
- cut or reduce spending through cutting budgets to departments, e.g. reduce expenditure on research and development

Comparison of ratio results between businesses

Stakeholders frequently compare the results of the ratios for different companies. They hope that comparisons show that their business is performing at least as well as others in the industry. If not, they will analyse the possible reasons for the under-performance of their company. This allows them to make some judgement about how efficiently the business is being managed.

Internal factors could be the inefficient use of resources or an increase in the cost of resources such as an increase in wage rates or an increase in the rate of inflation that has caused the cost of purchases to increase.

Some disappointing comparisons are due to internal factors. Although poor results can be explained by internal inefficiencies, sometimes they are due to external factors outside the control of any individual business. For example, poor ratios might result from a global or national recession.

Any cause for a worsening of a company's ratios should be analysed to determine if it indicates a trend, perhaps reflecting the overall performance of the economy, or is the result of a one-off event, such as a natural disaster.

Limitations of accounting ratios

Ratios are used to assess the performance of a company and any changes in performance that has occurred over time. Although they can be used to compare the performance of one company with another, there are some recognised limitations of their use.

Difficulties with using ratios

- The accuracy and usefulness of all of the ratios can be influenced by the way in which the profit for the business has been calculated. Different accounting techniques might have been applied when producing the financial statements for earlier years.
- Different companies might be using different methods of calculation of items such as depreciation.
- Comparisons with companies in a different industry are unlikely to be of value.
- Comparing the ratios of businesses of differing sizes can be misleading.
- Ratios are calculated based on published financial information and a company might have adjusted its financial statements to present a particular financial condition to any stakeholders.
- Economic conditions might have had an impact on the ratios for a particular year and could produce unfair and/or unrealistic comparisons with other years.
- Ratios are quantitative and ignore the qualitative aspects of business activity, e.g. whether the business is ethical in its activities and whether it uses renewable resources for its materials.

Investment appraisal

The concept of investment appraisal

Most businesses exist to make a profit. Investment appraisal involves a business in trying to assess the likely profitability of undertaking a particular course of action usually involving the purchasing of premises and/or equipment. Businesses need to know that if they undertake a specific project it will be financially safe and will allow them to reap some reward from the venture.

The need for investment appraisal

- To compare the expected outcomes of competing options.
- To estimate the costs, e.g. the cost of new premises, equipment or training. For example, if a business had to choose between installing two different types of production equipment, the business would compare the initial cost of the equipment together with any running and maintenance costs.
- To estimate the revenue in terms of timescale and size of any return on the investment.
- To assess the possible risk involved in a venture or to compare the relative risks of two or more possible investment opportunities.

Different projects can have very different outcomes in terms of the profit received after all costs have been covered.

The future value of any costs and revenue must also be considered as far as is possible. It is accepted that \$500 today will be worth more to us than if we have

to wait 5 years to receive the same amount. The \$500 could have been put in an interest-bearing bank account and received interest.

The significance of risk in investment decisions

- All investment decisions carry an element of risk but the potential risk can be minimised or avoided if businesses fully explore the possible implications of their decisions before embarking on any one course of action.
- When investment decisions are being made, the business is only able to estimate the costs and revenues associated with the project. Investment appraisal is an attempt to formalise those estimations and to compare alternatives.
- A sudden economic downturn can change everything that has been predicted — anticipated sales might not occur and costs might prove to be much higher than expected if a period of higher inflation occurs. Businesses use as much information as they can to assess the possible risk of any particular investment.
- Investment decisions will be based on past information and what can reasonably be expected to happen in the future. However, even consistent and stable past trends cannot guarantee that the same trend will continue in the future. For example, the financial crash of 2008 caused a lot of changes in the financial trends in many businesses.

Forecasting cash flows

An important part of investment appraisal is the prediction of future cash inflows and outflows.

Interpretation of cash-flow forecasts

- Cash-flow forecasts are drawn up to show the predicted costs of an investment project and the anticipated revenue.
- The costs will include the cost of purchasing premises and equipment, and any maintenance costs (this might be annual servicing and repairs).
- Wage costs and utility costs, e.g. electricity and water, will be estimated.
- Market research should be used as a basis for the predicted revenues.

Uncertainty in cash-flow forecasts

The further into the future predictions are made, the more possibility there is that the estimations will be wrong.

What can change?

- Customer tastes and preferences might change, making a previously popular product undesirable.
- Competitors' actions or technological change might alter revenues or costs.
- The rate of inflation may go up or down, making cost predictions unreliable.
- Particular costs of materials or labour might change.
- The general economic environment — a national or worldwide recession or boom period could change spending patterns.
- Trade union action might result in wage rates being increased above the previously anticipated rate of increase.

For these reasons, once a project has begun, it is important that constant reviews are undertaken to assess whether any corrective action is needed.

There might be times when, even though a lot of money has been invested into a project, the project should be abandoned and all monies invested should be

written off. It is sometimes more expensive to continue with an unprofitable project than to stop and to bear the loss of any money already invested.

Some changes are unpredictable and would make it impossible for some investment projects to be profitable. The financial crisis of 2008 caused many businesses to fail — the extent of this crisis could not have been predicted.

Once something happens to change the environment in which the business operates, the business must react to the new situation rather than continue with the planned activities that might no longer be viable.

When using cash flows for investment appraisal purposes, the cash flows are at today's values and have not taken the effects of inflation into account.

Basic methods: payback and average rate of return

Payback method

This method calculates the time it will take for the revenues (cash inflows) to fully cover the cost of the investment (cash outflows).

The time of the initial investment is usually termed year 0. In year 1 the cash outflows and the revenues are added together to give a net cash inflow (this could be a negative figure in early years and would therefore increase the money to be eventually recouped from future sales and profit). The net cash flow is deducted from the cost of the initial investment to give a 'cumulative cash flow' for year 1.

Example

The table below indicates that in the first year production must have still been very low. Perhaps a lot of training on using new equipment was required or perhaps there were some early difficulties and possibly modification needed. The revenue from the product gradually increased and the cost of the initial investment and running costs was recovered in the 5th year of this project.

Year	Cash outflows (\$)	Cash inflows (\$)	Net cash flow (\$)	Cumulative cash flow (\$)
0	(450,000)	0	(450,000)	(450,000)
1	(40,000)	45,000	5,000	(445,000)
2	(40,000)	80,000	40,000	(405,000)
3	(40,000)	160,000	120,000	(285,000)
4	(40,000)	240,000	200,000	(85,000)
5	(40,000)	270,000	230,000	145,000
6	(40,000)	310,000	270,000	415,000

The calculation of the precise payback period is achieved by using the amount still required at the end of the year before payback is achieved as follows:

$$\begin{aligned} \text{payback period} &= \frac{\text{amount still to be recovered}}{\text{net cash flow in following year}} \\ &= \frac{85,000}{230,000} \times 12 \text{ (months) or } 52 \text{ (weeks)} \\ &= 4.4 \text{ months} \end{aligned}$$

The investment pays back in 4 years and 4.4 months.

This is acceptable if the business has an objective of payback occurring within 5 years. However, if the objective is to undertake a project that needs to pay back within 3 years, this particular project should not be undertaken.

Example

Using the example above, the investment costing \$450,000 yields a cumulative cash flow over 5 years less the cost of the initial investment (which we take as profit at this level of study), i.e. \$595,000 – \$450,000 = \$145,000.

The formula for average rate of return is:

$$\text{average rate of return} = \frac{\text{average annual profit}}{\text{initial cost of investment}}$$

Therefore:

$$\frac{145,000}{5} = 29,000$$
$$\frac{29,000}{450,000} \times 100 = 6.44\%$$

Average rate of return (ARR)

This method calculates the expected return as a percentage of the cost of the original investment over the anticipated lifetime of the project.

You are unlikely to be asked to calculate ARR without being required to make some comment about whether the return is acceptable or not. The business might have a minimum return that it requires on all investments — if that is 5% then this investment meets that criterion. However, if the required return is 7%, this investment would not be pursued.

The ARR would also be compared to the return that could be gained if the money was used in a different way. For example, if placing the money in an interest-bearing bank account could yield 7%, or even 6.44%, the bank account would be the better option, assuming that this return lasts the length of the project. Placing the money in a bank account would avoid all the time and effort of a business project and would probably carry a lower risk.

Discounted cash flow methods

The investment appraisal methods above assume that money received in 5 years' time has the same value as money today. That is not true. \$145,000 will be worth more to us today than the same amount in 5 years' time. Inflation in an economy reduces the purchasing power of money over time. The money in our possession today could be placed in a bank account where it could earn interest over the 5 years.

In investment appraisal, we use a discounting factor to allow us to judge the value of money that will be received in the future compared to its value to us if we had the money today. It is commonly believed that the discounting factor used is to reflect the rate of inflation. Whilst it is accepted that inflation does reduce the future value of money, the discounting tables are based on the cost of capital or the prevailing rate of interest for that business.

Discounted payback and net present value (NPV)

Discounted payback recognises that money received in 3 or 4 years will not have the same value as if the money was in our possession today. If we had the \$145,000 today we could place it in a bank account and, if the rate of interest was 5% at the end of 1 year, we would have \$145,000 + \$7,250 = \$152,250. In the second year, the interest would result in us having \$152,250 + 5% = \$159,862.50.

Discounted payback

Taking the net cash flows from the example above, you need to multiply each one by the discounting factor relevant to each year.

Using an interest rate of 10%, the calculation would be:

Year	Discount factor at 10% rate of interest	Net cash flow (\$)	Discounted net cash flow (net cash flow × discount factor) (\$)	Present value Cumulative discounted net cash flow
0	1.00	(450,000)	(450,000)	(450,000)
1	0.91	5,000	4,550	(445,450)
2	0.83	40,000	33,200	(412,250)
3	0.75	120,000	90,000	(322,250)
4	0.68	200,000	136,000	(186,250)
5	0.62	230,000	142,600	(43,650)
6	0.56	270,000	151,200	107,550

Discounting the net cash flows shows that, in this example, the cost of the investment would not be recovered until part way through the 6th year, whereas without the discounting the payback period occurred during the 5th year of the project.

Net present value (NPV)

Net present value refers to the discounted value of net cash flows at the end of the investment period after discounting has been applied. In this case the investment project has a net present value of \$107,550 after 6 years. This means that it would be appropriate to go ahead with the project if its life span is anticipated to be 6 years. If it is only 5 years, the NPV will be negative, indicating that the project is not worthwhile.

Internal rate of return (IRR)

IRR is the point at which the NPV (using discounted cash flows) is equal to zero. If the IRR is 14% and the prevailing interest rate is 7%, the project would be profitable. The bigger the difference between the prevailing rate of interest and the IRR, the more profitable a project is likely to be. Alternatively, the higher the IRR, the higher the profitability of a proposed investment.

Qualitative factors in investment appraisal

Qualitative factors that might influence investment decisions

The investment appraisal methods outlined above are all quantitative methods. However, there are qualitative factors that should also be taken into account. Some qualitative factors might even override the financial aspects:

- Pollution. For example, if a project will pollute the environment, it would hopefully not be pursued even though it might be highly profitable.
- Employment levels. Social considerations are sometimes judged to be important, e.g. the negative impact on employment levels if workers are replaced with machinery.
- Is the quality of the product likely to be the same?
- Will staff training be required?

Comparison of investment appraisal methods and their limitations

Payback method does not take into account any profit achieved after the payback period, nor does it consider the time value of money. This method is also considered to be very simplistic and at best only a basic guide to assessing the potential viability of an investment.

Discounted cash flows attempt to take account of the time value of money but they can only be based on what is realistically expected to happen. Sudden or unexpected changes can mean that all assessments of potential investments are now inaccurate.

Investment appraisal methods that are based on profit can have different results depending on the method of depreciation used because this would influence the amount of profit.

Calculations based purely on projected returns do not consider the amount of risk involved in a project. Some businesses are more inclined to undertake risky projects than others. A high-risk project might be required to give a higher return than a low-risk one. This would be seen as a reward for the amount of risk taken.

Modern businesses need to consider the qualitative aspects of an investment as well as the quantitative factors due to increased media and pressure group activity. The increased use of the internet means that customers are quickly informed if a business is acting in an undesirable way, and customers might boycott the business.