

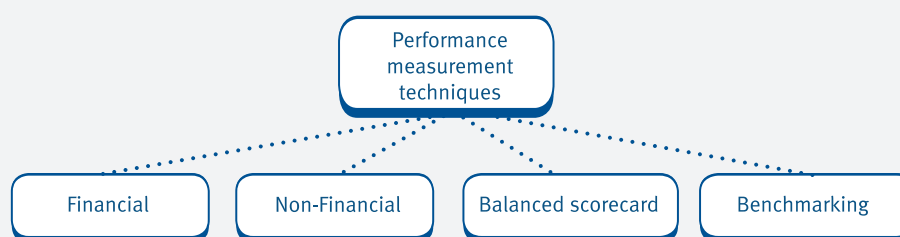
Performance measurement techniques

Chapter learning objectives

Upon completion of this chapter you will be able to:

- discuss the purpose of mission statements and their role in performance measurement
- discuss the purpose of strategic and operational and tactical objectives and their role in performance measurement
- discuss the impact of economic and market conditions on performance measurement
- explain the impact of government regulation on performance measurement
- discuss the relationship between short-term and long-term performance
- discuss and calculate measures of financial performance (profitability, liquidity, activity and gearing) and non-financial measures
- discuss the importance of non-financial performance measure
- Perspectives of the balanced scorecard
 - discuss the advantages and limitations of the balanced scorecard
 - describe performance indicators for financial success, customer satisfaction, process efficiency and growth
 - discuss and establish critical success factors and key performance indicators and their link to objectives and mission statements
 - establish critical success factors and key performance indicators in a specific situation
- discuss the role of benchmarking in performance measurement

- Economy, efficiency and effectiveness
 - discuss the meaning of each of the efficiency, capacity and activity ratios
 - calculate the efficiency, capacity and activity ratios in a specific situation
- Resource utilisation
 - describe measures of performance utilisation in service and manufacturing environments
 - establish measures of resource utilisation in a specific situation
- distinguish performance measurement issues in service and manufacturing industries in relation to quality.



1 Introduction

Performance measurement is the monitoring of budgets or targets against actual results to establish how well the business and its employees are functioning as a whole and as individuals.

Performance measurements can relate to short-term objectives (e.g. cost control) or longer-term measures (e.g. customer satisfaction).

Objectives and goals of a business will vary depending on the type of business that is being operated. For example:

- A profit seeking company's overall goal will be to maximise their shareholders' wealth so they will want to monitor profitability (based on increasing sales and reducing costs) and growth or market share compared to competitors.
- A not for profit organisation, for example a government department, will want to provide the best service possible for the lowest cost so that the residents being cared for achieve value for money from the taxes they pay.

What these businesses have in common is that they will have long term (strategic) goals or objectives. These long term goals will be broken down into tactical and operational targets which will need to be monitored. To be able to do this they will identify critical success factors and key performance indicators to monitor to ensure targets are met.

The mission statement and the corporate plan

You will recall that a mission statement, as discussed in chapter 1, should describe the overall goal of the organisation and that objectives may be developed at strategic, operational and tactical levels in order to allow an organisation to measure progress towards the overall goal.

The different elements of the mission statement can be used as a guide for producing performance measures for the business.

- **Purpose** – is the business meeting its main aims? Maximisation of shareholder wealth? Maintaining customer satisfaction? Producing innovative products/services?

- **Strategy** – is the business providing the products and services it planned to? Is the product or service being provided in the manner it intended?
- **Policies and culture** – are the staff behaving in the manner expected of them? Is customer service at an appropriate level?
- **Values** – are the core principles of the business being maintained and not compromised? Is staff morale being maintained at a suitable level? What is the level of staff turnover?

Suitable performance measures need to be set to monitor the achievement of each objective. Measures will differ according to the type of objective.

As seen in chapter 1 there are three different planning levels:

- **Strategic** or corporate planning – often the responsibility of the senior management and will be measured by indicators that reflect the performance of the whole organisation over the longer term.
- **Tactical** – often the responsibility of middle management and measures may be used that summarise the performance of a department or division, breaking the strategic plan into manageable chunks for each business unit or department
- **Operational** – often concerned with the day-to-day running of the organisation and are often physical measures turning the strategic and tactical plans into the day to day running of the business.

Suitable measures may include:

- **Strategic** – measurement of the overall profitability of the business and/or the return made on investing surplus cash. Return on investment (ROI), return on sales produced monthly
- **Tactical** – comparison of the actual costs and revenues with the budgeted costs and revenues for each business unit or department. Actual profit compared to budget produced monthly
- **Operational** – measurement of day to day targets such as meeting production requirements, meeting sales targets and reducing wastage. Quantity of rejects, number of customer complaints produced daily

As you can see there are short term objectives and long term goals and objectives.

The short term objectives will enable the businesses to monitor progression towards the ultimate long term goal and to enable performance of employees to be measured along the way. Suitable performance measures therefore need to be set to monitor the achievement of each objective.

2 External factors affecting performance measurement

External factors may be an important influence on an organisation's ability to achieve objectives. In particular market conditions and government policy will be outside of the control of the organisation's management and will need to be carefully monitored to ensure forecasts remain accurate.

Economic and market conditions

Any performance measure that is used by a business will need to be flexible to allow for peaks and troughs in economic and market conditions that are beyond the control of the business or the specific employee or manager.

The actions of competitors must also be considered. For example, demand may decrease if a competitor reduces its prices or launches a successful advertising campaign.

Government regulation

The government can have a direct effect on the workings of a private sector organisation by introducing regulations or by having departments that monitor business activity such as:

- The Competition Act which prohibits anticompetitive agreements and any abuse of a dominant market position.
- The Office of Fair Trading who investigates any businesses suspecting of breaching the Competition Act.

Other regulations that the government can enforce include:

- Taxation – tax on alcohol and petrol with the intention of reducing consumption
- Subsidies – subsidies given to firms providing training for employees
- Fines and quotas – quotas or maximums are set to limit production and if exceeded fines are imposed. For example fishing quotas are set to prevent over fishing of the seas and if a trawler brings in too much then a fine is incurred.

If a private sector organisation is affected by government regulation then the performance measures should take account of this externally imposed limitation i.e. a sales team target should not exceed a quota or exceed/undercut a price set by the government.

Public Sector organisations are owned and controlled by the government (or local government). They aim to provide public services, often free at the point of delivery. Their purpose is to provide a quality service to the public, for example a state school, the provision of water and sewerage services, refuse collections. The measurement of performance is much harder for public sector organisation the standard of the service will be based on opinions or feelings and not necessarily fact.

If we are trying to compare the performance of a private organisation with that of a public organisation the differences in strategy need to be considered. This can be seen in the summarised table below showing the differences between a private school and a state school.

Comparing strategy in private and public-sector organisations

Strategic feature	Private school	State school
General strategic goal	Competitiveness	Achievement of mission
General financial goals	Profit; growth; market share	Cost reduction; efficiency
Values	Innovation; creativity; good will; recognition	Accountability to public; integrity; fairness
Desired outcome	Customer satisfaction	Customer satisfaction
Stakeholders	Fee payers	Taxpayers; inspectors; legislators
Budget defined by	Customer demand	Leadership; legislators; planners
Key Success Factors	Growth rate; earnings; market share Uniqueness Advanced technology	Best management practices Standardisation; economies of scale Standardised technology

3 Critical success factors

Critical success factors (CSFs) are the essential areas of the business that must be performed well if the mission, objectives and goals of the business are to be achieved.

CSFs act as a common point of reference to measure the success of the business. CSFs help everyone in the team to know exactly what they need to do to ensure the success of the business. This helps employees perform their own work in the right context and so pull together towards the same overall aims to achieve goal congruence.

CSFs are related to the mission and goals of the business:

- The mission focuses on the overall long term aims and what is ultimately to be achieved
- Objectives break down the mission into quantifiable goals
- CSFs are the essential areas that must be perfected to achieve the objectives and therefore the mission of the business.

Measurement of CSFs is possible by the creation of key performance indicators (KPIs). KPIs can be based on financial and non-financial information.



Examples of CSFs and KPIs

The table below shows a number of performance indicators grouped against CSFs. The organisation will formulate its own, specific KPIs which best suit its business.

CSFs	KPIs
Competitiveness	<ul style="list-style-type: none"> • sales growth by product or service • measures of customer base • relative market share and position
Resource utilisation	<ul style="list-style-type: none"> • efficiency measurements of resources planned against consume • measurements of resources available against those used • productivity measurements
Quality of service	<ul style="list-style-type: none"> • quality measures in every unit • evaluate suppliers on the basis of quality • number of customer complaints received • number of new accounts lost or gained
Customer satisfaction	<ul style="list-style-type: none"> • speed of response to customer needs • informal listening by calling a certain number of customers each week • number of customer visits to the factory or workplace • number of factory and non-factory manager visits to customers

Quality of working life	<ul style="list-style-type: none">• days absent• labour turnover• overtime• measures of job satisfaction
Innovation	<ul style="list-style-type: none">• proportion of new products and services to old one• new product or service sales levels
Responsiveness (lead time)	<ul style="list-style-type: none">• order entry delays and errors• wrong blueprints or specifications• long set-up times• high defect count• machines that break down
Quality of output	<ul style="list-style-type: none">• returns from customers• reject rates• reworking costs• warranty costs
Flexibility (ability to react to changing demand and a changing environment)	<ul style="list-style-type: none">• product/service introduction flexibility• product/service mix flexibility• volume flexibility• delivery flexibility• time to respond to customer demands

4 Financial performance measures

Financial performance measures are used to monitor the inflows (revenue) and outflows (costs) and the overall management of money in the business. These measures focus on information available from the Statement of profit or loss and Statement of financial position of a business.

Financial measures can be used to record the performance of cost centres, profit centres and investment centres within a responsibility accounting system but they can also be used to assess the overall performance of the organisation. For example, if cost reduction or cost control is identified as a critical success factor, cost based performance measures might be an appropriate performance indicator to be used.

Cost based performance measures can be calculated as a simple cost per unit of output. The organisation will have to determine its policy for establishing cost per unit for performance measurement purposes. The chosen method should then be applied consistently.

5 Measuring profitability



The primary objective of a profit seeking company is to maximise profitability. A business needs to make a profit to be able to provide a return to any investors and to be able to grow the business by re-investment.

Three profitability ratios are often used to monitor the achievement of this objective:

- Return on capital employed (ROCE) = $\text{operating profit} \div (\text{non-current liabilities} + \text{total equity}) \%$
- Return on sales (ROS) = $\text{operating profit} \div \text{revenue} \%$
- Gross margin = $\text{gross profit} \div \text{revenue} \%$

NOTE: Operating profit is profit before interest and tax and after non-production overheads have been charged.

Return on capital employed (ROCE)

This is a key measure of profitability as an investor will want to know the likely return from any investment made.

ROCE is the operating profit as a percentage of capital employed. It provides a measure of how much profit is generated from each \$1 of capital employed in the business.

Operating profit (profit before interest) is being compared to long term debt (non-current liabilities) plus the equity invested in the business.

Operating profit represents what is available to pay interest due to debt and dividends to shareholders so the figures used are comparing like for like.

A high ROCE is desirable. An increase in ROCE could be achieved by:

- Increasing profit, e.g. through an increase in sales price or through better control of costs.
- Reducing capital employed, e.g. through the repayment of long term debt.

Return on sales (operating margin)

This is the operating profit as a percentage of revenue.

A high return is desirable. It indicates that either sales prices and or volumes are high or that costs are being kept well under control.

ROCE, ROS and the Asset turnover (see next section) ratios can be used together:

$$\frac{\text{ROCE}}{\text{Operating profit}} \div \frac{\text{Capital employed}}{\text{Capital employed}} = \frac{\text{ROS}}{\text{Operating profit}} \div \frac{\text{Revenue}}{\text{Revenue}} \times \frac{\text{Asset turnover}}{\text{Revenue}} \div \frac{\text{Capital employed}}{\text{Capital employed}}$$

This can be useful if only partial information is available. For example if the ROS and Asset turnover ratios are known then the ROCE can be calculated.



Illustration 1 – ROCE, ROS and asset turnover

Companies X and Y are both involved in retailing.

Relevant information for the year ended 30 September 20X5 was as follows:

	X	Y
	\$000	\$000
Revenue	80,000	200,000
Operating profit	10,000	10,000
Capital employed	50,000	50,000

It is possible to calculate ROCE, ROS and Asset turnover from the above information to examine the relationship between these 3 ratios.

Company X

ROCE = $10,000 \div 50,000 \times 100 = 20\%$

ROS = $10,000 \div 80,000 \times 100 = 12.5\%$

Asset turnover = $80,000 \div 50,000 = 1.6$

ROCE = ROS × Asset turnover = $0.125 \times 1.6 = 0.2 = 20\%$

Company Y

ROCE = $10,000 \div 50,000 \times 100 = 20\%$

ROS = $10,000 \div 200,000 \times 100 = 5\%$

Asset turnover = $200,000 \div 50,000 = 4$

ROS = ROCE ÷ Asset turnover = $0.2 \div 4 = 0.05 = 5\%$

Gross margin

The gross margin focuses on the trading activity of a business as it is the gross profit (revenue less cost of sales) as a percentage of revenue.

A high gross margin is desirable. It indicates that either sales prices and or volumes are high or that **production** costs are being kept well under control.

6 Measuring liquidity

A business can be profitable but at the same time encounter cash flow problems. Cash at the bank and profit are not the same thing (as discussed in Chapter 14).

There are two liquidity ratios that are used to give an indication of a company's ability to manage and meet short term financial obligations.

Current ratio

This is the current assets divided by the current liabilities.

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

The ratio measures the company's ability to meet its short term liabilities due within one year with the current assets than should be converted into cash within one year.

A ratio in excess of 1 is desirable but the expected ratio varies depending on the type of industry.

A decrease in the ratio year on year or a figure that is below the industry average could indicate that a company has liquidity problems. The company should take steps to improve liquidity, e.g. by paying payables as they fall due or by better management of receivables in order to convert the money owed into cash more efficiently.

Equally a high ratio could indicate that any surplus cash is not being made efficient use of. Cash does not provide a return so it should be re-invested in the business.

Acid test (Quick ratio)

This is similar to the current ratio but inventory is removed from the current assets due to its poor liquidity (time taken to convert into cash) in the short term.

$$\text{Quick ratio} = \frac{\text{Current assets} - \text{inventory}}{\text{Current liabilities}}$$

The comments are the same as for the current ratio.

7 Measuring activity



Activity ratios look at how well a business manages to convert statement of financial position items into cash. They are used to investigate how efficiently current assets are managed.

Asset turnover

$$\text{Asset turnover} = \text{Revenue} \div \text{Capital employed}$$

The asset turnover measures how much revenue is generated from each \$1 of capital employed in the business.

A high asset turnover is desirable. An increase in the asset turnover could be achieved by:

- Increasing revenue, e.g. through the launch of new products or a successful advertising campaign.
- Reducing capital employed, e.g. through the repayment of long term debt.

Inventory days

$$\text{Inventory days} = \text{inventory} \div \text{cost of sales} \times 365$$

This indicates the average number of days that inventory items are held for before they are sold.

Cost of sales is used in this calculation as opening inventory plus purchases less closing inventory equals the inventory being held. Sometimes a business might want to look at a specific line of inventory so more detailed information will be required.

An increase in the inventory holding period could indicate that the company is having problems selling its products and could also indicate that there is an increased level of obsolete inventory. The company should take steps to increase inventory turnover, e.g. by removing any slow moving or unpopular items of inventory and by getting rid of any obsolete inventory.

A decrease in the inventory holding period could be desirable as the company's ability to turn over inventory has improved and the company does not have excess cash tied up in inventory. However, any reductions should be reviewed further as the company may be struggling to manage its liquidity and may not have the cash available to hold the optimum level of inventory.

Receivable days

Receivable days = $\text{receivables} \div \text{credit sales} \times 365$

This is the average period it takes for a company's receivables to pay what they owe.

Sometimes the breakdown of revenue into cash and credit sales is not available, in which case revenue is used in place of credit sales and it is assumed that all sales are on credit.

An increase in the receivable days indicates that the company is struggling to manage its debts. Possible steps to reduce the ratio include:

- Credit checks on customers to ensure that they will pay on time
- Improved credit control, e.g. invoicing on time, chasing up debts.

A decrease in the receivable days may indicate that the company has improved its management of receivables. However, receivables days well below the industry average may make the company uncompetitive and profitability could be impacted as a result.

Payable days

Payable days = $\text{payables} \div \text{credit purchases} \times 365$.

This is the average period it takes for a company to pay suppliers for purchases.

If the value of credit purchases is not available then cost of sales can be used in its place.

An increase in the company's payable days could indicate that the company is struggling to pay its debts as they fall due. However, it could simply indicate that the company is taking better advantage of any credit period offered to them.

A decrease in the company's payable days could indicate that the company's ability to pay for its purchases on time is improving. However, the company should not pay for its purchases too early since supplier credit is a useful source of finance.



Test your understanding 1

The following figures are extracted from the accounts of Super Soups, a company selling gourmet homemade soups.

	20X9	20X8
	\$	\$
Total production costs	6,538,000	5,082,000
Gross profit	3,006,000	2,582,000
Operating profit	590,000	574,000
Total capital employed	6,011,000	5,722,000

Required:

Using appropriate ratios, comment on the profitability of Super Soups.



Test your understanding 2

Calculate the activity and liquidity ratios for P for the year ended 31 December 20X9.

	\$m
Revenue	1,867.5
Gross profit	489.3
Inventory	147.9
Trade receivables	393.4
Trade payables	275.1
Cash	53.8
Short-term investments	6.2
Other current liabilities	284.3

8 Measuring risk

In addition to managing profitability, liquidity and activity it is also important for a company to manage its risk. How 'geared' a business is can be calculated to assess financial risk. Gearing indicates how well a business will be able to meet its long term debts.

Capital gearing (leverage)

This ratio calculates the relationship between borrowed capital (debt) and owner's capital (equity):

Capital gearing = $\frac{\text{non-current liabilities (debt)}}{\text{ordinary shareholders funds (equity)}}$ %

or

Capital gearing = $\frac{\text{non-current liabilities (debt)}}{\text{non-current liabilities + ordinary shareholders funds (debt + equity)}}$ %

The level of gearing indicates how much a business relies on long term debt finance. The higher the percentage the higher the level of risk as any debt finance must be paid back through interest and capital repayments. There is a legal obligation to make these payments. Repayment of equity finance is through dividends and there is no legal obligation to make these payments to shareholders.

There is no 'correct' level of gearing but if debt exceeds equity then gearing is too high.

Interest cover (income gearing)

Interest cover = $\frac{\text{Operating profit}}{\text{Finance cost}}$.

This shows how many times the finance cost (interest payments) could be paid out of the operating profit. The higher the figure the better.

A decrease in the interest cover indicates that the company is facing an increased risk of not being able to meet its finance payments as they fall due.

The ratio could be improved by taking steps to increase the profit, e.g. through better management of costs, or by reducing finance costs through reducing the level of debt.

9 Problems with using only financial performance indicators

All of the ratios reviewed so far have concentrated on the financial performance of the business. Many of these ratios, e.g. ROCE, gross margin, may be used to assess the **performance of a division** and of the **manager** in charge of that division.

Achievement of these target ratios (financial performance indicators) may be linked to a reward system in order to motivate managers to improve financial performance.

However, there are a number of problems associated with the use of financial performance indicators to monitor performance:

Short-termism vs long term performance

Linking rewards to financial performance may tempt managers to make decisions that will improve short-term financial performance but may have a negative impact on long-term profitability. E.g. they may decide to cut investment or to purchase cheaper but poorer quality materials.

As mentioned at the start of this chapter any targets that are set at the different planning levels should all aim towards achieving the overall aim or mission of the business. There should be goal congruence to reduce the risk of a short termist view being taken by the managers.



Illustration 2 – Short termism

In order to achieve cost savings and to boost annual profit there are a limited number of things that a manager can do easily. One of these is to cut back on discretionary costs such as:

- advertising and marketing
- training
- maintenance
- research and development.

All these cuts may produce a short-term profit improvement; the problem comes with long-term profitability. Cut advertising and future sales may fall, cut training and staff may leave or become less efficient, cut maintenance and plant and machinery will become less productive. Cut backs on research and development can be particularly damaging in the long-term – the organisation may fall behind its competitors in developing new products and taking advantage of new technology.

Manipulation of results

In order to achieve the target financial performance and hence their reward, managers may be tempted to manipulate results. For example:

- **Accelerating revenue** – revenue included in one year may be wrongly included in the previous year in order to improve the financial performance for the earlier year.
- **Delaying costs** – costs incurred in one year may be wrongly recorded in the next year's accounts in order to improve performance and meet targets for the earlier year.
- **Understating a provision or accrual** – this would improve the financial performance and may result in the targets being achieved.
- Manipulation of **accounting policies** – for example, closing inventory values may be overstated resulting in an increase in profits for the year.

Do not convey the full picture

The use of only financial performance indicators has limited benefit to the company as it does not convey the full picture regarding the factors that will drive long-term profitability, e.g. customer satisfaction, quality.

Therefore, when monitoring performance, a broader range of measures should be used.

10 Non-financial performance indicators (NFPIs)

Although profit cannot be ignored as it is the main objective of commercial organisations, critical success factors (CSFs) and key performance indicators (KPIs) should not focus on profit alone. The view is that a range of performance indicators should be used and these should be a mix of financial and non-financial measures.

Examples of Non-Financial Performance Indicators (NFPI) include:

- measurements of customer satisfaction e.g. returning customers, reduction in complaints
- resource utilisation e.g. are the machines being operated for all the available hours and producing output as efficiently as possible?
- measurement of quality e.g. reduction in conformance and non-conformance costs.

The large variety in types of businesses means that there are many NFPIs. Each business will have its own set of NFPIs that provide relevant measures of the success of the business. However, NFPIs can be grouped together into 2 broad groups:

- Productivity
- Quality.

11 Productivity



A productivity measure is a measure of the efficiency of an operation, it is also referred to as **resource utilisation**. It relates the goods or services produced to the resources used, and therefore ultimately the cost incurred to produce the output. The most productive or efficient operation is one that produces the maximum output for any given set of resource inputs or alternatively uses the minimum inputs for any given quantity or quality of output.

Examples of resource utilisation:

- Hotel – the cost of the bed linen used in each room compared to the number of times the linen can be used before it needs to be disposed of, time taken to clean and set fair a room.
- Car sales team – Sales per employee, Sales per square metre of available floor space, average length of time a second hand car (e.g. taken as part exchange) remains unsold.

Types of productivity measures

Productivity measures are usually given in terms of labour efficiency. However productivity measures are not restricted to labour and can also be expressed in terms of other resource inputs of the organisation such as the machine hours used for production.

Productivity is often analysed using three control ratios:

Production-volume ratio

The production/volume ratio assesses the overall production relative to the plan or budget. A ratio in excess of 100% indicates that overall production is above planned levels and below 100% indicates a shortfall compared to plans.

The production/volume ratio =

$$\frac{\text{Actual output measured in standard hours}}{\text{Budgeted production hours}} \times 100$$

Capacity ratio

The capacity ratio provides information in terms of the hours of working time that have been possible in a period.

The capacity ratio =

$$\frac{\text{Actual production hours worked}}{\text{Budgeted production hours}} \times 100$$

A ratio in excess of 100% indicates that more hours have been worked than were in the budget and below 100% less hours have been worked than in the budget.

Efficiency ratio

The efficiency ratio is a useful indicator of productivity based on output compared with inputs.

The efficiency ratio =

$$\frac{\text{Actual output measured in standard hours}}{\text{Actual production hours worked}} \times 100$$

A ratio in excess of 100% indicates that the workforce have been more efficient than the budget predicted and below 100% less efficient than in the budget.



Illustration 3 – Productivity measures

Suppose that the budgeted output for a period is 2,000 units and the budgeted time for the production of these units is 200 hours.

The actual output in the period is 2,300 units and the actual time worked by the labour force is 180 hours.

Required:

Calculate how productive the work force has been.



Solution

Production/volume ratio

$$\frac{\text{Actual output measured in standard hours}}{\text{Budgeted production hours}} \times 100$$

$$\text{Standard hours per unit} = \frac{200 \text{ hours}}{2,000 \text{ units}} = 0.1 \text{ hours per unit of output}$$

$$\text{Actual output measured in standard hours} = 2,300 \text{ units} \times 0.1 \text{ hours} = 230 \text{ standard hours}$$

$$\text{Production/volume ratio} = \frac{230}{200} \times 100 = \mathbf{115\%}$$

This shows that production is 15% up on planned production levels.

Capacity ratio

$$\frac{\text{Actual production hours worked}}{\text{Budgeted production hours}} \times 100$$

$$\text{Capacity ratio} = \frac{180}{200} \times 100 = \mathbf{90\%}$$

Therefore this organisation had only 90% of the production hours anticipated available for production.

Efficiency ratio

$$\frac{\text{Actual output measured in standard hours}}{\text{Actual production hours worked}} \times 100$$

$$\text{Efficiency ratio} = \frac{230}{180} \times 100 = \mathbf{127.78\%}$$

The workers were expected to produce 10 units per hour, the standard hour.

Therefore, in the 180 hours worked it would be expected that 1,800 units would be produced. In fact 2,300 units were produced. This is 27.78% more than anticipated.

NB: production/volume ratio = capacity ratio × efficiency ratio

**Examples of productivity measures**

Productivity measures are not restricted to use in manufacturing industries but can be adapted for use in both the service and public sectors.

Public sector

A nurse in a fracture clinic should be able to complete the plastering of an average broken bone in 45 minutes.

The data on one nurse showed the following:

Hours worked in one week	55 hours
Actual number of casts completed	70

Each nurse is expected to work a 10 hour shift 5 days a week.

Calculate the production/volume ratio, capacity ratio and efficiency ratio for this nurse.

$$\text{Production/volume ratio} = \frac{70 \times 45/60}{50} \times 100 = \mathbf{105\%}$$

$$\text{Capacity ratio} = \frac{55}{50} \times 100 = \mathbf{110\%}$$

$$\text{Efficiency ratio} = \frac{52.5}{55} \times 100 = \mathbf{95.45\%}$$

Service sector

It should be possible to deliver a fast food meal in 1 minute 30 seconds. The information for one fast food restaurant is as follows:

Opening hours	8.30am to 7pm
Actual meals in one day	380 meals
Budgeted meals in one day	420 meals

Calculate the production/volume ratio, capacity ratio and efficiency ratio for this day.

$$\text{Production/volume ratio} = \frac{380 \times 1.5/60}{10.5} \times 100 = \mathbf{90.5\%}$$

$$\text{Capacity ratio} = \frac{10.5}{10.5} \times 100 = \mathbf{100\%}$$

$$\text{Efficiency ratio} = \frac{9.5}{10.5} \times 100 = \mathbf{90.5\%}$$



Test your understanding 3

The budgeted output for a period is 1,500 units and the standard time allowed per unit is 30 minutes. The actual output in the period was 1,400 units and these were produced in 720 hours.

Required:

Calculate the production/volume ratio, capacity ratio and efficiency ratio. Explain the meaning of your answer.

12 Quality

Quality is an issue whether manufacturing products or providing a service. Poor quality products or services will lead to a loss of business and damage to the businesses reputation. Targets of an appropriate level need to be set. Examples of NFPIs that could be used to monitor quality both from an internal and external (customer) perspective include:

- Wastage levels
- Internal re-working of finished products
- Customer complaints
- Speed of delivery
- Accuracy of delivery
- Number of returns
- Repeat sales
- New customers
- Growth in sales
- Labour turnover
- Staff absences
- Evaluation of development plans
- Job satisfaction
- Overtime working
- Product improvements
- Sales from new products
- Cost of research and development
- Cleanliness
- Tidiness
- Meeting staff needs
- Meeting government targets on emissions.

13 Problems with non-financial performance indicators

The use of NFPI measures is now common place, but it is not without problems:

- Setting up and operating a system involving a wide range of performance indicators can be time-consuming and costly
- It can be a complex system that managers may find difficult to understand

- There is no clear set of NFPIs that the organisation must use – it will have to select those that seem to be most appropriate
- The scope for comparison with other organisations is limited as few businesses use precisely the same NFPIs as the organisation under review.

14 The balanced scorecard

To get an effective system of performance appraisal a business should use a combination of financial and non-financial measures.

One of the major developments in performance measurement techniques that has been widely adopted is the balanced scorecard.

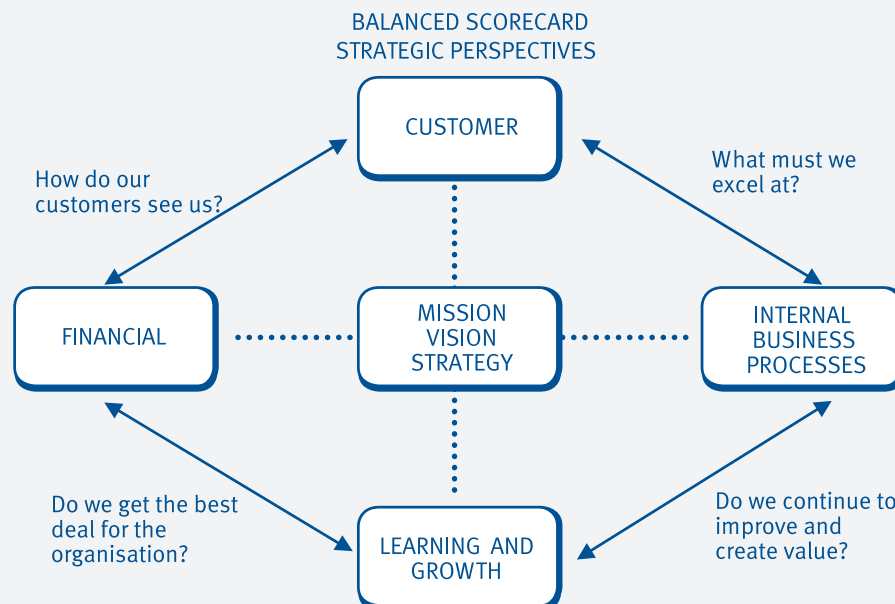
The concept was developed by Kaplan and Norton in 1993 at Harvard. It is a device for planning that enables managers to set a range of targets linked with appropriate objectives and performance measures.

The four perspectives

The framework looks at the strategy and performance of an organisation from four points of view, known in the model as four perspectives:

- financial
- customer
- internal (process) efficiency
- learning and growth.

The approach is shown in the following diagram:



Financial perspective

This focuses on satisfying shareholder value.

Appropriate performance measures would include:

- return on capital employed
- return on shareholders' funds.

Customer perspective

This is an attempt to measure the customers view of the organisation by measuring customer satisfaction. Examples of relevant performance measures would include:

- customer satisfaction with timeliness
- customer loyalty.

Internal perspective (process efficiency)

This aims to measure the organisation's output in terms of technical excellence and consumer needs. Indicators here would include:

- unit costs
- quality measurement.

Learning and growth perspective

This focuses on the need for continual improvement of existing products and techniques and developing new ones to meet customers' changing needs.

- A measure would include the percentage of revenue attributable to new products.

e.g

Illustration 4 – The balanced scorecard

For each perspective of the balanced scorecard, suggest and explain one performance measure that could be used by a company that provides a passenger transport service, e.g. a taxi company or a train company.

Customer perspective

Performance measure: percentage of services arriving on time
Reason for monitoring: on-time service is important to the customer

Internal business perspective

Performance measure: percentage of time for which vehicles are unavailable due to breakdown, maintenance etc.

Reason for monitoring: maximising vehicle availability is important for achievement of service targets

Learning and growth perspective

Performance measure: Training days per employee

Reason for monitoring: Need to keep employees updated with safety regulations, first aid and emergency procedures, etc.

Financial perspective

Performance measure: Operating profit per month

Reason for monitoring: Achievement of budgetary profit target

Note: other performance measures for each perspective would be equally acceptable.



Test your understanding 4

The following is Horn Ltd's statement of profit or loss for year ended 20X3, together with additional analysis of revenue and costs.

Horn Ltd

Statement of profit or loss for the year ended X3

	\$m
Revenue	1.35
Cost of sales	0.83
	<hr/>
Gross profit	0.52
Admin and distribution costs	0.15
Profit from operations	0.37
	<hr/>
Taxation	0.04
Profit after taxation	0.33
Dividends	0.13
	<hr/>
Profit for the period	0.20
	<hr/>
Total assets less current liabilities	2.40

An analysis of revenue and costs show:

Revenue	\$m
Existing products	1.03
New products	0.32
Sales to existing customers	0.82
Sales to new customers	0.53
Included in the cost structure is:	\$m
Research and development	0.08
Training	0.14
Customer support costs	0.04
Quality assurance	0.03

Required:

Suggest and calculate 2 suitable indicators for each of the 4 balanced scorecard perspectives.

Advantages and disadvantages of the balanced scorecard

The model can be seen as an extension of the use of a range of performance indicators, including non-financial measures and a move away from the traditional over-reliance on profit based and other financial measures.

Advantages

- uses four perspectives
- less able to distort the performance measure
- harder to hide bad performance
- long term rather than short term
- focuses on KPIs
- KPIs can be changed as the business changes

Disadvantages

- large numbers of calculations required
- subjective
- comparison with other businesses is not easy
- arbitrary nature of arriving at the overall index of performance



Advantages and disadvantages of the Balanced Scorecard

The advantages of the approach include the following:

- It looks at performance from the point of view of the four perspectives outlined above, not just from the narrow view of the shareholders as traditional analysis would.
- Managers are unlikely to be able to distort the performance measure.
- Bad performance is more difficult to hide as more performance indicators are being measured.
- It should lead to the long-term success of the business rather than focusing on short-term improvements.
- It focuses on key performance indicators. The process of identifying these indicators can make senior managers question strategy and focus on the core elements of the business.
- As the core elements of the business change, the performance indicators can be changed accordingly. It is therefore a flexible measure.

The disadvantages of the model include the following:

- It can involve a large number of calculations which may make performance measurement time-consuming and costly to operate.
- The selection of performance indicators under each of the four perspectives is subjective.
- This in turn will make comparisons with the performance of other organisations difficult to achieve satisfactorily.
- The weighting used to arrive at an overall index of performance are arbitrary and may need to be arrived at by trial and error.

Test your understanding 5

Faster Pasta is an Italian fast food restaurant that specialises in high quality, moderately priced authentic Italian pasta dishes and pizzas. The restaurant has recently decided to implement a balanced scorecard approach and has established the following relevant goals for each perspective:

Perspective	Goal
Customer perspective	<ul style="list-style-type: none"> To increase the number of new and returning customers To reduce the % of customer complaints
Internal	<ul style="list-style-type: none"> To reduce the time taken between taking a customer's order and delivering the meal to the customer. To reduce staff turnover
Innovation and learning	<ul style="list-style-type: none"> To increase the proportion of revenue from new dishes To increase the % of staff time spent on training
Financial	<ul style="list-style-type: none"> To increase spend per customer To increase gross profit margin

The following information is also available for the year just ended and for the previous year.

	20X8	20X9
Total customers	11,600	12,000
– of which are new customers	4,400	4,750
– of which are existing customers	7,200	7,250
Customer complaints	464	840
Time between taking order and customer receiving meal	4 mins	13 mins
% staff turnover	12 %	40 %
% time staff spend training	5 %	2%
Revenue	\$110,000	\$132,000
– revenue from new dishes	\$22,000	\$39,600
– revenue from existing dishes	\$88,000	\$92,400
Gross profit	\$22,000	\$30,360

Required:

Using appropriate measures, calculate and comment on whether or not Faster Pasta has achieved its goals.

15 Benchmarking

Benchmarking is a technique that is increasingly being adopted as a mechanism for continuous improvement.



Benchmarking is the establishment, through data gathering, of targets and comparators, that permit relative levels of performance (and particular areas of underperformance) to be identified. The adoption of identified best practices should improve performance.

It therefore requires organisations to:

- identify what they do and why they do it
- have knowledge of what the industry does and in particular what competitors do
- be fully committed to achieving best practice.

Any activity can be benchmarked and an organisation should focus on those:

- that are central to business strategy
- where significant improvement is required without increasing resources
- where staff are committed and eager for improvement.

The basic idea of benchmarking is that performance should be assessed through a comparison of the organisation's own products or services, performance and practices with 'best practice' elsewhere. The reasons for benchmarking may be summarised as:

- To receive an alarm call about the need for change
- Learning from others in order to improve performance
- Gaining a competitive edge (in the private sector)
- Improving services (in the public sector).

Types and levels of benchmarking

There are several types and levels of benchmarking, which are mainly defined by whom an organisation chooses to measure itself against.

These include:

Internal benchmarking. With internal benchmarking, other units or departments in the same organisation are used as the benchmark. This might be possible if the organisation is large and divided into a number of similar regional divisions. Internal benchmarking is also widely used within government. In the UK for example, there is a Public Sector Benchmarking Service that maintains a database of performance measures. Public sector organisations, such as fire stations and hospitals, can compare their own performance with the best in the country.

Competitive benchmarking. With competitive benchmarking, the most successful competitors are used as the benchmark. Competitors are unlikely to provide willingly any information for comparison, but it might be possible to observe competitor performance (for example, how quickly a competitor processes customer orders). A competitor's product might be dismantled in order to learn about its internal design and its performance: this technique of benchmarking is called reverse engineering.

Functional benchmarking. In functional benchmarking, comparisons are made with a similar function (for example selling, order handling, despatch) in other organisations that are not direct competitors. For example, a fast food restaurant operator might compare its buying function with buying in a supermarket chain.

Strategic benchmarking. Strategic benchmarking is a form of competitive benchmarking aimed at reaching decisions for strategic action and organisational change. Companies in the same industry might agree to join a collaborative benchmarking process, managed by an independent third party such as a trade organisation. With this type of benchmarking, each company in the scheme submits data about their performance to the scheme organiser. The organiser calculates average performance figures for the industry as a whole from the data supplied. Each participant in the scheme is then supplied with the industry average data, which it can use to assess its own performance.

The benchmarking process

The following steps are required in a systematic benchmarking exercise:

- planning
- analysis
- action
- review.

Planning includes selecting the activity to be benchmarked, involving fully the staff engaged with that activity and identifying the key stages of the activity relating to inputs, outputs and outcomes. It is important to establish the benchmark to a level of 'best practice'.

Analysis includes identifying the extent to which the organisation is under performing and to stimulate ideas as to how this can be met.

This may include whether new processes or methods are required. Implementation concerns the use of an action plan to achieve the improvement or the maintenance of the pre-determined standards. Management should ensure that resources are made available to meet the objectives set.

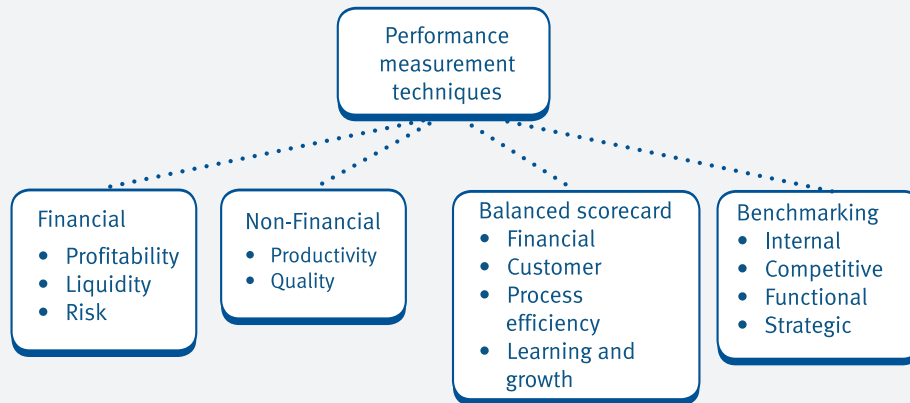
Action involves putting an appropriate plan into force in order to improve performance in the benchmarked areas.

Review includes monitoring progress against the plan and reviewing the appropriateness of the performance measure.

In practice, businesses establishing benchmarks will use a variety of information sources for their programmes. The most relevant and useful information would be that from a benchmarking partner. Such partnerships can be organised through trade associations and inter-firm comparison links.

All organisations can benefit with comparisons with others. Ideally, it should be judged against best practice wherever that may be found. Benchmarking analysis can provide such comparisons of the resources, competences in separate activities and overall competence of the organisation.

16 Chapter summary



Test your understanding answers



Test your understanding 1

Profitability ratios

	20X9	20X8
Gross margin = gross profit ÷ revenue (%)	31.50%	33.69%
Return on sales = operating profit ÷ revenue (%)	6.18%	7.49%
ROCE = operating profit ÷ CE (%)	9.82%	10.03%
Asset turnover = revenue ÷ CE	1.59	1.34
Note: Revenue = total production cost + gross profit	9,544,000	7,664,000

Comment

Overall, profitability has deteriorated slightly year on year.

Gross margin – Despite an increase in revenue of 24.6%, the gross margin has fallen by over 2% to 31.5%. Although revenue has shown a significant increase, the production costs have increased at a faster rate of 28.7% year on year. The falling gross margin may indicate that the company is unable to achieve the same level of sales prices as it was in 20X8 or is not as efficient at controlling its production costs.

Return on sales – Again, despite an increase in revenue of 24.6%, the return on sales has fallen from 7.49% to 6.18%. The falling return may indicate that the company is unable to achieve the same level of sales prices as it was in 20X8 or is not as efficient at controlling all of its costs.

Asset turnover – this has actually shown a small improvement year on year from 1.34 in 20X8 to 1.59 in 20X9. This shows that the company is getting better at generating revenue from the capital employed within the business.

ROCE – Despite the improvement in asset turnover, the ROCE has actually fallen slightly from 10.03% in 20X8 to 9.83% in 20X9. This means that the company is not as good at generating profit from its capital employed. The decrease in the ROCE is due to the fall in the profit margin.

It would be useful to obtain a further breakdown of revenue and costs, in order to fully understand the reasons for the changes and to prevent any further decline in the ratios discussed. It would also be useful to obtain the average ratios for the industry in order to gauge Super Soups performance against that of its competitors.



Test your understanding 2

Current ratio	$(147.9 + 393.4 + 53.8 + 6.2)/(275.1 + 284.3) = 601.3/559.4$	= 1.07
Quick ratio	$(601.3 - 147.9)/559.4$	= 0.81
Receivables days	$393.4/1,867.5 \times 365$	= 77 days
Inventory days	$147.9/(1,867.5 - 489.3) \times 365$	= 39 days
Payables days	$275.1/(1,867.5 - 489.3) \times 365$	= 73 days



Test your understanding 3

Output per standard hour is 2 units as each unit has a standard time allowance of 30 minutes.

Budgeted labour hours are $1,500/2 = 750$

The actual output measured in standard hours is $1,400/2 = 700$ standard hours

The production/volume ratio = $700/750 \times 100\% = 93.3\%$

The capacity ratio = $720/750 \times 100\% = 96\%$

The efficiency ratio = $700/720 \times 100\% = 97.2\%$

Production is 6.7% less than planned. This is due to a shortfall in capacity available of 4% and lower productivity of 2.8%.



Test your understanding 4

Balanced scorecard

Potential Horn Ltd performance indicators

- Financial perspective

Return on capital employed = $0.37/2.40 \times 100 = 15.42\%$

Return on sales = $0.37/1.35 \times 100 = 27.41\%$

- Customer perspective

Customer support as % of revenue = $0.04/1.35 \times 100 = 2.96\%$

% of business from existing customers = $0.82/1.35 \times 100 = 60.74\%$

- Learning and growth perspective

Training costs as % of total costs = $0.14/(0.15 + 0.83) \times 100 = 14.29\%$

% of revenue from new products = $0.32/1.35 \times 100 = 23.70\%$

- Internal perspective

Quality assurance % of revenue = $0.03/1.35 \times 100 = 2.22\%$

Admin and distribution costs % of revenue = $0.15/1.35 \times 100 = 11.11\%$

This list is not exhaustive – there will other indicators that Horn Ltd could calculate for each of the four perspectives.

To be useful these performance indicators would need to be compared with benchmarked or target levels for the current period and undergo analysis with previous years.



Test your understanding 5

Customer perspective

Goal: To increase the number of new and returning customers

Measure: The number of new customers has increased year on year from 4,400 to 4,750. This is an 8.0% increase. The number of returning customers has also increased slightly from 7,200 to 7,250, i.e. a 1.0% increase.

Comment: The company has achieved its goal of increasing the number of new and existing customers. It is worth noting that the proportion of customers who are returning customers has fallen slightly from 62.1% to 60.4% of the total customers. This could indicate a small drop in the level of customer satisfaction.

Goal: To decrease the % customer complaints

Measure: The percentage of customer complaints has increased from 4% ($464 \div 11,600$) to 7% ($840 \div 12,000$).

Comment: Faster Pasta should investigate the reasons for the increase in customer complaints and take the required action immediately in order to ensure that it can meet this goal in the future.

Internal perspective

Goal: To reduce the time taken between taking the customer's order and delivering the meal to the customer

Measure: The time taken has more than tripled from an average of 4 minutes in 20X8 to an average of 13 minutes in 20X9.

Comment: Customers may place a high value on the fast delivery of their food. The increase in time may be linked to the increased number of customer complaints. If this continues customer satisfaction, and therefore profitability, will suffer in the long-term. The restaurant should take steps now in order to ensure that this goal is achieved going forward.

Goal: To reduce staff turnover

Measure: This has risen significantly from 12% to 40% and hence the business has not achieved its goal.

Comment: The reasons for the high staff turnover should be investigated immediately. This may be contributing to longer waiting times and the increase in customer complaints. This will impact long-term profitability.

Innovation and learning perspective

Goal: To increase the proportion of revenue from new dishes

Measure: This has increased year on year from 20% ($\$22,000 \div \$110,000$) in 20X8 to 30% ($\$39,600 \div \$132,000$) in 20X9. Therefore, the restaurant has achieved its goal.

Comment: This is a favourable increase and may have a positive impact on long-term profitability if the new products meet the needs of the customers.

Goal: To increase the % of staff time spent on training.

Measure: This has fallen significantly from 5% to only 2% and hence the company is not achieving its goal.

Comment: Staff may be unsatisfied if they feel that their training needs are not being met. This may contribute to a high staff turnover. In addition, staff may not have the skills to do the job well and this would impact the level of customer satisfaction.

Financial perspective

Goal: to increase spend per customer

Measure: Spend per customer has increased from \$9.48 ($\$110,000 \div 11,600$) to \$11.00 ($\$132,000 \div 12,000$), i.e. a 16.0% increase.

Comment: This is a favourable increase. However, the issues discussed above must be addressed in order to ensure that this trend continues.

Goal: To increase gross profit margin.

Measure: The gross profit margin has increased year on year from 20% ($\$22,000 \div \$110,000$) to 23% ($\$30,360 \div \$132,000$).

Comment: This is a favourable increase. However, the issues discussed above must be addressed in order to ensure that this trend continues.