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# Learning Material for VM New Challenges for Management Accounting.

# Chapter 2: Introduction to Cost Terms and Concepts

Ing. Lenka Strýčková, Ph.D.

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# Chapter 2: Introduction to Cost Terms and Concepts

## Learning objectives

1. Define and illustrate a cost object.
2. Distinguish between direct costs and indirect costs.
3. Explain variable costs and fixed costs.
4. Interpret unit costs cautiously.
5. Distinguish inventoriable costs from period costs.
6. Illustrate the flow of inventoriable and period costs.
7. Explain why product costs are computed in different ways for different purposes.
8. Describe various basic cost terms that are used in the management accounting literature.

## Key words


average costs, avoidable costs, cost object, costs, direct costs, fixed costs, incremental costs, indirect costs, marginal costs, opportunity costs, period costs, product costs, relevant costs, revenues, sunk costs, unavoidable costs, variable costs

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## 2.1 Cost Objects

**A cost object** is any activity for which a separate measurement of costs is desired. In other words, if the users of accounting information want to know the cost of something, this something is called a cost object. Examples of cost objects include the cost of a product, the cost of rendering a service to a bank customer or hospital patient, the cost of operating a particular department or sales territory, or indeed anything for which one wants to measure the cost of resources used.

Organizations define **cost** as a resource sacrificed or forgone to achieve a specific objective. It is usually measured as the *monetary amount that must be paid* to acquire goods or services. An **actual cost** is the cost actually incurred, as distinguished from a **budgeted cost**, which is a predicted or forecasted cost.

The cost of an object is determined in two basic stages:

- **cost accumulation**, followed by
- **cost assignment**.

**Cost accumulation** is the collection of cost data in some organized way by means of an accounting system. For example, a car manufacturing company may collect costs in various categories such as different machines used, type of labour required behind production, and so on. The accumulated costs are then **assigned** to designated cost objects. The company managers may use such cost information in two main ways: (1) while making business decisions and (2) for implementing decisions.

This chapter will focus on the following cost terms and concepts:

- direct and indirect costs;
- period and product costs;
- cost behaviour in relation to volume of activity;
- relevant and irrelevant costs;
- avoidable and unavoidable costs;
- sunk costs;
- opportunity costs;
- incremental and marginal costs.

## 2.2 Direct and Indirect Costs

**Direct costs** of a cost object are directly related to the cost object and can be easily traced to it in a cost-effective way. For example, the cost of material that is required to produce a particular product can be easily traced to the finished product. The term cost tracing is used to describe the assignment of direct costs to a particular cost object.

**Indirect costs** of a cost object are related to the particular cost object but cannot be easily traced to it in a cost-effective way. For example, if the cost object is a product, supervision cost incurred by the company to keep a check on the work done by employees is an

indirect cost. These relate to the cost object. However, they are usually incurred for various types of products and hence it is difficult to trace these to individual products.

Cost allocation is used particularly to describe the assignment of indirect costs to a particular cost object. However, cost assignment is a general term that is used for allocating direct as well as indirect costs to their particular cost objects.

An appropriate allocation of cost objects is required so that the managers are not misled about the profitability of different products. Generally, the direct costs can be accurately allocated by the managers. The major problem arises when they have to allocate costs that are spread across the company and not to a particular product. For example, supervision costs can be allocated to various products cost objects on the basis of the number of employees working in each product department.

Figure 2.1 depicts direct costs and indirect costs and both forms of cost assignment - cost tracing and cost allocation—using the example of the BMW X6. The figure shows that direct costs such as cost of steel for BMW cars are traced to cost object, BMW X6. On the other hand, the indirect costs such as cost incurred to lease the plant for production needs to be allocated to a particular model of BMW, as these are no attributable to only one model of the car.

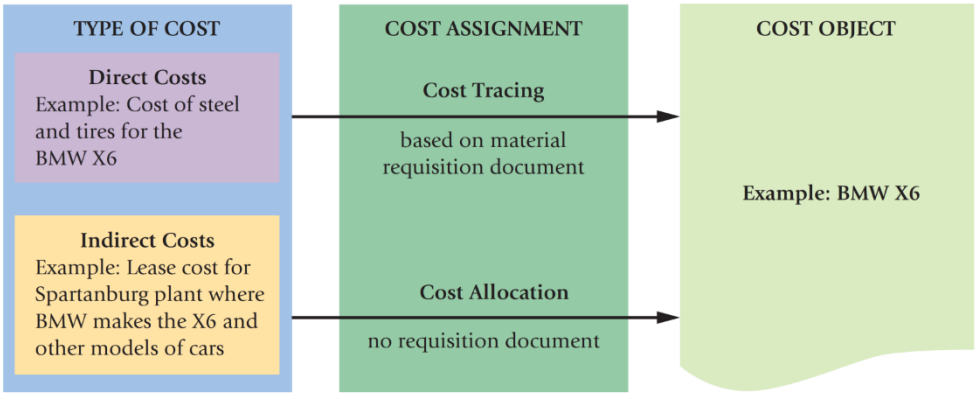


***Figure 2.1 Example of a Cost Assignment to a Cost Object***
Source: DATAR, S. M., RAJAN, M. V. Managerial Accounting, Making Decisions and Motivating Performance

Following are **the main factors that affect the classifications** of a cost as direct or indirect:

- The **materiality of the cost** in question. The smaller the amount of a cost – that is, the more immaterial the cost is – the less likely that it is economically feasible to trace that cost to a particular cost object.

- **Available information-gathering technology**. Improvements in information-gathering technology that makes it possible to consider more and more costs as direct costs. This can help trace cost objects in a more economically feasible way.
- **Design of operations**. Classifying a cost as direct becomes easier if a company's facility (or some part of it) is used exclusively for a specific cost object, such as a specific product or a particular customer.

It is also important for a manager to be aware of certain costs that can be both direct as well as indirect in nature for different cost objects. The direct/indirect classification depends on the choice of the cost object.

**In manufacturing organizations** products are frequently the cost object. Traditionally, cost accounting systems in manufacturing organizations have reflected the need to assign costs to products to value stocks and measure profits based on imposed external financial accounting requirements. Traditional cost accounting systems accumulate product costs as follows:

Direct materials
Direct labour
Prime cost
Manufacturing overhead
**Total manufacturing cost**

**Direct materials** consist of all those materials that can be identified with a specific product. For example, wood that is used to manufacture a desk can easily be identified as part of the product, and can thus be classified as direct materials. Alternatively, materials used for the repair of a machine that is used for the manufacture of many different desks are classified as **indirect materials**. These items of materials cannot be identified with any one product, because they are used for the benefit of all products rather than for any one specific product. Note that indirect materials form part of the manufacturing overhead cost.

**Direct labour** consists of those labour costs that can be specifically traced to or identified with a particular product. Examples of direct labour costs include the wages of operatives who assemble parts into the finished product, or machine operatives engaged in the production process. By contrast, the salaries of factory supervisors or the wages paid to the staff in the stores department cannot be specifically identified with the product, and thus form part of the **indirect labour costs**. The wages of all employees who do not work on the product itself but who assist in the manufacturing operation are thus classified as part of the indirect labour costs. As with indirect materials, indirect labour is classified as part of the manufacturing overhead cost.

**Prime cost** refers to the direct costs of the product and consists of direct labour costs plus direct material costs plus any direct expenses. The cost of hiring a machine for producing a specific product is an example of a direct expense.

**Manufacturing overhead** consists of all manufacturing costs other than direct labour, direct materials and direct expenses. It therefore includes all indirect manufacturing labour and materials costs plus indirect manufacturing expenses. Examples of indirect

manufacturing expenses in a multi-product company include rent of the factory and depreciation of machinery.

To ascertain the total manufacturing cost of a product, all that is required for the direct cost items is to record the amount of resources used on the appropriate documents. For example, the units of materials used in making a particular product are recorded on a stores requisition, and the hours of direct labour used are recorded on job cards. Having obtained the quantity of resources used for the direct items, it is necessary to ascertain the price paid for these resources. The total of the resources used multiplied by the price paid per unit of resources used provides us with the total of the direct costs or the prime cost for a product.

## 2.3 Variable and Fixed Costs

**Variable costs** change in total in proportion to changes in the related level of total activity or volume. For example, cost of raw materials required to produce one unit of output is a variable cost because total cost changes in proportion to changes in the number of products produced.

**Fixed costs** remain unchanged in total for a given time period, despite wide changes in the related level of total activity or volume. For example, the salary paid to the staff of the production unit is fixed and does not change with changes in number of units produced. The fixed cost per unit tends to reduce as the number of units produced reduces.

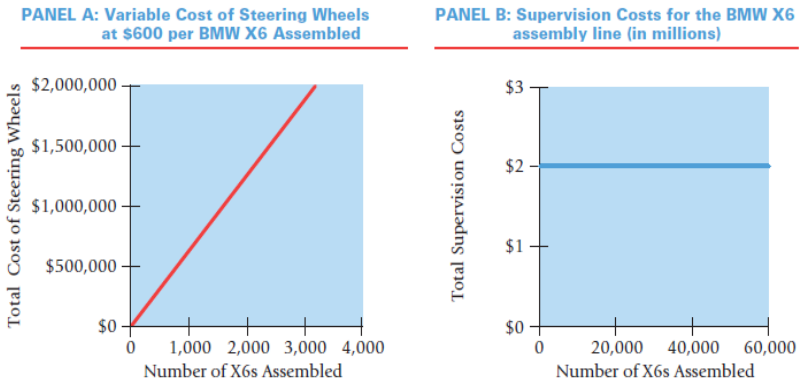


***Figure 2.2 Example of Variable and Total Costs***
Source: DATAR, S. M., RAJAN, M. V. Managerial Accounting, Making Decisions and Motivating Performance

Figure 2.2 graphically illustrates the variable and the fixed costs. In the first graph, the total cost incurred for steering wheels, by a car manufacturing company, increases with increase in production. This is a **variable cost graph**. On the other hand, in the second graph the supervision cost for the same company remains the same for all levels of production. This is a **fixed cost graph**.

Some costs have both fixed and variable elements and are called **mixed or semi-variable costs**. For instance, the telephone expense can have a fixed monthly rent which is the

fixed cost. Apart from that, the call rate per minute of usage that has to be paid to the service provider is variable.

A **cost driver** is a variable, such as the level of activity or volume that causally affects costs over a given time span. The level of activity or volume is a cost driver if there is a cause-and-effect relationship between a change in the level of activity or volume and a change in the level of total costs. For example, if the research and development costs change with the number of employees working on the development of the product, the number of employees is the cost driver of research and development costs.

**Relevant range** is the band or range of normal activity level or volume in which there is a specific relationship between the level of activity or volume and the cost in question. For example, a fixed cost is fixed only for a range of total activity and a given time span. Anything more or less than the range might lead the fixed cost to vary accordingly. For instance, the rent expenses that a company pays for its production facility will remain the same till the maximum production capacity of the facility. When the production increases beyond that point, the company will need to rent a new facility this will cause the fixed cost to increase with production.

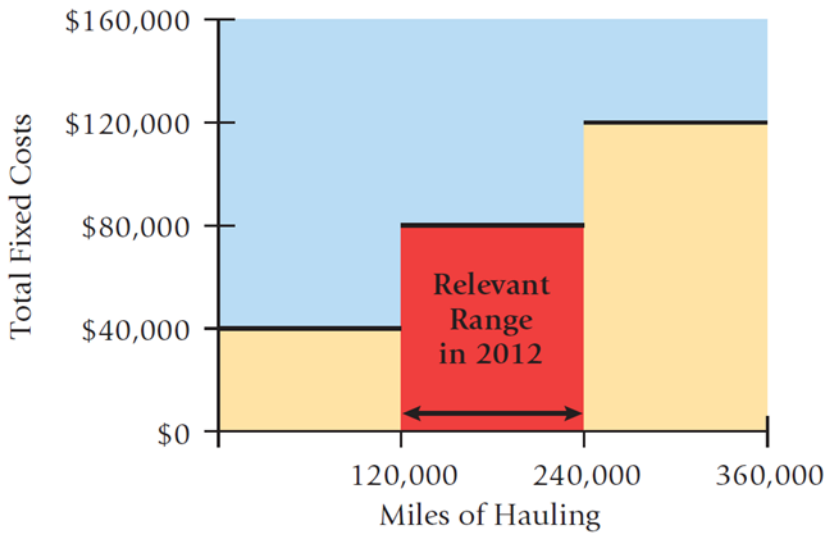


***Figure 2.3 Example of Relevant Range (Fixed Costs in Long Term)***
Source: DATAR, S. M., RAJAN, M. V. Managerial Accounting, Making Decisions and Motivating Performance

The two major classifications of costs that were discussed earlier were: **direct/indirect and variable/fixed**. Costs may simultaneously be as follows:

- *Direct and variable* – for example, cost of raw materials is a direct cost which varies with the volume of production.
- *Direct and fixed* – for example, the salary paid for the supervisor of a particular line of product is a direct cost to that product and remains fixed for the relevant range of production.
- *Indirect and variable* – for example, costs of indirect materials used in production is an indirect cost which varies with the volume of production.
- *Indirect and fixed* – for example, the rent paid for factory building is a direct cost which remains fixed for the relevant range.

Figure 2.4 presents examples of simultaneous cost classification with each of the four cost types.

| | | Assignment of costs to cost object | |
|---|---|---|---|
| | | **Direct cost** | **Indirect cost** |
| **Cost behaviour pattern** | **Variable cost** | *Cost object*: Assembled car<br>*Example*: Tyres used in assembly of car | *Cost object*: Assembled car<br>*Example*: Power costs where power usage is metered only to the plant |
| | **Fixed cost** | *Cost object*: Assembled car<br>*Example*: Salary of supervisor on Opel's Corsa assembly | *Cost object*: Assembled car<br>*Example*: Annual lease cost at Corsa plant line |

***Figure 2.4 Examples of simultaneous direct/indirect and variable/fixed cost classifications***
Source: BHIMANI, A. et al. Management and Cost Accounting

## 2.4 Total and Unit (Average) Costs

Accounting systems typically report both **total costs** and unit cost numbers. A **unit cost** (also called an average cost) is calculated by dividing some amount of total cost by the related number of units.

$$\text{Unit cost} = \frac{\text{Total manufacturing costs}}{\text{Number of units manufactured}}$$


For example, the unit cost of a batch having a total production cost of $25,000 and a total output of 1,000 units is $25.

Though unit costs are useful in various managerial decisions, these should be used cautiously. This is because unit costs include both fixed and variable costs. Therefore, the consideration of unit costs can lead to underestimation or overestimation of actual total costs. As a general rule, first calculate total costs, then compute a unit cost, if it is needed for a particular decision.

***Table 2.1: Key relationships: total costs and unit costs***

| Cost behaviour pattern | Total costs | Unit costs |
|---|---|---|
| **When item is a variable cost** | Total costs change with changes in level of cost driver | Unit costs remain the same with changes in level of cost driver |
| **When item is a fixed cost** | Total costs remain the same with changes in level of cost driver | Unit costs change with changes in level of cost driver |

Source: BHIMANI, A. et al. Management and Cost Accounting

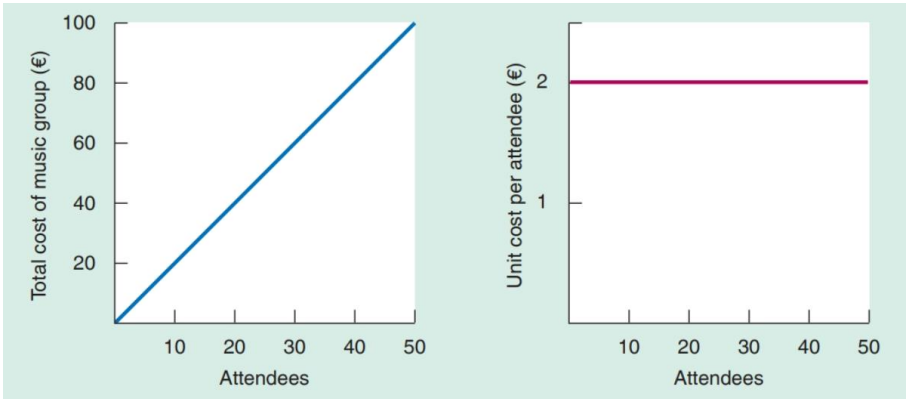


***Figure 2.5 Behaviour of total and unit costs: payment schedule for music group is 2 EUR per attendee***
Source: BHIMANI, A. et al. Management and Cost Accounting

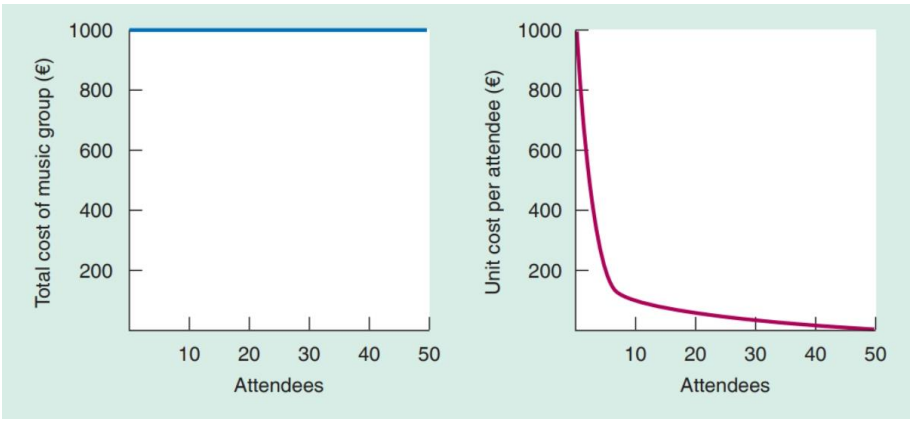


***Figure 2.6 Behaviour of total and unit costs: payment schedule for music group is fixed 1000 EUR***
Source: BHIMANI, A. et al. Management and Cost Accounting

## 2.5 Product and Period Costs

In general, in *a manufacturing organization* all manufacturing costs are regarded as **product costs** and non-manufacturing costs are regarded as **period costs**. Companies *operating in the merchandising sector*, such as retailing or wholesaling organizations, purchase goods for resale without changing their basic form. The cost of the goods purchased is regarded as a **product cost** and all other costs such as administration and selling and distribution expenses are considered to be **period costs**.

On closer look, an economy can be distributed in three different sectors, as follows:

- **Manufacturing-sector companies** purchase materials and components and convert them into various finished goods. For example, furniture workshops: They

purchase wood logs as raw materials and convert them into tables, chairs, beds, and so on.

- **Merchandising-sector companies** purchase and then sell tangible products without changing their basic form. They mainly include retailers, distributors, and wholesalers. For example, certain furniture shops purchase finished goods from the furniture workshops and sell them to other vendors or directly in the market.
- **Service-sector companies** provide services (intangible products) – for example, legal advice or audits – to their customers.

**Manufacturing-sector companies** purchase materials and components and convert them into various finished goods. These companies typically have one or more of the following three types of inventory:

- **Direct materials inventory.** Direct materials in stock and awaiting use in the manufacturing process, for example, wool required for the production of sweaters in winter.
- **Work-in-process inventory.** Goods that are partially worked on but not yet completed are goods that are in process.
- **Finished goods inventory.** Goods that are completed, but not yet sold.

Three terms commonly used when describing **manufacturing costs** are:

- **Direct material costs** are the acquisition costs of all materials that eventually become part of the cost object (work in process and then finished goods) and can be traced to the cost object in an economically feasible way. The computer chips used to make cellular phones is an example of direct materials.
- **Direct manufacturing labor costs** include the compensation of all manufacturing labor that can be traced to a cost object (work in process and then finished goods) in an economically feasible way. Wages and fringe benefits paid to machine operators is an example of direct manufacturing labor costs.
- **Indirect manufacturing costs** are all manufacturing costs that are related to the cost object (work in process and then finished goods) but cannot be traced to that cost object in an economically feasible way. For example, indirect manufacturing labor such as plant maintenance and cleaning labor.

**Inventoriable costs** are all costs of a product that are considered as assets in the balance sheet when they are incurred and that become cost of goods sold only when the product is sold. For manufacturing-sector companies, all manufacturing costs are inventoriable costs.

**Period costs** are all costs in the income statement other than cost of goods sold. They are treated as expenses of the accounting period in which they are incurred because managers expect most of those costs to benefit revenues in only that period and not in future periods. Some of the examples of period costs include marketing, distribution, and customer service costs.

- For *manufacturing-sector companies*, **period costs** are all nonmanufacturing costs in the income statement. For example, design costs and costs of shipping products to customers.
- For *merchandising-sector companies*, all costs that are not related to the cost of goods purchased for resale are treated as **period costs**. Examples of these period costs are labor costs of sales floor personnel and advertising costs.
- Because *service-sector companies* do not produce or sell tangible products, they do not have any inventoriable costs. Therefore, all costs in their income statement are **period costs**.

**The flow of inventoriable and period costs:**

- **Inventoriable costs** go through *the balance sheet* accounts of work-in-process inventory and finished goods inventory before entering cost of goods sold in the *income statement.*
- **Period costs** are expensed directly in *the income statement*.

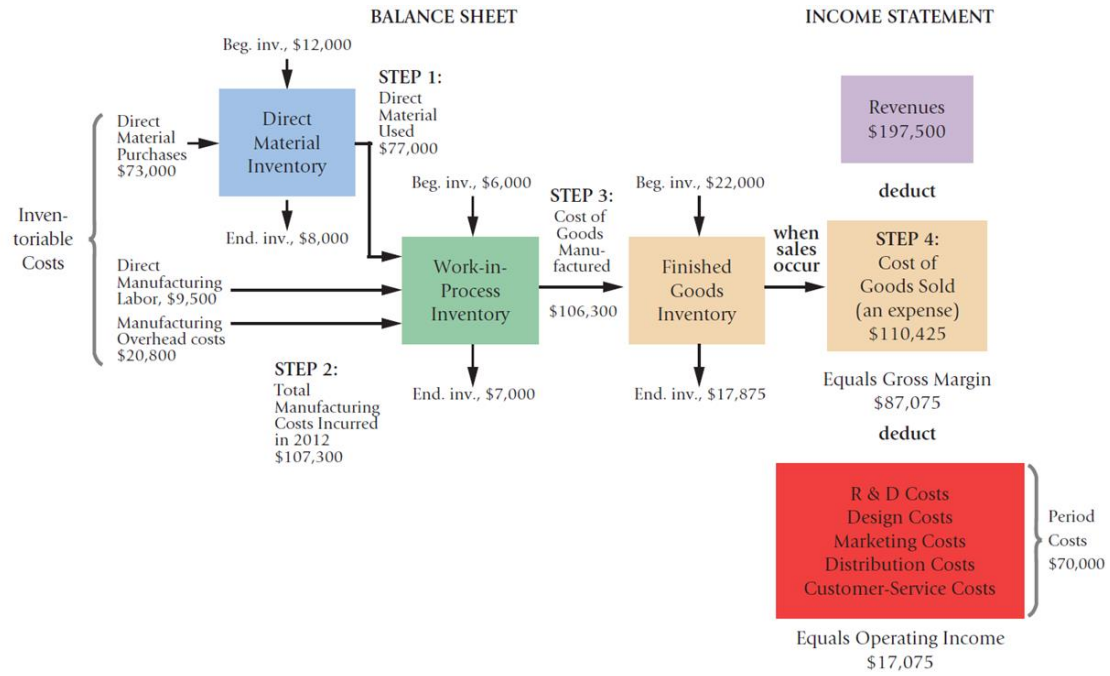


***Figure 2.7 Flow of Revenue and Costs for a Manufacturing-Sector Company***
Source: DATAR, S. M., RAJAN, M. V. Managerial Accounting, Making Decisions and Motivating Performance

The **cost of direct materials** used during a particular year is calculated as follows:

| | |
|---|---|
| Beginning inventory of direct materials | xxx |
| + Purchases of direct materials during the year | xxx |
| − Ending inventory of direct materials | xxx |
| = Direct materials used in during the year | xxx |

**Total manufacturing costs** refers to all direct manufacturing costs and manufacturing overhead costs incurred during a year for all goods worked on during the year.

**Cost of goods manufactured** refers to the cost of goods brought to completion, whether they were started before or during the current accounting period. The cost of goods manufactured during a particular year is calculated as follows:

| | |
|---|---|
| Beginning work-in-process inventory | xxx |
| + Total manufacturing costs incurred during the year | xxx |
| = Total manufacturing costs to account for | xxx |
| − Ending work-in-process inventory | xxx |
| = Cost of goods manufactured during the year | xxx |

The **cost of goods sold** is the cost of finished goods inventory sold to customers during the current accounting period. The cost of goods sold for a year is calculated as follows:

| | |
|---|---|
| Beginning inventory of finished goods | xxx |
| + Cost of goods manufactured during the year | xxx |
| − Ending inventory of finished goods | xxx |
| = Cost of goods sold for the period | xxx |

**Prime costs** are all direct manufacturing costs.

*Prime costs = Direct material costs + Direct manufacturing labor costs*

**Conversion costs** are all manufacturing costs other than direct material costs. They represent all manufacturing costs incurred to convert direct materials into finished goods.

*Conversion costs = Direct manufacturing labor costs + Manufacturing overhead costs*

## 2.6 Relevant and Irrelevant Costs and Revenues

For decision-making, costs and revenues can be classified according to whether they are relevant to a particular decision. **Relevant costs and revenues** are those future costs and revenues that will be changed by a decision, whereas **irrelevant costs** and revenues are those that will not be affected by the decision.

For example, if one is faced with a choice of making a journey by car or by public transport, the car tax and insurance costs are irrelevant, since they will remain the same whatever alternative is chosen. However, petrol costs for the car will differ depending on which alternative is chosen, and this cost will be relevant for decision-making.

## 2.7 Avoidable and Unavoidable Costs

Sometimes the terms avoidable and unavoidable costs are used instead of relevant and irrelevant cost. **Avoidable costs** are those costs that may be saved by not adopting a given

alternative, whereas **unavoidable costs** cannot be saved. Therefore, only avoidable costs are relevant for decision-making purposes. The decision rule is to accept those alternatives that generate revenues in excess of the avoidable costs.

## 2.8 Sunk Costs

**Sunk costs** are the cost of resources already acquired where the total will be unaffected by the choice between various alternatives. They are costs that have been created by a decision made in the past and that cannot be changed by any decision that will be made in the future. For example, the written down values of assets previously purchased are sunk costs.

Sunk costs are *irrelevant for decision-making*, but they are distinguished from irrelevant costs because not all irrelevant costs are sunk costs. For example, a comparison of two alternative production methods may result in identical direct material expenditure for both alternatives, so the direct material cost is irrelevant because it will remain the same whichever alternative is chosen, but the material cost is not sunk cost since it will be incurred in the future.

## 2.9 Opportunity Costs

Some costs for decision-making cannot normally be collected within the accounting system. Costs that are collected within the accounting system are based on past payments or commitments to pay at some time in the future. Sometimes it is necessary for decision making to impute costs that will not require cash outlays, and these imputed costs are called opportunity costs. **An opportunity cost** is a cost that measures the opportunity that is lost or sacrificed when the choice of one course of action requires that an alternative course of action be given up.

It is important to note that opportunity costs only apply to the use of scarce resources. Where resources are not scarce, no sacrifice exists from using these resources. If no alternative use of resources exists then the opportunity cost is zero, but if resources have an alternative use, and are scarce, then an opportunity cost does exist.

## 2.10 Incremental and Marginal Costs

**Incremental** (also called differential) **costs** and revenues are the difference between costs and revenues for the corresponding items under each alternative being considered. For example, the incremental costs of increasing output from 1000 to 1100 units per week are the additional costs of producing an extra 100 units per week. Incremental costs may or may not include fixed costs. If fixed costs change as a result of a decision, the increase in costs represents an incremental cost. If fixed costs do not change as a result of a decision, the incremental costs will be zero.

Incremental costs and revenues are similar in principle to the economist's concept of **marginal cost and marginal revenue**. The main difference is that marginal cost/revenue

represents the additional cost/revenue of one extra unit of output whereas incremental cost/revenue represents the additional cost/revenue resulting from a group of additional units of output. The economist normally represents the theoretical relationship between cost/revenue and output in terms of the marginal cost/revenue of single additional units of output.

The accountant is normally more interested in the incremental cost/revenue of increasing production and sales to whatever extent is contemplated, and this is most unlikely to be a single unit of output.

## Summary

The term **cost** has multiple meanings and different types of costs are used in different situations. This chapter has described the following basic cost terms that are used in the management accounting literature:

1. direct and indirect costs;
2. period and product costs;
3. cost behaviour in relation to volume of activity;
4. relevant and irrelevant costs;
5. avoidable and unavoidable costs;
6. sunk costs;
7. opportunity costs;
8. incremental and marginal costs.

A cost and management accounting system should generate information to meet the following requirements:

1. to allocate costs between cost of goods sold and inventories for internal and external reporting;
2. to provide relevant information to help managers make better decisions;
3. to provide information for planning, control and performance measurement.

A database should be maintained with costs appropriately coded or classified, so that relevant cost information can be extracted to meet each of the above requirements.

**Different companies may define and classify costs differently**. Therefore, managers must define and understand the way costs are measured in a company or situation. For example in labor cost there may be different categories such as direct labor, indirect labor compensation for office staff, security, re-work labor. Also, salaries are paid to managers, supervisors, and department heads. The payroll fringe cost borne by the companies is another type of a labor cost classification. The purpose of classifying costs in detail is to associate an individual cost with a specific cause or reason for why it was incurred.

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