**Chapter 2**

**Cost concepts and cost behavior**

**What Is a Cost?**

COST IS A SACRIFICE OF RESOURCES.

A cost is a sacrifice of resources. Every day, many different things are bought: clothing, food, books, music, perhaps an automobile, and so on. When one thing is bought, the ability to use these resources (typically cash or a line of credit) is given up (sacrificed) to buy something else. The price of each item measures the sacrifice made to acquire it. Whether cash is paid or use another asset, whether pay now or later (by using a credit card), the cost of the item acquired is represented by what is forgone as a result.

**Q.1.** What do you mean by Cost?

**Ans.1.** A cost is a sacrifice of resources.

**Cost versus Expenses**

EXPENSE- COST THAT IS CHARGED AGAINST REVENUE IN AN ACCOUNTING PERIOD.

It is important to distinguish cost from expense. An expense is a cost charged against revenue in an accounting period; hence, expenses are deducted from revenue in that accounting period.

**Q.2.** What is an expense?

**Ans.2.** An expense is a cost charged against revenue in an accounting period.

The two major categories of costs are outlay costs and opportunity costs. An outlay cost is a past, present, or future cash outflow. Consider the cost of a college education; clearly, the cash outflows for tuition, books, and fees are outlay costs. Cash is not all that college students sacrifice; they also sacrifice their time to get a college education. This sacrifice of time is an opportunity cost. Opportunity cost is the forgone benefit that could have been realized from the best forgone alternative use of a resource. For example, many students give up jobs to take the time to earn a college degree. The forgone income is part of the cost of getting a college degree and is the forgone benefit that could be realized from an alternative use of a scarce resource—time. These are other examples of opportunity costs:

• The opportunity cost of funds that you invest in a bank certificate of deposit is the forgone interest you could have earned on another security, assuming that both securities are equal in risk and liquidity.

• The opportunity cost of spending spring break in Florida is the forgone income from a temporary job; the opportunity cost of taking a temporary job during spring break is the forgone pleasure of a trip to Florida.

• The opportunity cost of time spent working on one question on an examination is the forgone benefit of time spent working on another question.

Of course, no one can ever know all of the possible opportunities available at any moment. Hence, some opportunity costs are undoubtedly not considered. Accounting systems typically record outlay costs but not opportunity costs. As a result, it is easy for managers to overlook or ignore opportunity costs in making decisions. A well-designed cost accounting system presents all relevant information to managers, including opportunity costs that they may otherwise ignore in decision making.

OUTLAY COST- PAST, PRESENT, OR FUTURE CASH OUTFLOW.

OPPORTUNITY COST**-** FORGONE BENEFIT FROM THE BEST (FORGONE) ALTERNATIVE COURSE OF ACTION.

**Q.3.** What is an opportunity cost?

**Ans.3.** Opportunity cost **is** forgone benefit from the best (forgone) alternative course of action.

**Presentation of Costs in Financial Statements**

Information for use by managers is concerned here. Therefore, when financial statements are presented or discussed, it is assumed that the statements are prepared for internal management use, not for external reporting. Focus is also on operating profit, the excess of operating revenues over the operating costs incurred to generate those revenues. This figure differs from net income, which is operating profit adjusted for interest, income taxes, and extraordinary items.

OPERATING PROFIT- EXCESS OF OPERATING REVENUES OVER THE OPERATING COSTS NECESSARY TO GENERATE THOSE REVENUES.

**Q.4.** Define to operating profit.

**Ans.4.** Operating profit is excess of operating revenues over the operating costs necessary to generate those revenues.

It is important to remember that information from the cost accounting system is just a means to an end; the final products are managerial decisions and actions (and the change in firm value) that result from the information generated by the system. The “most accurate” information is not being sought; the best information is being looked, just for understanding how the information is used in decision making, and recognizing the cost of preparing and using the information.

**Q.5.** In a cost accounting system the “most accurate” information is not being sought; the best information is being looked. **(True)**

A generic income statement for a firm, a division, a product, or any unit is shown in Exhibit 2.1. It summarizes the revenues (sales) of the unit and subtracts the costs of the unit. The costs include the cost of the goods or service the activity sells. Although the basic form of the income statement is the same regardless of the product or service an organization sells, the details, especially with respect to costs, vary depending on how the organization acquires the resources used to produce the product or service.

**Exhibit 2.1**

**Generic Income Statement**

Revenue . . . . . . . . . XXX

Costs. . . . . . . . . . . . . YYY

Operating profit . . . ZZZ

There are three types of income statements where the organization sells (1) a service, (2) a product that it acquires from another organization (a retailer), or (3) a product that it builds using materials from other organizations (a manufacturer).

**Service Organizations**

A service company provides customers with an intangible product. For example, consulting firms provide advice and analyses. The costs associated with RPE Associates, a compensation consulting firm, are shown in the income statement in Exhibit 2.2. The line item cost of services sold includes the costs of billable hours, which are the hours billed to clients plus the cost of other items billed to clients (for example, charges for performing an information search or printing reports). Costs that are not part of services billable to clients are included in the marketing and administrative costs. At RPE, many managers report costs both in the cost of services sold (working with a client) and in marketing and administrative costs (developing project proposals for new business). The distinction is based on the nature of the work, not who performs the task.

**Q.6.** A service company provides customers with an \_\_\_\_\_\_\_\_\_\_\_\_\_ product.

**Ans.6.** Intangible

**Exhibit 2.2**

**Income Statement for a Service Company**

**RPE ASSOCIATES**

Income Statement for the year ended December 31, 2014.

Sales revenue . . . . . . . . . . . . . . . . . . . . . . . SR 32,000

Cost of services sold. . . . . . . . . . . . . . . . . . 23,500

Gross margin . . . . . . . . . . . . . . . . . . . . . . . SR 8,500

Marketing and administrative costs . . . . . . . 4,300

Operating profit . . . . . . . . . . . . . . . . . . . ... SR 4,200

**Q.7.** In a service organization what is included in cost of services sold?

**Ans.7.** In a service organizationcost of services sold includes the costs of billable hours, which are the hours billed to clients plus the cost of other items billed to clients (for example, charges for performing an information search or printing reports).

**Retail and Wholesale Companies**

Retail and wholesale firms sell but do not make a tangible product (food, clothes, or a book). The income statement for these companies includes revenue and cost items as does that for service companies, but for retailers and wholesalers, it has an added category of cost information (called cost of goods sold ) to track the cost of the tangible goods they buy and sell.

**Q.8.** Retail and wholesale firms sell but do not make a \_\_\_\_\_\_\_\_\_\_ product (food, clothes, or a book).

**Ans.8.** Tangible

Southwest Office Products is a retail company that sells office supplies, such as paper products and computer accessories. The company’s income statement and cost of goods sold statement are shown in Exhibit 2.3. The cost of goods sold statement shows how the cost of goods sold was computed. Exhibit 2.3 shows the following information for Southwest:

• It had a SR 300,000 beginning inventory on January 1. This represents the cost of the paper, writing supplies, toner cartridges, and other salable items on hand at the beginning of the year.

• The company purchased SR 1,830,000 of goods during the year and had transportation-in costs of SR 90,000. Therefore, its total cost of goods purchased was SR 1,920,000 (= SR 1,830,000 for the purchases + SR 90,000 for the transportation-in costs).

**Exhibit 2.3**

Income Statement for Merchandise Company

**SOUTHWEST OFFICE PRODUCTS**

**Income Statement**

**For the Year Ended December 31, Year 2014**

**(SR 000)**

Sales revenue . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . SR 3,225

Cost of goods sold (see following statement) . . . . . . . . . . . . . . . . . . . . . . 1,775

Gross margin . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . SR 1,450

Marketing and administrative costs . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 825

Operating profit . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . SR 625

**Cost of Goods Sold Statement**

**For the Year Ended December 31, Year 2014**

**(SR 000)**

Beginning inventory. . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . SR 300

Cost of goods purchased

Merchandise cost . . . . . . . . . . . . . . . . . . . . . . . . . SR 1,830

Transportation-in costs . . . . . . . . . . . . . . . . . . . . . . 90

Total cost of goods purchased . . . . . . . . . . . . . . . . . . . . . . . . 1,920

Cost of goods available for sale . . . . . . . . . . . . . . . . . . . . . SR 2,220

Less cost of goods in ending inventory . . . . . . . . . . . . . . . . . 445

Cost of goods sold . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . ... SR 1,775

• Based on the information so far, Southwest had a SR 2,220,000 cost of items available for sale (= SR 1,920,000 total cost of goods purchased + SR 300,000 from beginning inventory). The SR 2,220,000 is the cost of the goods that the company could have sold, in other words, the cost of goods available for sale.

At the end of the year, the company still had on hand inventory costing SR 445,000. Therefore, Southwest sold items costing SR 1,775,000 (= SR 2,220,000 – SR 445,000).

The income statement summarizes Southwest’s operating performance with the following information:

• Sales revenue for the year was SR 3,225,000.

• The cost of goods sold amount, SR 1,775,000, came from the cost of goods sold statement. Therefore, the gross margin (the difference between sales revenue and cost of goods sold) is SR 1,450,000 (= SR 3,225,000 sales revenue – SR 1,775,000 cost of goods sold). If you were Southwest’s manager, you would know that, on average, every SR 1 of sales gave you about SR 0.45 (= SR 1,450,000 / SR 3,225,000) to cover marketing and administrative costs and earn a profit.

• The income statement also shows that marketing and administrative costs were

SR 825,000 and operating profits were SR 625,000 (= SR 1,450,000 gross margin – SR 825,000 marketing and administrative costs).

**Cost of goods sold**

Expense assigned to products sold during a period.

The term cost of goods sold includes only the actual costs of the goods that were sold. It does not include the costs required to sell them, such as the salaries of sales-people, which are marketing costs, or the salaries of top executives, which are administrative costs.

**Q.9.** What do you mean by cost of goods sold?

**Ans.9.** Expense assigned to products sold during a period.

Compare the income statement for Southwest Office Products with that for the service company, RPE Associates (Exhibit 2.2). Like other retail and wholesale organizations, southwest has an entire category of amounts that do not appear in a service company’s income statement. This category appears in the cost of goods sold statement, which accounts for the inventories, purchases, and sales of tangible goods. By contrast, the service company does not “purchase” anything to be held in inventory until sold. Service companies are generally most interested in measuring the cost of providing services while retail and wholesale firms focus on two items. The gross margin reflects the ability to price the products while the marketing and administrative costs reflect relative efficiency in operating the business itself.

**Q.10.** Namethe category of amounts that appear in retail and wholesale Companies income statement but not in a service company’s income statement.

**Ans.10.** The category that appears in the cost of goods sold statement is accounts for the inventories, purchases, and sales of tangible goods.

**Manufacturing Companies**

A manufacturing company has a more complex income statement than do service or retail/wholesale companies. Whereas the retailer/wholesaler purchases goods for sale, the manufacturer makes them. For decision making, it is not enough for the manufacturer to know how much it paid for a good; it must also know the different costs associated with making it.

**Product costs are those costs assigned to units of production and recognized (expensed) when the product is sold.** Product (manufacturing) costs follow the product through inventory. **Period costs (non manufacturing costs) include all other costs and are expensed as they are incurred.**

Before we present example statements for a manufacturing firm, we need to define some additional terms.

**Q.11.** What is product cost+

**Ans.11.** Product costs are those costs assigned to units of production and recognized (expensed) when the product is sold.

**Q.12.** What is period cost?

**Ans.12.** Period costs (non manufacturing costs) include all other costs and are expensed as they are incurred.

**Direct and Indirect Manufacturing (Product) Costs**

Product costs consist of two types—direct and indirect costs. **Direct manufacturing costs are those product costs that can be identified with units (or batches of units) at relatively low cost.** ***Indirect manufacturing costs are all other product costs.*** The glass in a light bulb is a direct cost of the bulb. The depreciation on the light bulb manufacturing plant is an indirect cost.

**Q.13.** What do you mean by direct manufacturing cost?

**Ans.13.** Direct manufacturing costs are those product costs that can be identified with units (or batches of units) at relatively low cost.

**Q.14.** What do you mean by direct manufacturing cost?

**Ans.14**. Indirect manufacturing costs are all other product costs, except direct manufacturing costs.

**Q.15.** The glass in a light bulb is a direct cost of the bulb. The depreciation on the light bulb manufacturing plant is an indirect cost. **(True)**

Direct costs are classified further into direct materials cost and direct labor cost. The manufacturer purchases materials (for example, unassembled parts), hires workers to convert the materials to a finished good, and then offers the product for sale. Thus, there are three major categories of product costs:

**Q.16.** Direct costs are classified further into \_\_\_\_\_\_\_\_\_ cost and \_\_\_\_\_\_\_\_\_\_cost.

**Ans.16.** Direct materials, Direct labor

1. **Direct materials that can be feasibly identified directly, at relatively low cost, with the product.** (To the manufacturer, purchased parts, including transportation-in, are included in direct materials.) Direct materials are often called raw materials. Materials that cannot be identified with a specific product (for example, paper for plant reports, lubricating oil for machines) are included in item 3.

2. **Direct labor of workers who can be identified directly, at reasonable cost,** **with the product.** These workers transform the materials into a finished product.

3. All other costs of transforming the materials into a finished product often referred to in total as **manufacturing overhead**. Some examples of manufacturing overhead follow.

**Manufacturing overhead- All production costs except those for direct labor and direct materials.**

• Indirect labor, the cost of workers who do not work directly on the product yet are required so that the factory can operate, such as supervisors, maintenance workers, and inventory storekeepers.

• Indirect materials, such as lubricants for the machinery, polishing and cleaning materials, repair parts, and light bulbs, which are not a part of the finished product but are necessary to manufacture it.

• Other manufacturing costs, such as depreciation of the factory building and equipment, taxes on the factory assets, insurance on the factory building and equipment, heat, light, power, and similar expenses incurred to keep the factory operating.

For manufacturing overhead, common synonyms used in practice are factory burden, factory overhead, burden, factory expense, and overhead.

**Q.17.** What do you mean by manufacturing overhead?

**Ans.17.** Manufacturing overhead- All production costs except those for direct labor and direct materials.

**Prime Costs and Conversion Costs**

**Prime costs-** Prime costs are the direct costs, namely, direct materials and direct labor.

**Conversion costs-** Conversion costs are the costs to convert direct materials into the final product. These are the costs for direct labor and manufacturing overhead.

Companies with relatively low manufacturing overhead focus on managing prime costs. Companies that have high direct labor and/or manufacturing overhead tend to be more concerned about conversion costs.

**Q.18.** Prime costs are the direct costs, namely, direct materials and direct labor. **(True)**

**Q.19.** Conversion costs are the costs to convert direct materials into the final product. These are the costs for direct labor and manufacturing overhead. **(True)**

**Nonmanufacturing (Period) Costs**

Nonmanufacturing costs have two elements: marketing costs and administrative costs. **Marketing costs are the costs required to obtain customer orders and provide customers with finished products. These include advertising, sales commissions, shipping costs, and marketing departments’ building occupancy costs. *Administrative costs are the costs required to manage the organization and provide staff support, including executive and clerical salaries; costs for legal, financial, data processing, and accounting services; and building space for administrative personnel.***

**Q.20.** Nonmanufacturing costs have \_\_\_\_\_\_\_elements: marketing costs and administrative costs.

**Ans.20.** Two

**Q.21.** Explain to marketing costs.

**Ans.21.** Marketing costs are the costs required to obtain customer orders and provide customers with finished products. These include advertising, sales commissions, shipping costs, and marketing departments’ building occupancy costs.

**Q.22.** Explain to administrative costs.

**Ans.22.** Administrative costs are the costs required to manage the organization and provide staff support, including executive and clerical salaries; costs for legal, financial, data processing, and accounting services; and building space for administrative personnel.

**Cost Allocation**

Many costs result from several departments sharing facilities (buildings, equipment) or services (data processing, maintenance staff). If you share an apartment with someone, the rent is a cost to the people sharing the apartment. If we want to assign costs to each individual, some method must be devised for assigning a share of the costs to each user. This process of assigning costs is called cost allocation.

**Q.23.** What do you mean by cost allocation?

**Ans.23.** Many costs result from several departments sharing facilities (buildings, equipment) or services (data processing, maintenance staff). This process of assigning these costs among various departments is called cost allocation.

**Cost object-** Any end to which a cost is assigned.

A cost object is any end to which a cost is assigned, for example, a unit of product or service, a department, or a customer. Managers make many decisions at the level of the cost object. Should we drop this product? How can we make this customer profitable? **A cost pool is the cost we want to assign to the cost objects. Examples are department costs, rental costs, or travel costs a consultant incur to visit multiple clients.** ***The cost allocation rule is the method or process used to assign the costs in the cost pool to the cost object.***

**Q.24.** A cost object is any end to which a cost is assigned, for example, a unit of product or service, a department, or a customer. **(True)**

**Q.25.** A cost pool is the cost we want to assign to the cost objects. Examples are department costs, rental costs, or travel costs etc. **(True)**

**Q.26.** The cost allocation rule is the method or process used to assign the \_\_\_\_\_\_\_\_\_\_in the cost pool to the cost object.

**Ans.26.** Costs

Consider the following simple example. Rockford Corporation has two divisions: East Coast (EC) and West Coast (WC). Computing services at Rockford are centralized and provided to the two divisions by the corporate Information Systems (IS) group. Total systems costs for the quarter are SR 1 million. Divisional financial statements are being prepared, and the accountant has asked for your help in allocating these costs to the divisions.

How would you suggest the accountant proceed? You might suggest that because there are two divisions, they share the costs equally, that is, each is charged SR 500,000 for IS services. The West Coast manager argues, however, that this is unfair because WC is much smaller than EC. She argues that the allocation should be based on a measure of divisional size, such as revenues. The East Coast manager argues that this is not right because most of IS time is spent in the West Coast division, where the equipment is more complex and requires more maintenance. As we will see, there is often no “right” way to solve this dilemma (but there may be some ways that result in poor decisions).

Let’s suppose the accountant chooses divisional revenue and that the revenue in EC is SR 80 million and the revenue in WC is SR 20 million. Then the allocation to the two divisions can be illustrated in the flowchart, or cost flow diagram, shown in Exhibit 2.5.

Because the East Coast division earns 80 percent (= SR 80 million of the total SR 100 million in revenues), it is assigned, or allocated, 80 percent of the IS costs, or SR 800,000 (= 80% of SR 1,000,000). Similarly, the West Coast division is assigned SR 200,000 (= 20% of SR 1,000,000). Many of the cost allocation method discussed are more complex than this simple example, but the fundamental approach is the same: (1) identify the cost objects, (2) determine the cost pools, and (3) select a cost allocation rule. We will make extensive use of cost flow diagrams such as the one in Exhibit 2.5 because they can help you understand (1) how a cost system works and (2) the likely effects on the reported costs of different cost objects from changes in the cost allocation rule.

**Exhibit 2.5**

**Cost Flow Diagram**

|  |
| --- |
| Corporate IS Group  SR 1,000,000 |

Cost

Pool

Cost

Allocation 80% a % Revenue 20% b

rule

|  |
| --- |
| East Coast  SR 800,000 |

|  |
| --- |
| West Coast  SR 200,000 |

Cost

objects

**Direct versus Indirect Costs**

**Any cost that can be unambiguously related to a cost object is a direct cost of that cost object.** ***Those that cannot be unambiguously related to a cost object are indirect costs.*** One difficulty is that a cost may be direct to one cost object and indirect to another. For example, the salary of a supervisor in a manufacturing department is a direct cost of the department but an indirect cost of the individual items the department produces.

**Q.27.** Any cost that ­­­­­­­­­­­­\_\_\_\_\_\_\_\_be unambiguously related to a cost object is a direct cost of that cost object.

**Ans.27.** Can

**Q.28.** Those that \_\_\_\_\_\_\_\_be unambiguously related to a cost object are indirect costs.

**Ans.28.** Cannot

**Details of Manufacturing Cost Flows**

Understand how material, labor, and overhead costs are added to a product at each stage of the production process.

Jackson Gears is a small machining and manufacturing company that makes gears for original equipment manufacturers (OEMs), such as automobile and farm equipment companies. Even if you have never been in a machine shop, you can imagine the process of making a gear. It would consist of three basic steps:

• First, you would see metal (direct material) being delivered to the receiving area, inspected, and then placed in the direct material inventory area (store) of the shop.

• Next, when it was time to produce gears, the metal would be transported to an assembly line. It would be fed to large machines (presses, lathes, and so on) that would turn the unformed metal into the finished gear. While the metal is in this part of the factory, it is neither direct material nor a gear; it is work in process.

• Finally, the gear is complete, and it is moved out to a separate area in the factory with other completed products. These gears are finished goods and ready for sale.

**Exhibit 2.6**

**Production Process at Jackson Gears**

|  |
| --- |
| Vendor 1 |

Store Process Complete Sell

|  |
| --- |
| Direct  materials  inventory |

|  |
| --- |
| Assembly line  (Work-in-process  inventory) |

|  |
| --- |
| Finished  goods  inventory |

Gear

Metal is sold

|  |
| --- |
| Vendor 2 |

**Finished goods- Product fully completed but not yet sold.**

**Work in process- Product in the production process but not yet complete.**

**Q.29.** What do you mean by finished goods?

**Ans.29.** Finished goods- Product fully completed but not yet sold.

**Q.30.** What do you mean by work in process?

**Ans.30.** Work in process- Product in the production process but not yet complete.

**How Costs Flow through the Statements**

**Income Statements**

Now that we understand the physical flow of the product through the process, next there is a numerical example to show how to report Jackson Gears’s revenues and costs. The result is an income statement for a manufacturing company (see Exhibit 2.7).

**Exhibit 2.7**

**Income Statement for a Manufacturing Firm**

**JACKSON GEARS**

**Income Statement**

**For the Year Ending December 31, Year 2014**

**(SR 000)**

Sales revenue . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . SR 20,450

Cost of goods sold (see Exhibit 2.8) . . . . . . . . . . . . . . . . . . . . . . . 13,100

Gross margin . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . SR 7,350

Less marketing and administrative costs . . . . . . . . . . . . . . . . . . 3,850

Operating profit before taxes . . . . . . . . . . . . . . . . . . . . . . . . . . SR 3,500

The income statement shows that Jackson Gears generated sales revenue of SR 20,450,000, had cost of goods sold of SR 13,100,000, and incurred marketing and administrative costs of SR 3,850,000 for the year, thereby generating an operating profit of SR 3,500,000.

**Cost of Goods Manufactured and Sold**

The following statement is the cost of goods manufactured and sold statement, which appears in Exhibit 2.8. You will be able to see how these items appear in the cost of goods manufactured and sold statement.

**Exhibit 2.8**

Cost of Goods Manufactured and Sold Statement for a Manufacturing Firm. **Direct Materials**

Assume the following for the company:

• Direct materials inventory on hand January 1 totaled SR 95,000.

• Materials purchased during the year cost SR 5,627,000.

**JACKSON GEARS**

**Cost of Goods Manufactured and Sold Statement**

**For the Year Ending December 31, Year 2014**

**(SR 000)**

Beginning work-in-process inventory, January 1. . . . . . . . . . ………… SR 270

Manufacturing costs during the year:

Direct materials:

Beginning inventory, January 1 . . . . . . . . . . . . . . . . R 95

Add purchases. . . . . . . . . . . . . . . . . . . . . . . . . . . . . 5,627

Direct materials available . . . . . . . . . . . . . . . . . SR 5,722

Less ending inventory, December 31 . . . . . . . . . 72

Direct material put into production . . . . . . . . . . . . . . . . . SR 5,650

Direct labor . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 1,220

Manufacturing overhead . . . . . . . . . . . . . . . . . . . . . . . . . . . 6,780

Total manufacturing costs incurred . . . . . . . . . . . . . . . . . . ………… 13,650

Total work in process during the year . . . . . . . . . . . . . . . . . . …..SR 13,920

Less ending work-in-process inventory, December 31 . . . . . …… 310

Cost of goods manufactured . . . . . . . . . . . . . . . . . . . . . . . . . SR 13,610

Beginning finished goods inventory, January 1. . . . . . . . . . . 420

Finished goods available for sale . . . . . . . . . . . . . . . . . . . . . SR 14,030

Less ending finished goods inventory, December 31 . . . . . . 930

Cost of goods sold . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . SR 13,100

• Ending inventory on December 31 was SR 72,000.

• Therefore, the cost of direct materials put into production during the year was SR 5,650,000, computed as follows (in thousands of SR):

Beginning direct materials inventory, January 1 . . . . . . . . . . . . . . . . . . . . . SR 95

Add purchases during the year . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . 5,627

Direct materials available during the year . . . . . . . . . . . . . . . . . . . . . . . SR 5,722

Less ending direct materials inventory, December 31. . . . . . . . . . . . . . . . . . 72

Cost of direct materials put into production . . . . . . . . . . . . . . . . . . . . . SR 5,650

**Work in Process**

Consider the following:

• The Work-in-Process Inventory account had a beginning balance of SR 270,000 on January 1, as shown in Exhibit 2.8.

• Exhibit 2.8 shows that costs incurred during the year totaled SR 5,650,000 in direct materials (as shown in the preceding direct materials inventory schedule),

SR 1,220,000 in direct labor costs, and SR 6,780,000 in manufacturing overhead. The sum of materials, labor, and manufacturing overhead costs incurred, SR 13,650,000, is the total manufacturing costs incurred during the year. Managers in production and operations give careful attention to these costs. Companies that want to be competitive in setting prices must manage these costs diligently.

• From here on the process can seem complicated, but it’s not really so difficult if you realize that accountants are just adding and subtracting inventory values. In other words, just as materials, in different forms, are moving from one inventory in the plant to another, the costs in the cost accounting system are moving from one inventory account to another. Adding the SR 270,000 beginning work-in-process inventory to the SR 13,650,000 total manufacturing costs gives SR 13,920,000, the total cost of work in process during the year. This is a measure of the resources that have gone into production. Some of these costs were in the work-in-process inventory on hand at the beginning of the period (that is the SR 270,000 in beginning inventory), but most has been incurred this year (that is the SR 13,650,000 total manufacturing costs).

• At year-end, the work-in-process inventory has a SR 310,000 cost, which is subtracted to arrive at the cost of goods manufactured during the year: SR 13,610,000 (= SR 13,920,000 – SR 310,000), which represents the cost of gears finished during the year. Production departments usually have a goal for goods completed each period. Managers would compare the cost of goods manufactured to that goal to see whether the production departments were successful in meeting it.

**Finished Goods Inventory**

The work finished during the period is transferred from the production department to the finished goods storage area or is shipped to customers. If goods are shipped to customers directly from the production line, no finished goods inventory exists. Jackson Gears has a finished goods inventory, however, because some of the gears are common across manufacturers and so it keeps some of them on hand to expedite orders. Here’s how the amounts appear on the financial statements:

• Exhibit 2.8 shows that Jackson Gears had SR 420,000 of finished goods inventory on hand at the beginning of the year (January 1). From the discussion about work in process, Jackson Gears completed SR 13,610,000 worth of product, which was transferred to finished goods inventory. Therefore, Jackson Gears had SR 14,030,000 finished goods inventory available for sale, in total.

• Of the SR 14,030,000 available, Jackson Gears had SR 930,000 finished goods still on hand at the end of the year. This means that the cost of goods sold was SR 13,100,000 (= SR 14,030,000 available – SR 930,000 in ending inventory).

**Cost of Goods Manufactured and Sold Statement**

As part of its internal reporting system, Jackson Gears prepares a cost of goods manufactured and sold statement (Exhibit 2.8). Such statements are for managerial use; Exhibit 2.8 incorporates and summarizes information from the preceding discussion.

Manufacturing companies typically prepare a cost of goods manufactured and sold statement to summarize and report manufacturing costs such as those discussed for Jackson Gears, most often for managers’ use. Some companies have experimented with preparing these statements for production workers and supervisors, who in some cases have found them effective communication devices once these people learn how to read them. For example, managers at Jackson Gears use the cost of goods manufactured and sold statement to communicate the size of manufacturing overhead and inventories to stimulate creative ideas for reducing these items.

The cost of goods manufactured and sold statement in Exhibit 2.8 has three building blocks. The first reports the cost of direct materials. Next is the work-in-process account with its beginning balance, costs added during the period, ending balance, and cost of goods manufactured. Third, the statement reports the beginning and ending finished goods inventory and cost of goods sold.

These financial statements are presented in a standard format that is used by many companies. It is important that financial statements effectively present the information that best suits the needs of your customers or information users (for example, managers of your company or your clients). For managerial purposes, it is important that the format of financial statements be tailored to what users want (or to what you want if you are the user of financial information).

**Cost Behavior**

The financial statements of Jackson Gears reports what happened, but they fail to show why. For that, we need to understand how costs behave and how managers analyze costs to arrive at their decisions. Managerial decisions lead to the activities that the firm undertakes, and these activities create (or destroy) the value in an organization. Information from the cost accounting system is a key ingredient in making these decisions.

Cost behavior deals with the way costs respond to changes in activity levels. Managers need to know how costs behave to make informed decisions about products, to plan, and to evaluate performance. Behavior of costs has been classified in four basic categories: fixed, variable, semi variable, and step costs, as discussed next.

**Q.31.** What do you mean by cost behavior?

**Ans.31.** Cost behavior deals with the way costs respond to changes in activity levels.

**Fixed versus Variable Costs**

FIXED COSTS - COSTS THAT ARE UNCHANGED AS VOLUME CHANGES WITHIN THE RELEVANT RANGE OF ACTIVITY.

VARIABLE COSTS - COSTS THAT CHANGE IN DIRECT PROPORTION WITH A CHANGE IN VOLUME WITHIN THE RELEVANT RANGE OF ACTIVITY.

**Q.32.** Explain to fixed costs.

**Ans.32.** Fixed costs - costs that are unchanged as volume changes within the relevant range of activity.

**Q.33.** Explain to variable costs.

**Ans.33.** Variable costs - costs that change in direct proportion with a change in volume within the relevant range of activity.

Suppose that management contemplates a change in the volume of a company’s activity. Some questions different managers might ask follow:

• An operations manager at United Airlines: How much will our costs decrease if we reduce the number of flights by 5 percent?

• A manager at the U.S. Post Office: How much will our costs decrease if we eliminate Saturday deliveries?

• A business school dean: How much will costs increase if we reduce average class size by 10 students by increasing the number of classes offered?

To answer questions such as these, we need to know which costs are fixed costs that remain unchanged as the volume of activity changes and which are variable costs that change in direct proportion to the change in volume of activity.

If the activity is producing units, variable manufacturing costs include direct materials, certain manufacturing overhead (for example, indirect materials, materials-handling labor, energy costs), and direct labor in some cases (such as temporary workers). Certain nonmanufacturing costs such as distribution costs and sales commissions are variable. Much of manufacturing overhead and many nonmanufacturing costs are fixed costs.

Although labor has traditionally been considered a variable cost, today the production process at many firms is capital intensive and the amount of labor required is not sensitive to the amount produced. In a setting in which a fixed amount of labor is needed only to keep machines operating, labor is probably best considered to be a fixed cost.

**Exhibit 2.9 Four Cost Behavior Patterns**

Variable Costs (a) Fixed Costs (b) Semi Variable Costs (c) Step Costs (d)

Volume Volume Volume Volume

**Q.34.** Write the name of cost behavior patters.

**Ans.34.** There is four cost behavior patters-

1. Variable Costs
2. Fixed Costs
3. Semi Variable Costs
4. Step Costs

In merchandising, variable costs include the cost of the product and some marketing and administrative costs. All of a merchant’s product costs are variable. In manufacturing, a portion of the product cost is fixed. In service organizations, variable costs include certain types of labor (such as temporary employees), supplies, and copying and printing costs. Exhibit 2.9 depicts variable cost behavior—(a), and fixed cost behavior— (b). Note in the graph that volume is on the horizontal axis, and total costs (measured in riyal) are on the vertical axis. Item (a) shows that total variable costs increase in direct proportion to changes in volume. Thus, if volume doubles, total variable costs also double. Item (b) shows that fixed costs are at a particular level and do not increase as volume increases.

The identification of a cost as fixed or variable is valid only within a certain range of activity. For example, the manager of a restaurant in a shopping mall increased the capacity from 150 to 250 seats, requiring an increase in rent costs, utilities, and many other costs. Although these costs are usually thought of as fixed, they change when activity moves beyond a certain range. This range within which the total fixed costs and unit variable costs do not change is called the relevant range.

Four aspects of cost behavior complicate the task of classifying costs into fixed and variable categories. First, not all costs are strictly fixed or variable. For example, electric utility costs may be based on a fixed minimum monthly charge plus a variable cost for each kilowatt-hour. Such a semi variable cost has both fixed and variable components. Semi variable costs, also called mixed costs, are depicted in Exhibit 2.9 (c).

Second, some costs increase with volume in “steps.” Step costs, also called semi-fixed costs, increase in steps as shown in Exhibit 2.9 (d). For example, one supervisor might be needed for up to four firefighters in a fire station, two supervisors for five to eight, and so forth as the number of firefighter’s increases. The supervisors’ salaries represent a step cost.

Third, as previously indicated, the cost relations are valid only within a relevant range of activity. In particular, costs that are fixed over a small range of activity are likely to increase over a larger range of activity.

Finally, the classification of costs as fixed or variable depends on the measure of activity used. For example, at Jackson Gears, part of the production cost is setting up the machines to run a specific part. Plant engineers have to calibrate the machine for each production run, but each run can produce up to 4,000 parts. If production volume is the activity measure, then the plant engineer costs are a step cost. However, if the number of production runs is the activity measure, then the plant engineer costs are variable; they spend the same amount of time for each run.

**Exhibit 2.10**

**Cost Data for Price Quotation**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | A | B | C | D |
| 1 | Cost Item | Amount |  | Notes |
| 2 | Develop production specifications for J12 | 2,000 |  | This is a one-time expenditure for drawings. |
| 3 | Direct materials (metal) | 10.00 |  | This is the cost per gear. |
| 4 | Direct labor | 2.00 |  | This is the cost per gear. |
| 5 | Set up machinery | 1,000 |  | Up to 4,000 gears can be produced in a single production run. |
| 6 | Inspect gears: Equipment | 500 |  | A new measuring device is required. |
| 7 | Labor | 0.25 |  | A new measuring device is required. |

Understanding cost behavior is an important part of using cost accounting information wisely for decisions. Consider a recent example at Jackson Gears. Eastern Transmission Company, a longtime customer of Jackson, has requested a price quotation from Jackson for a modified version of a common gear. The Modified gear is the J12. Eastern wants the quotation to cover a volume of J12 gears from 2,000 to 6,000, because it is not sure of its final requirement.

Jessica Martinez, the plant cost analyst, has prepared the preliminary cost data in Exhibit 2.10 for Sandy Ventura, the Jackson sales representative for Eastern. The cost for developing production specifications is fixed. It does not depend on the volume of gears actually produced. The direct materials and the direct labor costs are variable. They increase proportionately with volume.

The cost for setting up the machinery is neither fixed nor variable with respect to volume. The setup costs are semi fixed—they are incurred to set up the initial production run, and then they are not affected by production until 4,000 gears have been produced. To produce more than 4,000 gears, another fixed amount must be spent. The inspection costs are semi variable. The new measuring device is a fixed cost and the SR 0.25 per gear is variable.

**Components of Product Costs**

We have now seen that various concepts of costs exist. Some are determined by the rules of financial accounting. Some are more useful for managerial decision making. In this section, there is a diagram to explain various cost concepts and identify the differences.

Exhibit 2.11; assume that Jackson Gears estimates the cost to produce a specialized tractor gear during year 3. The full cost to manufacture and sell one gear is estimated to be SR 40, as shown on the left side of Exhibit 2.11. The unit cost of manufacturing the gear is SR 29, also shown on the left side of the exhibit. (One unit is 1 gear.) This full cost of manufacturing the one unit is known as the full absorption cost. It is the amount of inventor able cost for external financial reporting according to GAAP. The full absorption cost “fully absorbs” the variable and fixed costs of manufacturing a product.

The full absorption cost excludes nonmanufacturing costs; however, so marketing and administrative costs are not inventor able costs. This nonmanufacturing costs equal SR 11 per unit, which is the sum of the two blocks at the bottom of Exhibit 2.11.

The variable costs to make and sell the product are variable manufacturing costs, SR 23 per unit, and variable nonmanufacturing costs, SR 4 per unit. Variable nonmanufacturing costs could, in general, be either administrative or marketing costs. For Jackson Gears, variable nonmanufacturing costs are primarily selling costs. In other cases, variable administrative costs could include costs of data processing, accounting, or any administrative activity that is affected by volume.

**Exhibit 2.11**

**Product Cost Components—Jackson Gears**

|  |
| --- |
| **Direct materials = SR 8** |

|  |
| --- |
| **Variable**  **Manufacturing Cost** |

|  |
| --- |
| **Direct labor = SR 7** |

|  |
| --- |
| **Full absorption cost per**  **unit = SR 29** |

|  |
| --- |
| **Variable manufacturing**  **overhead = SR 8** |

|  |
| --- |
| **Unit variable**  **cost = SR 27** |

|  |
| --- |
| **Fixed manufacturing**  **overhead = SR 6**  **(= SR 12,000 / 2,000 units)** |

|  |
| --- |
| **Full cost per**  **unit = SR 40** |

|  |
| --- |
| **Variable marketing and administrative costs = SR 4** |

|  |
| --- |
| **Variable marketing and**  **administrative**  **costs = SR 4** |

|  |
| --- |
| **Fixed marketing and**  **administrative costs = SR 7**  **(= SR 14,000 / 2,000 units)** |

Exhibit 2.11 also includes unit fixed costs. The unit fixed costs are valid only at one volume—2,000 units (of this gear) per year—for Jackson Gears. By definition, total fixed costs do not change as volume changes (within the relevant range, of course). Therefore, a change in volume results in a change in the unit fixed cost. Full cost- Sum of all costs of manufacturing and selling a unit of product (includes both fixed and variable costs).

Full absorption cost- All variable and fixed manufacturing costs; used to compute a product’s inventory value under GAAP.

**Q.35.** What do you mean by full absorption cost?

**Ans.35.** Full absorption cost- All variable and fixed manufacturing costs; used to compute a product’s inventory value under GAAP.

**Q.36.** What do you mean by full cost?

**Ans.36.** Full cost- Sum of all costs of manufacturing and selling a unit of product (includes both fixed and variable costs).