ESERCIZI

1 USING REGRESSION TO CALCULATE FIXED COST, CALCULATE THE VARIABLE RATE, CONSTRUCT A COST FORMULA AND DETERMINE BUDGETED COST

Refer to the Pizza Vesuvio company information in **Cornerstone Exercise 14-16.**

Coefficients shown by a regression program for this data are:

Intercept	1,145
X Variable	13.82

Required:

Use the results of regression to make the following calculations:

1. Calculate the fixed cost of labor and the variable rate per employee hour.
2. Construct the cost formula for total labor cost.
3. Calculate the budgeted cost for next month, assuming that 675 employee hours are budgeted. Round answers to the nearest dollar.

2 COST BEHAVIOR

Refer to the Alisha Incorporated information in **Exercise 14-23**.

However, now assume that Alisha produced 80,000 thermometers (rather than 150,000). Round all answers to two decimal places.

Required:

1. What is the total maintenance cost incurred by Alisha last year?
2. What is the total fixed maintenance cost incurred by Alisha last year?
3. What is the total variable maintenance cost incurred by Alisha last year?
4. What is the maintenance cost per unit produced?
5. What is the fixed maintenance cost per unit?
6. What is the variable maintenance cost per unit?

3 METHOD OF LEAST SQUARES

Refer to the Luisa Crimini company information in **Exercise 14-28**.

Required:

1. Compute the cost formula for tanning services using the results from the method of least squares.
2. Using the formula computed in Requirement 1, what is the predicted cost of tanning services for September for 2,500 appointments?

4 CHANGING THE COST FORMULA FOR A MONTH TO THE COST FORMULA FOR A YEAR

Refer to the Fly High Airlines company information in **Exercise 14-31**.

Required:

1. Develop annual cost formulas for airplane depreciation, fuel, and airplane maintenance.
2. Using the three annual cost formulas that you developed, predict the cost of each resource in a year with

480,000 airline flight hours.

5 METHOD OF LEAST SQUARES, DEVELOPING AND USING THE COST FORMULA

The method of least squares was used to develop a cost equation to predict the cost of receiving. Ninety-six data points from monthly data were used for the regression. The following computer output was received:

Intercept	23,100
Slope	316

The driver used was number of parts inspected.

Required:

1. What is the cost formula?
2. Using the cost formula from Requirement 1, identify each of the following: inde pendent variable, dependent variable, variable rate, and fixed cost per month.
3. Using the cost formula, predict the cost of parts inspection for a month in which 2,500 parts are inspected.

6 METHOD OF LEAST SQUARES, BUDGETED TIME PERIOD IS DIFFERENT FROM TIME PERIOD USED TO GENERATE RESULTS

Refer to the company information in **Exercise 14-33.**

Required:

1. What is the cost formula for a year?
2. Using the cost formula from Requirement 1, predict the cost of parts inspection for a year in which 29,000 parts are inspected.

7 IDENTIFYING THE PARTS OF THE COST FORMULA; CALCULATING MONTHLY, QUARTERLY, AND YEARLY COSTS USING A COST FORMULA BASED ON MONTHLY DATA

Gordon Company's controller, Eric Junior, estimated the following formula, based on monthly data, for overhead cost:

Overhead Cost = $109,743 + ($80.75 x Direct Labor Hours)

Required:

1. Link each term in column A to the corresponding term in column B.

ColumnA Column B

Overhead cost Variable rate (slope) $109,743 Independent variable $80.75
Fixed cost (intercept) Direct labor hours Dependent variable

2. If next month's budgeted direct labor hours equal 5,000, what is the budgeted over head cost?
3. If next quarter's budgeted direct labor hours equal 18,000, what is the budgeted overhead cost?

8 IDENTIFYING FIXED, VARIABLE, MIXED, AND STEP COSTS

Consider each of the following independent situations:

a. A computer service agreement in which a company pays $150 per month and $15 per hour of technical time.
b. Fuel cost of the company's fleet of motor vehicles.
c. The cost of beer for a bar.
d. The cost of computer of computer printers and copiers in your college.
e. Rent for a dental office.
f . The salary of a receptionist in a law firm.
g. The wages of counter help in a fast-food restaurant.
h. The salaries of dental hygienists in a three-dentist office. One hygienist can take care of 120 cleanings per month.
i. Electricity cost, which includes a $15 per month billing charge and an additional amount depending on the number of kilowatt-hours used.

Required:

1. For each situation, describe the cost as one of the following: fixed cost, variable cost, mixed cost, or step cost. *(Hint:* First, consider what the driver or output measure is. If additional assumptions are necessary to support your cost type decision, be sure to write them down.)

Example: Raw materials used in production—Variable cost

2. Change your assumption(s) for each situation so that the cost type changes to a different cost type. List the new cost type and the changed assumption(s) that gave rise to it.

Example: Raw materials used in production. Changed assumption—the materials are difficult to obtain, and a year's worth must be contracted for in advance. Now, this is a fixed cost. (This is the case with diamond sales by DeBeers Inc. to its sightholders. See the following website for information: http://www.keyguide .net/sightholders/.)

9 IDENTIFYING USE OF THE HIGH-LOW, SCATTERGRAPH, AND LEAST SQUARES METHODS

Consider each of the following independent situations:

a. Shaniqua Boyer just started her new job as controller for St. Matthias General Hos pital. She wants to get a feel for the cost behavior of various departments of the hos pital. Shaniqua first looks at the radiology department. She has annual data on total cost and the number of procedures that have been run for the past 15 years. How ever, she knows that the department upgraded its equipment substantially two years ago and is doing a wider variety of tests. So, Shaniqua decides to use data for just the past two years.

b. Francis Hidalgo is a summer intern in the accounting department of a manufactur ing firm. His boss assigned him a special project to determine the cost of manufac turing a special order. Francis needs information on variable and fixed overhead, so he gathers monthly data on overhead cost and machine hours for the past 60 months and enters them into his personal computer. A few keystrokes later, he has information on fixed and variable overhead costs.
c. Ron Wickstead sighed and studied his computer printout again. The results made no sense to him. He seemed to recall that sometimes it helped to visualize the cost relationships. He reached for some graph paper and a pencil.
d. Lois March had hoped that she could find information on the actual cost of promot ing new products. Unfortunately, she had spent the weekend going through the files and was only able to find data on the total cost of the sales department by month for the past three years. She was also able to figure out the number of new product

launches by month for the same time period. Now, she had just 15 minutes before a staff meeting in which she needed to give the vice president of sales an expected cost of the average new product launch. A light bulb went off in her head, and she reached for paper, pencil, and a calculator.

Required:

Determine which of the following cost separation methods is being used: the high-low method, the scattergraph method, or the method of least squares.

SOLUZIONI

Esercizio 1

1 The fixed cost and the variable rate are given directly by regression.

Fixed cost = $ 1,145

Variable rate = $13.82

2. The cost formula is:

Total labor cost = $1,145 + ($13.82 × employee hours)

3. Budgeted labor cost = $1,145 + ($13.82 × 675) = $10,474

Exercizio 2

1. Total maintenance cost = $310,000 + ($18.50 × 80,000) = $1,790,000

2. Total fixed maintenance cost = $310,000

3. Total variable maintenance cost = $18.50(80,000) = $1,480,000

4. Total maintenance cost per unit

$$= \frac{\$310,000 + (\$18.50 \times 80,000)}{80,000}$$

$$= \frac{\$1,790,000}{80,000}$$

= $22.38

5. Fixed maintenance cost per unit = $\frac{\$310,000}{80,000}$ **= $3.88**

6. Variable maintenance cost per unit = $18.50

Esercizio 3

1. Total cost of tanning services = $1,290 + ($0.45 × Number of appointments)

2. Total predicted cost for September = $1,290 + ($0.45 × 2,500) = $2,415

Esercizio 4

1. **Total annual cost of airplane depreciation = 12($18,000,000)**
   = $216,000,000

   Total annual cost of fuel = $10,134 × Annual number of airplane flight hours

   Total annual cost of airplane maintenance = 12($4,000,000) + ($10,134 × Number of airplane flight hours)

   NOTE: Fixed and variable costs, based on monthly data, are computed in Exercise 14–31.

2. **Total annual cost of airplane depreciation = 12($18,000,000)**
   = $216,000,000

   Total annual cost of fuel = $10,134(480,000) = $4,864,320,000

   Total annual cost of airplane maintenance = 12($4,000,000) + ($268 × 480,000) = $176,640,000

Esercizio 5

1. **Total cost of receiving = $23,100 + ($316 × Number of parts inspected)**

2. **Independent variable—number of parts inspected**

   Dependent variable—total cost of receiving

   Variable rate—$316 per part inspected

   Fixed cost per month—$23,100

3. **Total cost of receiving = $23,100 + ($316 × 2,500) = $813,100**

Esercizio 6

1. **Total annual cost of receiving**

   = 12($23,100) + ($316 × Number of parts inspected in a year)
   = $277,200 + ($316 × Number of parts inspected in a year)

   NOTE: Fixed and variable costs, based on monthly data, are computed in Exercise 14–33.

2. **Total annual cost of receiving = $277,200 + ($316 × 29,000) = $9,441,200**

Esercizio 7

1. | | |
   |---|---|
   | **Overhead cost** | **Dependent variable** |
   | **$109,743** | **Fixed cost (intercept)** |
   | **$80.75** | **Variable rate (slope)** |
   | **Direct labor hours** | **Independent variable** |

2. Next month's budgeted overhead cost = $109,743 + ($80.75 × 5,000)
= $513,493

3. Next quarter's budgeted overhead cost = (3 × $109,743) + ($80.75 × 18,000)
= $329,229 + $1,453,500
= $1,782,729

4. Next year's budgeted overhead cost = (12 × $109,743) + ($80.75 × 58,000)
= $1,316,916 + $4,683,500
= $6,000,416

Esercizio 8

1.
- **a. Mixed cost**
- **b. Variable cost**
- **c. Variable cost**
- **d. Step cost with narrow steps**
- **e. Fixed cost**
- **f. Fixed cost**
- **g. Variable cost (assumes counter help can be called in or sent back home as the need arises)**
- **h. Step cost**
- **i. Mixed cost**

2.
- **a. While the contract stays the same ($150 per month plus $15 per hour of technical time), the company's need for computer technical help is so stable that the same number of hours are required each month. Now, the cost is essentially fixed.**
- **b. The company drives the vehicles on identical trips each month. Thus, the mileage and type of trip (highway versus in town) never vary. Now, the cost is essentially fixed.**
- **c. If beer is purchased in advance each day, in barrels to be tapped at night, and the leftover beer is poured down the drain at the close of business each day, the cost would be a step cost.**
- **d. The college may use so much paper that it considers the cost as essentially variable.**
- **e. Suppose that the dental office is located in a large shopping mall that charges rent based on the level of sales. Rent would be variable.**
- **f. If the law office expanded and an additional, temporary receptionist was hired on days with a heavy volume of appointments, the cost would be variable.**
- **g. If the individuals working behind the counter are assured that their complete shift would be worked once they arrive, the cost would be a step cost (assumes more counter help could be called in if demand rose).**
- **h. If the hygienists were paid based on number of patients seen, the cost would be variable.**

i. **If a company decided that the fixed amount of $15 per month was very small relative to the total electrical bill (e.g., $500 per month), then the cost could be viewed as variable.**

Esercizio 10

a. **This must be the high-low method because she has only two data points (one for each year).**

b. **This is the method of least squares done on a personal computer. While it is possible to use a personal computer to do the other methods, it is unlikely that Francis would have gone to all the trouble of entering 60 months of data simply to use the high-low method.**

c. **Ron is making a scattergraph.**

d. **In all probability, Lois is using the high-low method. She can do this quickly and get some rough results in time for her meeting.**