

ANALYSIS OF MIXED COSTS

HIGH-LOW METHOD

EXAMPLE: Kohlson Company has incurred the following shipping costs over the past eight months:

| Units Sold | Shipping Cost |
|--------------|------------------|
| January | 6,000 \$66,000 |
| February... | 5,000 \$65,000 |
| March..... | 7,000 \$70,000 |
| April | 9,000 \$80,000 |
| May..... | 8,000 \$76,000 |
| June..... | 10,000 \$85,000 |
| July | 12,000 \$100,000 |
| August..... | 11,000 \$87,000 |

With the high-low method, only the periods in which the lowest activity and the highest activity occurred are used to estimate the variable and fixed components of the mixed cost.

| | | |
|--------------------------------|--------|-----------|
| High activity level, July..... | 12,000 | \$100,000 |
| Low activity level, February | 5,000 | 65,000 |
| Change..... | 7,000 | \$ 35,000 |

Change in cost \$35,000/Change in activity 7,000=units Variable cost
= \$5 per unit

Fixed cost = Total cost - Variable cost element
= \$100,000 - (12,000 units × \$5 per unit)
= \$40,000

The cost formula for shipping cost is:

$$Y = \$40,000 + \$5X$$

LEAST-SQUARES REGRESSION (cont'd)

Example: Montrose Hospital operates a cafeteria for employees. Management would like to know how cafeteria costs are affected by the number of meals served.

| | Meals Served X | Total Cost Y |
|--------------|----------------------|--------------------|
| April | 4,000 | \$9,500 |
| May..... | 1,000 | \$4,000 |
| June..... | 3,000 | \$8,000 |
| July..... | 5,000 | \$10,000 |
| August | 10,000 | \$19,500 |
| September.. | 7,000 | \$14,000 |

Statistical software or a spreadsheet program can do the computations required by the least-squares method.

The results in this case are:

Intercept (fixed cost) \$2,433

Slope (variable cost)..... \$1.68

R²..... 0.99

The fixed cost is therefore \$2,433 per month and the variable cost is \$1.68 per meal served, or:

$$Y = \$2,433 + \$1.68X,$$

where X is meals served.

R² is a measure of the goodness of fit of the regression line. In this case, it indicates that 99% of the variation in cafeteria costs is due to the number of meals served. This suggests a very good fit.