

Problem:

The *Income Statement* of a particular Company is given for *Year 2004*. It has *Values of Sales, Costs (not categorized into Variable and Fixed Costs) and Profit for each Month* of the Year 2004. The *Question is determining the Level of Fixed and Variable Costs* in 2004 *as a Function of Sales*. You should *High-Low Method*. Please produce a write-up on this topic.

SOLUTION:

Given That:

- 1. Income Statement for Year 2004**
- 2. Monthly Values of Sales, Costs and Profit.**

[Note:

- 1. Costs data not classified into Variable and Fixed Cost element.*
- 2. The numerical data on Monthly - Sales, Costs and Profits are not attached.]*

To Find: Generalized (Conceptual & Theoretical) idea in determining Monthly Level of Fixed and Variable Costs as a Function of Sales for the year 2004 by use of Account Analysis or High-Low Method (preferably HLM).

HIGH LOW METHOD

CONCEPT

Cost structure of any Organisation shows the relative proportion of its fixed, variable, and mixed costs. Total / Mixed cost otherwise also known as a Semi-Variable Cost contains both variable and fixed cost elements. While Fixed Cost remains Constant for all volumes within a given capacity, Mixed Cost varies with changes in Volume but, unlike a Variable cost, it does not vary in direct proportion.

Examples are the rental of a delivery truck, where a fixed rental fee plus a variable charge based on mileage is made; and power costs, where the expense consists of a fixed amount plus a variable charge based on consumption. A further example is a total factory overhead, which is a mixture of fixed overhead and variable overhead

Usually during Planning, Controlling and Decision-Making, there arises necessity to segregate Mixed Costs into their Variable and Fixed Components. But when such categorization is not or not so easily possible, then by using High-Low Method an attempt is made to separate such Mixed Cost into its Fixed and Variable costs elements by analysing the change in Cost between the High and Low Levels of Activity.

DEFINITION

High-Low Method (HLM) is an algebraic procedure that estimates the Constant (fixed cost element) and Slope (variable rate per unit of X) of an Equation by using only the highest and lowest pairs of the sample data. As Mixed Cost necessarily includes elements of both fixed and variable cost, the HLM analysis takes the mathematical form of the linear equation $Y = a + bX$, (similar to Least Square Method, also called as Cost Formula). A formula relating Cost to Activity.

What is an Activity? For example, the total cost of X-ray film in a hospital will increase as the number of X - rays taken increase. Here, the number of X rays taken is an “Activity” base for explaining the total cost of X-ray film.

EQUATION

$Y = a + bX$; where

- Y is the Mixed/Semi-Variable Cost to be separated into its Fixed and Variable element. A dependant variable that reacts or responds to some controlling factor, i.e., ‘Y’ is the estimated value of a cost item for any specified value of ‘X’ (activity).
- X is any given measure of activity such as Direct Labour Hours, Machine Hours, Production or Sales. A variable that acts as a controlling factor.
- a is the estimated Total Fixed Costs component.
- b is the estimated variable cost rate per unit of ‘X’.

It is otherwise called as Cost Function or Cost Volume Formula.

EXAMPLES

For example, the cost-volume formula for factory overhead is $Y = \$200 + \$10X$ where

- Y = estimated factory overhead and
- X = Direct Labour-hours,

Which means that the Factory Overhead is estimated to be \$200 Fixed, plus \$10 per hour of Direct labour.

- Another example, if at the highest volume of processing items there were 10,000 items processed at a total cost of \$35,000 and at the lowest volume there were 6,000 items processed at a total cost of \$27,000, the high-low method indicates the variable rate was \$2 per unit. $(\$35,000 - \$27,000) \div (10,000 - 6,000)$. The fixed amount will be \$15,000 $[\$27,000 - \$2(6,000)]$.

COMPUTATION

The HLM is explained step by step as follows:

Step 1:

Select the highest and lowest pair. In other words, select the activity with the highest and lowest amounts. Also, select the costs adjacent to those activities (Sales, Production, Direct Labour Hours, Machine Hours and Mileage etc may be the activities).

Note: The cost amounts adjacent to these activity levels will be used, even though these cost amounts are not the highest and lowest 'costs.' Activity level rules.

Step 2:

Determine the slope. In other words, compute 'b' the variable cost per unit using formula:

Variable rate = Difference in Cost 'Y' / Difference in activity 'X'

Note: The activity levels and costs used are those of the two pairs, say for months chosen in step 1.

Step 3:

Plug the variable cost from step 2 and the activity and total cost from either the high or the low point into the total cost equation, to solve for fixed costs

Total Mixed Cost = Variable Cost + Fixed Cost

Fixed Cost = Total Mixed Cost – Variable Cost

(given) (variable rate \times **X**)

Total Mixed Cost =	Variable Cost	+ Fixed Cost
Total Mixed Cost =	Variable rate * 'X'	+ Fixed Cost

So, Total Cost Equation is then:

TOTAL COST = Variable Rate \times **X** + FIXED COST

SUMMARY

To be precise, **HLM** is a technique used to determine the variable rate (slope of a total cost line) of an independent variable and the fixed amount by using just two points: the highest point and the lowest point

As the name indicates, uses two extreme data points to determine the values of **a** (the fixed cost portion) and **b** (the variable rate) in the in the Cost – Volume Formula $Y = a + bX$. The extreme data points are the highest and lowest x - y pairs.

Cost accounting formula used for Cost Prediction and Flexible Budgeting purposes.