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LINKING COST-VOLUME-PROFIT ANALYSIS WITH GOAL VALUE ANALYSIS IN THE CURRICULUM USING SPREADSHEET APPLICATIONS

Lea R. Dopson

ABSTRACT

This paper is designed to demonstrate successful innovations in education, namely, combining a managerial accounting concept with a menu analysis concept using spreadsheet applications.

Goal Value Analysis

Goal Value (GV) analysis was introduced by Hayes and Huffman (1985) and then ten years later, at the height of what was known as the "Value Pricing" debate (Hayes & Huffman, 1995). GV analysis evaluates each menu item's food cost percentage, contribution margin, popularity, non-food variable costs (e.g., variable labor costs), and selling price. The formula for GV analysis is A × B × C × D = Goal Value, where

A = (1 – food cost percentage). This represents the gross profit of the item (Miller & avesic,1997). In other menu analysis methods, 1 – food cost percentage represents the menu item's contribution margin. In GV analysis, item contribution margin is represented in the last variable (D).

B = Number of covers/item. This represents the popularity of the item.

C = Selling price. This represents the market value of the item.

D = 1 – (food cost percentage + variable cost percentage). This represents the contribution margin of the item (including non-food variable costs).

The GV formula is used to create a specific GV for the entire menu, and then used to compute the GV of each individual menu item. The GV is based on specific goals identified for the foodservice operation. It is based on *desired* food cost percentage, *desired* average number of covers, *desired* check average, and *desired* variable costs. Menu items that achieve GVs higher than that of the overall menu GV will contribute greater than average profit percentages (Miller, Hayes, & Dopson, 2002).

Cost-Volume-Profit Analysis

A cost-volume-profit (CVP) analysis predicts the sales dollars and volume required to achieve desired profit (or break-even) based on known costs. CVP calculations can be done either on the dollar sales volume required to break even or achieve the desired profit, or on the basis of the number of guests (covers) required. The income statement can be converted to a contribution margin income statement by showing items in terms of the following:

(Sales – Variable Costs = Contribution Margin) – Fixed Costs = Profit

The sales to achieve break-even or desired profit in terms of dollars or units are calculated as follows:

$$\frac{\text{Fixed costs}}{\text{Contribution margin (per unit or \%)}} = \text{Break-even point (in guests served or dollars)}$$

$$\frac{\text{Fixed costs + before-tax profit}}{\text{Contribution margin (per unit or \%)}} = \text{Sales to achieve desired after tax profit (in guests served or dollars)}$$

Since desired sales levels are calculated based on selling price, fixed costs, variable costs, and contribution margin, changes in menu item selling prices and costs can be made to improve the operation's ability to break-even and achieve desired profit levels. This is where menu analysis concepts come into play (Miller, Hayes, & Dopson, 2002).

Linking CVP Analysis with Goal Value Analysis

CVP analysis is used to establish targets for the entire operation, whereas GV analysis evaluates individual menu items against those operational targets. GV analysis is based on the operational goals in terms of food cost, other variable costs, selling price, and number of covers. If, for example, the CVP analysis suggests that covers needed to generate desired profits will not likely be achieved, costs should be evaluated. If food and labor costs are reduced to generate a more reasonable sales figure in CVP by increasing contribution margin, then those changes affect the desired food and variable (labor) costs in GV analysis. In addition, desired selling price (check average) and number of covers in GV analysis should be set based on results in CVP analysis. Therefore, the two analyses can be strategically linked.

Spreadsheet Applications

In order to effectively teach the linkage between CVP analysis and GV analysis, the author has developed spreadsheet applications that combine the two analyses. An example of one of these spreadsheets can be seen on page 80. It was developed using the spreadsheet applications illustrated in the *Instructor's Manual to Accompany Food and Beverage Cost Control*, 2nd ed. (Miller, Hayes, & Dopson, 2002). Specifically, the spreadsheet contains a CVP analysis calculating sales to achieve break-even and desired profit. The data is then summarized in a contribution margin (CM) income statement so that students can see the breakdown of revenues, variable costs, contribution margin, fixed costs, and profit. The CM income statement is directly referenced to the CVP analysis. Then, the information obtained from the CVP analysis and the CM income statement is linked to the GV analysis to set targets for food cost percentage, number of covers, selling price (check average), and variable cost percentage. Specifically, the links are as follows:

CVP analysis	GV analysis
Food cost % from CM income statement	Food cost % goal
Guests served to achieve desired AT profit/30	Total average number of covers per night goal
Selling price	Selling price goal
Labor and other variable cost % from CM income statement	Variable cost % goal

The spreadsheet is set up so that any of the above numbers changed in the CVP analysis will automatically change in the GV analysis. In this way, students learn how the overall goals of the operation affect menu item profitability. Conversely, they can see how changes they make to menu items affect the overall profitability of the operation.

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SPREADSHEET APPLICATION EXAMPLE

Mexican Restaurant - 250 seats, average 2/12 turns per night

	Per Unit (Guest)	Percentage			
SP	$15.00	100%			
VC	9.00	60%			
CM	6.00	40%			
CVP Analysis					
Fixed costs	$90,000.00				
Desired after tax profit	$12,000.00				
Tax rate	40%				
Before tax profit	$20,000.00				
Break-even point in guests served	15,000.0	Rounded up =	15,000		
Break-even point in sales dollars	$225,000.00				
Guests served to achieve desired AT profit	18,333.3	Rounded up =	18,334		
Sales dollars to achieve desired AT profit	$275,010.00				

CM Income Statement for June					
Units Sold	18,334				
Revenues	$275,010.00	100.00%			
Food Cost	$88,003.20	32.00%			
Labor & Other VC	$77,002.80	28.00%			
Total Variable Costs	$165,006.00	60.00%			
Contribution Margin	$110,004.00	40.00%			
Fixed Costs	$90,000.00				
Before-Tax Profit	$20,004.00	7.27%			
Taxes	$8,001.60				
After-Tax Profit	$12,002.40	4.36%			

Total average number of covers / night	611	Average number of covers / item		87	
Goal Value Analysis Data					
Item	Food Cost % (in decimal form)	Number Sold	Selling Price	Variable Cost % (in decimal form)	
Fajita Plate	38%	86	$18.13	28%	
Grande Dinner	35%	116	$17.41	28%	
Menudo	25%	48	$12.16	28%	
Mexican Salad	24%	75	$13.91	28%	
Burrito Dinner	28%	73	$15.66	28%	
Chimichanga Dinner	33%	97	$17.41	28%	
Enchilada Dinner	26%	131	$10.41	28%	
Overall Menu (Goal Value)	32%	87	$15.00	28%	

Goal Value Analysis Results					
Item	Food Cost % (in decimal form)	Number Sold	Selling Price	Variable Cost % (in decimal form)	Goal Value
Grande Dinner	35%	116	$17.41	28%	485.7
Enchilada Dinner	26%	131	$10.41	28%	464.2
Chimichanga Dinner	33%	97	$17.41	28%	441.3
Mexican Salad	24%	75	$13.91	28%	380.6
Burrito Dinner	28%	73	$15.66	28%	362.2
Overall Menu (Goal Value)	32%	87	$15.00	28%	355.0
Fajita Plate	38%	86	$18.13	28%	328.7
Menudo	25%	48	$12.16	28%	205.7

Changes Made to Fajita Plate					
Item	Food Cost % (in decimal form)	Number Sold	Selling Price	Variable Cost % (in decimal form)	Goal Value
Fajita Plate	39%	90	$19.95	28%	361.4