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Use of Cost-Volume-Profit Analysis Technique in Customer Profitability Analysis and Model Suggestion for Businesses

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Extensive Summary

1. Introduction

After 1940's, the main objective for the companies was to feature the product quality. But with the development of service industry within the last 30 years, total quality management accepted that the main determiner for the product quality is the customer. Companies now aiming to raise customer satisfaction by determining valuable customers and by leaving the produce-sell-release policy. Hence, the sustainability of going concern principle lies underneath this necessity. It is a must that for the companies to sustain their lives within the high competitive environment, they have to classify their customers and make customer profitability analysis.

Previous studies show that big sized customers(BSC) are more costly and less profitable against the small and medium sized customers. BSC have sometimes daring offers from the company and in order to fulfill the orders, the company incur more costs and sometimes bankrupt. By examining customer profitability by cost-volume-profit analysis, solves the problems between the company and the customer, make way for healthy decisions for the customer and to reject the customer.

According to Söderlund and Vilgon(1999); customer profitability is a variable, resulting from income retrieved from the customer in a specific time less the costs incurred by that customer.

According to Christopher et al. (2008); the differenciation of customer profitability is a natural process. Each customer purchases the goods needed so different customers have different product mix.

According to Gill (2015); companies form unit costs in a volume base. Management can reform volume based data into activity based data. This reformation can cause cost-volume-profit analysis on activity base.

It is necessary to apply the cost-volume-profit analysis on the basis of the product mix generated by each customer's purchasing preference. By installing the customer based accounting system, more meaningful results will come out against product profitability.

2. Method

The research question is, "Do all the customers of a company have the same profitability?" Tied to the research question, it is aimed to model a system to enable determining the profitability of customers, segmentation of customers and the giving the decisions of improving and leaving by the help of cost-volume-profit analysis.

Simulation model is used in this study. By focusing on processes forming social realities / mechanisms / behaviors, simulation in social studies aims to fill the gap between descriptive approach and official approach in science. To identify the differences between business profitability and monitor the cost behavior by using artificial data a model is formed by using customer based simulation (Li, Mao, Zeng, Wang, 2008:401).

3. Findings

In this study, under the title of findings, both product based approach and customer based approach are explained.

3.1. Cost Volume Profit Analysis

Cost-volume-profit analysis is the key for understanding the cost behavior. Managers use cost-volume-profit analysis to drive their decisions and they are all strategic.

One should remember that customer is the basis for business operations. Either customer demands the needs and pull the goods from the company or the company discover the needs and pushes the goods to the customer. Companies measures the profitability of the products by calculating the cost of the goods sold when determining the total profitability. This leads the company to evaluate the profitable and non-profitable customers together. The investments made for non-profitable customers, decreases profitability and the efficiency of the company by increasing the costs. At this point, it becomes more important to measure the profitability of the customers. This is the starting point for identifying the research question for this study. In this study, firstly, multi-product based cost-volume-profit analysis and later customer-based cost-volume-profit analysis are examined.

3.2. Product-Based Analysis

Generally, cost-volume-profit analysis aims to identify the current profitability according to the sales of one or more products/services or figure out the sales quantity and total sales of a company in order to be profitable.

KFB Co. has a product mix of four products and sells this mix to 10 different customers. KFB Co. has two product mixes of which "standard" and "new" and the mixes are being analysed by both product based cost-volume-profit analysis and customer based cost-volume-profit analysis. Table 1 shows the profitability of standard product mix:

Table 1. KFB's Standard Product Mix Performance

Products	A	B	C	D	Total
Sales	105.00	25.00	55.00	65.00	250.00
(-) Variable Costs	-73.50	-7.50	-27.50	-39.00	-147.50
Contribution Margin	**31.50**	**17.50**	**27.50**	**26.00**	**102.50**
(-) Fixed Costs	-12.50	-30.00	-22.50	-15.00	-80.00
Profit, Loss or Break-Even	**+19.00**	**-12.50**	**+5.00**	**+11.00**	**+22.50**
Contribution Rate	30%	70%	50%	40%	

In order to overcome the loss for the product B, KFM Co. has made some decisions and forms a new product mix. Table 2, shows the latter situation.

Table 2. KFB's NewProduct Mix Performance

Products	A	B	C	D	Total
Sales	67.50	72.50	60.00	50.00	250.00
(-) Variable Costs	-47.25	-21.75	-30.00	-30.00	-129.00
Contribution Margin	**20.25**	**50.75**	**30.00**	**20.00**	**121.00**
(-) Fixed Costs	-12.50	-40.00	-24.00	-13.50	-90.00
P / L / Break-Even	**+7.75**	**+10.75**	**+6.00**	**+6.50**	**+31.00**
Contribution Rate	30%	70%	50%	40%	

Diagram 1, shows the weighted contribution margin break-even analysis for the standard and new product mixes.

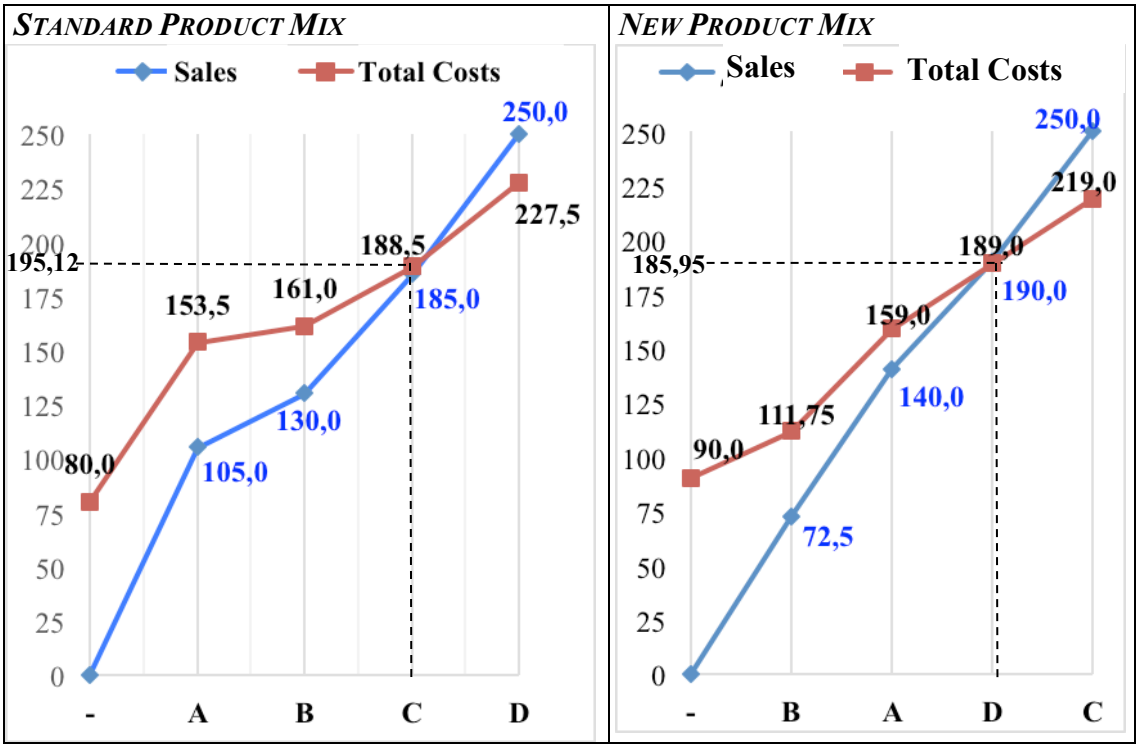

Diagram 1. KFB's Breakeven Point Charts on Product Mix

If the fixed costs can be distributed among the products, the fixed cost of the product will be equal to

As the fixed costs are allocated to the products evenly, the fixed cost of the products will be equal to the contribution margin. This enables to calculate breakeven point according to the contribution margin. Table below, shows this situation.

Table 3. Loading Fixed Costs into Products Calculation of CVP

Standard Product Mix	A	B	C	D	Total
(-) Fixed Costs	-12.50	-30.00	-22.50	-15.00	-80.00
(=) Contribution Margin	12.50	30.00	22.50	15.00	80.00
(x) Contribution Rate	%30	%70	%50	%40	
(÷)Breakeven Point of Sales	**41.67**	**42.86**	**45.00**	**37.50**	**167.02**
(÷) Sale Price	0.75	0.25	0.5	0.1	
(=) Break-Even Unit	**55.6**	**171.4**	**90.0**	**375.0**	

New Product Mix	A	B	C	D	Total
(-) Fixed Costs	-12.50	-40.00	-24.00	-13.50	-90.00
(=) Contribution Margin	12.50	40.00	24.00	13.50	90.00
(x) Contribution Rate	%30	%70	%50	%40	
(÷) Break-Even Point of Sales	**41.67**	**57.14**	**48.00**	**33.75**	**180.56**
(÷) Sale Price	0.75	0.25	0.50.	0.10	
(=) Break-Even Unit	**55.6**	**228.6**	**96.0**	**337.5**	

3.3. Customer-Based CVP Analysis

Businesses need to clearly define the value of the customer they want to offer for their chosen customer segments and then focus on finding ways to deliver that value at the most cost. By doing cost-volume-profit analysis on the basis of the customer, it is possible to obtain the ignored information in the product based cost-volume-profit analysis. In particular, the values of customer lifetime value, RFM, and customer value can be used as the distribution key when distributing indirect fixed costs to customers. The results of the customer-based cost-volume-profit analysis analysis of the standard product mix of KFB operation under various assumptions are shown in Table 4:

Table 4. Customer Based CVP Analysis of KFB's Standard Product Mix

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	TOPLAM
SALES	7.50	12.00	10.00	17.00	76.00	13.00	12.00	28.50	25.00	49.00	**250.00**
TOTAL COSTS	-9.25	-16.41	-11.53	-16.19	-60.29	-16.45	-14.83	-24.15	-20.83	-37.56	**-227.50**
P/L/BREAK-EVEN	**-1.75**	**-4.41**	**-1.53**	**+0.81**	**+15.71**	**-3.45**	**-2.83**	**+4.35**	**+4.17**	**+11.44**	**+22.50**
A	-0.26	-0.69			+8.53			+3.95		+7.48	**+19.00**
B	-1.35	-3.72	-1.35		-0.65	-3.39	-2.03				**-12.50**
C	+0.11		-1.06	+1.45	+2.49		-0.80	+0.40	+2.41		**+5.00**
D	-0.24		+0.88	-0.64	+5.34	-0.06			+1.76	+3.96	**+11.00**

The customer-based MLC analysis results of the KFB operation's new product mix are as shown in Table 5:

Table 5. Customer Based CVP Analysis of KFB's New Product Mix

	M1	M2	M3	M4	M5	M6	M7	M8	M9	M10	TOTAL
SALES REVENUE	7.50	12.00	10.00	17.00	76.00	13.00	12.00	28.50	25.00	49.00	**250.00**
TOTAL COSTS	-8.47	-15.52	-10.17	-17.16	-56.51	-14.29	-13.68	-25.71	-20.52	-36.97	**-219.00**
P/L/BREAKEVEN	**-0.97**	**-3.52**	**-0.17**	**-0.16**	**+19.49**	**-1.29**	**-1.68**	**+2.79**	**+4.48**	**+12.03**	**+31.00**
A		-2.78			+5.35			+3.22		+1.96	**+7.75**
B	-0.36	-1.36	+0.26	-1.12	+9.37	-1.23	-0.61	-1.06		+6.86	**+10.75**
C	-0.18	+0.62	-1.01	+1.86	+1.07		-1.07	+0.63	+4.09		**+6.00**
D	-0.43		+0.59	-0.90	+3.70	-0.05			+0.39	+3.21	**+6.50**

In the case of the customer doing the customer-based cost-volume-profit analysis, it is revealed that the total profit of the profitable customers is very much from the total profit related to the product. It has been determined that the cause of the difference is due to the loss of unprofitable customers. By conducting customer-based cost-volume-profit analysis; a continuous improvement in sales and discount policies to be made to customers can be achieved. In addition, the management of the manager can be realized with the help of this model by saving the management from the management of the customer.