Break-Even Point Analysis In Micro Enterprise In Palangkaraya

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Abstract

The purpose of this study is to identify Break-Even Point (BEP) and minimum sales which are required by a micro enterprise namely Keripik Kelakai Imur in Palangkaraya to achieve target profit. To find the Break-Even Point and minimum sales, BEP calculation with mathematic formula which is consisted of calculation steps is used. This study is done by interview and direct obeservation toward research object and collecting data which is required. The data were arranged depends on research needs and processed in several steps: calculating total sales in a month, calculating costs in a month, calculating Contribution Margin (CM) and unit contribution margin, Break-Even point analysis using mathematic formula, and decide sales planning using Least Square Method. The finding of the study shows that Keripik Kelakai Imur Palangkaraya reaches Break-Even Point in the amount of units sold of399units and was estimated to have sales revenue of Rp 5,685,428.571 or 568 unitson October 2014.

Keyword: Break-even Point, Micro Enterprise, Sales Planning , Profit planning, Contribution Margin, Least Square Method.

Introduction

Cost-volume-profit (CVP) analysis is one of the most widely used tools in managerial accounting, which serves multiple purposes such as evaluating alternative salesscenarios, budgeting and performance evaluation (Banker et al., 2013).CVP analysis helps managers predict how changes in costs and sales levels affect income (Wild et al., 2013). Practical applications of CVP require accurate cost structureestimates. Information gathered from cost accounting help management in making decisions.

Variable costing considers only variablemanufacturing cost in valuing inventories and determiningthe cost of goods sold. That is, only variable manufacturing costs are considered productcost and are allocated to products manufactured (Lakmal, 2014).This costing technique is used in CVP analysis. Contribution margin is the result of sales revenue minus total variable cost. Then operating income (contribution margin minus fixed expenses) is used in CVP analysis. Variable cost includes all costs that increase as more units are sold whereas fixed cost includes fixed overhead and fixed selling and administrative expenses.

Enyi (2012) noted breakeven analysis as the relationship betweencost, volume and profits at various levels of activity with emphasis on the breakeven point. Onthe other hand, it refers to the breakeven point (BEP) as a point where total money received fromsales is

equal to total money spent to produce the items.In other word BEP is the point of zero profit.

Keripik Kelakai is a favourite snack in Palangkaraya which is made from pakis. Micro Enterprise namely Kripik Kelakai Imur Palangkaraya is located at Jl. Majapahit Palangkaraya (P-IRT No. 5.04.6271.01.0066-18). Started their operation on July 2013, they only sell one product and had sales revenue of 2 until 5 millions per month. They had no idea of how many units should be produce each month to achieved specific target income.

The purpose of this study is to determine the BEP at Kripik Kelakai Imur and minimum sales to achieve specific target income. Contribution of this study for Kripik Kelakai Imur Palangkaraya is for better production and sales planning.

Literature Review
Cost Volume Profit (CVP) Analysis
CVP analysis is an important tool to help managers predict the volume of activity, the costs to be incurred, sales to be made, and profit to be received (Wild et al., 2013).
The CVP relation is based on thestandard model of fixed and variable costs, which implies a linear relation between sales andcosts, and therefore, between sales and income (Banker et al., 2013).

To know how revenues, expenses, and profits behave as volume changes, it is natural to begin by finding the firm's break even point in units sold (Hansen and Mowen, 2007). Gutierrez and Dalsted (2008) stated break-even analysis is a useful tool to study the relationship between fixed costs, variable costs and returns.

Fixed costs, incurred after the decision to enter into a business activity is made, are not directly related to the level of production. Fixed costs include, but are not limited to, depreciation on equipment, interest costs, taxes and general overhead expenses. Total fixed costs are the sum of the fixed costs.

Variable costs change in direct relation to volume of output. They may include cost of goods sold or production expenses such as labor and power costs, feed, fuel, veterinary, irrigation and other expenses directly related to the production of a commodity or investment in a capital asset. Total variable costs (TVC) are the sum of the variable costs for the specified level of production or output. Average variable costs are the variable costs per unit of output or of TVC divided by units of output.

According to Enyi (2012), the breakeven analysisenables abusiness organization to:
1. Measure profits and losses at different levels of activity.
2. Predict the effect of changes in the prices of the products.
3. Analyze the relationship between fixed costs and variable costs.
4. Predict the effect on profitability of changes in cost and efficiency.

Apart from the uses enunciated above, it listed the overriding assumptions of the breakevenanalysis as follows (Enyi, 2012) :
1. It assumes that selling prices are constant no matter the level of output.
2. It assumes that all productions are sold without opening/closing inventories.
3. It assumes that fixed costs remain fixed at all levels of output.
4. It assumes that variable costs per unit remain the same no matter the output level.
5. It can only apply to single product or a single mix of products.

Research Method

Primary data is used based on interview with management Keripik Kelakai Imur Palangkaraya which located at Jalan Majapahit no 5b, Palangkaraya. Data was collected since first month of operation, which was July 2013 including sales revenue, variable costs and fixed costs.

Analytical steps in this research :

1. Classify costs as variable and fixed.
2. *Contribution Margin* (CM) computation.
   Contribution Margin is computed using formula :
   Unit contribution margin = price – variable cost per unit

3. Compute BEP in unit.

$$\frac{Fixed\ expenses}{Unit\ contribution\ margin} = break - even\ point$$

4. Using *Least Square Method* to predict sales in October 2014.

Results

Kripik Kelakai Imur Palangkaraya only sell one product. Break even analysis can be done in this company because the assumptions below are fulfilled :

1. It assumes that selling prices are constant no matter the level of output, which is Rp 10,000.00 per unit.

2. It assumes that all productions are sold without opening/closing inventories.

3. It assumes that fixed costs remain fixed at all levels of output which is Rp 2,000,000.00 per month.Fixed costs consist of salary of 2 employees each Rp 750,000.00 and electricity costs using voucher system Rp 500,000.00 per month

4. It assumes that variable costs per unit remain the same no matter the output level which is Rp 4,985.00 per unit.

5. It can only apply to single product or a single mix of products.

- **Sales Data**

Sales data from the first month of operation (July 2013) until September 2014 follows:

Table 1. Sales Data of Keripik Kelakai Imur Palangkaraya

Month	Sales Revenue		Units Sold
2013			
July	Rp	5,320,000	532
August	Rp	9,170,000	917
September	Rp	5,740,000	574
October	Rp	5,690,000	569
November	Rp	5,230,000	523
December	Rp	5,980,000	598

2014			
January	Rp	2,690,000	269
February	Rp	1,400,000	140
March	Rp	5,610,000	561
April	Rp	7,640,000	764
May	Rp	10,400,000	1,040
June	Rp	11,300,000	1,130
July	Rp	2,640,000	264
August	Rp	4,840,000	484
September	Rp	3,860,000	386

Data source : Keripik Kelakai Imur Palangkaraya

Table 1 shows highest sales revenue was achieved in June (1,130 units) and lowest sales revenue was achieved in February (140 units). Price per unit is Rp 10,000.

- **Costs computation in Keripik Kelakai Imur**

Table 2 shows variable costs and fixed costs data :

Table 2. Variable Costs and Fixed Costs

Month	Variable Costs		Fixed Costs
2013			
July	Rp	3,166,000	Rp 2,000,000
August	Rp	6,931,000	Rp 2,000,000
September	Rp	3,679,000	Rp 2,000,000
October	Rp	2,960,000	Rp 2,000,000
November	Rp	2,551,000	Rp 2,000,000
December	Rp	3,943,000	Rp 2,000,000
2014			
January	Rp	473,000	Rp 2,000,000
February	Rp	1,542,000	Rp 2,000,000
March	Rp	2,388,000	Rp 2,000,000
April	Rp	1,815,000	Rp 2,000,000
May	Rp	5,270,000	Rp 2,000,000
June	Rp	5,365,000	Rp 2,000,000
July	Rp	500,000	Rp 2,000,000
August	Rp	2,315,000	Rp 2,000,000
September	Rp	651,000	Rp 2,000,000

Data source : Keripik Kelakai Imur Palangkaraya

Variable costs consist of raw material costs and fuel (Rp 4,985.00 per unit).

- **Computation of *Contribution margin* and *Contribution margin ratio***

Table 3 shows contribution margin and contribution margin ratio each month.

Table 3. CM and CMR

Month	*Contribution Margin*	*Contribution Margin Ratio*
2013		
July	Rp 2,154,000	40.49%
August	Rp 2,239,000	24.42%
September	Rp 2,061,000	35.91%
October	Rp 2,730,000	47.98%
November	Rp 2,679,000	51.22%
December	Rp 2,037,000	34.06%
2014		
January	Rp 2,217,000	82.42%
February	Rp (142,000)	-10.14%
March	Rp 3,222,000	57.43%
April	Rp 5,825,000	76.24%
May	Rp 5,130,000	49.33%
June	Rp 5,935,000	52.52%
July	Rp 2,140,000	81.06%
August	Rp 2,525,000	52.17%
September	Rp 3,209,000	83.13%

Data source : Keripik Kelakai Imur Palangkaraya

Negative contribution margin are shown in February (Rp 142,000)

- **Break-even point**

Unit contribution margin is Rp 5.015,00 (Rp 10,000.00 – Rp 4,985.00)

$$\frac{Fixed\ expenses}{Unit\ contribution\ margin} = break - even\ point$$

$$\frac{Rp\ 2,000,000.00}{5,015} = 399$$

Break-Even Point (BEP) in unit was 399 units. So the enterprise should sell minimum of 399 units in October.

- **Sales planning in October using Least Square Method**

Sales data from July 2013 until September 2014 (15 months) is used for sales forecast in October. February 2014 is the median data so X = 0 for February 2014.

Table 4. Sales Forecast

LEAST SQUARE				
Month	Y	X	YX	X^2
July	Rp 5,320,000	-7	Rp (37,240,000.00)	49
August	Rp 9,170,000	-6	Rp (55,020,000.00)	36
September	Rp 5,740,000	-5	Rp (28,700,000.00)	25
October	Rp 5,690,000	-4	Rp (22,760,000.00)	16
November	Rp 5,230,000	-3	Rp (15,690,000.00)	9
December	Rp 5,980,000	-2	Rp (11,960,000.00)	4
January	Rp 2,690,000	-1	Rp (2,690,000.00)	1
February	Rp 2,390,000	0	Rp -	0
March	Rp 5,610,000	1	Rp 5,610,000.00	1
April	Rp 7,640,000	2	Rp 15,280,000.00	4
May	Rp 10,400,000	3	Rp 31,200,000.00	9
June	Rp 11,300,000	4	Rp 45,200,000.00	16
July	Rp 2,640,000	5	Rp 13,200,000.00	25
August	Rp 4,840,000	6	Rp 29,040,000.00	36
September	Rp 3,860,000	7	Rp 27,020,000.00	49
Total	Rp 88,500,000.00	0	Rp (7,510,000.00)	280

Data source : Keripik Kelakai Imur Palangkaraya

Variable and fixed components are computed as follows:

$$a = \frac{\sum Y}{n} = \frac{\text{Rp}\quad 88,500,000.00}{15} = \text{Rp } 5,900,000.00$$

$$b = \frac{\sum XY}{\sum x^2} = \frac{\text{Rp}\quad (7,510,000.00)}{280} = (\text{Rp } 26,821.42857)$$

October 2014 was the 8th month so X = 8,

Y = a+bx

Y =Rp 5,900,000.00 + (Rp 26.821.42857) 8

Y = Rp 5,685,428.571 (568 units)

In October it was expected to sell 568 units, but in reality only 480 units were sold (still above BEP units of 399 units).

Closing

Micro enterprise Keripik Kelakai Imur Palangkaraya would achieve BEP if they can sell399 units. From sales forecast using least square method, it was estimated that in October 2014 there would be 568 units sold. In October 2014, Keripik Kelakai Imur Palangkaraya sold 480 units, which were above BEP but below sales forecast. Management of Keripik Kelakai Imur Palangkaraya can use this method to predict sales in preceding months so that they can control their production costs also.

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