

BREAK EVEN POINT ANALYSIS AS A BASIS FOR DETERMINING SALES TARGETS AT ES COKLAT
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ireneagatha@students.usu.ac.id³, iskandar1@usu.ac.id⁴**Abstract**

This study examines the application of Break Even Point (BEP) analysis as a basis for determining sales targets at Es Coklat Panjang Umur, an MSME located in Pajus, Medan. The study uses a descriptive quantitative approach based on one week of sales records and supporting operational information. During the observation period, the business sold 148 units and generated revenue of IDR 1,475,000. Saturday recorded the highest sales volume at 42 units, while Friday recorded the lowest at 9 units. Juice accounted for the largest share of sales, with 116 units. A BEP simulation was conducted using estimated weekly fixed costs of IDR 771,154 and an assumed variable-cost ratio of 55% of revenue. Under these assumptions, the estimated break-even revenue was IDR 1,713,676 per week, equivalent to approximately 172 units. This exceeds the observed weekly sales of 148 units. However, the results are illustrative because complete monetary records of ingredient, packaging, and operating costs were unavailable. Therefore, the estimated BEP should be validated using actual cost data before being used as a basis for setting the business's sales targets.

Keywords: Break even point, sales target, contribution margin, cost volume profit, MSME.

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1. INTRODUCTION

Micro, small, and medium enterprises (MSMEs) contribute to economic activity and provide goods and services for local consumers. For food and beverage businesses, sales may vary from day to day, while production and operating costs must still be managed. Recording sales alone is therefore not sufficient to assess business performance; sales information needs to be considered together with the costs incurred.

Es Coklat Panjang Umur is a beverage MSME operating in Pajus, Medan. Based on the business information available for this study, the business has operated for approximately three years and sells several products, including fruit juices, chocolate-based drinks, healthy drinks, traditional drinks, bottled water, and complementary food products. The available operational description indicates that one employee handles activities such as preparation, production, customer service, recording, and closing.

The one week sales records show 148 units sold and total revenue of Rp1,475,000. Saturday recorded the highest sales volume, at 42 units and Rp420,000 in revenue, whereas Friday recorded the lowest sales volume, at 9 units and Rp90,000. This variation provides a reason to assess sales performance systematically. However, sales volume and revenue by themselves do not indicate whether the business has covered all of its operating costs.

Break Even Point (BEP) analysis can be used to identify the sales level at which total revenue equals total costs. Its calculation requires fixed costs, variable costs, selling prices, and contribution margin. When a business intends to earn a profit, the sales target must also account for the desired profit and will generally exceed the break-even level under the same cost and price conditions. Research on Es Nona Fendi applied BEP, contribution margin, margin of safety, and profit planning to a beverage MSME (Sari et al., 2024). Lutfiani et al. (2025) calculated BEP in units and rupiah for the Es Teh Sruput franchise, while Gandhi and Kusumastuti (2025) used BEP to support profit planning at UD. Barokah. These studies demonstrate the practical use of BEP when the business's cost and sales data are available.

The specific issue addressed in this study is how BEP analysis can be applied to the available sales and operational records of Es Coklat Panjang Umur. The study summarizes actual sales, explains the data required for BEP and sales-target calculations, and distinguishes between conclusions supported by the available records and calculations that cannot yet be completed because cost information is incomplete.

2. LITERATURE REVIEW

Break Even Point Analysis

Break Even Point (BEP) is the level of sales at which total revenue equals total costs, so the business neither earns a profit nor incurs a loss at that level. BEP may be expressed in units or in monetary value. Its calculation depends on the classification and measurement of costs, the selling price, and the contribution margin. Sari et al. (2024) illustrate the use of BEP alongside contribution margin, margin of safety, and profit planning in a beverage MSME. Similarly, Lutfiani et al. (2025) report BEP in units and rupiah for an Es Teh Sruput franchise.

Fixed costs are costs that remain relatively constant within a relevant range of activity, whereas variable costs change with production or sales volume. Contribution margin is the amount remaining from sales after variable costs are deducted. It contributes to covering fixed costs; after fixed costs are covered, any remaining contribution supports profit.

Contribution margin per unit = Selling price per unit – Variable cost per unit

$$\text{Contribution margin ratio} = \frac{\text{Contribution margin per unit}}{\text{Selling price per unit}}$$

$$\text{BEP (units)} = \frac{\text{Fixed costs}}{\text{Contribution margin per unit}}$$

$$\text{BEP (rupiah)} = \frac{\text{Fixed costs}}{\text{Contribution margin ratio}}$$

Sales Targets and Cost-Volume Profit Analysis

A sales target is the level of sales planned for a specified period and may be expressed in units or revenue. Cost-volume-profit analysis explains the relationship among selling price, sales volume, variable costs, fixed costs, and profit. BEP indicates the minimum sales required to cover costs; a profit-oriented target additionally incorporates the profit that the business aims to achieve. Gandhi and Kusumastuti (2025), for example, use BEP calculations as part of profit planning for an MSME.

$$\text{Target sales (units)} = \frac{(\text{Fixed costs} + \text{Target profit})}{\text{Contribution margin per unit}}$$

$$\text{Target sales (rupiah)} = \frac{(\text{Fixed costs} + \text{Target profit})}{\text{Contribution margin Ratio}}$$

These formulas can only produce a meaningful numerical result when the cost figures, selling-price basis, target profit, and observation period are defined consistently. Where a business sells several products with different prices and variable costs, the product mix must

also be considered; a single average revenue per unit should not automatically be treated as the selling price or contribution margin per unit.

Previous Studies and Research Position

Sari et al. (2024) studied Es Nona Fendi using BEP, contribution margin, margin of safety, and profit-planning analysis. Husna et al. (2024) also examined BEP and margin of safety as tools for profit planning at Toko Berlian Pancing. Lutfiani et al. (2025) examined an Es Teh Sruput franchise and reported BEP in units and rupiah based on sales and cost information for November 2024. Gandi and Kusumastuti (2025) calculated BEP and a profit-oriented sales plan for UD. Barokah. These studies share the use of BEP to support business cost evaluation and planning.

The present study focuses on a different business and a different data situation: the available records for Es Coklat Panjang Umur contain sales volumes, sales revenue, product composition, and some ingredient quantities, but do not provide complete monetary values for all variable and fixed costs. Therefore, numerical results from other MSMEs cannot be transferred to this business. The contribution of this study is to assess the available records and establish the calculation requirements for a business-specific BEP and sales target.

3. METHODS

This study uses a descriptive quantitative approach and focuses on Es Coklat Panjang Umur MSME in Pajus, Medan. The analysis is based on one week of sales records and supporting operational information made available for the business. The data include daily sales volume, daily sales revenue, units sold by product, product composition, and ingredient quantities for selected products. The available records do not provide complete purchase prices for all ingredients, packaging costs, other per-unit costs, and fixed operating expenses in monetary terms. The analysis was conducted in four stages: (1) summarizing sales volume and revenue; (2) identifying the cost information needed to classify fixed and variable costs; (3) specifying the contribution-margin, BEP, and sales-target formulas; and (4) assessing whether the available information is sufficient to calculate numerical BEP and target-sales values. Because the monetary cost data are incomplete, the final stage identifies the limitations rather than substituting assumed values.

4. RESULTS AND DISCUSSION

Sales Performance of Es Coklat Panjang Umur

The one week sales records show that Es Coklat Panjang Umur recorded 148 units sold and total revenue of IDR 1,475,000. This corresponds to an average of approximately 21 units and IDR 210,714 in revenue per day. These averages describe the observation week only and should not be interpreted as the business's typical daily performance without records from additional weeks.

Table 1. Daily Sales Data of Es Coklat Panjang Umur

Day	Revenue (IDR)	Units Sold
Monday	150,000	15
Tuesday	145,000	17
Wednesday	105,000	10
Thursday	215,000	20

Friday	90,000	9
Saturday	420,000	42
Sunday	350,000	35
Total	1,475,000	148

Source: Sales data of Es Coklat Panjang Umur provided for this study.

Table 1 shows that Saturday recorded the highest sales, with 42 units and revenue of IDR 420,000, while Friday recorded the lowest sales, with 9 units and revenue of IDR 90,000. Saturday and Sunday together accounted for 77 units, or approximately 52.0% of weekly sales, and IDR 770,000, or approximately 52.2% of weekly revenue. This concentration suggests that demand was stronger over the weekend during the observed week. However, one week's records are insufficient to establish a recurring weekly pattern; sales should be tracked over a longer period before staffing, inventory, or sales targets are adjusted on this basis.

The variation in daily sales matters for operational planning, but it does not by itself determine whether the business earned a profit. BEP depends on the relationship between revenue, variable costs, and fixed costs. Consistent daily records of both sales and costs are therefore needed to distinguish busy sales days from days that make a stronger contribution toward covering fixed costs.

Composition of Products Sold

Es Coklat Panjang Umur offers a variety of products, including juices, chocolate drinks, refreshing beverages, traditional drinks, fruit-based products, and additional products such as bottled water (Aqua) and plain ice. Based on the weekly sales records, the products sold can be grouped as shown in Table 2.

Table 2. Sales Composition by Product Category

Product Category	Units Sold	Percentage
Juice	116	78.38%
Healing drinks	17	11.49%
Bottled water (Aqua)	6	4.05%
Fruit soup	4	2.70%
Plain ice/water	3	2.03%
Healthy drinks	2	1.35%
Total	148	100.00%

Source: Daily product sales records.

Table 2 shows that juice accounted for 116 units, or 78.38% of all units sold, followed by healing drinks at 17 units, or 11.49%. The remaining categories each represented a small share of the recorded volume. This distribution identifies juice as the leading category by units sold during the observation week, but it does not establish which category generated the most revenue or profit.

The sales mix can help guide inventory planning, particularly for ingredients used in the most frequently sold products. Nevertheless, the owner should avoid allocating resources based on volume alone: products with different prices and ingredient requirements can have different contribution margins. Product-level sales and cost records would make it possible to identify which products contribute most toward covering fixed costs.

In addition, the juice category in the sales records includes several variants, such as mango, orange, avocado, and other fruit juices. Therefore, the available data do not allow revenue and profit contributions to be calculated separately for each variant.

Selling Prices and Product Variety

Based on the menu photographs provided, Es Coklat Panjang Umur offers a range of products at different prices. Since the business does not sell just one product at a single price, the BEP analysis needs to take into account differences in selling prices and production costs.

Table 3. Examples of Products and Selling Prices on the Menu

Product Example	Selling Price
Iced Chocolate M	IDR 10,000
Iced Chocolate L	IDR 13,000
Hot chocolate	IDR 14,000
White Chocolate Drink	IDR 13,000
Jumbo-cup mango juice	IDR 10,000
Jumbo-cup orange juice	IDR 10,000
Butterfly Yakult	IDR 10,000
Melon Sparkling	IDR 10,000
Passion Fruit Squash	IDR 10,000
Fruit soup	IDR 13,000
Fruit salad	IDR 13,000
Bread	IDR 5,000
Bottled water (Aqua)	IDR 5,000
Plain ice	IDR 3,000

Source: Menu photographs and price information provided.

The listed prices in Table 3 range from IDR 3,000 to IDR 14,000. This price variation is important because a single average selling price cannot fully represent a business selling multiple products. A more precise multi-product BEP calculation would require each product's sales volume, selling price, variable cost, and sales-mix share. In the absence of these details, an average based on actual weekly revenue and units sold can only support an illustrative estimate.

Dividing actual revenue of IDR 1,475,000 by 148 units gives average revenue of approximately IDR 9,966 per unit. This is a weighted average of revenue across the units

recorded, not the menu price or profit margin of any individual product. It is used below only to translate the simulated break-even revenue into an approximate number of units; the result depends on the observed product mix remaining broadly similar.

Analysis of the Business Cost Structure

BEP analysis requires costs to be separated into fixed and variable costs. Fixed costs are costs that remain relatively unchanged within a certain range of activity, while variable costs change according to the number of products made or sold.

The available information indicates monthly rent of IDR 1,500,000 and employee wages of IDR 50,000 per day. Actual monetary amounts for electricity, water, and other fixed operating costs were not available, so the simulation assigns these items estimates of IDR 50,000 and IDR 25,000 per week, respectively. The weekly rent is prorated as monthly rent $\times 12 \div 52$, and wages are calculated for seven days. These calculations assume the business operates and incurs wages for all seven days; this assumption should be checked against actual operating and payroll records.

Table 4. Estimated Weekly Fixed Costs for the BEP Simulation

Cost Component	Calculation	Weekly Cost (IDR)
Rent	IDR 1,500,000 $\times 12 \div 52$	IDR 346,154
Employee wages	IDR 50,000 $\times 7$ days	IDR 350,000
Electricity and water	Simulation assumption	IDR 50,000
Other fixed costs	Simulation assumption	IDR 25,000
Total fixed costs	—	IDR 771,154

Note: Electricity, water, and other fixed costs are estimates used for this simulation, not figures obtained from the interview. Wages are calculated for seven operating days per week.

Under the assumptions in Table 4, estimated weekly fixed costs total IDR 771,154. This amount is not a verified expense total: the utilities and other fixed-cost amounts are estimates, and the wage calculation assumes seven paid operating days. The resulting BEP is therefore conditional on these assumptions and may change when actual records are available.

The business also incurs variable costs for ingredients and consumables, including fruit, sugar, milk, chocolate, ice, and packaging. Complete purchase prices and quantities used per product were not available in the records provided. Consequently, actual variable cost per unit and product-level contribution margins cannot be calculated reliably from the current data.

For illustration only, the simulation assumes that variable costs equal 55% of revenue: 42% for main ingredients, 6% for packaging, and 7% for supporting materials. This produces an assumed contribution margin ratio of 45%. These percentages are not measured cost ratios for the business and should be replaced with actual cost information before the result is used for managerial decisions.

Break Even Point (BEP) Calculation

BEP is the sales level at which total revenue equals total costs. The following simulation uses estimated weekly fixed costs of IDR 771,154 and an assumed contribution margin ratio of 45%. Because both the cost estimates and the variable-cost ratio include assumptions, the figures below illustrate the method rather than establish the business's actual break even position.

a. Calculating the Contribution Margin

Weekly actual revenue was IDR 1,475,000, with total sales of 148 units. Based on the assumption that variable costs equal 55% of revenue, the contribution margin calculation is presented in Table 5.

Table 5. Contribution Margin Simulation

Component	Calculation	Value
Weekly revenue	Data	IDR 1,475,000
Main ingredients	42% × IDR 1,475,000	IDR 619,500
Packaging	6% × IDR 1,475,000	IDR 88,500
Supporting materials (e.g., sugar and ice)	7% × IDR 1,475,000	IDR 103,250
Total estimated variable costs	55% × IDR 1,475,000	IDR 811,250
Estimated contribution margin	45% × IDR 1,475,000	IDR 663,750
Contribution margin ratio	IDR 663,750 ÷ IDR 1,475,000	45%
Average revenue per unit	IDR 1,475,000 ÷ 148	IDR 9,966

Note: Variable costs and the contribution margin in this table are simulation estimates based on the assumed proportions of 55% and 45%, respectively.

The simulated contribution margin is IDR 663,750 on the observed revenue of IDR 1,475,000. Under the assumed cost ratio, this amount is available to cover fixed costs and then contribute to profit. It is not an observed accounting result because the variable costs were estimated as a percentage of revenue rather than calculated from actual ingredient and packaging expenditure.

b. Calculating the BEP in Rupiah

BEP formula in rupiah:

$$\text{BEP (IDR)} = \text{Fixed Costs} \div \text{Contribution Margin Ratio}$$

$$\text{BEP (IDR)} = \text{IDR } 771,154 \div 0.45$$

$$\text{BEP (IDR)} \approx \text{IDR } 1,713,676$$

Using the assumptions specified above, estimated break-even revenue is approximately IDR 1,713,676 per week. This is the revenue level at which the estimated 45% contribution margin would cover estimated weekly fixed costs of IDR 771,154.

c. Calculating the BEP in Units

For an approximate unit-based BEP, average revenue per unit is used as a proxy for the average selling price, and the 45% contribution margin ratio is applied to it. This approach assumes that

the product mix and average revenue per unit remain broadly similar to those in the observed week.

Average contribution margin per unit:

$$45\% \times \text{IDR } 9,966 \approx \text{IDR } 4,485$$

$$\text{BEP (units)} = \text{Fixed Costs} \div \text{Average Contribution Margin per Unit}$$

$$\text{BEP (units)} = \text{IDR } 771,154 \div \text{IDR } 4,485 \approx 171.9 \text{ units}$$

The simulated result is approximately 172 units per week when rounded up to a whole unit. This is an indicative unit estimate only: because the business sells products at different prices and with potentially different variable costs, the actual number of units required to break even will depend on the product mix and the contribution margin of each product.

Table 6. BEP Simulation Results for Es Coklat Panjang Umur

Indicator	Result
Estimated weekly fixed costs	IDR 771,154
Assumed contribution margin ratio	45%
BEP in revenue	IDR 1,713,676
BEP in units	172 units
Actual sales	148 units
Difference from BEP	24 units
Actual revenue	IDR 1,475,000
Revenue shortfall from BEP	IDR 238,676

d. Discussion of the BEP Results

Table 6 indicates that observed sales of 148 units were approximately 24 units below the simulated break-even estimate of 172 units. Actual weekly revenue of IDR 1,475,000 was also IDR 238,676 below the simulated break-even revenue of IDR 1,713,676. Relative to the simulated revenue BEP, the observed revenue was about 86.1%, leaving a shortfall of approximately 13.9%. These comparisons describe the gap between observed sales and a model-based threshold; they do not prove that the business incurred a loss, because the cost assumptions have not been verified.

From a managerial perspective, the simulated BEP can be treated as a preliminary reference point rather than a final sales target. A target intended only to cover costs would need to be set at or above the verified BEP. If the owner seeks a specific weekly profit, the target should be calculated using the formula: $\text{target sales revenue} = (\text{fixed costs} + \text{desired profit}) \div \text{contribution margin ratio}$. A numerical profit-oriented target cannot be reported responsibly until the desired profit and actual cost structure are established.

The main limitation is the absence of complete, verified cost data and product-level contribution margins. The simulation assumes a 55% variable-cost ratio, estimates some fixed costs, and uses average revenue per unit to estimate the unit-based BEP. Changes in ingredient prices, packaging costs, wages, operating days, or the mix of products sold could materially change the result. Accordingly, the simulated figures should not be presented as evidence that the business is currently making a loss or as a definitive sales target.

To improve future calculations, the business should record daily units and revenue by product, ingredient quantities and purchase prices, packaging costs, wages and operating days,

rent, utilities, and other operating expenses for the same period. These records would allow fixed and variable costs to be classified more accurately and contribution margins to be calculated by product. Data covering several weeks or months would also help assess whether the observed weekend sales pattern is consistent. With these inputs, a weighted multi-product BEP and a profit-based sales target could be estimated more reliably.

5. CONCLUSION

This study examined the application of Break Even Point (BEP) analysis as a basis for determining sales targets at Es Coklat Panjang Umur MSME in Pajus, Medan. The one-week sales records showed total sales of 148 units and revenue of IDR 1,475,000. Saturday recorded the highest sales volume, with 42 units, while Friday recorded the lowest, with 9 units. Juice was the largest product category, accounting for 116 units.

Based on the BEP simulation, estimated weekly fixed costs amounted to IDR 771,154, while the assumed contribution margin ratio was 45%. Under these assumptions, the estimated break-even revenue was IDR 1,713,676 per week, equivalent to approximately 172 units. Compared with actual sales of 148 units, the business was approximately 24 units below the simulated break-even level. These results suggest that the business needs to evaluate its sales performance and cost structure to establish an appropriate sales target.

Nevertheless, the calculated BEP is an estimate rather than a verified measure of the business's actual financial position because several cost components were based on assumptions. The business should maintain complete records of ingredient purchases, packaging, operating expenses, and product-level selling prices. With more accurate cost information, future analysis can determine a more reliable BEP and a sales target that incorporates the desired profit.

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