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Comparative Analysis of Cost of Production Using Full Costing, Variable Costing, and Activity-Based Costing Methods in MSMEs of Tanjung pinang City

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Abstract

Culinary sector MSMEs continue to face challenges in determining accurate Cost of Production (COP), which often leads to pricing errors. This study aims to analyze and compare the calculation of COP using Variable Costing, Full Costing, and Activity-Based Costing (ABC) methods in a Sempol MSME located in Tanjungpinang. A descriptive quantitative approach was employed, with data collected through observation and interviews related to production costs and production volume. The results indicate that the COP of sempol was Rp541,66 per stick using the Variable Costing method and Rp609,86 per stick using the Full Costing method, while the COP of sausages was Rp658,39 and Rp692,49 per stick, respectively. The ABC method produced lower COP values, namely Rp105,76 per stick for sempol and Rp30,44 per stick for sausages, as costs were allocated based on production activities. This study concludes that different costing methods generate different cost information; therefore, the selection of an appropriate COP method should be aligned with the analytical objectives and cost management needs of MSMEs.

Keywords : Cost of Production; Activity-Based Costing; Variable Costing; MSMEs

INTRODUCTION

Micro, Small, and Medium Enterprises (MSMEs) play a strategic role in the Indonesian economy, particularly as contributors to Gross Domestic Product (GDP) and providers of employment opportunities. Data from Statistics Indonesia indicate that MSMEs contribute more than 60% of the national GDP and serve as the backbone of the community-based economy (BPS, 2024). In the culinary sector, MSMEs have experienced rapid growth alongside increasing demand for fast and practical food products, such as sempol and fried sausages, which are favored due to their affordable prices, widely accepted taste, and ease of preparation.

Despite their significant market potential, many culinary MSMEs continue to face challenges in managing production costs. One of the main issues is the inaccuracy in calculating the Cost of Production (COP). MSME owners often consider only raw material costs while failing to systematically include labor costs and overhead costs, resulting in selling prices that do not fully reflect actual production costs (Maulana et al., 2024; Trianawati & Sarwono, 2025). This condition may lead to low profit margins, pricing errors, and reduced business competitiveness.

The Cost of Production (COP) represents the total costs incurred to produce a product until it is ready for sale, including raw material costs, direct labor costs, and manufacturing overhead costs (Kholifah & Andini, 2024; Puspita & Jamiah, 2025). Therefore, selecting an appropriate COP calculation method is crucial for MSMEs to ensure that the resulting cost information is accurate and can be used as a basis for managerial decision-making.

Commonly used COP calculation methods include Variable Costing and Full Costing. Variable Costing assigns only variable production costs to the product and treats fixed costs as period expenses, making it suitable for short-term analysis (Harun et al., 2023). In contrast, Full Costing allocates all production costs, both fixed and variable, providing a more comprehensive cost representation and being widely used for financial reporting purposes (Marisya, 2022). However, both methods still have the potential to cause cost distortion, particularly when products differ in their levels of production activities.

As production processes become more complex, the Activity-Based Costing (ABC) method was developed to allocate overhead costs based on the activities consumed by products. This method is considered capable of producing more accurate cost calculations because it emphasizes the cause-and-effect relationship between activities and costs (Julita & Rahmazaniati, 2023; Abdullah, 2024). Several previous studies have also shown that the application of ABC in MSMEs can reduce cost distortion and provide more realistic COP information compared to traditional costing methods (Muhammad Abizar et al., 2025).

Based on these issues, this study was conducted on a Sempol MSME in Tanjungpinang with the objective of calculating and comparing the Cost of Production using Variable Costing, Full Costing, and Activity-Based Costing methods. The findings of this study are expected to provide a more accurate overview of the MSME production cost structure and serve as a reference for business owners in determining selling prices, improving cost efficiency, and strengthening business competitiveness in a sustainable manner.

METHODS

This study employs a descriptive quantitative approach aimed at analyzing and comparing the calculation of the Cost of Production (COP) using the Variable Costing, Full Costing, and Activity-Based Costing (ABC) methods in a Sempol MSME located in Tanjungpinang. This approach was selected because it enables a systematic description of production cost conditions based on numerical data obtained from the research object.

The research object is a micro-scale culinary MSME that produces two types of products, namely sempol and fried skewered sausages, located in Batu 2, in front of SMAN 4 Tanjungpinang. The study was conducted during the period of November–December 2025, with a daily production system and operating hours from the afternoon until the evening.

Data were collected through direct observation of the production process and structured interviews with the business owner. The collected data include the prices and quantities of raw materials, direct labor costs, manufacturing overhead costs (both variable and fixed), production volume, as well as information related to equipment usage and production activities. In addition, supporting documentation such as photographs and field notes was used to strengthen data validity.

The cost data obtained were then classified into several components, namely direct raw material costs, direct labor costs, variable overhead costs, and fixed overhead costs. All costs were standardized on a monthly basis to ensure consistency in comparing the COP across products and costing methods.

The COP calculation was carried out using three methods. The Variable Costing method calculates the COP by assigning direct raw material costs, direct labor costs, and variable manufacturing overhead costs to the product, while fixed overhead costs are treated as period expenses. The Full Costing method calculates the COP by allocating all production costs, both variable and fixed, to the product. Furthermore, the Activity-Based Costing (ABC) method was implemented through several stages, including the identification of main production activities, grouping costs into cost pools, determining relevant cost drivers, calculating activity cost rates, and allocating overhead costs to each product based on activity consumption.

The final stage of the study involved a comparative analysis by comparing the COP values generated by the three methods for sempol and sausage products. Differences in results were analyzed based on the treatment of overhead costs and the characteristics of production activities for each product. The findings of this analysis were used to draw conclusions regarding the most appropriate COP calculation method for cost management and decision-making in MSMEs.

RESULT AND DISCUSSION

Cost Classification and Production Cost

The Sempol MSME in Tanjungpinang incurs production costs consisting of direct raw material costs, direct labor costs, and manufacturing overhead costs, which are divided into variable overhead and fixed overhead. This cost classification serves as the primary basis for calculating the Cost of Production (COP) using various costing methods.

Tabel 1. Direct Costs

Description	Sempol	Sausage
Units Produced	7.800 units	15.600 units
Direct Material Cost	Rp. 2.756.000	Rp. 8.802.000
Direct Labor Cost	Rp. 1.300.000	Rp. 1.300.000

Raw material costs represent the largest cost component, particularly for fried sausage products, amounting to Rp8.802.000 per month, while raw material costs for sempol total Rp2.756.000 per month. This difference is influenced by the price of the main raw materials, as sausages have a relatively higher unit cost compared to sempol

ingredients. In addition, the higher production volume of sausages also contributes to the greater total raw material cost.

Tabel 2. Overhead Costs

Description	Cost
Depreciation Cost of Equipment and Machinery	Rp. 163.889
Fixed Overhead Cost	Rp. 1.063.889
Variable Overhead Cost	Rp. 338.000

Direct labor costs for both products are allocated proportionally, with each amounting to Rp1.300.000 per month. Meanwhile, variable overhead costs, including LPG gas, electricity, and water, total Rp338.000 per month and are evenly allocated between sempol and sausage products. Fixed overhead costs consist of rental expenses and equipment depreciation, with a total of Rp1.063.889 per month, which are also proportionally distributed between the two products. This cost structure indicates that although the business operates on a relatively small scale, the MSME still bears significant fixed costs in its production process.

Calculation of the Cost of Production (COP) for Sempol

The calculation of the Cost of Production (COP) for sempol in the MSME was carried out using three methods, namely Variable Costing, Full Costing, and Activity-Based Costing (ABC). The results indicate significant differences in COP values across the three costing methods.

Tabel 3. COP with Variable Costing Method for Sempol

Description	Cost
Direct Material Cost	Rp. 2.756.000
Direct Labor Cost	Rp. 1.300.000
Variable Overhead Cost	Rp. 169.000
Total Production Cost	Rp. 4.225.000
Units Produced	7.800 units
Cost of Production	Rp. 541,66

Using the Variable Costing method, the COP of sempol was calculated at Rp541,66 per stick. This value results from the variable costing approach, which only assigns variable costs, namely raw material costs, direct labor costs, and variable manufacturing overhead, while excluding fixed overhead costs from the product cost. This method reflects the marginal cost of production and is therefore relevant for short-term decision-making.

Tabel 4. COP with Full Costing Method for Sempol

Description	Cost
Direct Material Cost	Rp. 2.756.000
Direct Labor Cost	Rp. 1.300.000
Variable Overhead Cost	Rp. 169.000
Fixed Overhead Cost	Rp. 531.944,5
Total Production Cost	Rp. 4.225.000
Units Produced	7.800 units
Cost of Production	Rp. 609,86

Under the Full Costing method, the COP of sempol increased to Rp609,86 per stick. This increase is due to the inclusion of fixed manufacturing overhead costs, such as rental expenses and equipment depreciation, in the production cost. The full costing method provides a more comprehensive representation of production costs, as it incorporates all costs incurred during the production process.

Calculation of the Cost of Production (COP) for Sausage

The calculation of the Cost of Production (COP) for sausage in the MSME was carried out using three methods, namely Variable Costing, Full Costing, and Activity-Based Costing (ABC). The results indicate significant differences in COP values across the three costing methods.

Tabel 5. COP with Variable Costing Method for Sausage

Description	Cost
Direct Material Cost	Rp. 8.802.000
Direct Labor Cost	Rp. 1.300.000
Variable Overhead Cost	Rp. 169.000
Total Production Cost	Rp. 10.271.000
Units Produced	15.600 units
Cost of Production	Rp. 658,39

The results of the Cost of Production (COP) calculation for sausage products in the MSME exhibit a pattern similar to that observed for sempol products. Using the Variable Costing method, the COP of sausages was Rp658,39 per stick. This value reflects production costs that vary directly with production volume and are therefore relevant for short-term operational efficiency analysis.

Tabel 6. COP with Full Costing Method for Sausage

Description	Cost
Direct Material Cost	Rp. 8.802.000
Direct Labor Cost	Rp. 1.300.000
Variable Overhead Cost	Rp. 169.000
Fixed Overhead Cost	Rp. 531.944,5
Total Production Cost	Rp. 10.802.944,5
Units Produced	15.600 units
Cost of Production	Rp. 692,49

Under the Full Costing method, the COP of sausages increased to Rp692,49 per stick. This increase is attributable to the allocation of fixed manufacturing overhead costs into the product cost, resulting in a higher total production cost per unit. This method is more appropriate for financial reporting purposes and for determining selling prices that must cover all production costs.

Calculation of the Cost of Production (COP) with Activity Based Costing

To obtain a more accurate allocation of overhead costs that reflects resource consumption in each production activity, this study subsequently applies the Activity-Based Costing (ABC) method. This method assigns overhead costs based on cost-generating activities, thereby providing more precise product cost information compared to conventional costing methods.

Tabel 7. COP with Activity Based Costing

Activity	Cost per Activity	Cost for Sempol	Cost for Sausage
Fish grinding and dough mixing	Rp. 350.000	Rp. 350.000	
Skewering	Rp. 200.000	Rp. 100.000	Rp. 100.000
Frying	Rp. 750.000	Rp. 375.000	Rp. 375.000
Total		Rp. 825.000	Rp. 475.000
Units Produced		7.800 units	15.600 units
Cost of Production		Rp. 105,76	Rp. 30,44

The Activity-Based Costing (ABC) method resulted in a significantly lower COP for sempol, amounting to Rp105,76 per stick. This value was obtained by allocating overhead costs based on production activities, such as grinding and mixing the dough, shaping or skewering, and frying. These findings indicate that the ABC method is able to allocate overhead costs more precisely according to activity consumption, thereby avoiding excessive cost allocation to the product.

In contrast to the two previous methods, the Activity-Based Costing (ABC) method produced a very low COP for sausages, amounting to Rp30,44 per stick. The low COP value is due to the limited production activities consumed by sausage products, particularly the absence of grinding and dough-mixing activities as required in sempol production. This finding indicates that the ABC method is more sensitive to differences in production process characteristics across products.

Comparative Analysis of Costing Methods

To evaluate the implications of different costing approaches on product cost determination, this study compares the results obtained from Variable Costing, Full Costing, and Activity-Based Costing (ABC). This comparison is intended to highlight differences in cost allocation, cost accuracy, and managerial relevance across the three methods.

Tabel 8. Comparative of Costing Methods for Sempol

Cost of Production Methods	Cost
Variable Costing	Rp. 541,66
Full Costing	Rp. 609,86
Activity Based Costing	Rp. 105,76

This table presents a comparative summary of the Cost of Production (COP) for sempol calculated using Variable Costing, Full Costing, and Activity-Based Costing (ABC). The table shows noticeable differences in COP values across the three methods, reflecting variations in cost allocation approaches and the treatment of overhead costs. These differences indicate that the choice of costing method has a significant impact on the resulting product cost of sempol.

Tabel 9. Comparative of Costing Methods for Sausage

Cost of Production Methods	Cost
Variable Costing	Rp. 658,39
Full Costing	Rp. 692,49
Activity Based Costing	Rp. 30,44

The comparison of COP results shows that the Variable Costing method consistently produces lower COP values than the Full Costing method for both sempol and sausage products. The difference in the COP of sempol between Full Costing and Variable Costing is approximately Rp68 per stick, while the difference for sausages is around Rp34 per stick. This difference is entirely attributable to the treatment of fixed manufacturing overhead costs.

The Activity-Based Costing (ABC) method exhibits the most distinct results compared to the other two methods. ABC generates significantly lower COP values because overhead costs are allocated based on actual activity consumption rather than being evenly distributed. This finding indicates that conventional costing methods have the potential to cause cost distortion, particularly for products that consume fewer production activities.

Based on these results, it can be concluded that the choice of costing method has a substantial impact on the cost information generated. Variable Costing is suitable for short-term analysis and operational decision-making, Full Costing is relevant for pricing decisions and financial reporting, while Activity-Based Costing provides the most accurate cost information for evaluating activity efficiency and cost control in MSMEs with more than one type of product.

CONCLUSION

The production cost structure of the MSME consists of raw material costs, direct labor costs, and manufacturing overhead costs, which include both variable and fixed components. Raw material costs represent the largest cost component, particularly for sausage products, while fixed overhead costs such as rental expenses and equipment depreciation continue to contribute significantly to total production costs despite the micro-scale nature of the business.

The calculation of the Cost of Production (COP) using the Variable Costing method results in lower COP values than those obtained using the Full Costing method for both sempol and sausage products. This is because fixed overhead costs are not allocated to product costs under the Variable Costing approach, making this method more reflective of variable production costs and more relevant for short-term decision-making.

The Full Costing method produces higher COP values because all production costs, including fixed manufacturing overhead, are allocated to the products. This method provides a more comprehensive representation of production costs and is therefore more appropriate for financial reporting purposes and long-term pricing decisions.

Application of the Activity-Based Costing (ABC) method results in significantly lower COP values compared to the other two methods. This indicates that ABC is able to allocate overhead costs more accurately based on the actual consumption of activities by each product. The differences in COP results between sempol and sausage products under the ABC method reflect variations in the complexity and intensity of production activities required by each product.

Overall, the findings of this study demonstrate that the selection of a costing method has a substantial influence on the cost information generated. Variable Costing, Full Costing, and Activity-Based Costing each have distinct advantages and applications. Therefore, MSMEs are advised to select a costing method that aligns with their analytical

objectives, cost information needs, and production process characteristics in order to improve pricing accuracy and cost management efficiency.

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