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RE-COMPUTING THE COST OF GOODS MANUFACTURED OF A BROWNIE ORDER USING JOB-ORDER COSTING: A SECONDARY-DATA CASE STUDY OF TOMANG BAKERY, MEDAN

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ABSTRACT

Accurate unit cost information is essential for micro, small, and medium enterprises (MSMEs) that produce to order, because selling prices are usually set as a markup on cost. Siregar et al. (2024) reported that one box of brownies at Tomang Bakery, Medan, costs IDR 58,035 to produce and should sell for IDR 81,249 with a 40% markup, slightly above the bakery's price of IDR 80,000. This study re-analyses their published data using the job-order costing framework of Brewer, Garrison, and Noreen (2019). Cost data were extracted from the original tables, checked arithmetically, reclassified into direct materials, direct labor, and manufacturing overhead, and compiled in a job cost sheet and a schedule of cost of goods manufactured. The check found that the equipment depreciation total in the source already includes the machine depreciation reported separately, and that the depreciation of the digital cake weigher is miscalculated. The corrected cost is IDR 55,125 per box, 5.0% lower than reported, and the 40% markup price is IDR 77,175. The bakery's price of IDR 80,000 is therefore IDR 2,825 above the markup price instead of below it, which reverses the original conclusion. A sensitivity analysis shows that treating depreciation as a fixed cost, as variable costing requires, lowers the markup price to IDR 72,380, although this result depends on the cost-behavior assumption. The findings show that arithmetic verification and a consistent costing framework can change pricing conclusions for MSMEs.

Keywords: *job-order costing; MSME; cost of goods manufactured; overhead; pricing; bakery*

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1. INTRODUCTION

Micro, small, and medium enterprises (MSMEs) are a backbone of the Indonesian economy. They contribute roughly 61% of national gross domestic product and absorb about 97% of the workforce (Aprilia et al., 2025) Many of them, such as bakeries, caterers, tailors, and print shops, produce to order (Siregar et al., 2024a). Because every order differs in ingredients, labor time, and complexity, the cost of each order has to be accumulated separately. This is the logic of job-order costing (Managerial Accounting, n.d.). The resulting unit cost becomes the base of the selling price, which small businesses usually set as a markup on cost, so any error in the unit cost passes directly into the price. Accurate costing therefore matters for the financial sustainability of MSMEs: a price built on an understated cost erodes margin, while one built on an overstated cost can weaken competitiveness.

(Siregar et al., 2024a) applied the order cost method to one box of brownies at Tomang Bakery in Medan. They reported a production cost of IDR 58,035 and a selling price of IDR 81,249 after a 40% markup, and concluded that the bakery's actual price of IDR 80,000 is slightly too low. The article is valuable because it publishes an itemised cost build-up of a real MSME, which allows independent verification. On close reading, three issues appear. First, the overhead total seems to count machine depreciation twice, and one depreciation figure does not match its own inputs. Second, the article is titled variable costing, yet its product cost includes depreciation, which is usually a fixed cost. Third, the abstract refers to factory overhead determined in advance, but the overhead used is the actual cost per box and no predetermined overhead rate is computed. Prior MSME studies typically demonstrate job-order costing by computing the cost of one order from actual figures (Firmandani et al., 2024) Several others compare full and variable costing for the same business ((Murniati & Akira, 2025);(Siregar et al., 2024b) on A. Zaki Bakery, Medan; (Rachmawati et al., 2023) on Krishna Bakery, Jombang). Among the studies reviewed in this paper, however, none re-verifies the arithmetic of a published cost table before the figures are used for pricing, and few combine a job cost sheet, a schedule of cost of goods manufactured, journal entries, and an explicit statement of cost behavior in one case. This study fills that gap by re-analysing a published MSME case.

The study answers three questions. (1) What is the cost of one box of brownies when the published data are verified and compiled in a job cost sheet? (2) How do the corrected cost and selling price differ from those reported by Siregar et al. (2024) and from the bakery's actual price? (3) How sensitive is the markup price to the choice between absorption and variable costing? The contribution is a corrected benchmark for this case and a replicable verification procedure for MSME owners, lecturers, and students.

2. LITERATURE REVIEW

2.1 Job-Order Costing

Job-order costing is a cost accumulation system used when products or services differ from one job to the next. Costs are recorded on a job cost sheet, one per job, and the total is divided by the number of units to obtain the unit product cost(*Managerial Accounting*, n.d.). Manufacturing costs are classified into three groups. Direct materials are traced to a job through materials requisition forms. Direct labor is traced through time tickets. Manufacturing overhead, which includes indirect materials, utilities, and depreciation of production equipment, cannot be traced and must be applied to jobs.

Overhead is applied with a predetermined overhead rate (POHR) calculated before the period begins:

$$\text{POHR} = \frac{\text{Estimated Total Manufacturing Overhead}}{\text{Estimated Total Amount of The Allocation Base}}$$

A predetermined rate is needed because actual overhead is known only after the period ends and because monthly overhead and volume fluctuate (Brewer et al., 2019). At the end of the period, applied overhead is compared with actual overhead, and the difference is reported as underapplied or overapplied overhead. The choice of allocation base, such as direct labor hours or machine hours, affects the accuracy of job costs, and firms with different production departments or activities may use multiple predetermined rates. The cost of 5 completed jobs is reported in the schedule of cost of goods manufactured, from which cost of goods sold is derived (Brewer et al., 2019).

2.2 Absorption Costing and Variable Costing

Costs behave as variable or fixed: variable costs change in total with activity, while fixed costs do not within the relevant range (Brewer et al., 2019). Under absorption costing, all manufacturing costs, fixed and variable, are included in product cost, and this method is used for external reporting. Under variable costing, only variable manufacturing costs are included in product cost, and fixed manufacturing overhead is treated as a period expense. Variable costing is used internally for decisions such as pricing and break-even analysis (Brewer et al., 2019). The two methods give different unit costs whenever fixed overhead exists, so a study must state which one it uses.

2.3 Previous Studies on MSMEs

Depreciation can be allocated by the straight-line method, which spreads cost evenly over time, or by the units-of-activity method, which allocates cost according to actual use. Under straight-line depreciation, the charge per period is fixed. Under units-of-activity depreciation, the rate per unit of use is constant but the charge per period varies with use. This distinction matters when a study classifies depreciation as fixed or variable, because the classification determines whether depreciation enters a variable cost.

2.4 Research Gap

Indonesian studies have applied job-order costing to many small businesses, including a catering business (Ainiah & Primastiwi, 2024) and a home cake business (Sumawinata & Marsono, 2023) Mangintiu et al. (2020) applied variable costing to the pricing of white bread at a bakery, and Siregar et al. (2024) combined the order cost method with a variable costing label for brownies at Tomang Bakery. Studies that compare methods on the same business report that full costing gives a higher unit cost than variable costing: Pusbelladika (2025) for Bolu Idole, Rizky, Marliyah, and Kusmilawaty (2023) for A. Zaki Bakery in Medan, and Rachmawati, Anis, Iwanussoleh, and Adiyanto (2023) for Krisna Bakery in Jombang. Together, these studies show that job-order costing is practical for MSMEs and that its main use is to support selling-price decisions.

3. METHODS

3.1 Research Design

This is a quantitative re-analysis of secondary data in a single-case design. No new data were collected from the bakery, so all findings are limited to what Siregar et al. (2024) report.

3.2 Data Source

The data are the cost tables and text of (Siregar et al., 2024a), which the original authors obtained through interviews, observation, and documentation at Tomang Bakery. The unit of analysis is one production run that yields one box of brownies. All values are in Indonesian

rupiah (IDR). To avoid confusion, tables of the source are cited as Siregar's Table x, and tables of this article are numbered separately.

3.3 Procedure

1. **Extract the inputs of raw materials, direct labor, auxiliary materials, electricity, machine depreciation, and equipment depreciation from Siregar et al. (2024).**
2. Recompute every subtotal from its inputs and compare it with the reported figure. A discrepancy is any non-zero difference (recomputed minus reported).
3. Classify costs following Brewer et al. (2019): raw materials as direct materials, production wages as direct labor, and auxiliary materials, electricity, and depreciation as manufacturing overhead.
4. Compile a job cost sheet, a schedule of cost of goods manufactured, and journal entries for the order.
5. Compute depreciation per use as acquisition cost divided by estimated number of uses, as in the source.
6. Compute the markup price as $P = C \times (1 + m)$ with $m = 0.40$, as in the source, and the markup earned at the bakery's price (Pb = IDR 80,000) as $(Pb - C) \div C$.
7. Compare three scenarios: (A) figures as reported, (B) corrected absorption cost, and (C) variable cost excluding depreciation. Then vary the markup m from 30% to 50%.

3.4 Assumptions

(1) One production run yields one box.

(2) There is no beginning or ending work in process.

(3) Input figures that cannot be recomputed from the source, such as ingredient prices, are accurate.

(4) In scenario C, raw materials, direct labor, auxiliary materials, and electricity are treated as variable and depreciation as fixed. Because the source computes depreciation per use, this classification is tested in the discussion.

4. RESULTS AND DISCUSSION

4.1 Results

4.1.1 Verification of the Source Data

Table 1. Verification of reported costs per box of brownies (IDR)

Item	Source	Reported	Recomputed	Difference
Raw materials	Siregar's Table 1	32,000	32,000	0
Direct labor	Siregar's Table 2	10,000	10,000	0
Auxiliary materials	Siregar's Table 3	8,200	8,200	0
Electricity (2 kW × 0.5 h × 1,500)	Siregar's text	1,500	1,500	0
Digital cake weigher (28,000 ÷ 200)	Siregar's Table 4	125	140	+15

Electric oven (1,400,000 ÷ 500)	Siregar's Table 4	2,800	2,800	0
Machine depreciation, total	Siregar's Table 4	2,925	2,940	+15
Small equipment depreciation (50 + 175 + 130 + 50 + 80)	Siregar's Table 5	3,410	485	−2,925
Total overhead	Siregar's Table 6	16,035	13,125	−2,910
Total production cost	Siregar's Table 7	58,035	55,125	−2,910

Note. Difference = recomputed minus reported. Source: recomputed from Siregar et al. (2024).

Two discrepancies appear. First, the equipment depreciation total of IDR 3,410 equals the machine depreciation of IDR 2,925 plus the five small items totalling IDR 485. The total acquisition value of IDR 1,603,000 in Siregar's Table 5 likewise equals the machines (IDR 1,428,000) plus the small equipment (IDR 175,000). Machine depreciation is therefore counted twice, once in Siregar's Table 4 and again inside Siregar's Table 5. Second, the digital cake weigher costs IDR 28,000 with 200 uses, which gives IDR 140 per use, not IDR 125. The net effect is an overstatement of overhead and unit cost by IDR 2,910, which is 5.0% of the reported cost and 5.3% of the corrected cost.

4.1.2 Corrected Job Cost Sheet

Table 2. Job cost sheet: one order of brownies (IDR)

Cost element	Amount	Share of total
Job: one production run of brownies, quantity 1 box,		
Direct materials (flour, chocolate, eggs, butter, sugar)	32,000	58.1%
Direct labor (production worker)	10,000	18.1%
Overhead: auxiliary materials	8,200	
Overhead: electricity	1,500	
Overhead: machine depreciation	2,940	
Overhead: small equipment depreciation	485	
Total manufacturing overhead	13,125	23.8%
Total job cost	55,125	100%
Unit product cost (÷ 1 box)	55,125	

4.1.3 Schedule of Cost of Goods Manufactured

Table 3. Schedule of cost of goods manufactured for the order (IDR)

Component	Amount
Direct materials used	32,000
Direct labor	10,000
Manufacturing overhead applied	13,125
Total manufacturing costs	55,125
Add: beginning work in process	0
Less: ending work in process	0
Cost of goods manufactured	**55,125**

4.1.4 Journal Entries

Table 4. Journal entries for the order, assuming it is sold at the bakery's price of IDR 80,000 (IDR)

No	Event	Debit	Credit	Amount
1	Raw materials used	Work in Process	Raw Materials Inventory	32,000
2	Direct labor incurred	Work in Process	Wages Payable	10,000
3	Actual overhead incurred	Manufacturing Overhead	Raw Materials Inventory (auxiliary materials)	8,200
			Utilities Payable	1,500
			Accumulated Depreciation	3,425
4	Overhead applied	Work in Process	Manufacturing Overhead	13,125
5	Order completed	Finished Goods	Work in Process	55,125
6	Order sold (revenue)	Cash / Accounts Receivable	Sales	80,000
7	Order sold (cost)	Cost of Goods Sold	Finished Goods	55,125

Because the overhead applied equals the actual overhead, there is no underapplied or overapplied overhead in this order. The gross margin of the order is IDR 80,000 − IDR 55,125 = IDR 24,875, or 31.1% of the selling price.

4.1.5 Selling Price under Three Scenarios

Table 5. Unit cost and markup price by scenario (IDR)

Scenario	Unit cost	Price at 40% markup	Bakery price (80,000) minus markup price	Markup earned at 80,000
A. As reported by Siregar et al. (2024)	58,035	81,249	−1,249	37.8%
B. Corrected absorption (job-order) cost	55,125	77,175	+2,825	45.1%
C. Variable cost (excludes depreciation)	51,700	72,380	+7,620	54.7%

Note. Scenario C = 32,000 + 10,000 + 8,200 + 1,500. Markup earned = (80,000 − unit cost) ÷ unit cost. Source: author's calculation based on Siregar et al. (2024).

Table 6. Markup price by scenario and markup rate (IDR, rounded to the nearest rupiah)

Scenario	30%	40%	50%
A. As reported	75,446	81,249	87,053
B. Corrected absorption	71,663	77,175	82,688
C. Variable	67,210	72,380	77,550

Note. Source: author's calculation based on Siregar et al. (2024).

4.2 Discussion

The original conclusion reverses after correction. Siregar et al. (2024) conclude that the bakery's price is lower than the calculated price. After the double counting is removed, the markup price falls to IDR 77,175 and the bakery's price of IDR 80,000 is IDR 2,825 above it. The bakery earns a markup of about 45% on cost instead of being slightly underpriced. Table 6 shows that the bakery's price would be below the markup price only if the target markup exceeded about 45%. For an MSME owner, this shows that a price recommendation is only as reliable as the cost sheet behind it.

The costing method must be named correctly. The source calls its method variable costing, yet its product cost contains depreciation. Its cost of IDR 58,035 is closer to an absorption cost, and the corrected IDR 55,125 is the figure that suits inventory valuation and the cost of goods manufactured (Brewer et al., 2019). Scenario C, IDR 51,700 with a markup price of IDR 72,380, is a floor for internal pricing decisions rather than a reporting figure. Its result depends on the assumption that depreciation is fixed. The source describes its depreciation as straight-line (Siregar et al., 2024b), but it divides cost by the expected number of uses, which is the units-of-activity method. Under that method depreciation varies with use, so if it is treated as variable, the variable cost becomes IDR 55,125 and scenario C equals scenario B. The same caution applies to direct labor: if the production worker is paid a fixed monthly wage, labor is also a fixed cost and scenario C would be lower still. The sensitivity result therefore shows how strongly the price depends on cost-behavior assumptions, which an owner must confirm with actual records.

Method differences and data errors are separate effects. The direction of the difference agrees with comparable MSME bakery studies, in which full costing gave a higher unit cost than variable costing (Murniati & Akira, 2025) In the present case the absorption cost (IDR 55,125) exceeds the variable cost (IDR 51,700) by IDR 3,425, or 6.2% of the absorption cost, which equals the depreciation charged to the order. What this study adds is that the gap between the reported cost (IDR 58,035) and the variable cost is IDR 6,335, of which IDR 2,910 (about 46%) comes from arithmetic error and only IDR 3,425 from the choice of costing method. A comparison of methods on uncorrected data would therefore mix the two effects.

The per-use rates behave like predetermined rates, but a full POHR cannot be computed. Dividing equipment cost by expected uses and valuing electricity per oven run gives rates fixed before production, which resembles the logic of the predetermined overhead rate of Brewer et al. (2019). The oven-related overhead is IDR 2,800 depreciation plus IDR 1,500 electricity for a 0.5-hour run, an implied rate of IDR 8,600 per oven hour. If the bakery receives larger or different orders, oven hours would be a sensible allocation base. However, these are rates for individual overhead items, not an overall POHR. Because the source gives no annual overhead or annual number of runs, a full POHR and the under- or overapplied overhead at year end cannot be computed from these data.

Overhead is probably incomplete. The source reports no rent, water, gas, owner's labor, or marketing costs, and it describes one marketing employee outside production. If any of these belong to production, the corrected cost of IDR 55,125 is a lower bound. Owners should list all indirect costs per month before relying on a markup price.

Implications for MSMEs in Medan. First, verify every subtotal before setting a price, because a single double-counted item changed the conclusion here. Second, record each order on a job cost sheet and prepare a simple schedule of cost of goods manufactured. Third, separate fixed from variable costs and state which one is used for pricing. Fourth, estimate annual overhead and production volume so that a predetermined overhead rate can be used. Accurate cost information supports prices that cover costs, which is a basic condition for the financial sustainability of small food businesses.

Limitations. The analysis uses secondary data from one product and one bakery, assumes that one production run yields one box, and assumes that the source's other figures are accurate. The conclusions therefore concern the published data, not the bakery's current operations.

5. CONCLUSION

Re-computing the published Tomang Bakery data with job-order costing gives a unit cost of IDR 55,125 per box of brownies, not IDR 58,035, because machine depreciation was counted twice and the cake weigher depreciation was miscalculated. The 40% markup price is IDR 77,175, so the bakery's price of IDR 80,000 is above it and the original conclusion that the bakery underprices does not hold. Treating depreciation as fixed lowers the markup price to IDR 72,380, but this depends on the cost-behavior assumption, which shows that the costing method and its assumptions change the price and must be stated explicitly. Of the IDR 6,335 gap between the reported and the variable cost, IDR 2,910 is due to data error and IDR 3,425 to the costing method.

For MSMEs, the study suggests three practices: verify every subtotal before setting a price, record each order on a job cost sheet, and estimate annual overhead and production volume so that a predetermined overhead rate can be used. Future research should collect primary data from the bakery, including annual overhead, production runs, and multiple products, to compute a predetermined overhead rate, test different allocation bases, and measure underapplied or overapplied overhead.

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