Indonesian Journal of Accounting and Governance *ISSN : 2579-7573*
Vol. 8, No. 1, June 2024 *E-ISSN : 2715-5102*
https://doi.org/10.36766/ijag.v8i1.428

ANALYSIS OF JOINT COST ALLOCATION IN DETERMINING COST OF GOODS PRODUCTION

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Abstract

This scientific research paper aims to provide a detailed understanding of joint cost analysis using the 4(four) methods: physical, sales value at split-off point, net realizable value and constant-gross matgin method. This is research aims to provide information for cake store X on how to manage the costs of production, and to improve the management strategies, for it is known that the store uses the simplest recording of accounting which records only the purchase of inventory while deducting it from the sales of finished goods to determine the profit for the year. The results from this research is the most effective joint cost allocation method for cake shop X is the physical method because it is easy to implement.

Keywords: Joint Cost, Production Cost, Cost Allocation, Cost Accounting

1. Introduction

The pandemic that began in early 2020 that originated from China's Wuhan spread rapidly due to the lack of preparation. Like Bread Talk, Tous Les Jours and provence cake stores are also affected by COVID pandemic. (www.lampung-tribunews.com) This is due to a decrease in the number of visitors.

This resulted in the limitation of the operational hours of the store sale. This proves that the pandemic has greatly affected the past industry. Not forgotten to move in the work. The pastry, pandemic even made some UMKM declare bankruptcy or savings to minimize costs. In this pandemic situation, according to the Kemenkop UKM there are around 37,000 UMKM

Article History
Received : 2024-06-03
Revised : 2024-06-15
Accepted : 2024-06-28

that towere seriously affected by the existence of this pandemic is characterized by: about 56 percent ~~a~~ decline in sales, 22 percent reporting issues on the financial aspect, 15 percent reporting issues on the distribution and 4 percent difficulties in getting raw materials. It is also increasing if it is associated with the social limitation policy.Large (PSBB) is applied in several regions of Indonesia (Betty Silfia, 2021).

Rababah et all (2020) found that the small- and medium-sized companies are most affected by this pandemic, in addition to that our analysis has revealed that serious-impact areas and industries which were worst hit by the COVID-19 experienced a sharper decline in financial performance as compared to other industries in Chinese listed companies.

Cake Store X will be studied in this study as one of the UMKMs that affected by the disturbance. In addition, despite the COVID-19 pandemic, the current development of the business world requires companies to be able to manage all the potential that exists in the company, effectively and efficiently to compete in the market. One of Cake Shop X's efforts in anticipating these obstacles is to implement a reliable cost accounting system.

Cost accounting is part of accounting tasks related to recording and analyzing cost elements in an organization. So far, Cake Shop X has not conducted an in-depth cost analysis. Bookkeeping carried out by Cake Shop X is very simple in the form of transaction reports on the purchase of raw materials and supports for producing pastry products.

So far, Cake Shop X only measures company performance based on sales value. So the analysis process in decision-making, which is carried out becomes very limited. In addition, companies are also unable to make the right decisions quickly, especially when there are environmental changes during the COVID-19 pandemic which requires a fast and appropriate management response. Cake Shop X can determine priority product production to deal with operational constraints that occur due to

sudden disruptions such as pandemics. So that Cake Shop X can optimize business profits or at least cover business operations through revenue obtained from product sales. During the COVID-19 pandemic, the company's target is to be able to survive and generate profits, although it may not be optimal. Cost accounting analysis can be done through the determination of shared cost allocation methods. The selection of the right method in the shared cost allocation system has the purpose of calculating the cost of goods and determining the value of inventory.

The determination of the method of allocating shared costs as a tool for analyzing business is very relevant for Cake Shop X, because Cake Shop X has several products that use ingredients that are processed together before being reprocessed into cake products in various shapes and flavors. The separation point is characterized by additional production costs that are not used jointly by each product. A split point is a stage in the production process at which several products can be clearly identified. The main problem encountered in the production process that contains elements of shared costs is calculating the allocation of shared costs for each product produced. The cost of goods produced by Cake Shop X is made based on the cost of all main and supporting raw materials that are the material for the production of cake products. This happens because Cake Shop X does not have final supplies, so the cost of goods manufactured is the same as the cost of goods sold. While the allocation of shared costs incurred in Cake Shop X products is not detailed, Cake Shop X only makes calculations of income and expenses for all transactions.

Hakim (2012) discovered that the LEV value differed significantly before and after the economic crisis. Also, a drop in the capital structure (equity) from management or investors due to concerns about the impact of the crisis on reducing firm profitability, which is particularly risky for shareholders, might cause an increase in LEV value. A reduction in the capital structure (equity) provided by management or investors can result in a

reduction in operational effectiveness and efficiency, which has an impact on the company's overall performance. This study will evaluate the financial performance of Cake Shop X after the COVID-19 pandemic to provide more through information on this subject and to manage the costs of production, and also to improve the management strategies.

2. Literature Review

2.1 Micro, Small and Medium Enterprises (MSMEs)

MSMEs are productive businesses owned and run by individuals or business entities that meet the criteria as micro-enterprises according to law no. 20 of 2008. The criteria for MSMEs are individually divided into micro, small, and medium enterprises. The following are the differences in criteria and understanding of MSMEs:

1. Micro Enterprise

Micro enterprises are defined as productive economic enterprises owned by individuals or business entities that fit the criteria of micro-enterprises. The criteria for micro-enterprises are businesses that have a net worth of up to Rp 50,000,000.00 and the building and land where the business is located are not included. The proceeds from the sale of micro businesses per year are a maximum of Rp 300,000,000.

2. Small Enterprise

A small business is an independent productive economic enterprise owned by an individual or group that is not a branch of the parent company. While also not being part of a medium-sized business, either directly or indirectly. The criteria for a small business are businesses that have a minimum net worth of Rp 50,000,000 with a maximum ceiling of Rp 500,000,000. The results of business sales each year range from Rp 300,000,000 to a maximum of Rp 2,500,000,000.

3. Medium Enterprise

Medium enterprises are not branches or subsidiaries of central companies and are directly or indirectly part of small businesses or large enterprises with total net worth according to laws and regulations. Medium enterprises

categorize the criteria for net worth of more than Rp 500,000,000 to Rp 10,000,000,000 but do not include the value of land and buildings located. The annual sales result reaches Rp 2,500,000,000 to Rp 50,000,000,000.

2.2 Cost Accounting

Factors that affect the activities of a company include economic growth, technological advances and the development of the business world. Accounting has several specialized areas, namely auditing, financial accounting, taxation, management accounting, and cost accounting. According to Firdaus A. Dunia, et al (2019) in the 5th Edition of the book Cost Accounting explains that management accounting is the parent of cost accounting which is a special field of accounting that emphasizes determining and controlling costs. This field of study mainly focuses on the cost of producing an item. Cost accounting includes systems concerned with recording and precise measurement of cost elements from the time they occur and flow through the production process.

The purpose of the cost information is as follows:

1. Determination of cost of goods

The cost of goods is determined by costs collected according to jobs, departments or further broken down by cost pools, which will be charged to products and / services.

2. Cost Planning

As a tool to provide activity planning in formulating objectives and compiling operation programs. These predetermined goals are useful for determining strategies that apply to the long-term and short-term. Cost accounting provides cost information that assists management in making short-term operating decisions as well as allocating long-term decision resources and as a way to formulate strategies for the future, such as:

- determination of selling price and total sales volume
- product profit rate
- purchase
- Capital Expenditure
- factory expansion.

3. Cost Control

Control is management's effort to achieve goals that have been implemented by making continuous comparisons between the results obtained and those planned. Management can conduct performance evaluations based on comparisons between actual results and budgets prepared to produce an assessment of business efficiency and the ability to obtain profits from various products.

4. The basis for making specific decisions

Cost accounting allows additional insight into various cost information that acts as a comparison with the income flowing from various alternative actions that management has taken. Based on the information provided from cost accounting reports, management can start implementing planning decisions regarding specific issues, such as:

a. new product manufacturing.
b. doing stop or continue a certain product cycle.
c. make or buy products.
d. selling product directly or processing it further.

According to Sujarweni (2015), the three main types of cost accounting objectives are as follows:

1. Determination of product costs

Cost accounting provides information that can help management determine product costs. Cost accounting records, classifies, and summarizes the production costs of delivering products or services. The costs collected and presented are costs that have occurred historically. Generally, cost accounting is determining the basic price of products intended to meet the needs of external parties. Cost accounting provides information that can help management determine product costs. Cost accounting records, classifies, and summarizes the production costs of delivering products or services. The costs collected and presented are costs that have occurred historically. Generally, cost accounting is determining the basic price of products intended to meet the needs of external parties.

2. Cost Control

Cost accounting determines the appropriate budget value as a cost control

tool for management in determining the costs that must be incurred for the production of one unit of product. If these costs must be expensed, cost accounting acts as a tool to monitor whether actual costs correspond to planned costs.

3. Making specific decisions.

Cost accounting report information can also be used to make specific decisions regarding the future. The information produced by cost accounting reports is information that is relevant for making decisions that are directly related to future information. Specific decisions constitute a large part of a company's management activities, cost accounting is used to report the objectives of management accounting decisions. To meet the needs of management in decision-making, cost accounting develops various concepts for decision making cost information such as: opportunity costs, hypothetical costs, additional costs, avoidable costs, and lost revenue.

In MSMEs, management accounting information can be useful both in operational and strategic management featuring various planning and control activities (Randall and Horsman, 1998). Management accounting information is used to evaluate how the expectations of profitability in activities have been reached and, even more importantly, to learn how profitability can be improved in the future (Waymire, 2009). Common management accounting tasks for planning purposes are budgets, cash flow projections and the setting of performance targets. For control purposes, MSMEs tend to evaluate performance in relation to budgets or other targets, analyse the differences between actuals and targets, compute profitability (e.g. product, service, project or customer profitability), make variance analyses and take remedial actions if performance is unfavourable relative to targets.

2.3 Cost

According to Horngren, Charles T., Srikant M. Datar, and George Foster (2006), costs are resources sacrificed to achieve certain goals, usually in the form of currency such as cash and cash equivalents. According to Hansen and

Mowen (2005), costs must be incurred to obtain a product/service. Meanwhile, according to the World, F.A. (2018), costs are expenses incurred to obtain goods or services that are useful at the right time, in the future, or have utility in more than one accounting period. Based on the understanding of the experts above, it can be concluded that costs are defined as the time and resources required to be sacrificed and according to convention are usually measured in units of currency as a medium of exchange.

2.4 Cost of Goods Manufacture

The main application of the cost of production is to determine the cost of production of product units to be sold. So that when the product is delivered, the company can determine the profit or loss that will be received after deducting other costs. Thus, it is necessary to pay attention to the accuracy of calculating the cost of production because if a calculation error occurs it can cause losses for the company. According to Winardi (1990), stated production costs are types of sacrifice costs, predictability and measurable quantities related to the production process, which will be carried out in a certain accounting period. The exchange must be based on replacement value for the value of the unit sacrificed.

According to Mulyadi (2009), the purpose of calculating the cost of production is as follows:

1. Determine the selling price of products/services.
2. Monitor the realization of production costs.
3. Calculate periodic profits and losses.
4. Determine the inventory costs of finished and work in process products.

Cost of goods manufactured is important in providing management with an overview of overall production costs. By having a better understanding of production costs, companies can adjust to maximize their overall profitability. Management that is able to review how much the company is spending in terms of manufacturing costs across all specific components of raw materials, labor, and

overhead, can examine more thoroughly how to adjust to maximize net profit.

2.5 Method of Determining Cost of Goods Production

The way to calculate the cost of production is to break down all cost elements during production costs. Calculation of the cost of production can be done using 2 (two) approaches (Mulyadi, 2012), namely the full costing approach and the variable costing approach. Production costs take into account all costs associated with manufacturing inventory including direct materials, factory overhead and labor costs. The types of production costs are as follows (Mulyadi, 2012):

1. raw material
2. direct labor
3. manufacturing overhead

The methods used in determining the cost of production are full costing and variable costing. Both full costing and variable costing methods function as methods for calculating product costs (Mulyadi, 2012).

1. Full costing

The full costing method is used to determine production costs by calculating all elements of production costs. Production costs consist of several costs including raw material costs, direct labor costs and factory overhead costs, both of which are variable or fixed.

2. Variable costing

Variable costing is a type of pricing method for production costs that are variable in nature. There are several types of production costs that are variable, namely raw material costs, direct labor costs, and variable factory overhead costs.

2.6 Joint Cost and Joint Product

According to Mulyadi (2009), joint products are usually two or more products that can be produced together using a series of production processes. The selling price (quantity times the selling price per unit) of each combined product is usually relatively the same, which tends to cause no differences between the two. However, the resulting

product is considered a main product or by-product.

Joint products have a very close physical relationship to each other throughout the production cycle. If there is a sudden increase in quantity for one additional unit of product, there will also be a proportional increase. Products processed simultaneously often have the same relative value to each other. Joint products have a product split-off point which comes from the results of raw materials, labor and factory overhead costs which are divided by the product. After the split-off, the stand-alone product can be sold immediately or additional ingredients added to increase its value to be sold at a higher selling price.

It is important to identify joint costs to ensure that joint products can be separated. According to Supriyono (1999), a series of products are produced together using the same facilities. Product costs (Agus Purwaji, 2016) are production costs used by general products. Consists of direct material costs and direct labor costs that can be traced over the product range and factory overhead costs for each product line, often referred to as shared overhead costs. Meanwhile, joint costs (Mulyadi, 2009) are costs that are absorbed from the time the raw materials are processed to the point of separation of various types of products. Meanwhile, according to Carter and Usry (2009), joint costs are a type of cost that is absorbed during the production or manufacturing process for several types of combined goods.

2.7 Cost Allocation

Cost allocation is used to determine production costs and inventory value (Mulyadi, 2014). The purpose of cost allocation is to provide information for management, for the purposes of preparing financial reports and making decisions (Mulyadi, 2014).

According to Horngren (2008). Cost allocation is charged to indirect costs for certain cost objects. Cost allocation is a problem relating costs or groups of costs to a single or more costs. Cost allocation is used as an effort to identify one or more costs through one

cost function (Kennedy, 2022). The objectives of cost allocation are as follows (Pamungkas, 2023):

1. Allows companies to determine the right selling price for their products or services.
2. Allows companies to determine the right selling price for their products or services
3. Allows companies to identify areas that require improvement or cost reduction.
4. Helps in planning and controlling costs.

2.8 Joint Cost Method

Joint products, joint costs, by-products, are processes that can simultaneously produce two or more products. If there is a production process that can produce two or more products, then these products can be considered as joint products which can be classified as main products, or by-products, according to the definition of Horngren, Charles T., Srikant M Datar, and George Foster, (2006). The following is a definition of each type of product:

1. Main Product

   A product that has a relatively high selling value from one process result.

2. By-Products

   Products that have a low selling value when compared to the selling value of the main product.

3. Joint Products

   A product that has a relatively high selling value and cannot be separately identified as an individual product until the point of separation.

Halim (2012) states that Joint Products are several products produced from a series or series of production processes simultaneously using the same raw materials, labor and factory overhead, which cannot be traced or differentiated/separated at each products and have relatively the same sales value or product quantity. Meanwhile, Mulyadi (2012) states that joint products are two or more products that are produced simultaneously using a series of processes or a combined process. The

selling value of each of these joint products is relatively the same, so that none of the products produced are considered main products or by products.

Apart from the above, in accordance with the definition of William K. Carter and Milliton F. Usry (2004), the dividing point, which is defined as the dividing point as a single unit will produce by-products, which can be classified into two groups according to the marketing conditions of the product. That is:

1. By-products can be sold in their original form without further processing.
2. By-products that require further processing so they can be sold have 2 meanings, namely:
   (a) Common Cost, namely overhead costs from all factories in order to calculate the cost of goods allocated to existing departments (joining fee).
   (b) Joint Costs, namely joint production costs incurred in the production process and producing various kinds of products.

Halim (2012) explains that joint products have several characteristics, including the following:

a. Joint products have a close physical relationship with each other in the production process. If there is an additional quantity to add units of another product, then the quantity of the other product will increase proportionally.
b. No single product of the joint product has a significantly higher value than the other products.
c. In the joint product process, the term "split-off" is known, namely the time when each type of product is separated (split-off) from the raw materials, labor and overhead that the product has enjoyed together.
d. After being separated (split-off) the product stands on its own which may be sold immediately or may also be processed further to obtain a more profitable product.

Horngren (2012) suggests that joint costs can be allocated to each product using several methods, including:

1. Sales Value at Splitoff Method

ISSN : 2579-7573
E-ISSN : 2715-5102

This method is widely used to allocate joint costs to joint products. The rationale for this method is that the selling price of a product is a manifestation of the costs incurred in processing the product.

2. Physical Measure Method

The physical unit method tries to determine the cost of products together according to the benefits determined by each final product. In this method, joint costs are allocated to joint products on the basis of physical coefficients, namely the quantity of raw materials contained in each product. This coefficient is expressed in units of weight, volume or other measurements.

3. Net Realizable Value Method

The net realizable value (NRV) method allocates joint costs to joint products produced during the accounting period on the basis of their relative NRV—final sales value minus separable costs. The NRV method is typically used in preference to the sales value at splitoff method only when selling prices for one or more products at splitoff do not exist.

4. Constant Gross-Margin Percentage NRV Method

The constant gross-margin percentage NRV method allocates joint costs to joint products produced during the accounting period in such a way that each individual product achieves an identical gross-margin percentage. The constant gross-margin percentage NRV method is the only method of allocating joint costs under which products may receive negative allocations. This may be required in order to bring the gross-margin percentages of relatively unprofitable products up to the overall average. The constant gross-margin percentage NRV method also differs from the other two market-based joint-cost-allocation methods described earlier in another fundamental way. Neither the sales value at splitoff method nor the NRV method takes account of profits earned either before or after the splitoff point when allocating the joint costs.

3. Research Methods

The research method used by the author is a descriptive qualitative

ISSN : 2579-7573
E-ISSN : 2715-5102

method. Moleong (2017) defines qualitative methodology as a research procedure that produces descriptive data in the form of written or spoken words from people and observable behavior. According to Nazir (1988), the descriptive method aims to describe, explain, or describe the facts, characteristics, and relationships between phenomena that occur systematically, factually, and accurately.

Meanwhile, according to Sugiyono (2018), qualitative research methods are a type of research method in natural object conditions. The researcher acts as a key instrument for data collection techniques. Data analysis is inductive/qualitative, and research results emphasize meaning rather than generalization.

In this research, data collection techniques were carried out through interviews and documents which are described as follows:

1. Interview

According to Moleong (2017), an interview is a conversation with a specific purpose carried out by two parties, namely the interviewer who asks questions and the interviewee who answers the questions. Interviews can be conducted face to face, telephone or video call. Interviews can also be divided into structured interviews and unstructured interviews. The interview technique used in this research is unstructured interviews. The interview was conducted directly with the owner of Cake Shop X.

2. Documents

According to Sugiyono (2018), documentation is a method used to obtain data and information in the form of books, archives, documents, written figures and images in the form of reports and information used to support research. Document study acts as a complement to the use of observation or interview methods which will provide higher credibility through photos or written work from existing academics. The documents used for this research are reports on purchases of raw materials and sales of Cake Shop X rolled cake products for 1 (one) year, namely

ISSN : 2579-7573
E-ISSN : 2715-5102

January 2022 - December 2022, as well as other supporting documents. This document was obtained directly from Cake Shop X Management.

Data analysis according to Sugiyono (2018) is the process of searching and compiling data systematically. Data obtained from various interviews, field notes and documentation, with appropriate data then arranged into categories, broken down into units, synthesized, then rearranged into patterns, as well as selecting what is important and studied, and finally drawing conclusions so that it is more easy to understand by yourself and others. The data analysis method that will be carried out in this research is as follows.

1. Review financial report data.
2. Process data into 4 joint cost methods.
3. Compare the calculation results obtained.
4. Analyze the comparison results.
5. Make conclusions based on the results of the analysis that has been carried out.

4. Results

4.1 Business Process Cake Shop X

Cake Shop X is one of MSMEs in pastry industry. Cake Shop X has 2 (two) types of products with various flavors. Cake Shop X produces pudding cake and roll cake as well as several dry cakes such as cookies and nastar which are made during holiday sessions. Sales are carried out in 2 (two) ways, namely direct sales in shops/outlets and online sales via the Grab and Gojek platforms. However, in this research the author only examined the Roll Cake product which was the most dominant product produced by Cake Shop X compared to other products during the current year.

So far, Cake Shop X has not made financial reports. In fact, according to Kieso, Weygandt, & Warfield (2011), financial reports consist of a financial position report, profit and loss report, cash flow report, and retained earnings report. Putra & Lilis (2022) found that

ISSN : 2579-7573
E-ISSN : 2715-5102

accounting information systems have a substantial impact on MSMEs performance, and environmental uncertainty can reduce the influence of accounting expertise on MSMEs performance.

This research helps MSMEs analyze the most appropriate basis for cost allocation to be used as a basis for financial reports. Financial report gives the information regarding a company's finances in a certain period which can be used to describe the company's performance situation. Cake Shop X just made simple report that showed mutation of input and output some of material. That report can be seen on Table 1 below.

Table 4.1 Cake Shop Report for 31 December 2022

2022				
Keterangan		Jumlah (Gram)	Harga Per Unit gram	Total
Perseidan awal				
Telur		0	320	Rp0
Mentega		15000	917	Rp13.755.000
tepung		10000	135	Rp1.350.000
Gula		5000	220	Rp1.100.000
Total Persediaan awal				Rp16.205.000
Pembeliaan				
Telur		180250	320	Rp57.680.000
Mentega		66800	917	Rp61.255.600
tepung		35900	135	Rp4.846.500
Gula		66500	220	Rp14.630.000
Total Pembelian				Rp138.412.100
Harga Pokok Bahan siap pakai				
Telur		180250	320	Rp57.680.000
Mentega		61800	917	Rp56.670.600
tepung		30900	135	Rp4.171.500
Gula		51500	220	Rp11.330.000
Total HPB siap pakai				Rp129.852.100
Persediaan Bahan akhir				
Telur		0	320	
Mentega		20000	917	Rp18.340.000
tepung		15000	135	Rp2.025.000
Gula		20000	220	Rp4.400.000
Total Persediaan bahan akhir				Rp24.765.000
Biaya Bahan Baku				Rp129.852.100

Source: Cake Shop, 2023

Cake Shop X has several assets that are used to carry out business operations. However, so far Cake Shop X has not recorded the assets it owns. These assets include buildings, cake molding process equipment, refrigerators and ovens. Based on the discussion in chapter 2 (two), the importance of making financial reports. Basic accounting concepts according to understanding (Wadiyo, 2022), it is best for Cake Shop the company can understand its financial position report. The financial position report functions to summarize the assets, liabilities and equity of the business owner.

4.2 Capacity of Production

Production capacity can also be defined as the volume or number of products that can be produced by a production facility or company in a certain period using the resources available at that time. At the beginning of 2022, Cake Shop X has used a new oven, which has better quality and more consistent performance compared to the old version. This happens because new ovens are much more specific in baking cakes. As for the performance of the new oven, based on operating hours, the maximum production capacity in one day is 120 units. Even though the previous oven was only able to reach a maximum capacity of 100 units.

4.3 Production Cycle

The production process in making Roll Cake cakes begins by separating the egg yolks and egg whites from their shells to a designated place. After breaking the required number of eggs, it's time to separate the egg yolks from the egg whites. The next process is to measure the egg yolk into a mixing machine using a scale for a much more precise measurement. After measuring the desired nominal weight, the next step is to mix the eggs together, so that no lumps are produced for a much better texture. It should be noted that it is important that the mixture is not over mixed. After sufficient time to mix the dough, the next step is to pour the mixture into the cake mold, beforehand weighing the amount of dough that goes into the mold so that the size or quantity does not differ from each other, because

this will affect the baking process. Finally, after the mixture is poured into the cake mold, it's time to bake it, this last time is very important for final production, namely ensuring the product is not overbaked, so that the cake doesn't dry out or even burn.

When the product baking process is complete, the semi-finished product (work in process) will be added with the specified jam/filling material according to the order. This material is added by applying it evenly to the top layer of the product. After spreading enough jam/filling on the cake, the next step is to roll the cake so that it has an iconic shape. The product needs to be packed tightly so that it remains in its packaging form, so workers need to pay attention that this process requires a gentle touch so as not to cause damage to the cake. Because if damage occurs, it will definitely cause complaints from buyers, which can cause them to demand repayment or a new Roll Cake.

After the Roll Cake process is shaped iconically, the product is then packaged into a packaging box which is used as additional protection to store and transport the product safely. Packaging boxes are not only useful for product safety but also reduce the risk of the product being crushed or damaged due to shock during shipping. The packaging box also acts as protection from the risk of rain, which can reduce product quality.

4.4 Joint Cost

Cake Shop X has not calculated joint cost allocations in calculating the cost of goods sold. Recording at cake shop x only consists of a recap of expenses for purchasing raw and supporting materials in the production process of Roll Cake products. The raw and supporting materials used in 1 (one) production process in the joint product production process require several raw materials.

The following raw materials needed to produce around 10 (ten) product units are as follows:

1. Telur, 1,824 grams, Rp. 58,358;
2. Terigu, 600 grams, Rp. 8,100;
3. Gula, 1,200 grams, Rp. 26,400;
4. Mentega, 1,200 grams, Rp. 110,040;

Purchases of raw and supporting materials are made in cash, so that Cake Shop X calculates profits based on the selling price per unit minus the purchase price of raw materials, supporting materials and other overhead costs.

4.5 Joint Cost for Roll Cake

The joint costs of Roll Cake products are expenses for the production of sponge cakes which will be processed or reprocessed by adding further processing costs. The raw materials, supports and other overhead required to produce sponge cake in 1 (one) production, namely producing around 10 (ten) units of sponge cake.

During 2022, the costs incurred by Cake Shop X in producing sponge cakes are IDR. 37,503,330. This amount produces 515 units of sponge cake for 11 variations. The details of the production of the 11 Roll Cake variants can be seen in Table 4.2, Table 4.3 and Table 4.4.

Table 4.2 Joint Cost Calculation

	Cake 1 lyng	515 lyng
Telur	Rp58.368	Rp30.059.520
Gula	Rp2.640	Rp1.359.600
Terigu	Rp810	Rp417.150
Mentega	Rp11.004	Rp5.667.060
Total	Rp72.822	Rp37.503.330

Source: Cake Shop (2023)

Table 4.3 Inventory Report for 2022 (Part 1)

Joint Cost						
Joint Cost (Costs of 515 Roll cake and processing to Split Off)	Rp37.503.330					
	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Beggining Inventory	0	0	0	0	0	0
Production	21	16	103	70	21	70
Sales	21	16	103	70	21	70
Ending Inventory	0	0	0	0	0	0
Selling Price	Rp210.000	Rp210.000	Rp220.000	Rp210.000	Rp210.000	Rp210.000

Source: processed in research, 2023

Table 4.4 Inventory Report for 2022 (Part 2)

Joint Cost					
Joint Cost (Costs of 515 Roll Cake and Processing to Split off)	Rp37.503.330				
	Moocha Messes	Marble	Martabak	Black Point	Nutella
Beginning Inventory	0	0	0	0	0
Production	36	26	107	37	8
Sales	36	26	107	37	8
Ending Inventory	0	0	0	0	0
Selling Price	Rp210.000	Rp210.000	Rp235.000	Rp210.000	Rp210.000

Source: processed in research, 2023

The data in table 4.2, table 4.3 and table 4.4 above is the amount of Roll Cake inventory at Cake Shop X during 2022. The amount of initial inventory, production, ending inventory and selling price per unit of product. Table 2 and table 3 show the production and sales of all Roll Cake products totaling 515 units. Each consists of 21 units of strawberry, 16 units of blueberry, 103 units of pineapple, 70 units of vanilla cheese, 21 units of vanilla moocha and 70 units of pandan cheeses, 36 units of Moocha Messes, 26 units of marble, 107 units of martabak, 37 units of black point, and 8 units of Nutella.

Meanwhile, the selling price per unit of each product in the 2022 period for strawberry, blueberry, vanilla cheese, vanilla moocha and pandan cheese products is IDR. 210,000, and pineapple Rp. 220,000 while Moocha messes, marble, black point and nutella products are Rp. 210,000, and martabak Rp. 235,000. Table 4.2, table 4.3 and table 4.4 also show that the Roll Cake product has no ending inventory in the current year.

4.6 Joint Cost Analysis Using Physical Measure Method

Table 4.5 Joint cost allocation using physical measure for the year 2022.

Allocation of Joint cost using physical measure	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Physical measure of total productions	21	16	103	70	21	70
Weighting	4,08%	3,11%	20,00%	13,59%	4,08%	13,59%
Joint Cost Allocated	Rp1.529.262	Rp1.165.152	Rp7.500.666	Rp5.097.540	Rp1.529.262	Rp5.097.540
Joint Production cost/unit	Rp72.822	Rp72.822	Rp72.822	Rp72.822	Rp72.822	Rp72.822

Allocation of Joint cost using physical measure	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Physical measure of total productions	36	26	107	37	8	515
Weighting	6,99%	5,05%	20,78%	7,18%	1,55%	100,00%
Joint Cost Allocated	Rp2.621.592	Rp1.893.372	Rp7.791.954	Rp2.694.414	Rp582.576	Rp37.503.330
Joint Production cost/unit	Rp72.822	Rp72.822	Rp72.822	Rp72.822	Rp72.822	

Source: processed in research, 2023

Several variants have quite large Gross Margin levels, namely the strawberry, blueberry, nanas and marble variants. The Gross Margin for the Roll Cake variant reaches 61.99%. These results can be a reference for shops if they want to increase margins in their business, namely increasing production and sales of the Roll Cake variant. So you can optimize profits.

Table 4.6 Product Line Income Statement Using Physical Measure Method for the year 2022

Product Line Income Statement Using Physical Measure Method for the year 2022						
	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Revenues	Rp4.410.000	Rp3.360.000	Rp22.660.000	Rp14.700.000	Rp4.410.000	Rp14.700.000
Production Cost :						
Joint Cost Allocated	Rp1.529.262	Rp1.165.152	Rp7.500.666	Rp5.097.540	Rp1.529.262	Rp5.097.540
Separable Cost	Rp147.000	Rp112.000	Rp1.133.000	Rp1.890.000	Rp457.800	Rp1.960.000
Cost of Goods Sold	Rp1.676.262	Rp1.277.152	Rp8.633.666	Rp6.987.540	Rp1.987.062	Rp7.057.540
Gross Margin	Rp2.733.738	Rp2.082.848	Rp14.026.334	Rp7.712.460	Rp2.422.938	Rp7.642.460
Gross Margin Percentage	61,99%	61,99%	61,90%	52,47%	54,94%	51,99%

	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Revenues	Rp7.560.000	Rp5.460.000	Rp25.145.000	Rp7.770.000	Rp1.680.000	Rp111.855.000
Production Cost :						
Joint Cost Allocated	Rp2.621.592	Rp1.893.372	Rp7.791.954	Rp2.694.414	Rp582.576	Rp37.503.330
Separable Cost	Rp784.800	Rp182.000	Rp5.718.080	Rp1.387.500	Rp240.000	Rp14.012.180
Cost of Goods Sold	Rp3.406.392	Rp2.075.372	Rp13.510.034	Rp4.081.914	Rp822.576	Rp51.515.510
Gross Margin	Rp4.153.608	Rp3.384.628	Rp11.634.966	Rp3.688.086	Rp857.424	Rp60.339.490
Gross Margin Percentage	54,94%	61,99%	46,27%	47,47%	51,04%	53,94%

Source: processed in research, 2023

4.7 Joint Cost Analysis Using Sales Value at Split-off Method

Table 4.7 Joint cost using sales value at split-off for the year 2022

Allocation of Joint Cost Using Sales Value at Splitoff method	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Sales Value of Total Production at Splitoff point	Rp4.410.000	Rp3.360.000	Rp22.660.000	Rp14.700.000	Rp4.410.000	Rp14.700.000
Weighting	0,04	0,03	0,20	0,13	0,04	0,13
Joint Cost Allocated	Rp1.478.608	Rp1.126.558	Rp7.597.563	Rp4.928.693	Rp1.478.608	Rp4.928.693
Joint Production cost per item	Rp70.410	Rp70.410	Rp73.763	Rp70.410	Rp70.410	Rp70.410

Allocation of Joint Cost Using Sales Value at Splitoff method	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Sales Value of Total Production at Splitoff point	Rp7.560.000	Rp5.460.000	Rp25.145.000	Rp7.770.000	Rp1.680.000	Rp111.855.000
Weighting	0,07	0,05	0,22	0,07	0,02	
Joint Cost Allocated	Rp2.534.756	Rp1.830.657	Rp8.430.747	Rp2.605.166	Rp563.279	Rp37.503.330
Joint Production cost per item	Rp70.410	Rp70.410	Rp78.792	Rp70.410	Rp70.410	

Source: processed in research, 2023

Cake Shop X does not sell Bolu Cake products at the splitoff point. So the joint cost allocation analysis using the sales value at splitoff point method cannot use the splitoff price calculation for Cake Shop Rp. 120,000 per unit. Table 6 is a table regarding the joint cost allocation method using the market price method for sponge cake products.

The total joint product costs for strawberry, blueberry, vanilla cheese, vanilla moocha, pandan cheese, moocha messes, marble, black point and nutella, pineapple and martabak products are Rp. 72,822. This figure is the result of joint cost allocation multiplied by production data for each product. Based on the analysis of the Product.

Allocation of costs using the selling price method, product gross margins are not always the same from one to another. This is influenced by the price of the product and the number of products sold. Table 6 shows the total income for the 2022 period of Rp. 111,855,000.

Table 4.8 Product Line Income Statement Using Sales Value at Split-off Method for the year 2022

Product Line Income Statement Using Sales Value at Splitoff Method for the year 2022						
	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Revenues	Rp4.410.000	Rp3.360.000	Rp22.660.000	Rp14.700.000	Rp4.410.000	Rp14.700.000
Production Cost :						
Joint Cost Allocated	Rp1.478.608	Rp1.126.558	Rp7.597.563	Rp4.928.693	Rp1.478.608	Rp4.928.693
Separable Cost	Rp147.000	Rp112.000	Rp1.133.000	Rp1.890.000	Rp457.800	Rp1.960.000
Cost of Goods Sold	Rp1.625.608	Rp1.238.558	Rp8.730.563	Rp6.818.693	Rp1.936.408	Rp6.888.693
Gross Margin	Rp2.784.392	Rp2.121.442	Rp13.929.437	Rp7.881.307	Rp2.473.592	Rp7.811.307
Gross Margin Percentage	63,14%	63,14%	61,47%	53,61%	56,09%	53,14%

	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Revenues	Rp7.560.000	Rp5.460.000	Rp25.145.000	Rp7.770.000	Rp1.680.000	Rp111.855.000
Production Cost :						
Joint Cost Allocated	Rp2.534.756	Rp1.830.657	Rp8.430.747	Rp2.605.166	Rp563.279	Rp37.503.330
Separable Cost	Rp784.800	Rp182.000	Rp5.718.080	Rp1.387.500	Rp240.000	Rp14.012.180
Cost of Goods Sold	Rp3.319.556	Rp2.012.657	Rp14.148.827	Rp3.992.666	Rp803.279	Rp51.515.510
Gross Margin	Rp4.240.444	Rp3.447.343	Rp10.996.173	Rp3.777.334	Rp876.721	Rp60.339.490
Gross Margin Percentage	56,09%	63,14%	43,73%	48,61%	52,19%	53,94%

Source: processed in research, 2023

Using this method produces the same recommendations as using the Physical Measure allocation method, namely that several variants have quite large Gross Margin levels, namely the strawberry, blueberry, pineapple and marble variants. Gross Margin for this variant reaches 61.99%. These results can be a reference for shops if they want to increase margins in their business, namely increasing production and sales of the sponge cake variant.

4.8 Joint Cost Analysis Using Net Realizable Value Method

Table 4.9 Joint cost using Net Realizable value for the year 2022.

Allocation of Joint Costs Using Net Realizable Value Method	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Final Sales	Rp4.410.000	Rp3.360.000	Rp22.660.000	Rp14.700.000	Rp4.410.000	Rp14.700.000
Deduct Separable Costs	Rp147.000	Rp112.000	Rp1.133.000	Rp1.890.000	Rp457.800	Rp1.960.000
Net Realizable value at Splitoff	Rp4.263.000	Rp3.248.000	Rp21.527.000	Rp12.810.000	Rp3.952.200	Rp12.740.000
Weighting	0,04	0,03	0,22	0,13	0,04	0,13
Joint Cost Allocated	Rp1.634.016	Rp1.244.964	Rp8.251.338	Rp4.910.096	Rp1.514.885	Rp4.883.265
Production Cost Per Item	Rp84.810	Rp84.810	Rp91.110	Rp97.144	Rp93.937	Rp97.761

Allocation of Joint Costs Using Net Realizable Value Method	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Final Sales	Rp7.560.000	Rp5.460.000	Rp25.145.000	Rp7.770.000	Rp1.680.000	Rp111.855.000
Deduct Separable Costs	Rp784.800	Rp182.000	Rp5.718.080	Rp1.387.500	Rp240.000	Rp14.012.180
Net Realizable value at Splitoff	Rp6.775.200	Rp5.278.000	Rp19.426.920	Rp6.382.500	Rp1.440.000	Rp97.842.820
Weighting	0,07	0,05	0,20	0,07	0,01	
Joint Cost Allocated	Rp2.596.946	Rp2.023.067	Rp7.446.374	Rp2.446.424	Rp551.955	Rp37.503.330
Production Cost Per Item	Rp93.937	Rp84.810	Rp123.032	Rp103.620	Rp98.994	

Source: processed in research, 2023

Table 4.9 is a table of shared cost allocation methods using the average cost per unit method for Roll Cake products. Total cost of net realizable value at the time of separation (separable cost) was Rp. 14,012,180. This method declared valid and fulfilled for separates the various separable costs of products to obtain the net realizable value at the split-off point. The joint cost allocation is obtained from the average net realizable value at the split point.

Table 4.10 Joint cost using Net Realizable value for the year 2022.

Product Line Income Statement Using Net Realizable Value Method for the year 2022						
	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Revenues	Rp4.410.000	Rp3.360.000	Rp22.660.000	Rp14.700.000	Rp4.410.000	Rp14.700.000
Cost Of Goods Sold :						
Joint Cost	Rp1.634.016	Rp1.244.964	Rp8.251.338	Rp4.910.096	Rp1.514.885	Rp4.883.265
Seperable Cost	Rp147.000	Rp112.000	Rp1.133.000	Rp1.890.000	Rp457.800	Rp1.960.000
Production Cost	Rp1.781.016	Rp1.356.964	Rp9.384.338	Rp6.800.096	Rp1.972.685	Rp6.843.265
Gross Margin	Rp2.628.984	Rp2.003.036	Rp13.275.662	Rp7.899.904	Rp2.437.315	Rp7.856.735
Gross Margin Percentage	59,61%	59,61%	58,59%	53,74%	55,27%	53,45%

	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Revenues	Rp7.560.000	Rp5.460.000	Rp25.145.000	Rp7.770.000	Rp1.680.000	Rp111.855.000
Cost Of Goods Sold :						
Joint Cost	Rp2.596.946	Rp2.023.067	Rp7.446.374	Rp2.446.424	Rp551.955	Rp37.503.330
Seperable Cost	Rp784.800	Rp182.000	Rp5.718.080	Rp1.387.500	Rp240.000	Rp14.012.180
Production Cost	Rp3.381.746	Rp2.205.067	Rp13.164.454	Rp3.833.924	Rp791.955	Rp51.515.510
Gross Margin	Rp4.178.254	Rp3.254.933	Rp11.980.546	Rp3.936.076	Rp888.045	Rp60.339.490
Gross Margin Percentage	55,27%	59,61%	47,65%	50,66%	52,86%	53,94%

Source: processed in research, 2023

Based on Table 4.10, the highest gross margin was nanas variant with amount Rp13,275,662 (58.59% gross margin).

4.9 Joint Cost Analysis Using Constant-Margin Percentage NRV Method

Table 4.11 Joint cost using Constant-Margin Percentage NRV Method for the year 2022.

	CGM					
Allocation of Joint Costs Using Constant Gross Margin						
FInal Sales Value of TOtal Production During Accounting	Rp111.855.000					
Deduct Joint anda Seperable	Rp51.515.510					
Gross Margin	Rp60.339.490					
Gross Margin Percentage	53,94%					
	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Final Sales Value of Total Production during Accounting Period	Rp4.410.000	Rp3.360.000	Rp22.660.000	Rp14.700.000	Rp4.410.000	Rp14.700.000
Deduct Gross Margin, Using overall Gross Margin	Rp2.378.947	Rp1.812.531	Rp12.223.797	Rp7.929.824	Rp2.378.947	Rp7.929.824
Total Production Costs	Rp2.031.053	Rp1.547.469	Rp10.436.203	Rp6.770.176	Rp2.031.053	Rp6.770.176
Deduct Seperable Costs	Rp147.000	Rp112.000	Rp1.133.000	Rp1.890.000	Rp457.800	Rp1.960.000
Joint Costs Allocated	Rp1.884.053	Rp1.435.469	Rp9.303.203	Rp4.880.176	Rp1.573.253	Rp4.810.176

	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Final Sales Value of Total Production during Accounting Period	Rp7.560.000	Rp5.460.000	Rp25.145.000	Rp7.770.000	Rp1.680.000	Rp111.855.000
Deduct Gross Margin, Using overall Gross Margin	Rp4.078.195	Rp2.945.363	Rp13.564.315	Rp4.191.479	Rp906.266	Rp60.339.490
Total Production Costs	Rp3.481.805	Rp2.514.637	Rp11.580.685	Rp3.578.521	Rp773.734	Rp51.515.510
Deduct Seperable Costs	Rp784.800	Rp182.000	Rp5.718.080	Rp1.387.500	Rp240.000	Rp14.012.180
Joint Costs Allocated	Rp2.697.005	Rp2.332.637	Rp5.862.605	Rp2.191.021	Rp533.734	Rp37.503.330

Source: processed in research, 2023

The Constant-Margin Percentage NRV Method uses several stages/steps in allocating joint costs. This method has 3 (three) steps, namely the first step is to determine the gross margin obtained by company management as a whole for sales of Roll Cake products for the current year period, the second step is to determine total production costs, and the third step is to determine joint cost allocation costs.

Based on the table above, it can be seen that the gross margin obtained is Rp. 60,339,490 or 53.94%. Total production costs are Rp. 51,515,510, so the shared cost allocation is IDR 37,503,330. Meanwhile, the revenue obtained by Cake Shop X during the 2022 period is Rp. 111,855,000, with a Cost of Goods Sold of Rp. 51,515,510. So the resulting gross margin is Rp 60,339,490 or 53.94% for Roll Cake products for the year 2022 period. This value will be the basis for allocating joint costs using the Constant-Margin Percentage NRV Method.

Table 4.12 Joint cost using Net Realizable value for the year 2022.

Product Line Income Statement Using Constant Gross Margin Percentage NRV Method For the year 2022						
	Strawberry	Blueberry	Nanas	Vanilla Cheese	Vanilla Moocha	Pandan Cheese
Revenues	Rp4.410.000	Rp3.360.000	Rp22.660.000	Rp14.700.000	Rp4.410.000	Rp14.700.000
Cost of Goods Sold						
Joint Costs	Rp1.884.053	Rp1.435.469	Rp9.303.203	Rp4.880.176	Rp1.573.253	Rp4.810.176
Seperable Costs	Rp147.000	Rp112.000	Rp1.133.000	Rp1.890.000	Rp457.800	Rp1.960.000
Production Costs	Rp2.031.053	Rp1.547.469	Rp10.436.203	Rp6.770.176	Rp2.031.053	Rp6.770.176
Gross Margin	Rp2.378.947	Rp1.812.531	Rp12.223.797	Rp7.929.824	Rp2.378.947	Rp7.929.824
Gorss Margin Percentage	53,94%	53,94%	53,94%	53,94%	53,94%	53,94%

	Moocha messes	Marble	Martabak	Black Point	Nutella	Total
Revenues	Rp7.560.000	Rp5.460.000	Rp25.145.000	Rp7.770.000	Rp1.680.000	Rp111.855.000
Cost of Goods Sold						
Joint Costs	Rp2.697.005	Rp2.332.637	Rp5.862.605	Rp2.191.021	Rp533.734	Rp37.503.330
Seperable Costs	Rp784.800	Rp182.000	Rp5.718.080	Rp1.387.500	Rp240.000	Rp14.012.180
Production Costs	Rp3.481.805	Rp2.514.637	Rp11.580.685	Rp3.578.521	Rp773.734	Rp51.515.510
Gross Margin	Rp4.078.195	Rp2.945.363	Rp13.564.315	Rp4.191.479	Rp906.266	Rp60.339.490
Gorss Margin Percentage	53,94%	53,94%	53,94%	53,94%	53,94%	53,94%

Source: processed in research, 2023

At observations per Roll Cake product variant produced by Cake Shop This result means that to cover the costs of the other 11 Roll Cake variants, the most sales are required, namely martabak and pineapple which have the highest sales percentage when compared to the other variants. So it can be concluded that the largest sales variant may not receive attention from management and can result in determining an inappropriate sales strategy.

5. Conclusions and Recommendation

5.1 Conclusions

This research is limited to Cake Shop X which operates in the pastry services sector. Beside that, Cake Shop is one of MSMEs which hasn't provide financial statement properly.

Based on the results of the discussion in the previous chapter, the most effective joint cost allocation method used by cake shop is the physical method. This method is recommended because it is easy to use. Apart from that, the variant has a number and selling price that is quite significantly different from other variants. nanas and martabak variants because the number of sales exceeds 100 units per year while other variants only reach 50% of total sales.

5.2 Recommendations

Based on the results of the discussion and conclusions in this research, the following suggestions are given to Store X:

1. Create simple financial reports to measure business performance.
2. Using the physical method is easy to implement because it uses weighting as a measure of production and costs.

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