

# Comparative Analysis of the Wooden House Production Principal Cost Calculation Using the Full Costing and Variable Costing Method

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**Abstract**—The study aims to determine differences in the calculating of the principal cost of production of two types of wooden houses using two methods: full costing and variable costing methods. Their comparison can be used as a basis for determining the selling price of the product and the relevant production principal cost method. Starting from the cost of raw material, labour cost and other costs that are included in the element of wooden house production (overhead cost). This study uses a qualitative descriptive method that describes and explains the various data obtained by the researchers both quantitative and qualitative data. The results indicate that the calculation using full costing method is greater which is Rp. 703.250 when compared to calculation with the other method for both types of wooden houses. These results show a small difference between them. It is in the form of fixed overhead costs which are not charged to production principal cost using variable costing method. Of these two methods, the variable costing method is more relevant because the cost of the product is lower than that of full costing method. These result can give the producers good information for choosing the better calculation method.

**Keywords**—full costing methods, variable costing methods

## I. INTRODUCTION

Profit formation components require management tools that are able to produce relevant information in order to make appropriate economic and financial decisions, namely accounting. Accounting is the activity of providing quantitative data, especially financial data from economic units that can be used in making economic decisions [1]. One of the important decisions that must be taken by management is concerning determining the cost of the product. Determining the principal cost of production is very important considering that the benefits of information on the cost production determines the selling price of the product, cost of goods for finished products and products in the process that will be presented in the balance sheet.

In determining the principal cost of production, the information needed by the company is information regarding the cost of raw materials, labour costs and factory overhead costs. These three types of activities must be determined carefully both in the recording and classification, so that the

information on the cost of production produced can be relied on both for determining the principal selling price and profit planning as well as periodic profit and loss calculation [2]. Determining the principal cost of production by using the right model will contribute to decision making for determining the selling price and the desired level of profit. But if the company is less careful or wrong in determining the cost of production, there will be an error in determining the selling price that affects the profit targeted by the company. Considering the importance of the principal cost of production for every company both small, medium and large scales, it is very important for the companies, especially those engaged in manufacturing to calculate the principal cost of production using the right calculation model. Therefore, it is deemed necessary to make a comparison of the cost using various production methods, namely full costing and variable costing methods.

The Minahasa typical wooden house industry in Tombasian Atas Village, West Kawangkoan Subdistrict, Minahasa Regency is a business occupied by some of the population both as carpenters and business owners. The abundance of resources in the form of wood from trees around the production area is the reason why this industry still exists in the era of global competition. The areas of marketing of wooden house products are not only local but also areas outside the Island of Sulawesi. However, like other industries in general, wooden house manufacturers have not been able to calculate the principal cost of production for each product due to limited knowledge of business owners. In ability to calculate and determine the range of costs incurred in producing 1 unit of wooden house makes the determination of the principal cost of production based solely on how much the costs incurred without going through a detailed calculation of the real costs incurred. This has an impact on the difficulty in determining the selling price which will affect the profit to be obtained. In determining the amount of the cost of production, two methods are known namely, full costing method and variable costing method [3]. This research compared the determination of principal cost of production using both methods and determined the selling price after estimating the real cost of the production of wooden houses is known.

## II. RESEARCH METHODOLOGY

Research about calculation comparison between using full costing method and variable costing method for wooden house production is different from that of other goods in the cost characteristic including raw materials, labour cost and overhead cost. In our region, there has never been a research on wooden house production before. This research was conducted in Tombasian Atas Village, West Kawangkoan Subdistrict, Minahasa Regency and the object of research was the location of wooden house production. The data obtained were processed qualitatively using a case study method develop [4]. This case study approach facilitated the researchers in directly observing the production activities carried out by the objects of research by using various data sources.

The types of data used in this study are qualitative and quantitative data. Qualitative data obtained are data in the form of organizational structure, equipment or machinery used in production process. Quantitative data are data that can be measured by numerical scale. Quantitative data obtained in the formal cost information are used to produce finished products that are ready for sale. The data sources consist of primary and secondary data. These primary data are taken from the company's production data by conducting interviews. Secondary data are data obtained from the existing sources such as books related, literature which is in accordance with the research title and research results. The following are the stages of activities in this study.

- Conducting direct observation, the production activities of wooden houses in Tombasian Atas Village.
- Collecting data on wooden house production such as the production costs, the labour costs and other production data.
- Classifying the costs of wooden house production process.
- Analysing and Identifying each cost that is included in the wooden house product in detail.
- Calculating the cost of production by using full costing and variable costing methods.
- Comparing the results of the calculation of the principal price using full costing and variable costing methods.
- Calculating the mark up of selling price based on the cost of production of each method.
- Making an engineered calculation of gross profit on gross sales at the cost of each method.

Determining which method is the most relevant to be applied in the determination of the principal price of the wooden house business in Tombasian Atas Village.

## III. RESULTS AND DISCUSSION

### A. Identification of Wooden House Production Principal Cost

1) *Raw material costs:* The main materials for production of wooden houses are derived from Cempaka and Ngantu trees. The use of materials for a two – room type a size of 7 X 9 meters is 10 cubic of Cempaka wood and 3 cubic of Ngantu wood with a cubic price of Rp 2.500.000 for cempaka wood and Rp 2.000.000 for ngantu wood. The use of ngantu wood is done to reduce production costs while still paying attention to the quality of wood house produced. For a three – room type with a size of 7 X 20 m, the use of ranges from 18 cubic meters with a percentage consisting of 80% of Cempaka wood or about 14 cubic and 4 cubic of Ngantu wood (20%).

The other raw material in the process of producing wooden house is zinc. Both for a two – room variant and a three – room variant costs incurred for the use of zinc remain the same. The zinc used is around 100 pieces at a price of Rp.70.000 each. The following is an estimate of the cost of the raw materials for the manufacture of a two – room variant and a three – room variant of wooden houses.

TABLE I. RECAPITULATION OF A TWO – ROOM VARIANT RAW MATERIAL COST

No	Raw Material	Quantity of Use	Unit Price	Total Cost
1	Cempaka wood	10 cubic	2.500.000	25.000.000
2	Ngantu wood	3 cubic	2.000.000	6.000.000
3	Zinc	100 pieces	70.000	7.000.000
Total Raw Material Cost				38.000.000

TABLE II. RECAPITULATION OF A THREE – ROOM VARIANT RAW MATERIAL COST

No	Raw Material	Quantity of Use	Unit Price	Total Cost
1	Cempaka wood	18 cubic	2.500.000	45.000.000
2	Ngantu wood	4 cubic	2.000.000	8.000.000
3	Zinc	100 pieces	70.000	7.000.000
Total Raw Material Cost				60.000.000

2) *Labor cost:* In the process of producing wooden houses, Mr. Wowor as the owner of the business employs 5 people to help him in doing the job. The wages given are Rp. 150.000 /day for Mr. Wowor as the head carpenter and Rp. 100.000/ day for the people who help him. The period of work for a wooden house affects the wages paid. For a three – room wooden house, the period of production is approximately one and half months or ranges from 40 to 43 days while for the two – room variant, the period ranges from 30 to 32 days.

**TABLE III. RECAPITULATION OF LABOR COST FOR A TWO – ROOM VARIANT**

No	Labour	Period of Work	Wage/day	Total Cost
1	Head Carpenter	32 days	150.000	4.800.000
2	Workers	32 days	100.000	3.200.000
Total Labor Cost For A Two – Room Variant				8.000.000

**TABLE IV. RECAPITULATION OF LABOR COST FOR A THREE – ROOM VARIANT**

No	Labour	Period of Work	Wage/day	Total Cost
1	Head Carpenter	43 days	150.000	6.450.000
2	Workers	43days	100.000	4.300.000
Total Labor Cost For A Two – Room Variant				10.750.000

**TABLE V. DEPRECIATION COST OF PRODUCTION EQUIPMENT**

Production Equipment	Acquisition Cost (Rp)	Economic Age	Year Obtained	Annual Depreciation (Rp)	Monthly Depreciation (Rp)
Planes	370.000	4	2016	92.500	7.700
Electric Drill	350.000	5	2015	87.500	7.300
Electric Saw	500.000	4	2016	125.000	10.500
Grinding Machine	270.000	6	2014	45.000	3.750

The other fixed overhead costs are electricity costs charged every month amounting to Rp. 250.000,- and the costs for buying grinding eyes as much as Rp. 102.000,- and electric drill head as much as Rp. 52.000. The following is the total fixed overhead cost that occurs in the production process of wooden houses.

**TABLE VI. FIXED FACTORY OVERHEAD COSTS**

Cost Component	Unit Price (Rp)	Number of Units	Total Cost
Depreciation of Plane Machine			7.700
Depreciation of Electric Drill			7.300
Depreciation of Electric Saw			10.500
Depreciation of Grinding Machine			3.750
Electricity Cost			250.000
Electric Drill Bit	26.000	2	52.000
Grinding Eyes	25.500	4	102.000
Cement	60.000	2	120.000
Trass			150.000
Total Cost			703.250

*b) Variable overhead costs:* Variable Overhead Costs include the purchase cost of nails, glue, 5 mm sand paper, glass, door hinges, etc.

### 3) Factory overhead cost:

*a) Fixed overhead costs:* Fixed Overhead Costs include depreciation of fixed assets in the form of Nikkon brand planes, Bosch brand electric drills, Modern electric saws type M – 2600 L and Modern brand grinding machine type M 2300B. Depreciation costs are calculated using the straight line method with an estimated no residual value and cost charged. To the production cost which is a monthly depreciation cost. The following is the assumption of depreciation costs of production equipment.

**TABLE VII. VARIABLE OVERHEAD COSTS FOR A TWO – ROOM WOODEN HOUSE**

Cost Component	Unit Price (Rp)	Number of Units	Total Cost
Five inch nails	55.000	1kg	55.000
Four inch nails	47.000	4 kg	188.000
Three inch nails	36.000	3 kg	108.000
Ten inch nails	15.000	2	30.000
Seven inch nails	17.500	3	52.500
Zinc nails	35.000	2,5 kg	87.500
Fox Glue	17.500/700gr	2 bottle	35.000
Sand Paper			50.000
Glass, Hinges,etc			1.000.000
Consumption Costs	75.000/day	32 days	2.400.000
Total Cost			4.006.000

**TABLE VIII. VARIABLE OVERHEAD COSTS FOR A THREE – ROOM WOODEN HOUSE**

Cost Component	Unit Price (Rp)	Number of Units	Total Cost
Five inch nails	55.000	1,5kg	82.500
Four inch nails	47.000	4,5 kg	211.500
Three inch nails	36.000	3,5 kg	126.000
Ten inch nails	15.000	2,5	37.500
Seven inch nails	17.500	3,5	61.250
Zinc nails	35.000	2,5 kg	87.500
Fox Glue	17.500/700gr	3 bottle	52.500
Sand Paper			80.000
Glass, Hinges,etc			1.750.000
Consumption Costs	75.000/day	43 days	3.225.000
Total Cost			5.713.750

### B. Calculation of The Principal Cost of Production of Wooden Houses

Calculation of the principal cost of production of wooden houses used 2 methods of calculation, namely: Full Costing Method and Variable Costing Method.

1) *Full costing method:* With a full costing approach, the estimated cost of production of wooden house based on all elements of the costs incurred during production both permanent and variable. The following is a calculation the principal cost of production using full costing method.

- Calculation of a Two - Room Wooden House Production Cost:

Raw Material	Rp. 38.000.000
Labour Direct Cost	Rp. 8.000.000
Fixed Overhead Cost	Rp. 703.250
Variable Overhead Cost	<u>Rp. 4.006.000</u>
Product Production Cost	Rp. 50.709.250

- Calculation of a Three - Room Wooden House Production Cost:

Raw Material	Rp. 60.000.000
Labour Direct Cost	Rp. 10.750.000
Fixed Overhead Cost	Rp. 703.250
Variable Overhead Cost	<u>Rp. 5.713.750</u>
Product Production Cost	Rp. 77.167.000

2) *Variable costing method:* Different from full costing method, in variable costing method, the cost calculated is only variable costs. The following is the calculation of the production cost using the variable costing method.

- Calculation of a Two - Room Wooden House Production Cost:

Raw Material	Rp. 38.000.000
Labour Direct Cost	Rp. 8.000.000
Variable Overhead Cost	<u>Rp. 4.006.000</u>
Product Production Cost	Rp. 50.006.000

- Calculation of a Three - Room Wooden House Production Cost:

Raw Material	Rp. 60.000.000
Labour Direct Cost	Rp. 10.750.000
Variable Overhead Cost	<u>Rp. 5.713.750</u>
Product Production Cost	Rp. 76.463.750

3) *Comparison of the determination of the principal cost of production using the full costing and variable costing methods:*

a) *Comparison of principal cost of production:* The results obtained by using two methods of determining the principal price indicate that there as a difference between the principal cost of production using the full costing method and variable costing method although the difference is not too large, that is, Rp. 703.250.

TABLE IX. COMPARISON OF THE PRINCIPAL COST OF PRODUCTION

Variants of Wooden House	Principal of Cost Production		Difference of Principal Cost of Production
	Full Costing Method	Variable Costing Method	
A Two-Room Size	50.709.250	50.006.000	703.250
A Three-Room Size	77.167.000	76.463.750	703.250

b) *Comparison of gross profit:* The difference in the principal cost of production resulting from two different methods affects the gross profit generated. A two – room wooden house is estimated to have the highest selling price as

much as Rp.85.000.000 and that of a three – room wooden house is Rp. 115.000.000. The following is presented the comparison of gross profit of the methods.

TABLE X. COMPARISON OF GROSS PROFIT OF FULL COSTING

Variants of Wooden House	Selling Price (Rp)	Full Costing Method (Rp)	Gross Profit (Rp)
A Two-Room Size	85.000.000	50.709.250	34.290.750
A Three-Room Size	115.000.000	77.167.000	37.833.000

TABLE XI. COMPARISON OF GROSS PROFIT OF VARIABLE COSTING

Variants of Wooden House	Selling Price (Rp)	Full Costing Method (Rp)	Gross Profit (Rp)
A Two-Room Size	85.000.000	50.006.000	34.994.000
A Three-Room Size	115.000.000	76.463.750	38.536.250

#### IV. CONCLUSION AND RECOMMENDATION

Based on the result of research conducted to the wooden house businessmen, in the village of Tombasian Atas, there are some conclusions that can be drawn by the team as follows:

- The wooden houses businessmen in the village of Tombasian Atas in determining the principal cost have not yet applied accounting and are not even aware of the accounting calculations.
- By using two methods of determining the principal cost of production, namely, full costing and variable costing method, the principal cost of production is not too much different caused by the differentiating value, which is a fixed cost that is not economical so that the principal cost of production is relatively the same.
- Of the two methods, the variable costing method is considered to be the most suitable to be applied by the wooden house businessmen because it results in a lower principal cost of production compared to that of full costing method. This is also supported by the higher gross profit as shown by table 10 and 11.

- The result of research provides more accurate information about the principal cost of wooden house production that the wooden house producers can determine the real profit.

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