

Analysis of Influence of Raw Materials Fees and Factory Overhead Costs on Gross Profit

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The purpose of this study to estimate the accuracy of the research data, and to know how much the influence of raw material costs and factory overhead costs on gross profit. The study was conducted on the type of cigarette industry at PT Hanjaya Mandala Sampoerna, Tbk, the reason researchers chose PT H.M Sampoerna, Tbk as the object because based on the data that it has the highest gross profit compared to similar companies. The method used is descriptive analysis with the help of an IBM SPSS Statistics 25 program. In this study used secondary data processing namely the financial statements of PT Hanjaya Mandala Sampoerna, Tbk for a period of seven years, in 2011-2017. The results showed that the data tested were normal by using Kolmogorov Smirnov and Scatterplot tables, based on correlation coefficient test shows a very strong relationship, and the cost of raw materials and factory overhead costs respectively has partially significant influences on gross profit, also both of cost of raw materials and factory overhead costs have simultaneously significant influences on gross profit PT Hanjaya Mandala Sampoerna, Tbk.

Key words: *Raw Material Costs, Factory Overhead Costs and Profit*

Introduction

The company is one of the facilities that can support government programs in various sectors of a country's economy. Along with the rapid development of the business world will overtime bring the impact of increasingly fierce trade competition, especially in similar companies, so companies require to work more efficiently to survive in their respective fields. In globalization, competition will become sharper because to enter the global market many factors must be corrected and improved, includes : quality, timeliness, and capital. The general purpose of an established company is to generate profits through products which has a sustainable

competitive advantage against competitors. The basic goal of any organization, whether it is a national or a multinational organization, is to get maximum profit in an attempt to persuade the shareholder's needs or stakeholder's asset maximization as revealed by Pandey, I. M. (2000). These products can be non-physical products, raw materials, finished goods ready for consumption.

The tobacco industry is one of the largest economic sectors in Indonesia because cigarette consumption in this country is very large. It is estimated that around 65% of male citizens in Indonesia are smokers and in general Indonesia is the second largest cigarette market share in Asia after China. The TobaccoAtlas site noted that 53.7 million adults in Indonesia were active smokers. While 2.6 million young Indonesians have the same hobby. It is estimated that Indonesian smokers use approximately 5-7% of their income every month to buy cigarettes or other tobacco-derived products. No wonder there are many cigarette factories operating in Indonesia.

Some cigarette companies with the largest production volume in this country, namely PT H.M Sampoerna, PT Gudang Garam, PT Djarum, and PT Bentoel. The first rank company is PT H.M Sampoerna, which controls 33.4% of the national cigarette market. PT H.M Sampoerna is a subsidiary of PT Philip Morris Indonesia which is affiliated with Philip Morris International Inc. The company, which has a local office in Surabaya, last year made a net profit of Rp 12.6 trillion from the sale of 101.3 billion cigarettes. PT Gudang Garam managed to sell 78.7 billion cigarettes and get a net profit of Rp 7.8 trillion. However, PT Djarum, which is one of the largest cigarette companies in Indonesia, does not register on the Indonesia stock exchange, so financial data are not known, including profits. In fourth place is PT Bentoel, which recorded a gross profit in 2017 reaching Rp 2.09 trillion (<http://nasional.kompas.com>, accessed on 31 May 2018).

Here, the list of three cigarette companies attached on the Indonesia Stock Exchange, namely PT Gudang Garam Tbk., PT Bentoel Internasional Investama Tbk., and PT HM Sampoerna Tbk. The following is a comparison of the profit and loss statements of the cigarette companies listed on the Indonesia Stock Exchange.

Based on the data, PT HM Sampoerna, Tbk, in 2011-2012 raw material costs increased by 1,904,319 or an increase of 32% compared to the previous year, factory overhead costs also increased by 414,202 or an increase of 21% and gross profit also increased by 3,311,725 or increased 22%. In 2012-2013 raw material costs increased by 1,325,095 or increased by 17%, factory overhead costs decreased by 53,173 or around 2% and gross profit increased by 1,564,049 or around 8%. In 2013-2014 raw material costs increased by 577,369 or around 6%, factory overhead costs 106,954 or around 5%, gross profit also rose by 428,725 or around 2%. In 2014-2015 raw material costs increased by 580,598 or around 6%, factory overhead costs were 784,263 or around 32%, gross profit was 1,264,318 or around 6%. In 2015-2016 raw

material costs decreased by 125,989 or around 1% due to the burden of adding low excise and falling clove commodity prices since last year remained, factory overhead costs decreased by 558,398 or about 17% because in that year there was a reduction in employees, gross profit increased by 2,090,296 or around 10% and in 2016-2017 the cost of raw materials decreased by 280,176 or around 3%, factory overhead costs increased by 304,414 or around 11% and gross profit increased by 361,166 or around 2%.

Based on the financial description data of PT H.M Sampoerna, Tbk mentioned above, there was a phenomenon where in 2016 PT H.M Sampoerna, Tbk experienced a decrease in raw material costs and a decrease in factory overhead, but the gross profit of PT. H.M Sampoerna, Tbk increased from the previous year. This is improperly with the theory issued by Carter (2008: 129) which stated that "the level of profit earned by a company can be determined by the volume of production produced, the more production volume achieved, the higher profit earned, on the contrary, the cost of production an increase but not offset by an increase in revenue will actually reduce the profits that can be obtained by the company or even will result in losses.

The phenomenon where in 2016 PT H.M Sampoerna, Tbk experienced a decrease in raw material costs and a decrease in factory overhead, but the gross profit of PT. H.M Saampoerna, Tbk increased from the previous year. This is not in accordance with the theory put forward by Carter (2008: 129) which states that "the level of profit earned by a company can be determined by the volume of production produced, the more production volume achieved, the higher the profit earned, on the contrary, the cost of production an increase but not offset by an increase in revenue will actually reduce the profits that can be obtained by the company or even will result in losses.

Hypothesis development

The cost of raw materials according to Baldric Siregar et al (2014: 38) is " the value of raw materials used in the production process to be converted into finished materials." According to Baldric et al (2014: 38) overhead costs are "all production costs other than the cost of raw materials and direct labor costs," Meanwhile Supriyono (2014: 177-178) explained that profits consist of several types:

1. Gross profit is the difference between net income and sales and cost of goods sold.
2. Profit from operations is the difference from gross profit with total operating expenses.
3. Net profit is the last number from the calculation of profit and loss where to look for operating profit plus income and minus other expenses.

Mulyadi (2015: 10) also added about the relationship that "production costs are an economic source that is sacrificed to produce output, the expected output value is greater than the input that is sacrificed to produce these output so that organizational activities can produce.

Profit is the difference between income over expenses related to the company's business activities. In order to obtain profits in accordance with what is desired by management, the company must prepare a good profit plan by taking into account several possible factors that can affect earnings. There are three factors that can affect company profits, namely costs, selling prices and sales or production volumes, Mukhishotul jannah (2018).

From some of the factors mentioned above, the cost of production is one of the factors that influence the size of the profit in a company. Production costs represent costs incurred to process raw materials into finished products that are ready for sale. These costs consist of raw material costs, direct labor costs, and factory overhead costs, Mulyadi, (2012).

Production costs consist of three costs namely raw material costs, direct labor costs, and factory overhead costs. Raw material costs are costs incurred to buy raw materials that have been used to produce a finished product. While direct labor costs are costs incurred to pay for work directly involved in the production process. Factory overhead costs are costs in addition to direct raw material costs and direct labor costs but are also needed in the production process which includes overhead costs, namely the cost of auxiliary materials, Mulyana (2018).

Reducing production costs is a very important activity because it affects the profits earned by the company. The efficiency of production costs is carried out to determine whether certain orders are able to generate gross profit or bring about gross losses, management requires information on production costs that have been incurred to produce certain orders, Mulyadi, (2012).

Manufacturing company is a company that has a business activity to change a finished product through a process of technological stages to change raw materials into finished goods. Therefore, with the manufacturing process, the company incurs production costs. The company will expect a large gross profit because its main goal is to achieve profit. Gross profit will certainly affect the net income of a company which will also fall on the continuity of its business, Mulyana (2018).

Runt-tests are part of non-parametric statistics which can also be used to test whether there is a high correlation between residuals. If there is no correlation between residuals, then it can be said that the residual is random or random. Runt-test can be used to see whether residual data occur randomly or not (systematically).

Runt-test is done by making a basic hypothesis, namely:

HO: residual (res_1) random

HA: residual (res_1) is not random

Refer to the basic hypothesis above, the basis for making statistical test decisions with using the Runt-test is Ghozali, (2018):

1. If the Asymp.Sig value. (2-tailed) <0.05, then HO is rejected and HA is accepted. This means that residual data occur randomly (systematically).
2. If the value of Asymp.Sig. (2-tailed) > 0.05, then HO is accepted and HA is rejected. This means that residual data occur randomly

Wiratna Sujarweni (2014: 185) said that "The multicollinearity test is used to determine whether there are independent variables that have similarities between the independent variables in a model." The similarity between independent variables results in a very strong correlation. It is also useful to detect the presence or absence of multicollinearity in research using the Variance Inflation Factor (VIF) which is the opposite of tolerance, here is below the form:

$$VIF = \frac{1}{(1 - r^2)}$$

Where r^2 is the coefficient of determination.

If the correlation is small, it means showing a large VIF value. If $VIF > 10$, there will be multicollinearity among other independent variables. Conversely, if $VIF < 10$ then there are no symptoms of multicollinearity.

Wiratna Sujarweni (2014: 186) added that" Heteroscedasticity examines the difference in residual variance of one observation period to another observation period." This test is done by looking at a certain pattern on the graph with the Y axis which is a prediction and the X axis which is residual. The way to predict the presence or absence of heteroscedasticity in a model can be seen with the Scatterplot image pattern. Regression is said to not occur heteroscedasticity if:

- 1) Data points spread above and below or around the number 0.
- 2) Data points do not collect only above or below.
- 3) Spread the points and may not form a wavy pattern, widen then narrow and widen again.
- 4) Distribution of patternless data points.

If within the analysis provides a picture of certain patterns such as the points forming a regular pattern (wavy widened then narrowed) then heteroscedasticity has occurred.

Research Methodology

1 Data Sources

The research used in this study is a descriptive method with a quantitative approach. Quantitative research is a research whose data in the form of numbers ranging from data collection, interpretation of the data, and the appearance of the results, Sugiyono (2017), and the data source used is secondary data. Sugiyono (2015: 137) explained that "Secondary data is an indirect source of providing data to data collection.". This study took secondary data and data collection was carried out on one of the publicly traded companies listed on the Indonesia Stock Exchange (IDX), namely PT H. M Sampoerna, Tbk by taking data from 2011-2017 financial statements.

2. Data Analysis

In processing and analysis data used IBM Statistics Production Science (SPSS) version 25 software with descriptive statistical data. According to Sugiyono (2017: 147) that descriptive analysis is a statistic used to analyze data by describing data that has been collected as it is without intending to make generally accepted conclusions or generalizations, and Imam Ghozali (2013: 160) told that the normality test aims to test whether the regression model, confounding or residual variables have a normal distribution. In this analysis consists of descriptive statistical tests (tests of normality, autocorrelation, heteroscedasticity and multicollinearity), multiple linear analysis and hypothesis testing (t test, F test, and coefficient of determination). As we know that the **t test** and the **f test** assume that the residual value follows the distribution normally or cannot be seen from the Kolmogorov-smirnov results. It is said that the regression model meets normality if the resulting residual value is greater than 0.05. According to Wiratna Sujarweni (2014: 126) correlation is one of the statistical inferences that will test whether two or more variables that have a relationship or not.

Partial correlation analysis is used to determine the relationship between two variables, where other variables that are considered to influence as control variables will be controlled. The coefficient values range from -1 to 0 or 0 to 1. If the coefficient value is getting closer to 1 then the relationship will be even tighter. Meanwhile, if the coefficient value is getting closer to 0 then the relationship is getting weaker. According to Imam Ghozali (2013: 97) the Coefficient of Determination (R^2) is a proposition of variability in a data that is calculated based on a statistical model. The purpose of this analysis is to calculate the effect of the independent variable on the dependent variable. If the value of R^2 is higher, then the greater the proportion of the total variation of the dependent variable that can be explained by the independent

variable. So if $R^2 = 1$ has the meaning that the model corresponds to all the variables in the Y variable and if $R^2 = 0$ then it implies that there is no the relationship between variable X and variable Y.

According to Wiratna Sujarweni (2014: 149) "Multiple linear regression is a regression that has one dependent variable and more than one independent variable". Meanwhile, according to Sugiyono (2015: 275) "Multiple regression analysis is used by researchers, if researchers intend to predict how the state (ups and downs) of the dependent variable (criterium), if two or more independent variables as predictor factors are manipulated (raised or lowered values) so a double analysis will be done if the number of independent variables is at least 2 "

Here is a model of multiple linear regression equations:

$$Y = \alpha + b_1 x_1 + b_2 x_2$$

Where:

- Y = Gross profit
 α = Constant
b1, b2 = Regression Coefficient
X1 = Raw material costs
X2 = factory overhead.

While partial hypothesis testing or **t test** according to Imam Ghozali (2013: 98) **t** statistical test shows how far the influence of an explanatory or independent variable individually in explaining the variation of the dependent variable.

1. If the significance value > 0.05 then the hypothesis is rejected (regression coefficient is not significant). This means that partially the independent variable has no significant effect on the dependent variable.
2. To test the hypothesis **t** with decision making criteria comparing the statistical value of **t** with a critical point according to the table. If the calculated statistical **t value** $>$ **t table value**, then we accept an alternative hypothesis which states that an independent variable individually will affect the dependent variable.

Simultaneously according to Imam Ghozali (2013: 98) **f test** basically shows whether all independent variables included in the model have a joint influence on the dependent variable. To test this hypothesis, **statistical F** is used with the following decision-making criteria:

- a) If the significance value > 0.05 then the hypothesis is rejected. This means that simultaneously the independent variable does not have a significant effect on the dependent variable.
- b) Compare the F value of the calculation results with the f value according to the table. If the calculated F value is greater than the table F value, then H_0 is rejected and H_a is accepted.

Result and Discussion

Based on result of technical analysis using statistical test shows that:

1. Total raw material costs (X1) at PT H.M Sampoerna, Tbk, for period 2011-2017 can be seen in the table 1 below:

Based on the results of the study "Effect of Raw Material Costs and Factory Overhead Costs on Gross Profit." Obtained the following results:

That the raw material cost variable (X1) with a total of 7 data has an average (mean) of 9,045,725.71 with a minimum amount of 5,964,225 and a maximum amount of 10,351,606 while a standard deviation is 1,598,763,613.

2. Total factory overhead costs (X2) at PT H.M Sampoerna, Tbk. The 2011-2017 period can be seen in the table below: Based on the results of the study "Effect of Raw Material Costs and Factory Overhead Costs on Gross Profit." Obtained the following results:

Factory overhead variable (X2) with a total of 7 data has an average (mean) of 2,561,937.29 and a minimum amount of 1,963,713 and a maximum number of 3,215,959 and a standard deviation is 420,689,784.

3. Gross profit (Y) in this study as follows:

Table 1. Gross profit (In million rupiah)

Year	Gross profit	Ups and down	%
2011	15,195,503	-	0
2012	18,507,288	3,311,785	22%
2013	20,071,337	1,564,049	8%
2014	20,500,062	428,725	2%
2015	21,764,389	1,264,327	6%
2016	23,854,676	1,991,000	10%
2017	24,215,842	361,166	2%

Source: PT H.M Sampoerna, Tbk

Based on the results of the study "Effect of Raw Material Costs and Factory Overhead Costs on Gross Profit." Obtained the following results:

The gross profit variable (Y) has a total of 7 data with an average value of 20,587,012.57 and a minimum amount of 15,195.503 and a maximum number of 24,215,842 and a standard deviation is 3,133,138,278.

The Kolmogorov-Smirnov calculation results show that the significance value is $0.200 > 0.05$. Thus, it can be concluded that the regression model is feasible to use because it meets the normality assumption or it can be said that the research data is normally distributed.

Based on the results of the table above, it can be seen the value of Asymp. Sig. (2-tailed) obtained 0.431. Asymp value results. Sig. (2-tailed) > 0.05 , then H_0 is accepted and H_A is rejected. This means that residual data occur randomly.

The tolerance value for the Raw Material Cost is 0.348 and VIF 2.870. While the tolerance value for Factory Overhead Costs is 0.348 and VIF 2.870. These results indicate that the tolerance value is more than 0.10 and the VIF value is less than 10, then the research variables are considered to be free from multicollinearity symptoms. From the results of the above analysis, it can be stated that the variables in this study did not experience multicollinearity disorders.

It is known that there is no clear pattern, and points that spread randomly both above and below the zero on the Y axis. So it can be concluded that the model in this study is qualified to be a good model because there is no heteroscedasticity.

It is known from the results of the correlation above produced a correlation of 0.922 between raw material costs and factory overhead costs to gross profit. This also shows that there is a very strong relationship between raw material costs and factory overhead costs to gross profit.

It is known that the coefficient of determination (Adjusted R^2) obtained is 0.850. This shows that the variable Raw Material Costs and Factory Overhead Costs contribute 85% of gross profit. While the remaining 15% is explained by other variables not included in the analysis model of this study.

Multiple linear analysis of SPSS 25 results in this study produced a regression formula $Y = 3,595,708,218 + 1,559X_1 + 1,129X_2$ which means that the constant value was 3,595,708,218 and the raw material cost coefficient (X_1) was 1.559 and the coefficient of factory overhead costs amounted to 1,129.

The results of t arithmetic for Raw Material Costs of 5.165 while the value of t table = 2.776 then **t count > t table**. While the significance value for t arithmetic variable cost of raw materials amounted to $0.004 < 0.05$. Based on these results, H1 is accepted, which means that the cost of raw materials has a positive and significant effect on gross profit.

The results of t arithmetic for Factory Overhead Costs of 2.916, while the value of t table = 2.776, then the value of $t >$ table. While the significance value for t arithmetic variable factory overhead costs is $0.033 < 0.05$. Based on these results, H2 is accepted, which means that factory overhead costs are positive and significant to gross profit.

And it is known that the calculated F value that shows a value of 11,346, which means that the value is greater than the F table value of 6.94 with a significance value of $0.02 < 0.05$. This shows that this regression model can be used to predict the variable costs of raw materials and factory overhead costs to gross profit, or it can also be said that Ho is rejected and Ha is accepted and there is a simultaneous influence between raw material costs and factory overhead costs on gross profit.

Conclusion

Research conducted on the financial statements of PT H.M Sampoerna, Tbk from the period 2011-2017 by taking data annually then tested and analyzed using the SPSS 25 program, the following conclusions can be drawn:

1. The cost of raw materials (X1) with a total of 7 data has an average (mean) of 9,045,725.71 with a minimum amount of 5,964,225 and a maximum amount of 10,351,606 while a standard deviation of 1,598,763,613.
2. Factory overhead costs (X2) with a total of 7 data have an average (mean) of 2,561,937.29 and a minimum amount of 1,963,713 and a maximum amount of 3,215,959 and a number of standard deviations of 420,689,784.
3. Gross profit (Y) with a total of 7 data has an average value (mean) of 20,587,012.57 and a minimum amount of 15,195.503 of and a maximum number of 24,215,842 and a number of standard deviations of 3,133,138,278.
4. The results of t arithmetic Raw Material Costs (X1) of 5.165 while the value of t table = 2.776 then **t arithmetic > t table**. While the significance value of t arithmetic for the Raw Material Cost variable is $0.004 < 0.05$. Based on these calculations, H1 is accepted, which means the cost of raw materials has a positive and significant effect on gross profit. The results of t arithmetic for Factory Overhead Costs of 2.916 while the value of t table = 2.776, then the value of $t >$ table. While the significance value for t arithmetic variable factory overhead costs is $0.033 < 0.05$. Based on these calculations, H2 is accepted, which means that the factory overhead costs are positive and significant to gross profit. The Fcount result shows a value of 11,346, which means it is greater than

the F table of 6.94 with a significant value of $0.02 < 0.05$. This shows that the regression model can be used to predict the variable costs of raw materials and factory overhead costs against gross profit. It can also be said that H_0 is rejected and H_a is accepted and there is a simultaneous influence between the cost of raw materials and factory overhead costs on gross profit.

g. Suggestion

Based on the conclusions above that have been submitted and from the discussion in the previous chapter the researcher presents his own suggestions for theoretical and practical suggestions.

1. Theoretical Suggestions

For further research materials, it is expected that the next researcher can add other variables apart from the cost of raw materials and factory overhead costs, and not only look for the effect but also try to analyze the efficiency of these costs to profits for both gross profits and other profits.

2. Practice Advice

For industrial companies, especially PT H.M Sampoerna, Tbk. It is expected that:

- a. For company management, it is better to conduct an analysis of the cost efficiency of raw materials on a regular basis in order to be able to find out the causes of changes in costs that occur so that they can do the efficiency of raw material costs by finding suppliers who sell raw materials that are low but with high quality.
- b. For company management, it is better to conduct an efficiency analysis of overhead costs at the factory to be able to reduce overhead costs at the factory by saving electricity consumption, efficient use of vehicle fuel, and looking for suppliers of auxiliary raw materials such as paper, filters, glue, plastics for cigarette packaging. , which is cheap and high quality.
- c. To increase profits, the company, especially related management in addition to efficiency costs must be able to increase sales volume because with the high level of sales volume it will be able to offset the costs incurred even the sales value must be greater than the value of costs incurred by the company in order to get a profit maximum.
- d. For company management, it is better to conduct an analysis of raw material cost efficiency on a regular basis in order to find out the causes of cost changes that occur so that they can make decisions appropriately and can also do raw material cost efficiency by finding suppliers who sell low-quality but high-quality raw materials. ,

and to reduce factory overhead costs by saving electricity consumption, efficient use of vehicle fuel, and looking for suppliers of supporting raw materials such as paper, filters, glue, plastics for cigarette packaging, which are cheap and high quality. To increase profits, the company, especially related management, in addition to efficiency, costs must be able to increase sales volume because with high levels of sales volume, it will be able to offset the costs incurred, even the sales value must be greater than the costs incurred by the company in order to get maximum profit.

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