FACTORS AFFECTING THE SELECTION OF INVENTORY VALUATION METHODS IN INDUSTRIAL COMPANIES IN INDONESIA STOCK EXCHANGE

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Abstract

The purpose of this study is to prove and analyze the factors that influence the choice of inventory valuation methods in industrial companies on the Indonesia Stock Exchange. In this study, an associative quantitative research approach was used, namely research aimed at examining the effect or relationship between two or more variables. The data analysis technique used logistic regression analysis method. Logistic regression is an analytical tool used to measure the influence of the independent variable on the dependent variable in the form of a dummy variable. The results of data analysis and discussion prove that company size (SIZE) has an effect on the selection of inventory valuation methods for industrial companies on the IDX for the 2015-2017 period. Inventory intensity affects the selection of inventory valuation methods for industrial companies on the IDX for the 2015-2017 period. Simultaneously company size (SIZE), and Inventory Intensity affect the selection of inventory valuation methods for industrial companies on the IDX for the 2015-2017 period. The greater the size of the company, the more access it can be for managers to establish a constant (unchanging) inventory valuation method. Companies that are larger in size are thought to have a greater tendency to choose the correct method. Based on the political cost hypothesis in positive accounting theory, it is stated that large companies tend to manage their inventory well. Changes in the inventory valuation method from the average method to FIFO will cause the company's profits to be higher and it is expected that the company's shares can be sold at a price that is favorable to the company. The results of this study indicate that the net profit margin has an effect on the choice of inventory valuation method because the companies used in this study are companies that earn profits.

Keywords : Company size (SIZE), Intensity Inventory, FIFO Method, LIFO Method and Logistic Regression.

I.   INTRODUCTION

Background

Obstacles or constraints in production activities can occur for several reasons, one of which is due to inventory. When there are problems in inventory, such as delays in inventory, the production process will also be hampered automatically which will have an

impact on the ability to earn a profit. Inventory, is a company asset that occupies a fairly important position in a company, be it a trading company or an industrial company (industry), especially companies engaged in construction, almost 50% of company funds will be embedded in inventory, namely to buy materials, building material. Inventory is a general term that denotes everything or the organization's resources stored in anticipation of meeting demand. Inventories in industrial companies and trading companies have different definitions. In trading companies, inventory of merchandise is defined as all goods purchased from suppliers, stored in warehouses and sold to consumers. In industrial companies, inventory is defined as the inventory of raw materials, goods in process and finished goods that are intended to be processed and sold. So the inventory of merchandise in industrial companies undergoes a process of production or processing of goods until they become finished goods that are ready to be sold to customers.

From the explanation previously described regarding inventory, it can be concluded that inventory has a very important role in a company. Inventory has a big role in maintaining the stability of the company's operations. Once the role of inventory is important, it is necessary to choose an appropriate inventory accounting method for a company.

One of the important meanings of selecting the inventory accounting method is for the inventory control process. Not all companies have the same policy in choosing the inventory accounting method because the inventory accounting method used must also pay attention to the type of company operational activities. The application of different accounting methods will have different effects. The company's profit statement will differ between the use of the FIFO (First In First Out) method and the average method. Because of this, the authors consider that the things that influence the choice of inventory valuation methods are important and interesting to study.

Much research has been conducted regarding the selection of inventory valuation methods. However, the types of factors studied differ from one another. In addition, it was also found that there were inconsistencies in the results of research between one researcher and another for many factors. The inconsistency of the results of previous studies shows that this research needs to be reexamined. This study reconfirms the conclusions of previous studies regarding the factors that influence the choice of accounting valuation methods by taking three factors to be studied, namely company size, net profit margin, and inventory intensity, especially in industrial companies in 2015 - 2017.

This study is a replication of Maharani's research (2017) entitled The Effect of Company Size, and Inventory Turnover on the Selection of Inventory Valuation Methods in Industrial Companies in the Consumer Goods Industry Listed on the Indonesia Stock Exchange for the period 2009-2013. This is to replace the net profit margin variable into a net profit margin because the results of previous studies have proven to have no effect. Previous research has not been able to prove the influence of independent variables on the dependent variable, while the results of other studies have proven to be influential, so further research is needed to prove it.

II.   LITERATURE AND HYPOTHESIS REVIEW
INVENTORY

Inventory of a portion of one of the current assets usually has a large proportion in the company's statement of financial position. Relative to total assets, this causes the inventory value in the financial position report to be seen as a material item and is vulnerable to theft. According to Kasmir (2008), " inventory is a number of items stored by the company in a place (warehouse).

Inventories are items of assets held for sale in the normal course of business or goods that are used or consumed in the production of goods for sale. " (Kieso et al. 2002: 444).

Inventories are assets that are stored for sale in the normal course of the company, as well as assets that are available for use as material in the production process. (Skousen Stice, 2001: 513).

The Indonesian Institute of Accountants through its Statement of Financial Accounting Standards (SAK 2009: 14.1) defines inventories as follows: Inventories are assets that:
1. Available for sale in normal business activities;
2. In the production process and / or on the way, or
3. In the form of materials or equipment for use in the production process or service improvement.

The conclusion is that the inventory is an asset that includes goods owned by the company with the intention of being sold within a certain business period, or the inventory of goods that are still in progress or in the production process, or the inventory of raw materials awaiting their use in a production process. Valuation of inventory is important for companies to determine the value of inventories included in the balance sheet. In calculating the cost of goods sold and the cost of goods sold, it is necessary to look at a number of assumptions regarding the determination of the cost of goods which will be charged to inventory and sales.

According to Baridwan (2004: 181) there are three methods of inventory valuation, namely:
1) The cost method which consists of FIFO, LIFO and Average.
2) The method of lower cost or lower net realizable value (market).
3) The selling price method.

Rangkuti (2004: 1) says "The FIFO inventory valuation method is the ending inventory valued according to the latest price developments and uses the previous price in determining the cost of goods sold". Schroeder (2005: 4) explains "The FIFO method assumes that the first items purchased or produced will be sold or used first, so that what is left in the ending inventory is the last purchased or produced goods".

Example of calculation of the FIFO method:

Table 2.1 Inventory Transaction Data

Tanggal	Uraian	Unit	Biaya/unit	Total Biaya
1 Jan	persediaan awal	100 unit @	Rp.10,- = Rp.	1.000,-
15 Apr	pembelian	200 unit @	Rp.11,- = Rp.	2.200,-
24 Ags	pembelian	300 unit @	Rp.12,- = Rp.	3.600,-
27 Nov	pembelian	400 unit @	Rp.13,- = Rp.	5.200,-
		1000 unit		Rp. 12.000,-

Sumber: Jerry J. Weygandt, 2007

Table 2.2 Example of calculation of the FIFO method

Tanggal	Uraian	Unit	Biaya/unit	Total
27 Nov	pembelian	400 unit	Rp. 13	Rp. 5.200
24 Ags	pembelian	50 unit	Rp. 12	Rp. 600
Jumlah		450 unit		Rp. 5.800

Sumber: Jerry J. Weygandt, 2007

The Last In-First Out (LIFO) Inventory Valuation Method is based on the assumption of the last cost of a particular item. The LIFO method assumes that the last item purchased is the first item sold. Under the LIFO method, the cost of the ending inventory is determined by taking the cost per unit of the oldest item and calculating it forward after the entire unit of inventory is costed. So the cost that is calculated first in ending inventory is the cost of the beginning inventory. Thus the ending inventory value according to the purchase price of the last incoming goods is: Example of Calculating the LIFO Method:

Table 2.3 Inventory Transaction Data

Tanggal	Uraian	Unit	Biaya/unit	Total Biaya
1 Jan	persediaan awal	100 unit @	Rp.10,- = Rp.	1.000,-
15 Apr	pembelian	200 unit @	Rp.11,- = Rp.	2.200,-
24 Ags	pembelian	300 unit @	Rp.12,- = Rp.	3.600,-
27 Nov	pembelian	400 unit @	Rp.13,- = Rp.	5.200,-
		1000 unit		Rp. 12.000,-

Sumber: Jerry J. Weygandt, 2007

Table 2.4 Example of Calculation of the LIFO Method

Tanggal	Uraian	Unit	Biaya/unit	Total Biaya
1 Jan	persediaan awal	100 unit	Rp.10,- = Rp.	1.000,-
15 Apr	pembelian	200 unit	Rp.11,- = Rp.	2.200,-
24 Ags	pembelian	150 unit	Rp.12,- = Rp.	1.800,-
Jumlah		450 unit		Rp. 5.000,-

Sumber: Jerry J. Weygandt, 2007

B. Factors Affecting the Selection of Inventory Valuation Methods

1. Company Size

Suwito and Herawaty (2005) stated that public companies listed on the Indonesia Stock Exchange can be categorized into 3 (three) major groups, namely large companies (large firms), medium companies (mediumsize) and small companies (small firms).

This company size determination is based on the company's total assets. Company size is a scale which can be classified as large or small as a company according to various ways, including: total assets, log size, stock market value, and others (Machfoedz, 1994) in Atarwaman (2011).

Sutrisno (2003: 57) says "The size of the company is the size of the company which is assessed from its assets. The bigger the assets of a company, it can be said that the bigger the size of the company".

The size of the company (firm size) in this study is projected by the natural logarithm of the assets. The greater the total assets owned by the company, the greater the size of the company so that the company size can be projected according to Cahyana (2009: 137) as follows:

$$SIZE = LnTA$$

Where :

Size   = Company Size

LnTA   = Natural Logarithm of Total Assets

2. Inventory Intensity

Inventory intensity is a measure calculated from the cost of goods sold divided by the average inventory during a period. Companies must sell their inventory as quickly as possible in order to generate profits. The faster the company sells inventory, the higher the profit it makes, and the opposite applies to slow moving goods. Ideally the company should be able to operate without having inventory, but for the most part, companies should have a number of items on hand.

Inventory intensity shows the efficiency of management in managing inventory. Inventory intensity can affect the choice of inventory accounting method used. According to Setiyanto (2015) when the inventory is high, the manager will choose the average method so that the inventory is smaller than when using the FIFO method. This is done so that the manager's performance in managing inventory is considered good by the company because the lower the inventory, the more efficient the inventory management will be.

C. Conceptual framework

Based on the explanation above, the conceptual framework can be described as follows:

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┌─────────────────────┐
│   Company Size      │
│      (X1)           │─────────┐
└─────────────────────┘         │        ┌──────────────────────┐
                                 ├───────▶│  Inventory Valuation │
                                 │        │       Method         │
┌─────────────────────┐         │        │        (Y)           │
│ Inventory intensity │─────────┘        └──────────────────────┘
│      (X2)           │
└─────────────────────┘
```
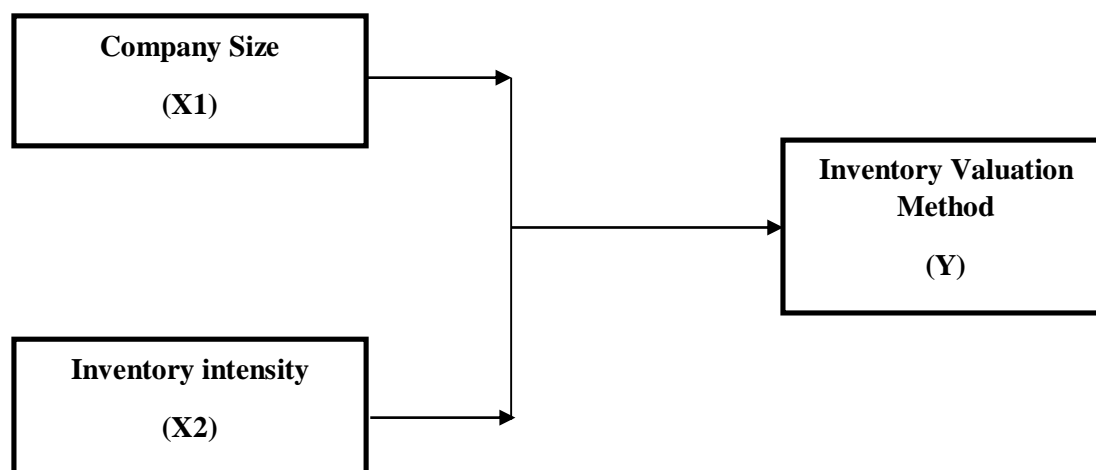
Figure : Conceptual framework

Research Hypothesis

Based on the problem formulation and conceptual framework above, it can be concluded that the hypothesis in this study are:

1. Company size, inventory intensity partially influence the inventory valuation method of industrial companies listed on the IDX.
2. Company size, inventory intensity simultaneously affect the inventory valuation method of industrial companies listed on the IDX.

III.   RESEARCH METHODS
Research Approach

When viewed from the variable point of view, the research used is associative research, which is research that aims to examine the influence and relationship between two or more variables. This research has the highest level when compared to other studies, such as descriptive and comparative research. So when viewed from the point of view of the method, the research used is descriptive research, namely research to obtain problem solving by describing the current state of the research object based on the facts that appear as they are.

The population in this study were industrial companies listed on the Indonesia Stock Exchange with an observation period of 2015 - 2017. The population in this study was 140 companies. The sample selected in this study using purposive sampling method in which the sample selected is a sample in accordance with the criteria of the researcher obtained as many as 44 companies.

Operationalization of Variables

This research follows previous studies in measuring the dependent and independent variables. Table 1 will explain the operational calculations for the dependent and independent variables.

Table Operational Variables

Variable	Definition	Indicator	Scala
Company Size (X_1)	The size of the company's business as seen based on the company's total assets	$SIZE = LnTA$	Rasio
Inventory Intensity (X2)	A measure used for inventory levels.	$\dfrac{HPP}{(Initial\ inventory + Ending\ Inventory)/2}$	Rasio
Inventory Method (Y)	The method used to assess, calculate and report inventory	Inventory accounting methods that may be used according to IFRS are the average method = 0 and the FIFO method = 1	Dummy

Technical Analysis of Research Data

Descriptive Statistics

Descriptive statistics are used to provide a description of the data seen from the mean, standard deviation, and maximum-minimum. The mean is used to estimate the average population size estimated from the sample. Standard deviation is used to assess the mean dispersion of the sample. Maximum-minimum is used to see the minimum and maximum values of the population. This needs to be done to see the overall picture of the samples that have been collected and meet the requirements to be used as research samples.

Testing the Feasibility of the Regression Model

The feasibility of the regression model was assessed using the Hosmer and Lemeshow's Goodness of Fit Test. Hosmer and Lemeshow's Goodness of Fit Test tests the null hypothesis that the empirical data fits or fits the model (there is no difference between the model and the data so that the model can be said to be fit). If the statistical value of Hosmer and Lemeshow's Goodness of Fit Test is equal to or less than 0.05, then the null hypothesis is rejected, which means that there is a significant difference between the model and its observation value so that the Goodness fit model is not good because the model cannot predict the value of the observation. If the statistical value of Hosmer and Lemeshow's Goodness of Fit Test is greater than 0.05, then the null hypothesis cannot be rejected and it means that the model is able to predict its observation value or it can be said that the model is acceptable because it fits the observation data.

The coefficient of determination (Cox and Snell's R Square)

Cox and Snell's R Square is a measure that tries to imitate the R2 measure in multiple regression which is based on the likelihood estimation technique with a maximum value of less than 1 (one) so it is difficult to interpret. Nagelkerke's R square is a modification of the Cox and Snell coefficients to ensure that the value varies from 0 (zero) to 1 (one). This is done by dividing the value of Cox and Snell's R2 by the maximum value. Nagelkerke's R2 value can be interpreted as R2 value in multiple regression. A small value means that the ability of the independent variables to explain the variation in the dependent variable is very limited. A value close to one means that the independent variables provide almost all the information needed to predict the variation in the dependent variable.

Logistic Regression Model

Regression models were performed using logistic regression analysis. Logistic regression is an analytical tool used to measure how far the influence of the independent variable on the dependent variable in the form of vdummy variable. Logistic regression analysis method as follows:

$Y = \beta1\ X1 + \beta2\ X2 + \beta3\ X3$

Information :

Y = Inventory Valuation Method

X1 = Company Size

X2 = Inventory intensity

$\beta1$- $\beta3$ = Regression coefficient.

IV. RESULTS AND DISCUSSION

Descriptive statistics

Descriptive statistics are used to provide an overview of the research data that is used as the sample used in the study. Descriptive statistics in this study are focused on the minimum, maximum, average and standard deviation values shown in the Table 4.1 :

Tabel 4.1. Descriptive Statistics

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Company Size	126	11.40	16.34	13.72	1.08
Inventory Intensity	126	86.52	5443.74	632.32	752.06
Inventory Method	126	.00	1.00	0.24	0.43
Valid N (listwise)	126				

Source: Research Results, 2020 (Processed Data)

Based on the descriptive results in Table 4.1, it can be seen that the data to be used in this study amounted to 126 data obtained from 42 companies for 3 years, varying widely with a very wide range. Table 4.1 shows the average value of the size of industrial companies listed on the IDX in 2015-2017 is 13.72. The minimum company size value is 11.40 and the maximum value is 16.34. The standard deviation of 1.08 indicates a very close (homogeneous) spread of data.

Table 4.1 shows the average value of Inventory Intensity of Industrial companies listed on the IDX in 2015-2017 amounting to 632.32. The minimum Inventory Intensity value is 86.52 and the maximum value is 5443.74. The standard deviation of 752.06 indicates the spread of data is very far (heterogeneous).

Table 4.1 shows the average value of the Inventory Method of Industrial companies listed on the IDX in 2015-2017 is 7.88. The minimum value for the Inventory Method is 0 for the average method and the maximum value is 1 for the FIFO method. The standard deviation of 0.43 indicates the spread of data is very far (heterogeneous).

Feasibility Testing of Regression Models

After descriptive statistical analysis, then statistical tests will be carried out, namely using logistic regression to determine whether there is an effect of company size, inventory intensity or inventory turnover ratio, on the selection of inventory valuation methods, and forming a logistic regression model. Hypothesis testing is carried out using logistic regression which is carried out jointly for the four variables, namely company size, inventory intensity, with a significance level of 5%. The logistic regression equation is formulated to perform the Hosmer and Lemeshow Goodness of Fit Test logistic regression test. Here are the test results:

Table 4.2

Feasibility Testing of Regression Models

Hosmer and Lemeshow Test

Step	Chi-square	df	Sig.
1	6.783	8	.560

Based on the results of the data processing above, the significance value of the Statistics Hosmer and Lemeshow's Goodness of Fit Test is 0.560, which is above 0.05. This indicates that there is no significant difference between the model and the data. This also means that the model is able to predict the value of the observation or the model is acceptable because it matches the observation data. This means that the logistic regression model can and is feasible to use for further analysis.

Coefficient of Determination (Cox and Snell's R Square)

Cox and Snell's R Square is a measure that tries to imitate the R2 measure in multiple regression which is based on the likelihood estimation technique with a maximum value of less than 1 (one) so it is difficult to interpret. Cox and Snell's R Square is a modification of the Cox and Snell coefficients to ensure that the value varies from 0 (zero) to 1 (one). The following is the coefficient of determination.

Table 4.3

Coefficient of Determination

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	121.477[a]	.125	.188

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

The test results of Cox and Snell's R Square show that the value is 0.125 or 12.5%, which means that the contribution of the company size variable, net profit margin and inventory intensity can explain its effect on the inventory valuation method by 12.5%, the remaining 87.5% is influenced by other factors which were not examined in this study.

Hypothesis test

Partial Influence

Hypothesis testing using logistic regression is carried out by including all variables. This test aims to see the effect of company size, net profit margin and inventory intensity on the selection of inventory valuation methods. This test was carried out using the enter method with a significance level of 5%. The basis for the decision is if the significance value> 0.05 then Ha is rejected while the significance value <0.05 then Ha is accepted. The test results are as follows.

Table 4.4. Logistic Regression Testing (partially)

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1[a]	SIZE	-.664	.247	7.239	1	.007	.515
	INTENS	.001	.000	5.661	1	.017	1.001
	Constant	8.191	3.338	6.020	1	.014	3.608E3

a. Variable(s) entered on step 1: SIZE, NPM, INTENS.

The results of partial logistic regression testing using the enter method can be seen in Table 4.4 and by looking at the significance value of each independent variable. For company size, a significance value of 0.007 <0.05 means that Ha is accepted. H0 is rejected, indicating that firm size has a significant effect on the choice of inventory valuation method.

Inventory intensity or inventory turnover ratio with a significance value of 0.017 <0.05 means that Ha is accepted. H0 is rejected indicating that inventory intensity has a significant effect on the choice of inventory valuation method.

Simultaneous Influence

Furthermore, logistic regression testing will be carried out simultaneously (together). The test in logistic regression is called the Omnibus Tests of Model Coefficient which aims to see whether the four independent variables, namely company size, net profit margin and inventory intensity together have an effect on the selection of inventory valuation methods. The test results can be seen in the SPSS processing results table:

Table 4.5. Logistic Regression Testing (Simultaneously)

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	16.840	3	.001
	Block	16.840	3	.001
	Model	16.840	3	.001

Table 4.5 shows that the significance value is 0.001. The significance value is 0.001 <0.05, then Ha is accepted. This indicates that the variable company size and inventory intensity simultaneously have a significant effect on the selection of inventory valuation methods.

The results of logistic regression testing, both partial and simultaneous, state that the results of testing the significance value are below 0.05. This shows that the results of logistic regression testing either partially or simultaneously are consistent and the same, namely company size and inventory intensity have a significant effect on the selection of inventory valuation methods.

Logistic Regression Model

Regression models were performed using logistic regression analysis. Logistic regression is an analytical tool used to measure the influence of the independent variable on the dependent variable in the form of a vdummy variable. The results of the logistic regression analysis method are as follows:

Table 4.6. Logistic Regression Testing

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)
Step 1ª	SIZE	-.664	.247	7.239	1	.007	.515
	INTENS	.001	.000	5.661	1	.017	1.001
	Constant	8.191	3.338	6.020	1	.014	3.608E3

a. Variable(s) entered on step 1: SIZE, NPM, INTENS.

The results of logistic regression testing using the enter method can be interpreted as follows:

$$Y = -0{,}664X1 + 0.001 X2$$

The equation above can be explained as follows:

1. The beta value of company size is -0.664, indicating that if the size of the company increases by 1 unit, the choice of inventory valuation method will decrease by -0.664. The conclusion is that the larger the size of the company indicates the position of the company is already strong so that it is less likely to change inventory valuation methods.
2. The beta value of inventory intensity is 0.001, indicating that the intensity of the inventory is increasing by 1 unit, the choice of inventory valuation method will increase by 0.001. The conclusion is that the greater the intensity of the inventory indicates that inventory valuation must use the most appropriate method so that the company is more likely to change inventory valuation methods.

Discussion

1. The Effect of Firm Size (SIZE) on the Choice of Inventory Methods

The test results for company size state that company size has a significant effect on the choice of inventory valuation methods. The results of this study are consistent with research conducted by Marwah (2015) and Mukhlasin (2002), which proves that company size affects the choice of inventory valuation methods.

The greater the size of the company, the more access it can be for managers to establish a constant (unchanging) inventory valuation method. Companies that are larger in size are thought to have a greater tendency to choose the correct method. Based on the political cost hypothesis in positive accounting theory, it is stated that large companies tend to manage their inventory well.

2. Effect of Inventory Intensity on Inventory Method Choice

The test results for Inventory Intensity state that firm size has a significant effect on the choice of inventory valuation method. The results of this study are consistent with research conducted by Setiyanto (2015), Mukhlasin (2002) which proves that Inventory Intensity affects the choice of inventory valuation methods.

The test results for inventory intensity state that the inventory intensity or inventory turnover ratio has a significant effect on the selection of inventory valuation methods. Companies that use the average method have an indication of high inventory turnover, whereas companies that use the FIFO method have an indication of low inventory turnover. Based on these results, the results of this study are consistent with research conducted by Mukhlasin (2002) which proves that inventory intensity affects the choice of inventory valuation methods. This is because in this study companies that use the average method have a high ending inventory so that they have a low inventory turnover and some have a low ending inventory as if the company uses the FIFO method.

3. The Effect of Company Size (SIZE) and Inventory Intensity Simultaneously on the Choice of Inventory Method

The logistic regression test results simultaneously state that the significance value test results are below 0.05. This shows that the logistic regression test results simultaneously prove that company size and inventory intensity have a significant effect on the selection of inventory valuation methods. The results of this study are inconsistent with the results of the research by Herlin Tundjung Setijaningsih and Cecilia Dewi Pratiwi (2010) which prove that company size, inventory intensity, variability of cost of goods sold, and variability of accounting profit do not significantly influence the choice of inventory valuation methods.

The test results of Cox and Snell's R Square show that the value is 0.125 or 12.5%, which means that the contribution of the company size variable, net profit margin and inventory intensity can explain its effect on the inventory valuation method by 12.5%, the remaining 87.5% is influenced by other factors which were not examined in this study. The implication of the results of this study is that company size and inventory intensity can simultaneously form and influence inventory valuation methods.

V. Conclusions and recommendations

A. Conclusion

From the results of the research and hypothesis testing that has been done, several conclusions can be drawn as follows:

1. The partial test results can be proven that the size of the company (SIZE) affects the selection of inventory valuation methods for Manufacturing companies listed on the IDX for the 2015-2017 period has an effect on the selection of inventory valuation methods for Manufacturing companies listed on the IDX for the 2015-2017 period. Inventory intensity affects the selection of inventory valuation methods for Manufacturing companies listed on the IDX for the 2015-2017 period.
2. Simultaneous test results Company size (SIZE) and Inventory Intensity affect the selection of inventory valuation methods for Manufacturing companies listed on the IDX for the 2015-2017 period.

B. Suggestions

The suggestions based on the conclusions and limitations of the research above are as follows:

1. The next researcher is expected to increase the number of other independent variables such as capital structure, sales, costs and other factors so that adding the variables will add new and better findings that are thought to affect the inventory valuation method.
2. The next researcher is expected to increase the amount of data by adding a more up-to-date time period so that the research results can be more generalized.

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