Inventory Performance Effect On Gross Margin Rate Of Inventory Investment

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Abstract
This study aims to test the effect of the Inventory Efficiency Ratio, Inventory Responsiveness Ratio, and Inventory Turnover on the gross margin rate of inventory investment. Data were collected from retail companies on the Indonesia Stock Exchange in 2021. The results show the Inventory Efficiency Ratio has a not significant positive impact, Inventory Responsiveness Ratio has a significant negative impact, and Inventory Turnover has a significant positive impact on the Gross margin rate of inventory investment. Also found the Inventory Efficiency Ratio has a significant positive effect, while the Inventory Responsiveness Ratio has a significant negative impact on Inventory Turnover.
Keywords: *Inventory Efficiency Ratio, Inventory Responsiveness Ratio, Inventory Turnover,Gross Margin Rate of inventory investment*

I. INTRODUCTION

Retail companies in Indonesia are currently facing difficult times. One by one companies began to stop operating their retail outlets [1]. Several retail companies have closed their business outlets, including 7-Eleven, Matahari Department Store, Lotus Department Store, and Debenhams which were closed by PT Mitra Adi Perkasa Tbk [1]. The problem is that the sales volume of these companies has not increased in fact, it has decreased. In fact, as a company engaged in the trade of convenience goods, its sales volume should have increased in line with the increase in the country's economic growth, because the increase in the country's economic growth will be followed by an increase in people's purchasing power.

Several parties indicated that the closure of several retail outlets was caused by e-commerce, which had recently developed rapidly, causing consumers to switch to making purchases through e-commerce. However, these indications are not necessarily completely correct, because not all retail companies close their outlets, so it is reasonable to suspect that the companies that experienced the closing of these outlets were companies that were unable to manage their inventory investments properly. If these retail companies are able to manage their inventory investments well, they will not experience losses that will cause outlets to be closed. So the main key to the success of a retail company lies in its ability to manage inventory investment to increase company sales and profits [2]. The ability of retail companies to manage inventory investment properly will have a direct impact on the gross margin level of inventory investment so that the company avoids losses.

For companies engaged in the retail industry, the gross margin rate of inventory investment is the main determinant of the company's profitability. The closure of several retail outlets was a direct result of the decrease in the gross margin rate of inventory investment. The gross margin rate of inventory investment is a measure of a company's ability to use inventory investment to generate gross margins. So, the gross margin rate of inventory investment is directly related to inventory performance. The low gross margin rate of inventory investment indicates problems in inventory management. Therefore, it is very important for managers to know what factors determine the gross margin rate of inventory investment. There are several factors identified as determinants of inventory performance, namely Inventory Efficiency, Inventory Responsiveness, and Inventory Turnover [3].

The first way to increase the Gross Margin Rate of Inventory Investment is to increase Inventory Efficiency. Efforts to increase the Inventory Efficiency Ratio can be carried out by reducing inventory investment to a truly efficient level, meaning that inventory investment is only made in the amount that is really needed to meet sales demand. So that investment in inventory does not exceed the need to meet sales, it can be done by implementing just in time purchasing management. In just-in-time purchasing management, suppliers must be selected whose locations are close to the company and bound by long-term contracts so that the supplier has a strong commitment to the company[4]. Efforts to increase the Inventory Efficiency ratio can also be carried out by reducing the cost of products sold to the minimum level. Efforts to reduce the cost of products

sold can be done in several ways, for example by taking advantage of cash discounts, choosing the cheapest means of transportation for goods sold, and making purchases in bulk.

The second way to increase the Gross Margin Rate Of Inventory Investment is to reduce the Inventory Responsiveness Ratio to the most efficient level. A high Inventory Responsiveness Ratio indicates that the company has the ability to quickly meet sales requests. However, a high Inventory Responsiveness Ratio requires the availability of high inventory investment, even though inventory investment is basically an unproductive investment, so the higher the level of inventory investment, it will actually reduce the level of the Gross Margin Rate Of Inventory Investment. Efforts to reduce the Inventory Responsiveness Ratio can be done by reducing the ratio of the percentage change in inventory. A low percentage change in inventory ratio can be achieved if the company implements just-in-time purchasing management, where the company only chooses suppliers that are located as close to the company as possible and binds them with long-term contracts, so that the supplier has a high commitment to immediately fulfill the company's demand[4]. This high supplier commitment to the company will cause the company to no longer need to invest too much in inventory.

The third way to increase the Gross Margin Rate of Inventory Investment is to increase Inventory Turnover. Inventory Turnover shows that in one year how many times the company can sell its inventory investment and replenish the inventory investment. The more frequently a company can sell its entire inventory investment and replenish the inventory investment, the greater the company's gross margin rate of inventory investment. So it needs to be emphasized that what makes the Gross Margin Rate Of Inventory Investment high is not the amount of inventory investment but how often in one year a company is able to sell its inventory investment and replenish the inventory investment.

The strategy that managers can implement to increase inventory turnover is by increasing sales and/or reducing inventory investment to the most efficient level possible.

Increasing sales can be done through an aggressive policy on credit sales, while ways to reduce inventory investment to the most efficient level possible can be done by implementing a just-in-time purchasing policy. With this policy, the company only chooses suppliers that are located as close as possible to the company and binds them with long-term contracts so that the supplier has a high commitment to immediately fulfill the company's demands. This high supplier commitment to the company will cause the company to no longer need to invest too much in inventory.

Research on Inventory Performance Effect On the Gross Margin Rate of Inventory Investment in companies engaged in retail trade has not yet been found in Indonesia, therefore this research is expected to provide benefits for managers to have a better understanding of inventory investment management.

This study aims to empirically test how Inventory Efficiency, Inventory Responsiveness, and Inventory Turnover impact the Gross Margin Rate of Inventory Investment by using data from companies engaged in the retail industry whose shares are listed on the Indonesia Stock Exchange. The analysis is carried out simultaneously using path analysis so that it can provide comprehensive information on the various factors that determine the Gross Margin Rate of Inventory Investment.

II. Literature Review And Hypothesis Development

Effect of Inventory Efficiency Ratio (IER) on Gross margin rate of inventory investment (GMROII). The Gross Margin Rate Of Inventory Investment (GMROII) is one of the fundamental measuring tools used by retail companies to evaluate gross margin and inventory investment performance for decision-making [5]. The gross margin rate of inventory investment can also be defined as the profitability valuation ratio of inventory investment which reflects the company's ability to convert inventory into cash above the cost of inventory [6].

The Gross Margin Rate Of Inventory Investment is calculated by dividing the gross margin by the average inventory cost which is often used in the retail industry [6]. So, the more efficient the average inventory cost, the higher the gross margin rate of inventory investment. Therefore, the inventory efficiency ratio, as one of the main components of the performance measure of net working capital, will be a concern for managers [7]. The Inventory Efficiency Ratio is the ratio of the cost of products sold to inventory, so the greater this ratio indicates the more efficient inventory investment management. Efficient inventory investment management allows most of the inventory to be converted into the cost of products sold thereby increasing gross margin.

Efficient inventory management will save funds invested in inventory, so that these funds can be allocated to other productive investments, thereby increasing gross margins [8]. Thus, the hypothesis can be proposed as follows.
Ha1: The Inventory Efficiency Ratio has a significant positive effect on the Gross Margin Rate of Inventory Investment.

Effect of Inventory Responsiveness Ratio (IRR) on Gross margin rate of inventory investment (GMROII). The inventory responsiveness ratio is the ratio of the percentage change in inventory to the

percentage change in the cost of products sold. This ratio reflects how quickly inventory can meet the increase in the cost of products sold due to increased sales [9]. The more the percentage change in inventory ratio compared to the percentage change in cost of products sold ratio, the higher the inventory responsiveness ratio will be. The higher inventory responsiveness ratio indicates that more inventory is available to meet the increase in the cost of products sold as a result of an increase in sales. The need for more inventory to meet the cost of products sold can cause inventory inefficiency, thereby reducing the gross margin rate of inventory investment [9].

On the other hand, the Gross Margin Rate of Inventory Investment is the ratio of the gross margin to inventory investment, so the larger the inventory investment, the lower the Gross Margin Rate of Inventory Investment. Thus, the higher the Inventory Responsiveness Ratio, the more inventory it will require, resulting in a lower gross margin rate of inventory investment.

Ha2: Inventory Responsiveness Ratio has a significant negative effect on the Gross Margin Rate of Inventory Investment.

Effect of Inventory Turnover (IT) on Gross Margin Rate of Inventory Investment (GMROII). Inventory Turnover is the ratio of sales to average inventory. Inventory Turnover is a measure of inventory productivity, which shows how many times a year a company can sell its inventory and replace it again. High inventory turnover indicates a high frequency of sales or relatively low inventory levels so that it can increase the gross margin rate of inventory investment [10]. Conversely, low Inventory Turnover indicates a low sales frequency or excessive inventory investment, which is inefficient and results in a low the Gross Margin Rate of Inventory Investment.

Ha3: Inventory Turnover has a significant positive effect on the Gross Margin Rate of Inventory Investment.

Effect of Inventory Efficiency Ratio (IER) on Inventory Turnover (IT). The Inventory Efficiency Ratio is a comparison of the cost of products sold to inventory, which shows the proportion of inventory that can be converted into the cost of products sold for sale in one year. A high Inventory Efficiency Ratio indicates that most of the inventory can be converted into the cost of products sold for sale or because the company implements effective inventory management so that only a small portion of inventory cannot be sold.

The higher the Inventory Efficiency Ratio, the higher the Inventory Turnover, because most of the inventory can be sold, so the company's inventory is more efficient [11]. Conversely, low Inventory Efficiency Ratio indicates that only a small portion of inventory can be converted into the cost of products sold for sale, resulting in low Inventory Tuners or because the company has too much inventory, so most of the inventory settles in warehouses and is inefficient.

Ha4: Inventory Efficiency Ratio has a significant positive effect on Inventory Turnover.

Effect of Inventory Responsiveness Ratio (IRR) on Inventory Turnover (IT). The Inventory Responsiveness Ratio is the ratio of the percentage change in inventory to the percentage change in the cost of products sold. This ratio reflects how quickly inventory can meet the increase in the cost of products sold due to an increase in sales. The greater the Inventory Responsiveness Ratio indicates that the greater the inventory owned by the company in order to meet the increase in the cost of products sold due to increased sales.

On the other hand, Inventory Turnover is the ratio of sales to the average inventory, so that the larger the inventory, the lower the Inventory Turnover. Thus, a greater Inventory Responsiveness Ratio will result in lower Inventory Turnover. So there is a negative relationship between the Inventory Responsiveness Ratio and Inventory Turnover [12]

Ha5: Inventory Responsiveness Ratio has a significant negative effect on Inventory Turnover.

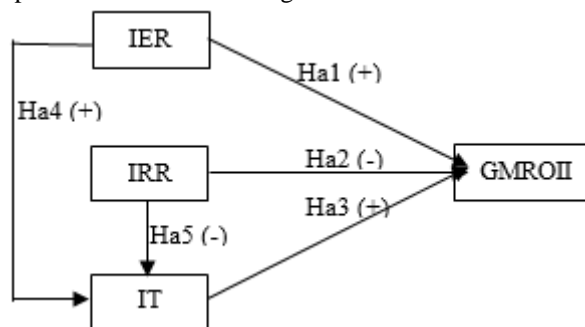The framework of thought is presented in the following model.

Figure 1: Research Model

III.   RESEARCH METHOD

This research was conducted using a census of all trading sector companies whose shares were consistently listed on the Indonesian Stock Exchange in 2021 and 2022. The total number of trading sector companies is 31 companies, however, 28 companies have complete data for 2021 and 2022.

Measurement of Research Variables. The dependent variable of this study is the Gross Margin Rate on Inventory Investment (GMROII) which is measured by the ratio between Gross Margin and Inventory Investment which is formulated as follows.

GMROII = (Sales - Cost of Goods Sold)/Investment (1)

The independent variables of this study are Inventory Efficiency Ratio (IER), Inventory Responsiveness Ratio (IRR), and Inventory Turnover (IT).

The measurement of the Inventory Efficiency Ratio (IER) variable is formulated as follows [3] :

IER = Inventory / Cost of Goods Sold   (2)

From this formula, if the inventory gets bigger, the IER will also get bigger which shows that inventory is getting inefficient because more inventory cannot be converted into sales. To avoid reverse scoring, the formula is modified as follows:

IER = Cost of Goods Sold / Inventory   (3)

From this new formula, the higher Inventory Efficiency Ratio (IER) indicates that inventory management is more efficient.

The measurement of the Inventory Responsiveness Ratio (IRR) variable is formulated as follows:
$IRR = [(Inv_t - Inv_{t-1})/Inv_{t-1}]/[(CoGS_t - CoGS_{t-1})/CoGS_{t-1}$ (4)

The measurement of the Inventory Turnover (IT) variable is used in the following formula:
IT = Sales / [(Initial Inventory + End Inventory) / 2]   (5)

Data analysis method. This research analysis tool is Ordinary Least Square (OLS) regression and uses α of 0.05. The regression function used is as follows.
Regression **Model 1**:
$GMROII = \alpha_1 + \beta_1 IER + \beta_2 IRR + \beta_3 IT + e_1$ (6)
Regression **Model 2**:
$IT = \alpha_2 + \beta_4 IER + \beta_5 IRR + e_2$ (7)
where:
GMROII = Gross margin rate of inventory investment.
IER = Inventory Efficiency Ratio
IRR = Inventory Responsiveness Ratio
IT = Inventory Turnover

To find out the mediating role of Inventory Turnover (IT) on the effect of Inventory Efficiency Ratio (IER) on the Gross margin rate of inventory investment (GMROI) the Sobel test was used. [13], where:
$t = ab/\delta ab$ (8)
$\delta ab = \sqrt{(a^2 \delta b^2 + b^2 \delta a^2 + \delta a^2 \delta b^2)}$ (9)
where: a is β_4; b is β_3 and δa is the Standard Error of β_4; δb is Standard Error of β_3.

Meanwhile, to examine the mediating role of Inventory Turnover (IT) on the effect of Inventory Responsiveness Ratio (IRR) on the Gross Margin Rate of Inventory Investment (GMROII), then: a is β5; b is β3 and δa is the Standard Error of β5; δb is the Standard Error of β3.

IV.   RESULTS

After screening and transforming the data, regression **Model 1** and regression **Model 2** are obtained which are free from classical assumptions and fit problems, so they are feasible to be used as analytical tools.

To test the hypotheses Ha 1, Ha 2, and Ha3, **Model 1**s regression on equation (11) is used which is obtained from the **Table 1**:

Tables **1.** Model 1 Regression Coefficient

Independent Variables	Beta (β)		Std Errors	t-value	Sign.
IER	0.019		0.022	0.871	0.395
IRR	-0.502		0.134	-3.760	0.001
IT	0.148		0.067	2.209	0.037
Dependent Variable: GMROII					
R.Square	0.684				
F. statistic	13.703				
Sign. F statistic	0.000				

Source: Processed research data, 2023

$$GMROII = \alpha_1 + \beta_1 IER + \beta_2 IRR + \beta_3 IT + e_1 \qquad (10)$$
$$GMROII = 0.415 + 0.019 IER - 0.502 IRR + 0.148 IT + e_1 \qquad (11)$$

The Regression Model 1 has an R Square of 0.684 or 68.40 percent with a significant F-statistic of 0.000 so it is significantly able to explain the variation in the Gross Margin Rate of Inventory Investment (GMROII) caused by the Inventory Efficiency Ratio (IER), Inventory Responsiveness Ratio (IRR), and Inventory Turnover (IT) of 68.40 percent, while 31.60 percent is caused by other factors that are not included in the Regression Model 1. Thus, the Regression Model 1 is declared fit so that it can be used as a hypothesis testing tool.

Testing the Ha1 hypothesis, namely the Inventory Efficiency Ratio has a significant positive effect on the Gross Margin Rate of Inventory Investment. Based on **Table 1**, it is known that the Inventory Efficiency Ratio (IER) has a regression coefficient β of 0.019 with a significance probability of 0.395 where the probability of significance is greater than α of 0.05 so that the Ha1 hypothesis is rejected, meaning that the higher the Inventory Efficiency Ratio substantially increases the Gross Margin Rate of Inventory Investment.

Testing the Ha2 hypothesis namely the Inventory Responsiveness Ratio has a significant negative effect on the Gross Margin Rate of Inventory Investment. Based on **Table 1** it is known that the Inventory Responsiveness Ratio (IRR) has a regression coefficient β of -0.502 with a significance probability of 0.001 where the probability of significance is smaller than α of 0.05 so that the Ha2 hypothesis is accepted, meaning that an increase in the Inventory Responsiveness Ratio will substantially reduce the Gross Margin Rate On Inventory Investment.

Testing the Ha3 hypothesis namely the Inventory Turnover has a significant positive effect on the Gross Margin Rate of Inventory Investment. Based on **Table 1**, it is known that Inventory Turnover (IT) has a regression coefficient β of 0.148 with a significance probability of 0.037 where the probability of significance is smaller than α of 0.05 so that the Ha3 hypothesis is accepted, meaning that an increase in inventory turnover will substantially increase the Gross Margin Rate On Inventory Investment.

From the analysis using regression **Model 1**, the results of testing the hypotheses Ha1, Ha2, and Ha3 are shown in Table 3 as follows.

Table 3. Results of Hypothesis Testing Ha1, Ha2, and Ha3

Hypothesis	Beta (β)	p-value	Results
Ha1	0.019	0.395	Rejected
Ha2	-0.502	0.001	Accepted
Ha3	0.148	0.037	Accepted

Source: Processed research data, 2023

To test the hypotheses Ha4 and Ha5 used **Model 2** regression on equation (13) which is obtained from the **Table 2**.

Tables **2.** Model 2 Regression Coefficient

Independent Variables	Beta (β)	Std. Error	t-value	Sign.
IER	0.199	0.045	4.465	0.000
IRR	-0.811	0.341	-2.389	0.027
Dependent Variable: IT				
R Square	0.560			
F statistic	12.728			
Sign. F statistic	0.000			

Source: Processed research data, 2023

$$IT = \alpha_2 + \beta_4 IER + \beta_5 IRR + e_2 \qquad (12)$$
$$IT = 13.593 + 0.199\ IER - 0.811\ IRR + e_2 \qquad (13)$$

The Regression Model 2 has an R Square of 0.560 or 56.00 percent with a significant F-statistic of 0.000 so it is significantly able to explain the variation in the Inventory Turnover (TI) caused by the Inventory Efficiency Ratio (IER) and Inventory Responsiveness Ratio (IRR) of 56.00 percent, while 44.00 percent is caused by other factors that are not included in the Regression Model 2. Thus, the Regression Model 2 is declared fit so that it can be used as a hypothesis testing tool.

Testing the Ha4 hypothesis namely the Inventory Efficiency Ratio has a significant positive effect on Inventory Turnover. Based on **Table 2** it is known that the Inventory Efficiency Ratio (IER) has a regression coefficient β of 0.199 with a significance probability of 0.000 where the probability of significance is smaller than α of 0.05 so that the Ha4 hypothesis is accepted, meaning that a substantial increase in the Inventory Efficiency Ratio will be followed by an increase in Inventory Turnover.

Testing the Ha5 hypothesis namely the Inventory Responsiveness Ratio has a significant negative effect on Inventory Turnover. Based on **Table 2** it is known that the Inventory Responsiveness Ratio (IRR) has a regression coefficient β of -0.811 with a significance probability of 0.027 where the probability of significance is smaller than α of 0.05 so that the Ha5 hypothesis is accepted, meaning that a substantial increase in Inventory Responsiveness Ratio (IRR) will actually be followed by a decrease in Inventory Turnover.

The summary of the results of testing the Ha4 and Ha5 hypotheses using the 2nd regression model is presented in **Table 4** as follows.

Table$_s$ 4. Results of Hypothesis Testing Ha4 and Ha5

Hypothesis	Beta (β)	p-value$_s$	Results
Ha4	0.199	0.000	Accepted
Ha5	-0.811	0.027	Accepted

Source: Processed research data, 2023

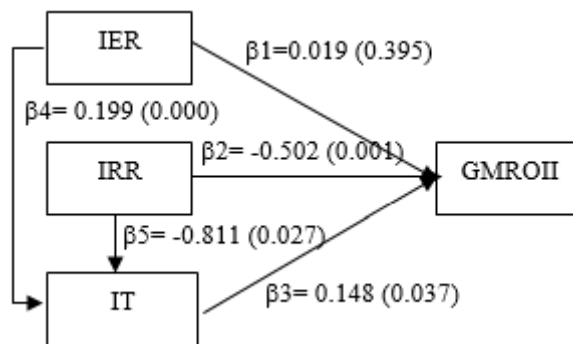For more details, testing these hypotheses is presented in **Figure 2**.

Figure 2. Analysis Model

V.   DISCUSSIONS
Effect of Inventory Efficiency Ratio on Gross Margin Rate of Inventory Investment. The results of testing the Ha1 hypothesis prove that there is a positive but not significant effect of the Inventory Efficiency Ratio on the Gross Margin Rate of Inventory Investment. This means that increasing the Gross Margin Rate of Inventory Investment can be done directly through efforts to increase inventory efficiency, although the results were not substantial.

The way to increase the Inventory Efficiency Ratio can be carried out by reducing inventory investment to a truly efficient level, meaning that inventory investment is only made in the amount that is really needed to meet sales demand. So that investment in inventory does not exceed the need to meet sales, it can be done by implementing just in time purchasing management. In just-in-time purchasing management, suppliers must be selected whose locations are close to the company and bound by long-term contracts so that the supplier has a strong commitment to the company[4]. Efforts to increase the Inventory Efficiency Ratio can also be carried out by reducing the cost of products sold to the minimum level. Efforts to reduce the cost of products sold can be done in several ways, for example by taking advantage of cash discounts, choosing the cheapest means of transportation for goods sold, and making purchases in bulk.

Increasing inventory efficiency shows that there is an effort to reduce inventory materially, resulting in efficiency [9]. But on the other hand, efforts to reduce inventory materially will have an impact on reducing the company's ability to meet customer demand. If the increase in inventory efficiency is carried out continuously, so that companies often cannot meet customer demands, then the company will actually lose customers. The loss of these customers will have an impact on the decline in the gross margin rate of inventory investment. This

is the reason why the increase in inventory efficiency was not followed by a significant increase in the Gross Margin Rate of Inventory Investment.

Effect of Inventory Responsiveness Ratio on Gross Margin Rate of Inventory Investment. The results of testing the H2 hypothesis prove that the Inventory Responsiveness Ratio has a substantially negative effect on The Gross Margin Rate of Inventory Investment. This proves that efforts to increase the Inventory Responsiveness Ratio require the provision of more and more inventory [9], but the provision of an increasing number of inventories will cause inefficiencies, thereby reducing the Gross Margin Rate Of Inventory Investment. In addition, an increasing number of inventories, if not offset by an increase in sales, will directly reduce the Gross Margin Rate of Inventory Investment.

The way to increase the Gross Margin Rate of Inventory Investment is to reduce the Inventory Responsiveness Ratio to the most efficient level. A high Inventory Responsiveness Ratio indicates that the company has the ability to quickly meet sales requests. However, a high Inventory Responsiveness Ratio requires the availability of high inventory investment, even though inventory investment is basically an unproductive investment, so the higher the level of inventory investment, it will actually reduce the level of the gross margin rate of inventory investment. Efforts to reduce the Inventory Responsiveness Ratio can be done by reducing the ratio of the percentage change in inventory. A low percentage change in inventory ratio can be achieved if the company implements just-in-time purchasing management, where the company only chooses suppliers that are located as close to the company as possible and binds them with long-term contracts, so that the supplier has a high commitment to immediately fulfill the company's demand[4]. This high supplier commitment to the company will cause the company to no longer need to invest too much in inventory.

Effect of Inventory Turnover on the Gross Margin Rate of Inventory Investment. The results of testing the H3 hypothesis prove that Inventory Turnover has a significant positive effect on the Gross Margin Rate of Inventory Investment. This shows that increasing the Gross Margin Rate Of Inventory Investment can be done by increasing Inventory Turnover [10].

Inventory Turnover shows that in one year how many times the company can sell its inventory investment and replenish the inventory investment. The more frequently a company can sell its entire inventory investment and replenish the inventory investment, the greater the company's Gross Margin Rate of Inventory Investment. So, it needs to be emphasized that what makes the Gross Margin Rate of Inventory Investment high is not the amount of inventory investment but how often in one year a company is able to sell its inventory investment and replenish the inventory investment.

The way that can be taken by managers to increase Inventory Turnover is by increasing sales and/or reducing inventory investment to the most efficient level possible. Increasing sales can be done through an aggressive policy on credit sales, while ways to reduce inventory investment to the most efficient level possible can be done by implementing a just-in-time purchasing policy. With this policy, the company only chooses suppliers that are located as close as possible to the company and binds them with long-term contracts so that the supplier has a high commitment to immediately fulfill the company's demands. This high supplier commitment to the company will cause the company to no longer need to invest too much in inventory[4].

Efforts to increase inventory turnover by increasing sales is not a job that can be done easily by managers, because there are many uncontrollable external factors that affect sales, including competitors and market prices. Conversely, increasing inventory turnover through inventory efficiency is more controllable so it is easier for managers to do by reducing inventory to a very minimal level but still being able to meet the needs for sales.

Effect of Inventory Efficiency Ratio on Inventory Turnover. The results of testing the H4 hypothesis prove that there is a significant positive effect of the Inventory Efficiency Ratio on Inventory Turnover. These results provide clues to managers that the higher the efficiency level of inventory investment, the higher the inventory turnover rate. Increasing the Inventory Efficiency Ratio can be done by reducing inventory investment to the minimum level but still being responsive enough to meet sales needs. Efforts to reduce inventory investment to the minimum amount can be done by managers by implementing a just-in-time purchasing policy. The implementation of a just-in-time purchasing policy can be done by selecting only suppliers that are located as close as possible to the company's location and bound by long-term contracts so that suppliers have a high commitment to be able to quickly meet the company's demands, thus the company does not need to invest in inventory.

Reducing inventory to this minimum level will not only increase the Inventory Efficiency Ratio but also increase Inventory Turnover considering inventory turnover is the ratio of sales to average inventory. This is the reason why an increase in the Inventory Efficiency Ratio will have a sizable positive impact on increasing Inventory Turnover.

The Role of Inventory Turnover Intermediaries on the Effect of Inventory Efficiency Ratio on the Gross Margin of Inventory Investment. From **Figure 2** it is known that the direct effect of the Inventory Efficiency Ratio on the Gross Margin Rate of Inventory Investment is indicated by path β1. From the test

results shown in Figure 2, it is known that the Inventory Efficiency Ratio has a positive but not significant effect on the Gross Margin Rate of Inventory Investment, which is indicated by the large value of β1 of 0.019 with a significant probability level of 0.395.

On the other hand, the indirect effect of the Inventory Efficiency Ratio on the Gross Margin Rate of Inventory Investment through Inventory Turnover is shown by the β4 and β3 pathways. From the test results shown in Figure 2, it can be seen that the Inventory Efficiency Ratio has a significant positive effect on the Inventory Turnover rate, which is indicated by the magnitude of the β4 value of 0.199 with a significance probability level of 0.000. While Inventory Turnover has a significant positive effect on the Gross Margin Rate of Inventory Investment, which is indicated by the path of the magnitude of the β3 value of 0.148 with a significance probability level of 0.037, it can be concluded that Inventory Turnover is a pure mediating variable that mediates the effect of the Inventory Efficiency Ratio on the Gross Margin Rate of Inventory Investment.

To prove that Inventory Turnover is a purely mediating variable that mediates the effect of the Inventory Efficiency Ratio on the Gross Margin Rate of Inventory Investment, the Sobel test is used in formula (8).

From **Figure 2**, **Table 1**, and **Table** 2 it is known that:

$a = \beta_4 = 0.199$; $b = \beta_3 = 0.148$; $\delta a = 0.045$; $\delta b = 0.067$, then

$\delta ab = \sqrt{(0.199^2)(0.067^2) + (0.148^2)(0.045^2) + (0.045^2)(0.067^2)}$

$\delta ab = 0.015$ so that the magnitude of the t statistic according to formula (8) can be calculated as follows.

$t = [(0.199)(0.148)]/0.015$ so that a t count of 1.963 is obtained. Meanwhile, the value of the t statistic based on Table-t with a degree of freedom of n-1 is 1.717. Thus the value of the t statistic based on the results of calculations with formula (8) is greater than the statistical value of t obtained based on Table-t, so it can be concluded that Inventory Turnover is a pure mediating/intervening variable which significantly mediates the effect of the Inventory Efficiency Ratio on the Gross Margin Rate of Inventory Investment.

Effect of Inventory Responsiveness Ratio on Inventory Turnover. The results of testing the H5 hypothesis prove that the Inventory Responsiveness Ratio has a substantially negative effect on the Inventory Turnover so an increase in the Inventory Responsiveness Ratio will have a direct impact on a decrease in the Inventory Turnover. An increase in the Inventory Responsiveness Ratio can occur if the ratio of changes in inventory investment is greater than the ratio of changes in the cost of products sold. The greater Inventory Responsiveness Ratio indicates that the company has a large inventory investment so that it can quickly meet changes in sales. If the company has a large enough inventory investment, then the company's ability to convert inventory investment into sales and replenish the inventory investment or inventory turnover will decrease [14]. A decrease in the ability of the number of times a year a company can convert inventory investment into sales will have a direct impact on decreasing the gross margin rate of inventory investment, this is in accordance with the results of testing the Ha2 hypothesis.

The Role of Inventory Turnover Intermediaries on the Effect of Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment. From **Figure 2** it can be seen that the Inventory Responsiveness Ratio has a significant positive effect on the Gross Margin Rate of Inventory Investment, which is indicated by the magnitude of the β2 value of -0.502 with a significance level of 0.001. On the other hand, the Inventory Responsiveness Ratio has a significant positive effect on Inventory Turnover, which is indicated by the β5 value of -0.811 with a significance level of 0.027, and Inventory Turnover has a significant positive effect on the Gross Margin Rate Of Inventory Investment, which is indicated by the β3 value of 0.148 with a significance level of 0.037. Thus, it can be concluded that Inventory Turnover is a semi-mediation variable that mediates the effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment.

To prove that Inventory Turnover is a semi-mediation variable that mediates the effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment, the Sobel test is used.

$t = ab/sab$

$\delta ab = \sqrt{(a^2\delta b^2 + b^2\delta a^2 + \delta a^2\delta b^2)}$

From **Figure 2**, **Table 1**, and **Table 2** it is known that:

a is equal to β5 of -0.811; b is equal to β3 of 0.148; δa of 0.341; δb is 0.067, then

$\delta ab = \sqrt{[(0.811^2)(0.067^2) + (0.148^2)(0.341^2) + (0.341^2)(0.067^2)]}$

$\delta ab = 0.078$

$t = [(0.811)(0.148)]/0.078$ so that a t-count of 1.547 is obtained. Meanwhile, based on the Table-t with degrees of freedom (d. f) of n-1, a t-table value is 1.717, so the a t-count which has a value of 1.547 is smaller than a t-table which has a value of 1.717. So, it can be concluded that Inventory Turnover is a semi-mediation/intervening variable that does not significantly mediate the effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment. This result is reinforced by the calculated t value of the direct effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment of 2.209 which is greater than the calculated t value of the indirect effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment through Inventory Turnover of 1.547. So, it can be concluded

that the direct effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment is stronger than the indirect effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment through Inventory Turnover.

VI. CONCLUSION

From testing the hypothesis, it is obtained evidence that partially the Inventory Efficiency Ratio has a not significant positive effect on the Gross Margin Rate Of Inventory Investment, the Inventory Responsiveness Ratio has a significant negative effect on the Gross Margin Rate Of Inventory Investment, and Inventory Turnover has a significant positive effect on the Gross Margin Rate Of Inventory Investment. The Inventory Efficiency Ratio has a significant positive effect on Inventory Turnover, while the Inventory Responsiveness Ratio has a significant negative effect on Inventory Turnover.

From the mediation test using the Sobel test, it was found that Inventory Turnover is a pure mediating/intervening variable that significantly mediates the effect of the Inventory Efficiency Ratio on the Gross Margin Rate of Inventory Investment. From the mediation test using the Sobel test, it was also obtained evidence that Inventory Turnover as a semi-mediation/intervening variable mediates the insignificant effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment. The direct effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment is stronger than the indirect effect of the Inventory Responsiveness Ratio on the Gross Margin Rate of Inventory Investment through Inventory Turnover.

The limitation of this study is the sample size which is too small, this is because there are only 23 retail companies listed on the Indonesia Stock Exchange, therefore it is suggested that future research overcomes these limitations by increasing the number of years of observation so that more observation data is obtained.

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