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Inventory Position and Performance of Railroad Transportation Services in Indonesia

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Abstract: This study aims to determine the position of inventory on the profitability of rail transport services company. Research on the effect of stock position on Return On Equity (ROE), Return On Invesment (ROI) and Inventory Turnover (PP) has been done by quantitative method. The results of previous studies on the relationship of inventory with profitability have different results on each research object so it becomes the motivation in this study.This research is quantitative research type. The population of this study are all Financial Statements of PT Kereta Api Indonesia (Persero) (PT KAI). The sample used is the financial report of PT KAI in 2008 – 2016', so it counts 9 years of the data being research commonly. Data analysis techniques used commond size analysis and multiple regression analysis. The results showed that for the classical assumption test did not occur violation of normality, autocorrelation, heterocedasticity and multicollinearity. After hypothesis testing, it is found that the alternative hypothesis (H_1) unacceptable so the null hypothesis (H_0) is accepted. Inventory of Facilities (Ps), Street Supply and Bridge (Pjj) and Inventory of Signal, Telecommunication and Electricity (Psin) have no effect to ROE. It was also found that the alternative hypothesis (H_2) unacceptable so its null hypothesis (H_0) is accepted. In other words the Facilities Inventory (Ps), Street Supply and Bridges (Pjj) and Inventory of Signals, Telecommunications and Electricity (Psin) have no effect on ROI. It was also found that the alternative hypothesis (H_3) unacceptable so its null hypothesis (H_0) is accepted. In other words the Facilities Inventory (Ps), Street Supply and Bridges (Pjj) and Inventory of Signals, Telecommunications and Electricity (Psin) have no effect on PP. This is logic because the inventory data used is the total ending inventory. The total ending inventory is not an element of the profit / loss statement itself.
Keywords: Inventory, Profitability, ROE, ROI, Inventory Turnover.

INTRODUCTION

PT Kereta Api Indonesia (Persero) (PT KAI) is one of the companies in the field of transportation services. The year 2009 was the new era of PT KAI. Companies that were initially product oriented turned into profit-oriented companies. Companies that have been found to suffer losses began to experience improvements. The improvements in the form of increased profits and continuous increase in income.

Along with the increase in earnings income regularly, inventories also experienced a significant increase. In 2007 the total inventory amounted to Rp 302,823,251,465, - but until 2016 the total became Rp 546,223,589,156. End-of-2016 inventories almost doubled the value of inventories in 2007.

Besides having advantages, inventory with a high amount also has a bad impact on the company. In general, companies with higher inventory levels than competitors tend to be in a weaker competitive position. Inventory and how inventory is managed is closely related to the company's ability to gain the competitive side to make money now and in the future [1].

The relationship between inventory management and profitability becomes an interesting thing to study. Prempeh [2] argues that there is a strong relationship between the management of raw material inventories and the profitability of the manufacturing industry in Ghana and its positive relationship. Nwakaego, et al. [3] found that there was a positive correlation between inventory management practices and ROE. Shardeo [4] argues that there is a strong

relationship between inventory turnover ratios and net income of SAIL companies. Lwiki, et al. [5] found that there was a positive correlation between inventory management practices and financial performance of sugar companies.

Mbula, *et al*. [6] found that there was a significant relationship between inventory management and financial performance of companies funded by government venture capital in Kenya. Etale and Bringilar [7] suggest that efficient inventory cost management has a positive correlation to the profitability of beer companies listed on NSE. Juliansyah [8] argues that every decrease in inventory days or receivables will increase return on assets. Song [9] states that the accurate amount of inventory can be lower the inventory level and save cost. Mogere, *et al.* [10] stated that inventory management was an important factor in order to improve production efficiency in tea factories.

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Shin, *et al*. [11] stated that a low ratio of inventory to a company's sales is related to a higher profit margin for the company. Panigrahi [12] states that proper inventory management of inventories will increase the position of liquidity and profitability. Capkun [13] argues that there is a positive correlation between inventory and financial performance in the manufacturing industry. Dwakaego, et al. [14] explained that there is a relationship between inventory turnover ratios and company profitability. Koumanakos [15] argues that the higher the level of inventory held by a company, the lower the rate of return. Kimaiyo and Ochiri [16] cost reduction is needed for inventory management practices related to the performance of manufacturing companies. Sitienei and Memba [17] argue that inventory turnover has a non-significant negative relationship to ROA & GPM.

Based on the above explanation, the following hypotheses are formulated:

H_1: Inventory of facilities, inventory of roads and bridges and inventory of electrical and telecommunications signals materials affect ROE.
H_2: Inventory of facilities, supplies of roads and bridges and inventory of electrical and telecommunications signals materials affect ROI.
H_3: Inventory of facilities, inventory of roads and bridges, and bridges and inventory of electrical and telecommunications signals affect the Inventory Turnover (PP).

RESEARCH METHODS

This study uses a quantitative descriptive approach with the type of hypothesis testing research. The types of data used are primary data and secondary data. Primary data is obtained through observation and interviews. Secondary data in the form of financial statements obtained from PT. KAI. The population of this study is all PT KAI's financial statements. Research sample data can be obtained only from 2008 to 2016. The sampling technique is called convinience sampling.

This study uses the method of financial statement analysis with a trend analysis approach and multiple linear regression. Linear regression method is used because the independent variables are more than 1 (one) and to test the research hypothesis.

- Testing of the First Hypothesis

At this stage, regression analysis is used to determine the effect of means inventory, road and bridge inventory and electrical and telecommunications signals inventory on profitability in terms of Return On Equity (ROE). The regression equation is:

$$ROE = a_0 + a_1PS + a_2PJJ + a_3Psin + e \quad (i)$$

- Testing of the Second Hypothesis

Regression analysis is used to determine the effect of inventory, road and bridge inventory and electrical and telecommunications signals inventory on profitability in terms of Return on Investment (ROI). The regression equation is:

$$ROI = b_0 + b_1PS + b_2PJJ + b_3Psin + e \quad (ii)$$

- Testing of the Third Hypothesis

Regression analysis is used to determine the effect of means of inventory, road and bridge inventory and electrical and telecommunications signals inventory of inventory turnover. The regression equation is:

$$PP = b_0 + b_1PS + b_2PJJ + b_3Psin + e \qquad \text{(iii)}$$

RESULTS AND DISCUSSIONS

Overview of Inventory at PT KAI

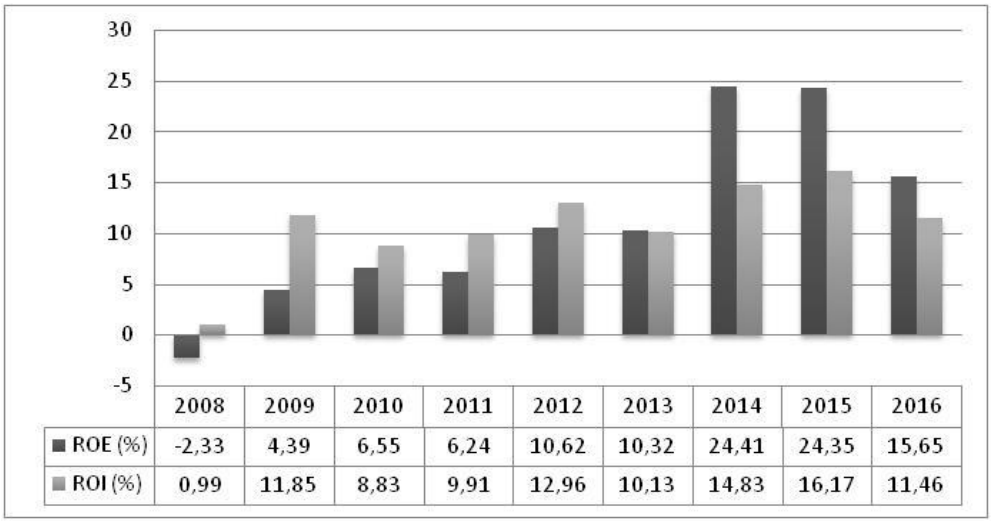
PT KAI is a State-Owned Enterprise (BUMN) that is engaged in services, namely providing transportation services to the public that are directly related to the general public. In terms of maintaining the smooth operation of the railroad services business, maintenance activities are carried out both facilities and infrastructure.

Maintenance activities are also carried out on all infrastructure owned by PT KAI. The infrastructure is divided into 2, namely railroad and signal. Maintenance of the railroad includes maintenance of all rails, money orders (transfer of train lines) and bridges that are passed by the train. Signal maintenance involves maintaining all signals both mechanical signals and electrical, electrical and communication signals along the railroad track. This activity is absolutely carried out so that the train operational activities run smoothly.

Trend Analysis of Financial Ratios Based on Decree of the Minister of BUMN No. 100 / MBU / 2002

The 2008 ROE was -2.33%. 2009 ROE of 4.39%, in 2010 amounted to 6.55%, in 2011 amounted to 6.24%, in 2012 amounted to 10.62%, in 2013 amounted to 10.32%, in 2014 amounted to 24.41% and year 2015 amounted to 24.35% (figure 5.5). In 2008 the ROE was negative because this company was experiencing a substantial loss of 83,486,599,127 rupiah. This indicates that the company is "sick." The company with a negative ROE value also means that it is not able to provide dividends to its shareholders and not prospects. Need to change so that the company grows again.

The ROE value for the period 2009 to 2014 has increased because PT KAI has experienced an increase in the revenue of rail transportation services. This increase in income is of course followed by an increase in profits. Increased profits will make the company able to provide returns to shareholders well. The ROE value from 2008-2016 shows that the performance of railroad companies is good in terms of returning dividends to investors.



	2008	2009	2010	2011	2012	2013	2014	2015	2016
ROE (%)	-2,33	4,39	6,55	6,24	10,62	10,32	24,41	24,35	15,65
ROI (%)	0,99	11,85	8,83	9,91	12,96	10,13	14,83	16,17	11,46

Fig-1: ROE and ROI for 2008 – 2016

Source: primary data, 2017

Regression Analysis
Classical Normality Assumption Test Results

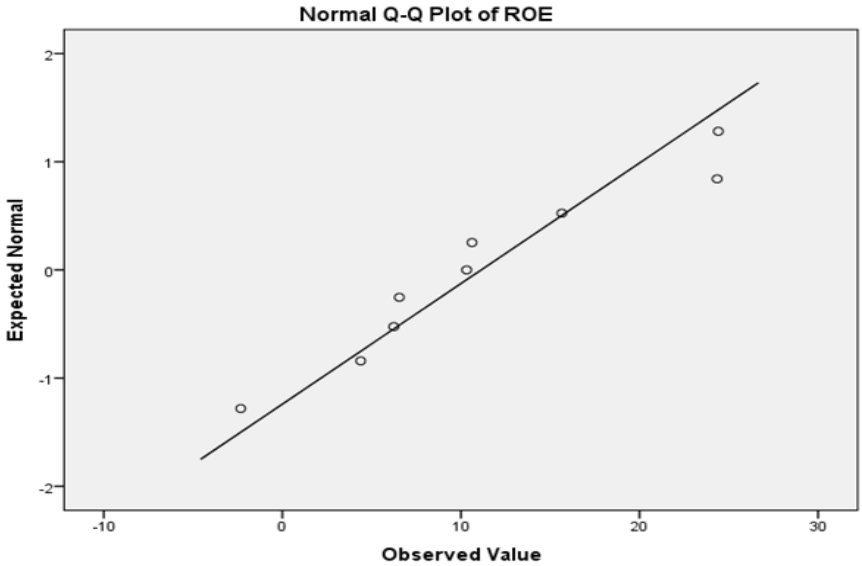


Fig-2: Normality Test Results Equations (i)
Source: primary data, 2017

Based on Figure-2, the distribution of points is relatively close to a straight line so it can be interpreted that data on means of inventory, bridge road inventory, inventory of electricity telecommunications signals, ROE used, normal distribution.

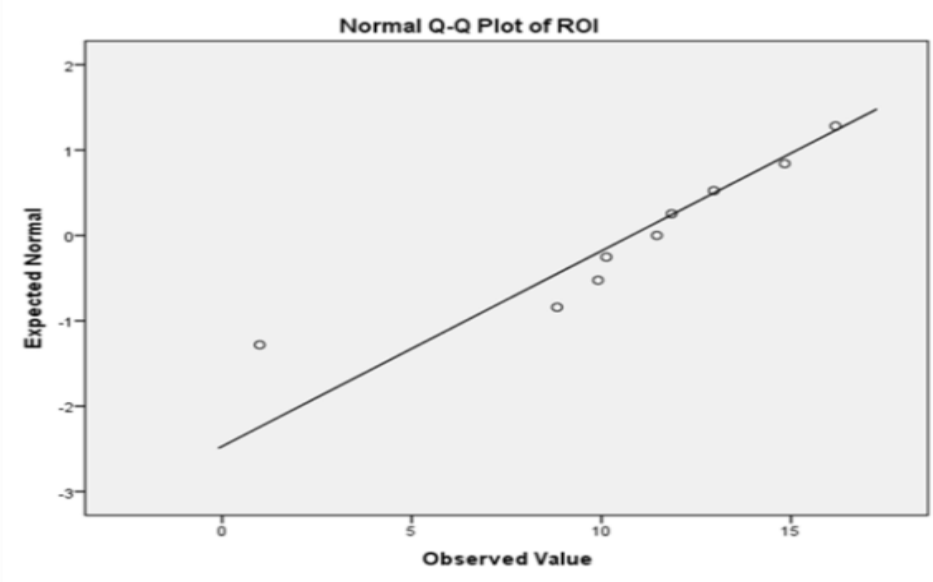


Fig-3: Equation Test Normality Results (ii)
Source: primary data, 2017

Similarly, equation (ii). Distribution of points produced relatively close to a straight line (figure 3). This means that data on means of supplies, bridge road inventory, electricity telecommunications signal inventory and ROI used, have a normal distribution.

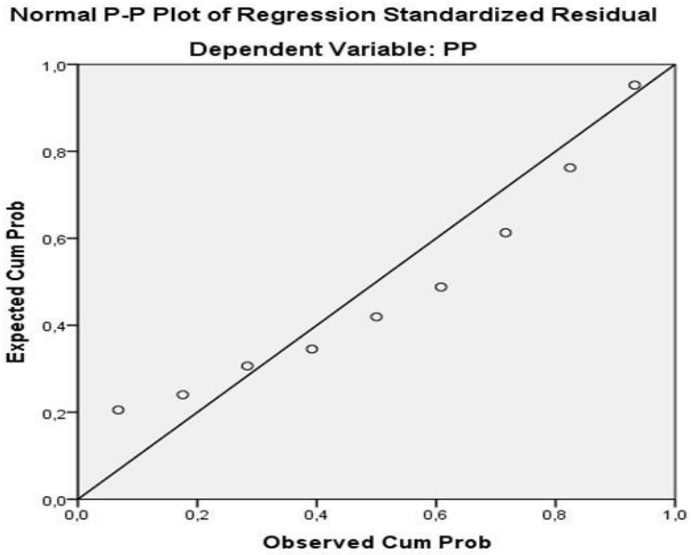


Fig-4: Equation Test Normality Results (iii)
Source: primary data, 2017

In equation (iii). The distribution of the points produced is relatively close to the straight line (figure 4) which means data on means of supply, bridge road inventory, inventory of electricity telecommunications signals and PP used, has a normal distribution.

Multicollinearity Test Results

Table-1: Multicollinearity Test Results (i)

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Ps	0,922	1,085
	Pjj	0,958	1,044
	Psin	0,952	1,051

a.Dependent Variable: ROE
Source: primary data, 2017

VIF value for Inventory Inventory variable on ROE is 1.085 (Table-1). The highest VIF limit value is 5, so that the variable inventory does not occur multicollinearity or is still below the limit. VIF values for Road and Bridge Inventory variables for ROE are 1.044. The highest VIF limit value is 5, so that the variable inventory means there is no multicollinearity or is still under the batasa. VIF value for Inventory variables Telecommunication and electricity signals on ROE of 1.051. The highest VIF limit value is 5, so that the variable inventory does not occur multicollinearity or is still below the limit.

Table-2: Multicollinearity Test Results (ii)

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Ps	0,922	1,085
	Pjj	0,958	1,044
	Psin	0,952	1,051

a.Dependent Variable: ROI
Source: primary data, 2017

VIF value for Inventory Inventory variable on ROI is 1.085 (Table-2). The highest VIF limit value is 5, so that the variable inventory does not occur multicollinearity or is still below the limit. VIF values for Road and Bridge Inventory variables for ROI are 1.044. The highest VIF limit value is 5, so that the variable inventory means there is no multicollinearity or is still under the batasa. VIF value for Inventory variables Telecommunication and electricity signals on ROI is 1.051. The highest VIF limitation value is 5, so for the inventory inventory variable there is no multicollinearity or is still below the limit so there are no symptoms of multicollinearity in equations (i) and (ii).

Table-3: Multicollinearity Test Results (iii)

Coefficients[a]

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	PS	0,958	1,043
	PJJ	0,951	1,052
	PSin	0,989	1,011

a. Dependent Variable: PP

Source: primary data, 2017

VIF values for Inventory variables for PP are 1.043 (Table 3). The highest VIF limit value is 5, so that the variable inventory does not occur multicollinearity or is still below the limit. VIF values for Road and Bridge Inventory variables for PP are 1.052. The highest VIF limit value is 5, so that the variable inventory does not occur multicollinearity or is still below the limit. VIF value for Inventory variables Telecommunication and electricity signals to PP is 1.011. The highest VIF limitation value is 5, so that the inventory inventory variable does not occur multicollinearity or is still below the limit so there are no symptoms of multicollinearity in equation (iii).

Heteroscedasticity Test Results

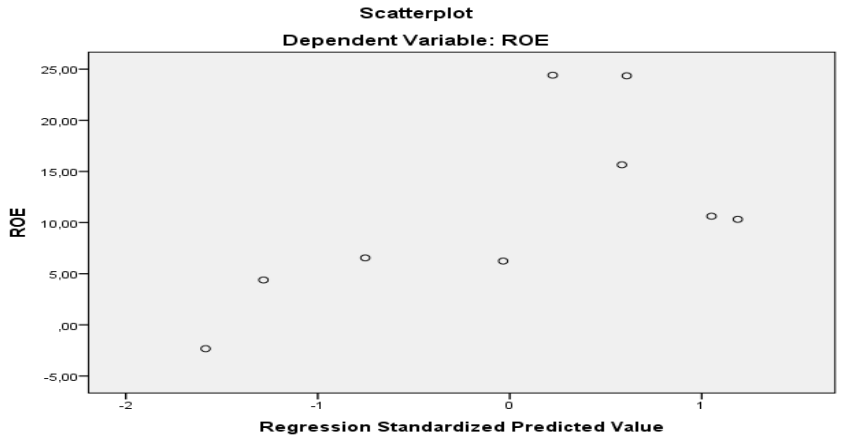


Fig-5: Test Results for Heterocapacity for Equations (1)

Source: primary data, 2017

In figure-5 it appears that the distribution of the points produced does not form a certain line pattern so that heterocedasticity can be said to occur.

The regression equation (ii) also carried out heterokedsity testing with the help of SPSS software. The test results of equation (ii) are shown in figure-6. In figure -6 it appears that the distribution of the points produced does not form a certain line pattern so that heterocedasticity can be said to occur.

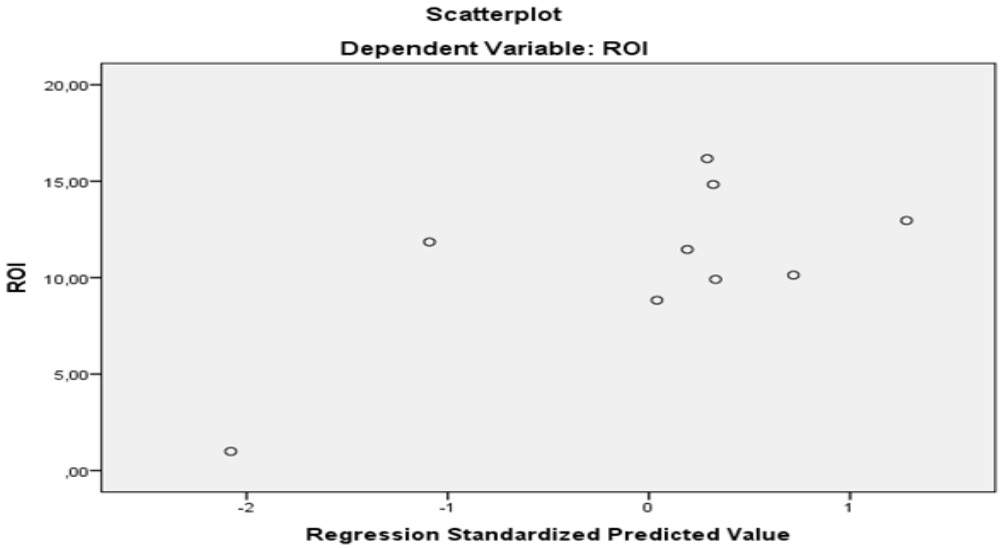


Fig-6: Test Results for Heterocapacity for Equations (ii)
Source: primary data, 2017

Testing the regression equation (iii) is tested with the help of SPSS software. In Figure 7, the distribution of the points produced by the regression equation (iii) does not form a particular line pattern. This pattern can be said to have no heterocedasticity.

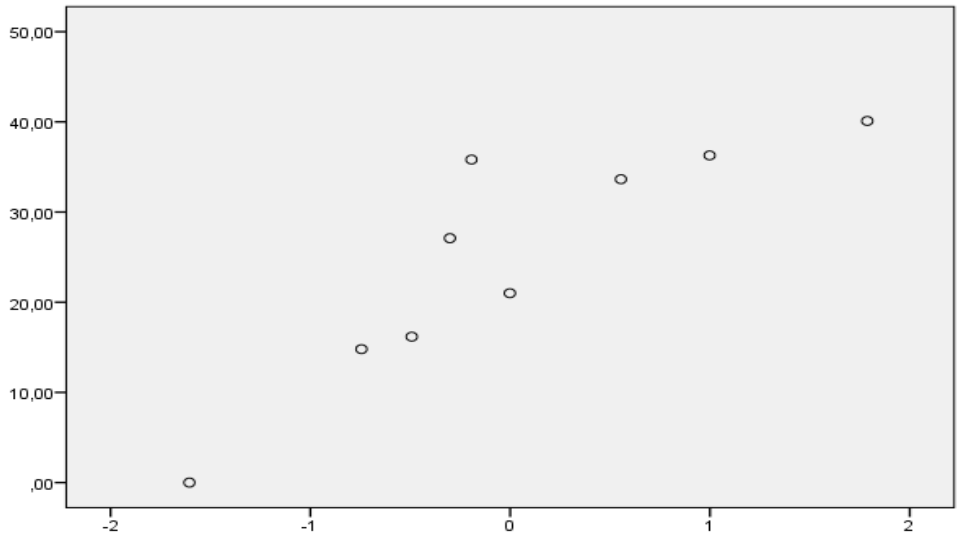


Fig-7: Test Results for Heterocapacity for Equations (ii)
Source: primary data, 2017

Autocorrelation Test Results

Table-3: DW Table Calculate Equation (i)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,637[a]	0,406	0,050	8,74446	1,340

Predictors: (Constant), Psin, Pjj, Ps
Dependent Variable: ROE
Source: primary data, 2017

The number of samples is 9 years with 3 independent variables, then the DW table is equal to dL = 0.4548 and dU = 2.128. Based on the table above, we can conclude the value of dL <DW Calculate ROE <dU. This means there is no autocorrelation.

Autocorrelation assumption test results for multiple regression tests for Ps, Pjj and Psin for ROI in table-3:

Table-4: DW Table Calculate Equation (ii)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,690[a]	0,477	0,163	3,99718	2,018

Source: primary data, 2017

The number of samples is 9 years with 3 independent variables, then the DW table is equal to dL = 0.4548 and dU = 2.128. Based on the table above, it can be concluded that the value of <DW <Calculate ROI <dU. This means that there is no autocorrelation in equation (ii).

Autocorrelation assumption test results for multiple regression tests for Ps, Pjj and Psin for PP in table 5:

Table-5: DW Table Calculate Equation (iii)

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0,881[a]	0,776	0,642	7,84013	2,999

a. Predictors: (Constant), PSin, PS, PJJ

b. Dependent Variable: PP

Source: primary data, 2017

The number of samples is 9 years with 3 independent variables, then the DW table is equal to dL = 0.4548 and dU = 2.128. Based on the table above, it can be concluded that the value of dL <DW Calculates PP <dU. This means that there is no autocorrelation in equation (iii).

HypotheisTest Result

Table-6: Hypothesis Test Results for Equations (i)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	261,633	3	87,211	1,141	0,417[b]
	Residual	382,328	5	76,466		
	Total	643,961	8			

a. Dependent Variable: ROE

b. Predictors: (Constant), Psin, Pjj, Ps

Source: primary data, 2017

Based on table 6 above, the Sig is obtained. F is 0.417 (p> 0.05). It can be said that H_0 is accepted, meaning that the variable inventory of facilities, road and bridge inventory and the supply of telecommunication and electricity signals do not significantly influence ROE.

Table-7: Hypothesis Test Results for Equations (ii)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	72,752	3	24,251	1,518	0,318[b]
	Residual	79,887	5	15,977		
	Total	152,639	8			

a. Dependent Variable: ROI

b. Predictors: (Constant), Psin, Pjj, Ps

Source: primary data, 2017

Based on the above table 7, the Sig value is obtained. F is 0.318 (p> 0.05), it can be said that H_0 is accepted, meaning that the variable inventory of facilities, road and bridge inventory and the supply of telecommunications and electricity signals do not significantly influence ROI.

Table-8: Hypothesis Test Results for Equations (iii)

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1066,874	3	355,625	5,786	0,044[b]
	Residual	307,338	5	61,468		
	Total	1374,212	8			

a. Dependent Variable: PP

b. Predictors: (Constant), PSin, PS, PJJ

Source: primary data, 2017

Based on table 8 above, the Sig is obtained. F is 0.044 (p> 0.05), it can be said that H_0 is accepted, meaning that the variable inventory of facilities, road and bridge inventory and the supply of telecommunications and electricity signals do not have a significant effect on PP.

Based on the type, this research is an explanatory study, namely research that explains the relationship between Inventory variables, Inventory of Roads and Bridges and Inventory of Telecommunications and Electricity Signal as independent variables and ROE and ROI as the dependent variable. This study uses data from each of the means of inventory facilities, Bridge Road Inventory and Electricity Telecommunication Signal Inventory for the period 2008 - 2016. The purpose of this study was to determine the inventory position of PT KAI's profitability.

The main purpose of this research is to analyze inventory position on profitability. Inventory data used is the total ending inventory recorded in the balance sheet and ready to be used for the maintenance process. Hypothesis testing is done by using multiple linear regression analysis. Hypothesis test results based on table 4.8 obtained the value of Sig. F is 0.417 (p> 0.05), it can be said that Ho is accepted, meaning that the variables of means of supply, supply of roads and bridges and supplies of telecommunication and electricity signals have no significant effect on ROE.

Inventories based on table 4.9 get the value of Sig. F is 0.318 (p> 0.05), it can be concluded that H_0 is accepted, meaning that the variable inventory of facilities, the supply of roads and bridges and the supply of telecommunication and electricity signals do not have a significant effect on ROI. This happens because the inventory data, bridge road inventory and the supply of electricity telecommunications signals used are the total inventory end. The total value of the ending inventory is not included in the statement of Profit / Loss. The total value of the ending inventory is presented in the Balance Sheet report, so it is logical that the size of the inventory does not affect profitability. This means that no matter how much the increase or decrease in the amount of inventory owned by the company does not affect the company's profitability performance. In a railroad service company, inventory is used to maintain the facilities and infrastructure owned so as to generate income. The process of change from inventory to income does not occur directly as in trading companies and manufacturing.

CONCLUSIONS

The conclusions that can be drawn from this study are:

The proportion of inventory related to financial aspects based on the decision of the minister of BUMN is:

- The total inventory value at PT KAI for the period 2008 - 2016 tends to increase.

- The highest composition of PT KAI's inventory is the supply of facilities (62%), followed by bridge road inventories (28%), inventory of electricity telecommunications signals (8%) and facilities inventory (2%).
- Average inventory turnover during the period of 2008-2016 is 28.26 times. The higher the turnover rate or the longer days of inventory storage, the lower the efficiency of the company's operations.

The impact of the inventory on the profitability performance of the railroad service companies is as follows:

- Equipment availability, bridge road inventory and inventory of electrical and telecommunications signals materials supplies do not affect ROE.
- Equipment availability, bridge road inventory and inventory of electrical and telecommunications signals materials supplies do not affect ROI.
- Inventory of facilities, bridge road inventory and electrical and telecommunications signals stock do not affect PP.

Referring to the results of conclusions and discussions, some suggestions can be made that can benefit several parties:

- For PT KAI's management, it should pay attention to the balances in the entire warehouse. Increasing warehouse balance does not affect the value of ROE and ROI, but will impact on report card performance assessment.
- For academics, it is expected that future researchers can add to the object of research with diverse companies so they can add insight and knowledge. Academics can also look for factors other than inventory that affect a company's ROE, ROI and Inventory Turnover (PP).

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