

THE EFFECT OF CUSTOMER AMOUNT, WATER LOSS RATE, OPERATING EXPENSES ON RENTABILITY OF PDAM IN YOGYAKARTA

PENGARUH JUMLAH PELANGGAN, TINGKAT KEHILANGAN AIR, DAN BEBAN OPERASIONAL TERHADAP RENTABILITAS PDAM SE-YOGYAKARTA

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Abstract

Public sector financial management is important for Perumda PDAM in running its business. The main issue in optimizing financial performance is something that needs to be faced by companies today. The assessment of financial performance is measured through ROE indicators. This study aims to determine the effect of the number of customers, the level of water loss, and operational expenses on profitability at PDAMs in DIY Province. The dependent variable in this study is return on equity (ROE). The independent variable consists of three variables, namely the number of customers, the level of water loss, and operational expenses. The research population is all PDAM Regional Public Companies in Indonesia for the period 2017 - 2022. The research sample amounted to five PDAM Perumda that met the research criteria. The data testing method uses multiple linear regression analysis. The test results concluded that partially only the variable number of customers and the level of water loss had a significant effect on profitability as measured by the ROE indicator. However, based on the results of the F statistical test, it is concluded that the variables of the number of customers, the level of water loss, and operational expenses have a significant influence simultaneously on the profitability of PDAMs.

Keyword : customers, water loss rate, operational expenses, ROE

Abstrak

Manajemen keuangan sektor publik menjadi hal yang penting bagi Perumda PDAM dalam menjalankan bisnisnya. Isu utama dalam mengoptimalkan kinerja keuangan menjadi hal yang perlu dihadapi oleh perusahaan saat ini. Penilaian kinerja keuangan tersebut diukur melalui indikator ROE. Penelitian ini memiliki tujuan untuk mengetahui pengaruh jumlah pelanggan, tingkat kehilangan air, dan beban operasional terhadap rentabilitas pada PDAM di Provinsi DIY. Variabel dependen dalam penelitian kali ini adalah return on equity (ROE). Variabel independen terdiri dari tiga variabel yaitu jumlah pelanggan, tingkat kehilangan air, dan beban operasional. Populasi penelitian adalah seluruh Perusahaan Umum Daerah PDAM yang ada di Indonesia periode tahun 2017 – 2022. Sampel penelitian sejumlah lima Perumda PDAM yang memenuhi kriteria penelitian. Metode pengujian data menggunakan analisis regresi linear berganda. Hasil pengujian menyimpulkan bahwa secara parsial hanya variabel jumlah pelanggan dan tingkat kehilangan air berpengaruh signifikan terhadap rentabilitas yang diukur dengan indikator ROE. Hasil uji statistik F disimpulkan bahwa variabel jumlah pelanggan, tingkat kehilangan air, dan beban operasional memiliki pengaruh signifikan secara simultan terhadap rentabilitas PDAM.

Kata kunci: pelanggan, tingkat kehilangan air, beban operasional, ROE

A. Introduction

In 1999 the Government of the Republic of Indonesia passed Law Number 22 of 1999 concerning the Regional Government. This regulation is the first legal basis for the implementation of regional autonomy in Indonesia. Regional autonomy is the right and obligation of an autonomous region to manage its own governance and the interests of local communities in accordance with applicable laws and regulations (Anita, 2022).

In 2014, this Law underwent several changes to its provisions in accordance with current developments which affected the existing situation, state administration and implementation of regional autonomy. As a result, the basis for implementing regional autonomy in Indonesia was replaced by Law Number 23 of 2014 concerning Regional Government. In article 331 paragraph (4), as a form of implementation of regional autonomy, this law gives regional governments the power to establish Regional Owned Enterprises which are tailored to regional needs and the feasibility of the business sector to be established.

According to Government Regulation Number 54 of 2017, it is explained that Regional Owned Enterprises is a business entity whose capital comes mostly or entirely from the region. The establishment of Regional Owned Enterprises in Indonesia aims to provide public services, fulfill community needs, and optimize the potential of Natural Resources which is useful for increasing regional income.

Water is a natural resource that is important for the lives of many people. The availability of clean water is needed for various economic sectors such as households, industry, and district/city government infrastructure. Therefore, one of the regional autonomy policies in the Special Region of Yogyakarta Province is to form a body providing clean water distribution through the establishment of a Regional Drinking Water Company hereinafter abbreviated as PDAM

The community expects certainty about the continuity of water distribution provided by PDAM. However, the coverage of PDAM in this province is still relatively low, which is no more than 6% of the population in the Special Region of Yogyakarta Province as listed in table 1.1 as follows:

Table 1 The amount of PDAM Customers in DIY Provinc

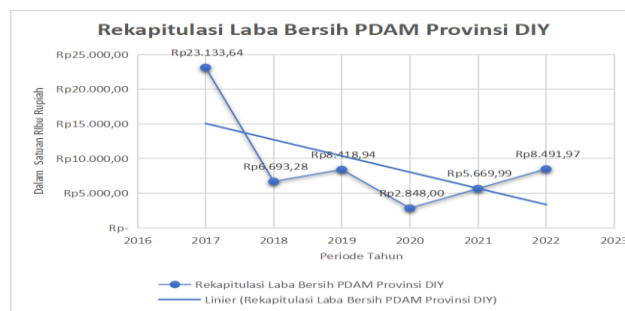
Tahun	Jumlah Penduduk Provinsi D.I.Yogyakarta (Jiwa)	Jumlah Pelanggan PDAM Provinsi D.I.Yogyakarta (Jiwa)	%
2017	3.768.235	157.005	4,17
2018	3.818.266	168.681	4,42
2019	3.868.588	180.605	4,67
2020	3.919.197	192.525	4,91
2021	3.970.220	203.957	5,14
2022	4.021.816	215.879	5,37

Source: BPS of D.I.Yogyakarta Province

As a Regionally-Owned Enterprise, PDAM has the responsibility to distribute its profits to the regions. The use of profits in PDAM is regulated through the articles of association and then the percentage of distribution is adjusted to the policy set by the Regional Head Representing the Regional Government in the Ownership of Regional Assets Separated in the Regional Public Company (KPM) as the owner of the power of attorney for PDAM.

If the profit increases, the PDAM's contribution to the Regional Original Income (PAD) to the province will be greater. However, over the past six years, PDAM in the Special Region of Yogyakarta Province has not shown a significant increase in profit as seen in the following trend diagram:

Picture 1 Declining Trend of PDAM Net Profit in DIY Province



Based on the graph regarding the downward trend in net profit of all PDAM in the Province of DIY, it can be seen that 2017 was the year with the highest recapitulation of PDAM profits in the Province of DIY compared to the following five years. This indicates that in 2017, PDAM was able to generate a large proportion of profit sharing to be distributed as locally-generated revenue (PAD) for the region. However, during the next four years from 2018 to 2022 the company experienced fluctuations in profit recapitulation.

The downward trend in profits was triggered by several factors faced by PDAM. Based on the results of an interview on September 12, 2023, the Business Development Division of PDAM Tirtamarta stated that the decline in the number of customers was caused by the large number of Yogyakarta residents switching to communal wells around their neighborhood. The downward trend in profits was triggered by several factors faced by PDAM. Based on the results of an interview on September 12, 2023, the Business Development Division of PDAM Tirtamarta stated that the decline in the number of customers was caused by the large number of Yogyakarta residents switching to communal wells around their neighborhood.

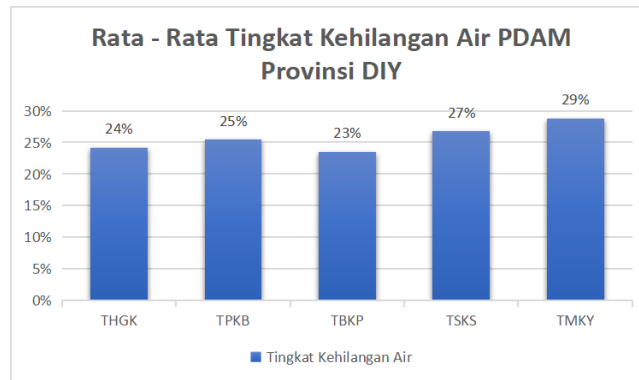
In addition, from the Self-Request Unsubscription Check Form, it is known that unsubscribing from PDAM Tirta Marta water is also dominated by various factors, such as frequent disruptions in the distribution of clean water from PDAM Tirtamarta and the lack of responsiveness from the company to requests for pipe repairs.

Meanwhile, based on an explanation from one of the employees of the Internal Control Standards Division of Perumda PDAM Tirta Handayani, Gunungkidul Regency, there are a number of reasons that are factors in the decline in PDAM's profits. The reason is because the age of the water meter is too old, resulting in inaccurate water meter calculation results. The results of the water meter calculations affect the amount of service rates that must be paid by consumers. If the results of the water meter calculations are not accurate, the income received by PDAM could be lower than it should be.

In addition, what caused the decline in profit was the existence of pipe leaks that could not be handled immediately considering the limited technical human resources to overcome it. The existence of damage to the piping system that was not detected by officers also indirectly resulted in obstacles in the distribution of water that could not be channeled optimally. Various obstacles in water distribution including those caused by pipe repairs result in water leaks. The longer the process of repairing damaged pipes will have an impact on the increasing level of water loss or Non-revenue Water (NRW) experienced by most PDAMs in the Province of D.I. Yogyakarta.

According to the provisions of the Agency for the Improvement of Drinking Water Supply System Implementation (BPPSPAM), the tolerance limit for the level of water loss by PDAM is 20%. However, the value of the level of water loss by PDAM in the Special Region of Yogyakarta Province still far exceeds this limit. This is reflected in the following graph:

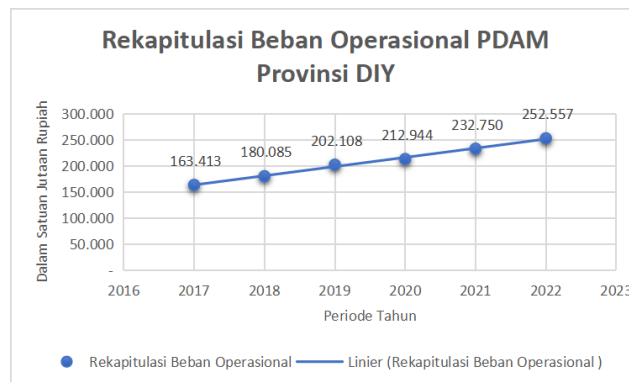
Picture 2 Average Water Loss Rate



Source: Ministry of PUPR

In the graph above, it can be seen that Perumda PDAM Tirta Binangun Kulon Progo Regency has the lowest Average Water Loss Rate of 23%, while PDAM Yogyakarta City has the highest average Average Water Loss Rate of 29%. However, overall, the five PDAMs in the DIY Province are still unable to meet the maximum tolerance limit for the Average Water Loss Rate set by BPPSPAM. The high acquisition of Average Water Loss Rate every year results in a decrease in the cost of water distribution service bills. Therefore, this has implications for less than optimal profit acquisition.

Picture 3 Recapitulation of PDAM Operational Expenses



Source: Ministry of PUPR

There has been an increase in PDAM's operational burden from 2017 to 2022, from IDR 163,413 million to IDR 252,557 million. This increasing trend will affect the acquisition of a decreasing amount of profit. If left unchecked, this condition will reduce the amount of profit that can be distributed as dividends for the region. In order to

manage the efficiency of operational activities at PDAM, BPPSPAM in collaboration with the Ministry of Public Works and Public Housing (Kemen PUPR) prepared an assessment of the development of the drinking water supply system (SPAM) as one of the performance assessment indicators for PDAM throughout Indonesia.

Based on the Decree of the Chairman of the Supporting Agency for the Development of Drinking Water Supply Systems Number 002/KPTS/K-6/IV/2010 concerning the Evaluation of the Performance of Drinking Water Supply System Development Services in Drinking Water Company Regions, the evaluation of PDAM performance uses the Balance Score Card (BSC) approach.

Through this approach, the company's ability to earn profit is seen in the profitability aspect and measured using the return on equity (ROE) indicator. This is applied to measure optimization in the process of good operational activities. The goal is for the company to achieve a positive and significant level of profitability as a basis for business continuity (Putri, Wiratno, & Sunarmo, 2017).

As a primary indicator in assessing the company's main performance, profitability is closely related to the level of profit for the company. Improving the marketing strategy for PDAM services is often the main focus of the company when facing a decline in profit, even though based on data on the number of PDAM customers; recapitulation of PDAM's net profit in the Special Region of Yogyakarta; average water loss rate in the Special Region of Yogyakarta; and recapitulation of PDAM's operational expenses. Thus, this study aims to study the relationship between the number of customers, the amount of water loss, and operational costs on PDAM profitability.

B. Literature Review

Public Sector Management Accounting

Public sector management accounting is one of the branches of accounting that involves the process of reporting financial information in the internal departments of a public sector company. "Management accounting is the presentation of financial and non-financial information (operational processes, workforce, environment, culture and others) to managers as a basis for designing organizations and their activities, decision making and also feedback or control processes, all of which are carried out to achieve goals. This means that management accounting is used as a container for all improvements in public sector performance" (Indra Bastian, 2015).

Financial Performance Assessment

Financial performance assessment is a management tool to increase the responsibility and quality of the decision-making process in a company (James B. Whittaker (in Indra Bastian, 2015)). Based on the Decree of the Head of the Supporting Agency for the Development of Drinking Water Supply Systems Number 002/KPTS/K-6/2010 concerning the Assessment of the Performance of Drinking Water Supply System Development Services at Regional Drinking Water Companies, the PDAM Performance Assessment uses a “balanced scorecard” approach to measuring various aspects, namely financial, service, operational, and human resource aspects. In the financial aspect, BPPSPAM reviews the quality of financial performance in terms of profit through profitability with the Return on Equity (ROE) indicator.

PDAM profitability

The Drinking Water Supply System Development Support Agency (2020) explains that profitability is the ability of PDAM which is useful for creating profits in order to maintain business continuity. Profitability in PDAM is measured through the Return on Equity (ROE) indicator which is obtained from the result of dividing net profit after tax by the amount of company equity (BPPSPAM, 2020).

C. Research Methodology

Research Design

This study is a type of research through a quantitative approach designed to identify and analyze the relationship between the variables of the number of customers, the level of water loss, and operational burdens on profitability in all Perumda PDAMs in the Special Region of Yogyakarta Province during the period 2017 to 2022.

Sample and Population

The population of this study consists of all regional drinking water companies registered in the operational area of Indonesia II, namely the Special Region of Yogyakarta Province from 2017-2011, while the sample is part of the number and characteristics of a population. Determination of the sample of this study uses a non-probability approach, namely purposive sampling. The sample in the study was taken

from PDAMs that have data on the development of the number of customers, the level of water loss, the operational burden of ROE calculations in the PDAM BUMD performance evaluation book.

Data Analysis Tools

The data obtained were analyzed using multiple regression analysis

$$Y = \alpha + \beta_1 JumPL_1 - \beta_2 AVERAGE WATER LOSS RATE_2 + \beta_3 BOP_3 + \varepsilon$$

Information:

- Y = Rentabilitas PDAM Se-Provinsi D.I.Yogyakarta
- α = Koefisien variabel dependen
- β_1 = Koefisien variabel independen 1
- $JumPL_1$ = Perkembangan Jumlah Pelanggan
- β_2 = Koefisien variabel independen 2
- $Average Water Loss Rate_2$ = Tingkat Kehilangan Air
- β_3 = Koefisien variabel independen 3
- BOP_3 = Beban Operasional
- ε = Variabel Gangguan

D. Research Results and Discussion

Multiple Linear Regression Test Analysis

The following are the results of multiple linear regression tests based on the calculation results using SPSS as follows:

Table 2 Multiple Linear Regression Test Analysis Results

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error			
1	(Constant)	16,142	1,795		8,995	0,000
	Jumlah Pelanggan (X1)	-0,00011	0,000	-0,661	-6,016	0,000
	Tingkat Kehilangan Air (X2)	-0,354	0,067	-0,509	-5,286	0,000
	Beban Operasional (X3)	-1,035E-05	0,000	-0,102	-0,927	0,363

a. Dependent Variable: Rentabilitas (Y)

$$Y = 16.142 - 0.00011 X_1 - 0.354 X_2$$

Analysis of Determination Coefficient Test (R^2)

The coefficient of determination test is a test conducted to evaluate how much percentage of the variation of the independent variables (number of customers, level of water loss, and operational load) used in the model in this study can explain the variation of the independent variable (profitability).

Table 3 Coefficient Determination Result Test

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.872 ^a	0,761	0,733	0,74586
Kehilangan Air (X2), Jumlah Pelanggan (X1)				

Based on the results presented in the table above, the percentage of diversity of the profitability variable (ROE) (y) that can be explained by the variables Number of Customers (X1), Water Loss Level (X2), and Operational Expenses (X3) is 73.3%, while the remaining 26.7% is explained by variables outside the regression model.

Table 4 Result of T test

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	16,142	1,795		8,995	0,000
	Jumlah Pelanggan (X1)	-0,00011	0,000	-0,661	-6,016	0,000
	Tingkat Kehilangan Air (X2)	-0,354	0,067	-0,509	-5,286	0,000
	Beban Operasional (X3)	-1,035E-05	0,000	-0,102	-0,927	0,363
a. Dependent Variable: Rentabilitas (Y)						

The results of individual significance show that the variables of the number of customers and the level of water loss have a significant influence on PDAM's profitability (ROE). These results can be seen in the significance probability value obtained by the two variables of 0.000. Furthermore, the variable number of customers $0.000 < 0.050$ with a calculated t value of $-(6.016) > t$ table $-(0.3739)$ while the variable

level of water loss obtained a calculated t value of $-(5.286) > t$ table $-(0.3739)$. Both calculated t values produced by the variable number of customers and the level of water loss showed results that were greater than the existing calculated t value. This means that H_0 is rejected so that the constant is declared significant to the regression model.

Tabel 5 Result of F Test

ANOVA ^a						
Model	Sum of Squares	df	Mean Square	F	Sig.	
1	Regression	45.966	3	15.322	27.542	,000 ^b
	Residual	14.464	26	0.556		
	Total	60.430	29			
a. Dependent Variable: Rentabilitas (Y)						
b. Predictors: (Constant), Beban Operasional (X3), Tingkat Kehilangan Air (X2), Jumlah Pelanggan (X1)						

According to the results of the F statistical test calculation, the results obtained are that the calculated f value $(27,542) > f$ table (3.369) and sig $(0.000) < 0.05$, so it is concluded that there is a significant influence of the variable number of customers X1, water loss rate X2, and operational load X3 simultaneously on profitability Y so that H1 is accepted and H0 is rejected. This means that in this study there is a linear relationship between all independent variables and the dependent variable.

Discussion

Number of PDAM Customers in DIY

The results of the individual significance test (statistical t test) show that the number of customers calculated based on direct channel units has a negative and significant effect on PDAM's profitability as measured by the ROE indicator. This can be seen from the coefficient value of the number of customers variable of -1.10×10^{-4} ; the calculated t value of -6.016 ; and the significance probability value of 0.000 (less than 0.05). This means that the number of customers will reduce ROE.

The findings are also inconsistent with the research of Merina. Y, Sri. M, & Yana Ulfah (2017) who found that the number of customers affects the profitability of PDAM Tirta Mahakam Tenggara. In addition, research conducted by Mintari, Utary, & Ulfah (2019) explains that the number of customers has an influence on the profitability of PDAM in Tallo Palopo Regency.

Through the research of Merina. Y, Sri. M, & Yana Ulfah (2017), they argue that this relationship is influenced by the offering of products and services that provide more satisfaction to PDAM Tirta Mahakan Tenggara customers. According to Mintari, Utary, & Ulfah (2019), this can happen because PDAM East Kalimantan is continuously improving the quality of service provided to PDAM customers.

The negative influence between the number of customers on profitability (ROE) occurs due to three factors. First, based on the self-request unsubscription checking form, most of the DIY Province PDAM Water customers have more than one water source including PDAM water pumps and communal wells (Fauziah, 2016). Second, the volume of water sold at PDAM is much lower compared to the existing water production volume. Third, the number of recorded customers is not all active customers.

The number of inactive customers has the potential to increase the Average Water Loss Rate of the amount of receivables and has an impact on the amount of receivables allowance. The more receivables allowance, the smaller the profit obtained by the company.

PDAM Water Loss Rate

The level of water loss has a negative and significant effect on PDAM's profitability. If the level of water loss is higher, the volume of water distributed will be lower. This has an impact on the volume of PDAM's drinking water consumption per small direct channel unit. Furthermore, considering that PDAM's main business activity is selling water, the small volume of water distribution will affect the income from the sale of PDAM's small volume of drinking water.

The problem of high water loss rate is triggered by several factors such as outdated piping system since the Dutch era, the lack of responsiveness of PDAM in handling customer complaints about water leaks considering the number of technical repair personnel is not balanced with the number of complaints reported by PDAM customers, and the filtration process before PDAM drinking water is safe for consumption resulting

in Average Water Loss Rate of much PDAM water being wasted before it is ready to be distributed to PDAM customers. This means that the level of water loss has a negative and significant effect on the profitability of PDAM throughout the Province of D.I.Yogyakarta.

PDAM Operational Expenses

The results of the analysis above, conclude that operational costs have a negative but insignificant effect on PDAM's profitability. PDAM's operational costs consist of various costs sacrificed to run the company's daily operations. According to BPPSPAM (2010: 35), PDAM's operational costs consist of several components, namely employee costs, fuel costs, electricity costs, depreciation & amortization costs, maintenance costs, administrative & general costs, and other operational costs.

Furthermore, the operational costs used to repair the pumping system are included in the transmission and distribution costs with a nominal amount that is still relatively low compared to administrative and general costs. Therefore, although operational costs increase every year, this increase is not dominated by costs that are directly related to the production process and water distribution.

Furthermore, the insignificant relationship between operating expenses and profitability measured by the ROE indicator is caused by the equity component in the ROE indicator. Based on the calculation of financial performance (BPPSPAM, 2010), ROE is formed from the amount of net profit divided by the amount of equity (equity + reserves). However, operating expenses are more closely related to revenue and profit. The higher the profit, the higher the Average Water Loss Rate of operating income. This income will tend to increase if the amount of operating expenses is smaller than the amount of income.

Rentability of PDAM

Based on the results of this study, it shows that the coefficient of determination is able to produce a value of 0.724. This means that through the data presented and processed in this study, there are 72.4% of the dependent variable, namely the profitability of PDAMs throughout the Province of D.I. Yogyakarta, which can be explained by the three independent variables tested, namely the number of customers, the level of water loss, and operational load. Furthermore, 27.6% of other factors that

influence the profitability variable of PDAMs throughout the Province of D.I. Yogyakarta are explained by other variables.

The highly significant F statistical test results can be interpreted that the increase in the number of customers, the level of water loss, and operational costs together have an influence of 75.3% on the PDAM profitability obtained. This means that the relationship between the three independent variables on PDAM profitability has a significant response. Therefore, a significant decrease in profitability can be proven from the simultaneous increase in the number of customers, the level of water loss, and operational costs.

E. Conclusion

The number of PDAM customers has a negative and significant effect on the profitability of PDAMs throughout DIY. The level of PDAM water loss has a negative and significant effect on the profitability of PDAMs throughout DIY. PDAM operational costs have a negative and insignificant effect on the profitability of PDAMs throughout DIY. The number of customers, the level of water loss, and PDAM operational costs have a significant effect on the profitability of PDAMs throughout DIY.

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